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ABSTRACT

The Circulation of Money in Roman Britain from the First to Third century by John Creighton

"Any analysis of the ancient economy that pretends to be more than a mere antiquarian listing of discrete data has perforce to employ models"

Moses Finley The Ancient Economy

This thesis develops and employs models with the specific intention of trying to reconstruct an impression of how money circulated in Roman Britain in the first three centuries AD. The models are self standing and are potentially applicable to a wide variety of numismatic material, and also to other forms of material culture.

The work is divided into three parts. In the first the nature of the evidence from coin hoards is assessed. Using the weights of the coins, and analyses of the structure of the hoards, conclusions can be drawn about the changing velocity of circulation of coin at different dates, about its entry points into circulation, and about the division of wealth within society. The section uses a corpus of coin hoards from Britain which is provided in an appendix.

The middle part draws in the evidence from site finds. A model is created which combines site find and hoard evidence to attempt to reconstruct an idea of the changing money supply of Britain. This is done for both *denarii* and *sestertii* . The model is tested against a variety of data.

In the final section, a variety of other forms of evidence are drawn in to discuss broadly chronologically the changing nature of the circulation of money in Britain from the first to third century AD. The transition from Iron Age to Roman coins is analysed paying particular attention to the case of the Iceni. The relationship between the use of silver and 'bronze' coins is investigated, the debasement of the *denarius* and its replacement by the '*antoninianus*' is discussed. Finally the quantity theory of money is applied to the data, and the numismatic information is contrasted with that from other branches of archaeology.

The Circulation of Money in Roman Britain from the First to Third century

John Douglas Creighton

Submitted for Doctorate of Philosophy at
the University of Durham, in the Department of Archaeology

1992

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from it should be acknowledged.



1 - 5 JAN 1993

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Declaration
No part of this work has been submitted as part of a degree by myself at this or any other university.

Statement of Copyright
The copyright of this thesis (with the exception of Appendix 2.21, part 1) rests with the author. No quotation from it should be published without his prior written consent and information derived from it should be acknowledged.

Appendix 2.21 (part 1) is a modified version of the unpublished work of M. Sekulla, and the copyright remains with him.

Preface

This thesis was made possible by the grant of a Durham University Studentship and a British Academy Award. Throughout I was supervised by John Casey. Frequent consultations over numerous cups of coffee and the occasional bottle of wine were always enjoyable. This thesis owes much to John who allowed me free reign to follow my own nose into areas which other supervisors might have discouraged. Also, for a thesis conducted so far from London, his own personal library proved invaluable. I have a lot to thank him for, and am glad to take this opportunity so to do.

The final stages of this work took place with the assistance of the Leslie Brooks Fellowship at St. Cuthbert's Society, with rooms provided just above the Society's wine cellar. I found it a most agreeable fellowship. More recently employment by King Alfred's College Winchester and Reading University has sustained me.

Throughout the years many people have contributed to this work. Some by reading through drafts, others by chatting over a bottle of wine or by providing me with opportunities to talk. I would like to thank the following: 'Chip', Jeremy Evans, Mike Fulford, Colin Haselgrove, Simon Keay, Tony King, Martin Millett and Richard Reece. The list is by no means exclusive. In particular I would like to thank Richard Brickstock whose keen attention to numismatic details and English grammar has benefited this work enormously.

I would like to single out the work of several people. Many of the ideas here first germinated when putting together a seminar paper as an undergraduate at Durham in 1984. I had to read through many of Richard Reece's papers, and I began to think about the limits of numismatic evidence. Some of the sections in here are the logical developments of ideas born back then.

None of this work would have been possible without the numerous numismatists who have catalogued hundreds of thousands of coins over the years; and those who have started to bring the data together in the form of corpora. I would like to single out Nick Ryan's work on site finds and Mike Sekulla's unpublished work on Northern coin hoards, both were invaluable to me. Just as important as the identifications are coin analyses, and here the late David Walker must be mentioned. The foundations for the sections within on bronze coinage in Britain and the debasement of the *denarius* were clearly laid down by him.

One person whose work I have deliberately ignored has been Chris Going's. There is a congruence of interest between one of the closing themes of this thesis (4.5) and the

work Going has been doing on pottery production cycles in Roman Britain. This emerged after a chance meeting in the Institute of Archaeology followed by far too many beers on an empty stomach. A manuscript copy of a paper by him arrived just as the final changes to this thesis were being drafted, too late to be incorporated properly. There are many similarities in our views and yet important differences as well. That remains as something to explore in the future.

There are bound to be mistakes which remain in any work as large as this, despite other people's help in tracking them down and eliminating them. They are of course all my own fault.

Finally I must thank my parents for their support over the years.

John Creighton
Winchester
December 1991

1.0 An Introduction

1.01 Economic data and Roman Britain
1.02 Coins and Archaeologists
1.03 The economy of an empire
1.04 Aims

1.01 Economic data and Roman Britain

> "...the Romano-British economy has left us almost totally deficient in reliable statistics. That alone would make most modern methods of studying economic life inapplicable. We are, moreover, dealing with a world that, though highly sophisticated, worked in such a different way from our own that many commonplaces of modern economies are largely irrelevant... it is probably fruitless to seek to understand the underlying working of the ancient economy."
>
> (Salway 1981, 617)

If I had one principle aim in writing this thesis then it was to dispel the pessimism aired by Salway above. There are few literary references to 'economic life' in Britain in comparison to the heartland of the Roman Empire, and yet the by-products of that social and economic system, the archaeology, has probably been studied far more intensively in Britain than in any other province. However, archaeology has not yet provided the facts, figures and statistics that Salway felt were required, though that is not to say it is not possible. This thesis is an explicit attempt to explore how much is possible. What can one say about the Romano-British economy, or more specifically its monetary economy?

Anyone who tries to reconstruct statistics for the economy of the ancient world is liable to be prone to wide margins of error. I have no doubt that this work suffers from that as much as any other, but I think that the attempt is worthwhile nonetheless. Perfect economic data simply do not exist even in the world today. Government facts and figures may be issued frequently, but that is not to say that they are accurate. Opposition parties feel obliged to dispute them, frequently with good foundation. Not only does this economic data get criticism from other politicians, but economists themselves can get decidedly fed up:

> "Financial markets everywhere twitch at each new revelation in an ever-widening range of official statistics on economic performance. Yet the figures themselves seem increasingly foggy, with balances of payments that do not balance and national accounts that do not add up. ... Are all countries' statistics equally dodgy? ... Italy is widely thought to have the worst. International statisticians have still not forgiven it for adding an extra 18% to its GDP overnight in 1987, which just happened to push the size of its economy ahead of Britain's."
>
> (The Economist, no.7723, 1991, p 114)

So when I look back at the ancient historical world with its partial data liable to wide margins of error, comprising exaggerations, figments of rhetoric and maybe even the odd gross inexactitude, somehow things do not seem so different from today.

In studying the Romano-British monetary economy what information do we have at our disposal? In the realm of financial records the answer is very little. What appear to be accounts have been found amongst the tablets from Vindolanda, but whether they represent anything other than notional transactions of money within the confines of the Roman army's internal accounting system is unsure (Birley 1990). Few inscriptions have any prices on them, and when they do they are not particularly helpful (RIB 215, 274, 754 and 899). The most informative comes from a statuette of Mars found in the Foss Dyke in Lincolnshire. It stated that it had cost of 100 HS to make with the three *denarii* for the bronze donated for by the smith (RIB 274). However, one price is not going to tell us much about the economy of a country. Little help is obtained looking overseas for parallels. Most of the prices recorded in Italy and North Africa are for marble statues rather than bronze statuettes, so comparisons are difficult (Duncan-Jones 1982). Beyond a couple of literary references to the province the only other evidence we have comes from coins, and it is to these that the attention of this thesis primarily turns. If monetary information is to be reconstructed for Britain then it has to draw upon the creation of models based upon numismatic and archaeological data.

1.02 Coins and Archaeologists

In March 1973, a two day discussion was held at the Institute of Archaeology in London. The volume which evolved from it tried to close the growing gap between numismatics and archaeology (Casey & Reece 1974). All the papers contained within were concerned with 'applied numismatics'. The collection reflected the state of the subject at the time: What had been done so far? Where was the subject going? A number of themes kept on cropping up: one of them was a pessimistic view of how much coins could legitimately tell us, and how numismatic data had been misused by field archaeologists:

> "Several speakers expressed a feeling of despondency if not downright despair about the use of coins to archaeologists, especially their value as dating evidence. This despair came mainly from the archaeologists, but one suspects this is largely due to the expectation in the past of too much information from single coin finds."
>
> (Collis 1974b, 173)

> "This paper has been a plea for a realistic view of medieval English coins as dating evidence. Archaeologists want dating evidence which is certain and precise and when they find a coin they all too readily assume that they have got it. They rarely have."
>
> (Archibald 1974, 264)

One particular point which occurred in the majority of papers was coping with the longevity of coinage in circulation. It was not possible to create any simple rules about how long coins remained in circulation:

> "In normal circumstances a penny of 1250 found in a level of 1300 is certainly residual but a penny of 1300 found in a level of 1350 could very well be a contemporaneous loss as the coins of 1300 were among the commonest of those in circulation fifty years later."
>
> (Archibald 1974, 235)

This concern was by no means a new one. In his review of Romano-British archaeology in 1930 Collingwood referred to it being a major problem in dating (Collingwood 1930, 187). The only way which many of the authors thought they could tackle it at the time was by looking at the state of wear on the coin, though all professed a degree of unhappiness about this. Few considered wear to be a reliable guide to longevity. Different denominations circulated at different rates at different times. Many coins also lay idle in hoards for long periods of time. A number of suggestions were made during the discussions and Collis wrote an additional paper outlining some of his own ideas for tackling the problem (Collis 1974b). Unfortunately, more than ten years on, the preoccupations in the numismatic literature are still the same. In 1986 Casey still needed to say: "...the way in which many archaeologists have used, and are using, coin evidence is deplorable. Many discussions of sites are based on naive and erroneous assumptions rising from a profound ignorance of the problems which are inherent in numismatic studies." (Casey 1986, 68); and in 1987 Reece recounted a particularly depressing story of the problems of residuality (Reece 1987, 15-18).

The residuality of the coinage in the monetary system remains one of the major problems of applied numismatics and archaeology. Most material culture in Britain from the first century BC has been dated using associations with coinage. When it is considered that many Republican *denarii* were a couple of centuries out of date before they were lost, this can be worrying. The problem needs to be tackled as a matter of urgency if numismatic methodology is to develop. Some ideas have been put forward in articles such as Collis (1974b) and Crummy and Terry (1979), but the ideas have yet to be converted into usable numismatic tools.

1.03 The economy of an empire

Meanwhile in ancient history and other spheres of archaeology interest in the nature of 'the economy' grew throughout the 1970s and 80s. Two of the most influential works dealing with the Roman world were written by ancient historians. They were Moses Finley's 'The Ancient Economy' (1973) and Keith Hopkins' article 'Taxes and trade in the Roman Empire' (1980). Though Finley's work was largely restricted to historical

data, Hopkins paper was more interdisciplinary. Hopkins used many forms of evidence many would prefer to see as the preserve of archaeologists: shipwreck numbers, hoard structures, even population figures. Yet even these figures and some general statements about the levels of material culture understate the potential that the archaeological data can provide.

One of the main reasons that macro-economic studies have been slow to develop from archaeological evidence is the requirement for quantified groups of material distributed over a wide area. Many pottery and bone analysts have different ways of recording their data, and their lack of consistency hinders comparisons over any area larger than that which an individual can cover. Numismatics, however, has already overcome many of these problems. Though numismatists may still quibble over some identifications and attributions, there is now a tremendous degree of consistency in the recording of coinage. RIC and LRBC have become the standard catalogues, though occasionally references to other volumes still occur. This uniformity means that numismatics provides a tremendous potential data base spanning much of the Empire which has been reasonably consistently recorded.

What information does the paleoeconomist require? At present archaeology is divided into a variety of specialist fields. If it is going to reconstruct macro-economic models of the past then a large number of numeric variables are going to be required, each quantifying various aspects of Romano-British life. It would be perfectly possible to develop variables representing: the quantity of pottery from local, regional and overseas kilns found on sites; the amount of building activity (in the towns, small towns, villages and villa sites); the variety of produce grown on rural sites; and so on. Once such variables are established then it would be possible to see how changes in one area of Romano-British life effected other aspects. Such multi-variate models exist already for analysing more modern economic data, and similar methods have been used on anthropological data (Pryor 1977). Other variables could be derived from the literary and epigraphic record, such as estimates of the size of the standing army in Britain and its notional pay. As with all variables, limits of accuracy would be required.

Then there are a range of monetary variables which it would be interesting to relate to these. How much money was there in circulation and how evenly was this divided up? How quickly or slowly did it circulate? Where did it enter circulation? To what extent did society become monetized - was money progressively used for more and more things until the end of Roman Britain or did the monetary economy periodically expand and contract? All these questions appear to be impossible to answer directly, especially considering that fundamental variables like the residuality of coinage in the circulation

pool have yet to be worked out. All are questions about a dynamic system, whilst we only have its static remains left to exaimine.

Some people have already made such attempts to measure and compare some of these variables for the Empire as a whole. Crawford, on the basis of die-link studies, estimated the output of coinage in the late Republic. He then compared this figure to the total level of army pay during the period. The two plotted together (Crawford 1974, 697-707) showed a fair correlation down to the time of Sulla. On the other hand, Burnett (1987, Fig 5.1) attempted a similar analysis, this time comparing the army figures with the output of new coin as represented in the large Monte Codruzzo hoard. He managed to see only a very approximate correlation between the two. For the match to have been perfect would have required the army to have been paid only in new coin. Crawford believes that this was probably the case up until Sulla (Crawford 1974, 617-8), but after that the idea is harder to sustain. Indeed by 43 BC we have literary evidence for the reuse of old coin as payments by Octavian and Brutus (Crawford 1974, 640 n.2). In the same vein, Casey (1986, 123) compared Carradice's Domitianic output figures (Carradice 1983, 88-9) with the estimated level of army pay at the time. On average, the mint output only accounts for about 15% of the cost of the army. Even taking into account errors in the calculation of the output figures and the level of army pay, this difference is considerable. This is surely to be accounted for by the recycling of coin.

Hopkins (1980,106-9) tried to build an idea of residuality into his model of the money in the late Republic. Using Crawford's volume of output figures and making a number of assumptions about the data, he reconstructed a graph which purported to show the growth of the money supply during the late Republic; this he correlated with the idea of increasing trade. The following assumptions were used: "(a) either 30,000 coins were on average struck per (obverse) die, or the average number of coins struck per die was roughly stable throughout the period 157-50 BC; (b) the rate of loss was significant, and is here set tentatively at 2 per cent per year; (c) the initial stock of silver coins in 158 BC tentatively set at 35 million *denarii* ." Also he held that old coin was not reminted. Assumptions (a) and (c) are useful devices, they might prove to be inaccurate but they provide an order of magnitude and scale. The rate of loss from circulation, however, seems very high. Casey has suggested, from an analysis of finds at Corbridge and Caerleon, that only about 0.003 per cent of coins passing through a site get dropped and passed into the archaeological record (Casey 1986, 84-5). Even if the site lists only represent one hundredth of what there remains potentially to find, the 0.3 per cent still remains a whole order of magnitude different from Hopkins figure, though there are significant differences between the nature of Hopkins and Casey's analyses. But even if a growth in the money-supply was real (and setting a lower wastage rate would only

enhance this), the Empire had expanded as well during this period and the *denarius* had taken over from some pre-existing monetary systems in many of these areas. So if the increase in the money-supply was matched by a similar rise in the population using the coin then its net economic effect would be minimal. The lesson from this must be that monetary data must not be treated (and certainly interpreted) in isolation from other variables.

The one major problem with these kinds of studies ultimately based upon die-link analyses is that they only tell us (more often than not) about empire-wide phenomenon. The *denarius* circulated throughout the empire (with perhaps the exception of Egypt), by examining how many were produced will tell us about money-supply figures for the empire as a whole, but if our interest is on any lesser scale (such as the interaction between provinces) then this kind of analysis is not going to hold except in rare cases (such as the *Britannia* issues under Antoninus Pius). Also they cannot tell us about levels of Imperial expenditure since state payments may have been made in old coin as well as new.

1.04 Aims

> "...grousing is not good enough. Even in modern economic history, Fogel pointed out in a programmatic statement on econometric history, the 'new economic history', it "is often true that the volume of data available is frequently below the minimum required for standard statistical procedures. In such instances the crucial determinant of success is the ability of the investigator to devise methods that are exceedingly efficient in the utilization of data - that is, to find a method that will permit one to achieve a solution with the limited data that are available." For us there are very narrow limits: ... We shall see, however, that methods can sometimes be found by which to organize ancient data that appear beyond redemption at first sight."
>
> (Finley 1973, 25)

In what follows new numismatic models are developed with the explicit aim of trying to obtain monetary economic data for just one small area of the Roman World: Britannia. Above I posed a number of questions which one might wish to ask of the Romano-British monetary economy:

- How much money was there in circulation?
- How evenly was this distributed?
- How rapidly did it circulate?
- Where and how did coin enter circulation?
- Was monetization progressive or variable?

All of these questions and more are answered to some degree in what follows, and correlations with other historical and archaeological data are made. Some of the models

are more reliable than others and I hope that throughout I have made clear the reliability of the conclusions drawn.

The period chosen for the study has been the duration of the circulation of the *denarius* in Britain. Often the fourth century has received more attention because of the wild variation in the number of coins discarded in different periods; on all coin histograms the late third and fourth century always appears to be more dramatic than the tiny variations in the first and second century. Mint details and regional production provide the fourth century specialist with an extra avenue to explore which the High Empire monetary system does not really have. Nonetheless, the High Empire with its longevity of circulation of coin and its more subtle variation is perhaps an even harder testing ground for developing new models. Once developed and tested for Britain, hopefully these models will be suitable for use in other provinces and other coin series.

I am sure that as Finley said much of what follows may appear to be beyond redemption at first sight. However, I believe that much of it will sustain a second look.

Section 2: The Hoard

2.1 Historical and Conceptual Survey

First hoard typologies are reviewed (2.11), then the position of the hoard within the currency system pool is assessed (2.12). Two analyses are performed to try to clarify some of the ideas suggested about the nature of coin hoards (2.13-14), and finally the link between hoard structure and the nature of the circulation pool is discussed.

2.2 The Hoard Database

In this section the requirements of a hoard database are assessed (2.21). The hoard corpus is then introduced (2.22) with further comments about their structure and codification of the database (2.23 & 2.24).

2.3 Coin Wear and the Velocity of Circulation of Coinage

In this section the contribution that coin wear can make to reconstructing the circulation pattern of coinage is addressed. The work of Rogers and Duncan-Jones is examined where it is always assumed that the rate of wear did not vary (2.33). Learning the lessons from these analyses, a different way of looking at coin wear is attempted allowing for the chronological variation in rates of wear (2.34-36). In the light of this some of Duncan-Jones' work on the circulation of *sestertii* is reassessed (2.37).

2.4 Uniformity and Variability in Hoards

A broad pattern of similarity is found amongst British *denarius* hoards of the same date (2.41 & 2.42), however, this is not to say that their composition is entirely uniform. Reasons for variation in hoard structure are discussed (2.43), and contingency tables are used to see if this variability is consistent over time (2.44). It is not, and reasons are sought for this (2.45 & 2.46).

2.5 Hoard Structure

The aim of this section is to expand upon some of the ideas introduced in section 2.4. Here we want to examine in detail hoard structure. Two new methods are developed to quantify the structure of hoards (2.51 to 2.54). This information is then analysed for chronological (2.55) and geographical (2.56) trends; both of which are found.

2.6 Hoard Size

This section looks at the information to be derived from the size of hoards Three main questions are asked. Is there any difference between the structure of large and small hoards? (2.62) Is there any change in the relative numbers of big and small hoards through time? (2.63 & 2.64) And is there any geographical pattern to the distribution of abnormally large hoards in Britain? (2.65) But first the quality of the database is assessed (2.61).

2.1 Historical and Conceptual Survey

2.11 Hoard typologies
2.12 The place of hoards in the currency system
2.13 The micro-excavation of hoards
2.14 Searching for emergency coin hoards
2.15 The equation of the hoard with the currency pool

First hoard typologies are reviewed (2.11), then the position of the hoard within the currency system pool is assessed (2.12). Two analyses are performed to try to clarify some of the ideas suggested about the nature of coin hoards (2.13-14), and finally the link between hoard structure and the nature of the circulation pool is discussed.

2.11 Hoard typologies

Many hours of numismatic scholarship have gone into the creation of hoard typologies: emergency hoards, savings hoards, robber hoards, and other types of hoards, each expressing different motives for the accumulation and deposition of assemblages of coinage. These divisions are clearly expressed in Grierson's introduction to numismatics (Grierson 1975, 124-136). However, recently doubt has been cast upon the value of such distinctions. Kent (1974) repeated the standard typology while expressing reservations about many of the categories, whereas Crawford condemned the exercise as being of little validity and use: "One spectre that needs to be exorcised...is the obsession of much earlier scholarship with the classification of coin hoards according to the purpose of their depositors, a subject on which neither the ancient literary sources nor the circumstances of discovery of hoards shed much light." (Crawford 1983, 198). Reece expressed a similar viewpoint arguing that "anything which any archaeologist says about the circumstances surrounding a coin hoard can only come from his own head because it cannot come from the hoard" (Reece 1987, 47). To be fair, the occasional hoard exists which does 'speak' to us. One such was from Bollingen in Wurttemberg, buried in 1634 during the Thirty Years War. It contained a message saying that the Swedes were coming, taking everything into their possession, this hoard being all that the owner had left to protect (Grierson 1975, 132). However, such a case is the exception.

Since a debate exists about the value of these typologies, then this seems like a sensible place to start. The major classifications ascribed to hoards are as follows:

Emergency hoards:

> "It has, of course, long been recognized that the widespread concealment and loss of coin hoards, at a particular period, in a particular country or district, was, in all probability, due to unsettled conditions in that country or district. It has too, long ago been pointed out, notably by Sir George Macdonald, by Dr H. Mattingly, by Mr B. H. St. J. O'Neil, and by Dr C. H. V. Sutherland, that, in view of the probable connection between the loss of a large number of coin hoards and contemporary events, a study of the Roman coin hoards lost at various periods in Britain may be expected to throw light

> on contemporary Romano-British history, as well as, obviously, on contemporary Romano-British currency."
>
> (Robertson 1974, 14)

Such has been the historically dominated view of coin hoards, lots of hoards directly indicating warfare or troubled times (though this does not represent Robertson's view in totality). Leaving this questionable idea aside for one moment, what are the key points that a numismatist has to look for to distinguish an emergency hoard from any other type? The theorists suggest that special selection factors would not exist in the hoard, the collection being a corpus of whatever the collector could lay his hands on at the time he took fright. So 'emergency hoards' would represent a good idea of the money in circulation at the time of the crisis (cf. Grierson 1975, 133; Casey 1986, 54).

Savings hoards:

These Grierson described as being "hoards in the traditional sense - savings put together by their owners over a period of years" (1975, 135). We are expected to recognize these by the different set of selection criteria which determined their composition. It is suggested that they are selective, containing high value coins rather than low ones, and better specimens of such coins, some perhaps even unworn. Indeed because of all these complicated selection factors Grierson despaired of such hoards being much use in the reconstruction of the pattern of money in circulation: "It is probably the case that savings hoards are more useful to the modern scholar in supplying him with material than for any conclusions he can draw from their structure or incidence." (Grierson 1975, 135). Another suggestion is that if we look at the sequence of deposition of coins in a savings hoard, we might discover a chronological pattern. With the earlier coins at the bottom and the most recent issues at the top (Casey 1986, 55). This would only be the case in a hoard which had never been disturbed during its accumulation.

As can be seen, these ideas suggest that there would be a marked difference between the composition of emergency and savings hoards. Kent summarizes the argument:

> "The first group [emergency hoards], it is held, discloses a cross section of the available currency in the desired denominations at the date of deposition. Such hoards will reveal a gradation of wear from the earliest to the most recent coin. The second [savings hoards] results from careful men putting aside coins from time to time over a lengthy period; such hoards contain random peaks of material, corresponding to fluctuations in their collectors' prosperity, and do not show gradation of wear to the same extent."
>
> (Kent 1974, 185)

However, this nice distinction can become totally blurred as Casey points out: "...there is nothing to prevent a savings hoard being snatched from its domestic deposit place in a crisis and used to form an emergency hoard in some other location, but it would nearly be impossible to make this distinction in normal circumstances and the mere possibility of

such an event emphasizes the extreme difficulty and ambiguity of interpretation of hoard evidence." (Casey 1986, 56).

Robber hoards:

This kind of hoard presumably reflects stolen booty, in which case it seems difficult to see how it would differ from a savings hoard on analysis. Grierson however, points out that "...robber hoards can often be recognized by the presence in them of cut up silver plate as well as coin. Many date from the time of the Germanic invasions, two of the best-known having been found in the British Isles, at Coleraine in Ulster and Traprain Law in Scotland." (Grierson 1975, 132). However, the presence of hack silver together with coinage suggests that these might better be seen as collections of bullion, both recovered from areas beyond the Roman frontier. Surely what we have here is a difference in the function of coinage; that of money in the province and bullion beyond its frontiers. There is no necessity to resort to recourse to motives of dishonesty and Germanic invasions.

Abandoned currency hoards:

This category represents a collection of coins deliberately left unrecovered because the coins themselves had become demonetized by a currency reform. Often the numerous hoards of the Gallic Empire are assigned to this category in the belief that *antoniniani* were no longer legal tender after Aurelian's reform. A similar situation may have happened with the coins of Magnentius after his defeat in 353. Presumably these hoards would be typologically similar to savings hoards; though they would only occur in larger numbers at a time of dramatic change in the currency system.

Purse hoards.

These are meant to be small groups of coins, accidentally lost by the carrier, rather than deliberately hoarded away. Typologically they would be fairly small groups, possibly of mixed denominations and containing the smaller coins which do not usually occur in savings hoards. Their alleged importance is that they represent what 'the man in the street' was taking to market that day; in another words they "...show which coins were in contemporary use and for how long individual issues continued in circulation, so giving an index of the reliability for dating of individual coins found in archaeological strata." (Casey 1986, 57).

Other types of hoard:

These are the main descriptive categories used. Many variants on these themes exist, 'currency hoards' and 'circulation hoards' can often be used as terms to describe the

larger versions of 'purse hoards'. An example of one would be a shop-keeper's till found in a destruction deposit, such as the Minturno hoard (RRCH 98), lost in 191BC (Crawford 1983, 198).

Problems with 'emergency hoards'

However, as stated, such divisions have not met with universal approval. Much of the work done on the location and periods of warfare on the basis of 'emergency hoards' has met with a great deal of criticism and scepticism. When historical periods have been investigated, though there is often an increase in the numbers of hoards left in the ground, their geographical distribution rarely has a direct correlation with the location of the historical battlegrounds. Kent (1974) examined the hoards of the Civil War in the United Kingdom. He showed that the distribution of hoards during this period was certainly different from that of the preceding and following years. However,the 'war distribution' did not demonstrate any kind of relationship to the storm centres of the war; except for one small cluster around the garrison town of Newark (Kent 1974, 192). Grierson recalled the early seventh century in the eastern Mediterranean, where the overrunning by the Persians of the mainland led to numerous hoards occurring on the islands of Cyprus and Crete; presumably places of refuge rather than areas of action (Grierson 1975, 132). Finally Pepys' hoard was buried in Huntingdonshire; while the actual trouble which had stimulated its collection and deposition had taken place in the Medway (Casey 1986, 54). Clearly where we have supplementary historic information, the distributions of hoards are shown to be very spurious guides to actuality. Misuse of hoard data in less well documented periods is all too easy. The interpretation of Gallic Empire hoards in Gaul in the late third century by Blanchet (1900) is one such example. Gallic Empire hoards are much more frequent than hoards of the preceding periods, and historically there were 'barbarian incursions' attested in Gaul. Blanchet combined these two pieces of information, interpreting the distribution of hoards directly as the areas of disturbance. While seeming to be a logical procedure, this phenomenon of Gallic empire hoards also takes place in Britain, where no such incursions are recorded (for a critique see Reece 1981c). If historical cases are fraught with problems, woe betide us venturing with the idea into proto-historic periods. Grierson sounded a suitable warning of danger:

> "...numismatics have shown how hoards can often serve as guides to areas of military activity...."
>
> "...Where particular interpretations like troop movements are involved, however, we usually have to know about their existence first, either from other archaeological evidence or from documentary sources, and then show how the coin finds confirm them and add greater precision to the details. Too many alternatives are possible for it usually to be safe to base particular explanations on coin finds alone."
>
> (Grierson 1966, xi-xii)

If we question the merits of using 'emergency hoard' distributions as a method of quasi-historical reconstruction, then what of the actual initial classification of the hoards?

Problems with hoard typologies:

> "...past commentators have always started discussion of hoards of any date with ideas of savings hoards, emergency hoards, and purse hoards, and the different categories have to be drawn from the commentator's own mind since they preface any discussion of actual hoards, and the different categories have been fixed to different hoards with practically no justification."
>
> (Reece 1987, 61)

There is an important problem with these models of hoard construction. Since they are almost entirely drawn from the imagination of numismatists trying to reconstruct past human motives, hoards which fit into these preconceptions will neither prove or disprove the ideas without any other corroborative data, such as the note in the Wurttemberg hoard. Where testing has been possible such as with the location of civil war coin hoards, these preconceptions have proved unreliable. One must wonder how useful these distinctions are. After all, as Casey (1986, 56) pointed out, a savings hoard snatched in an emergency and buried, still, in the eyes of a numismatist, has the composition of a savings hoard. Crawford was highly sceptical about it all:

> "Classification of coins prior to hoarding, however, does not support the notion of a rigid distinction between 'circulation' hoards and 'savings' hoards. Seneca (*De vita beata* XXIV 2) talks of...'a hoard hidden away, which you would not bring out unless it were necessary'; and one may hypothesize that some of the hoards of which we know are of this type, consisting only of an accumulation of coins from which none has ever been taken away. At the other extreme lies a hoard such as the Minturno hoard (RRCH 98), the contents of a shopkeeper's till, lost in the fire of 191BC. Between these two extremes there is surely an infinite gradation..."
>
> (Crawford 183, 199)

Reece went even further by suggesting that "...if these divisions are worthwhile, then they ought to be visible in the hoards, which ought to divide up into different numerical groups." (Reece 1987, 61). Later in this section this proposition will be tested.

2.12 The place of hoards in the currency system

If we want to realize data from coin hoards, then we must examine their relationship to the circulation of money. The classic view of this is illustrated by Haselgrove's model (1987, 35), redrawn in fig. 21.01. Here coin hoards are seen as an appendage to the circulation of money, somewhere that coins can go and rest out of circulation for a while, before being recovered and doing the rounds of the market place again. Indeed the definition of hoard in this diagram is that of a concealed body of coinage. However, this gives a remarkably out-on-a-limb picture of hoards.

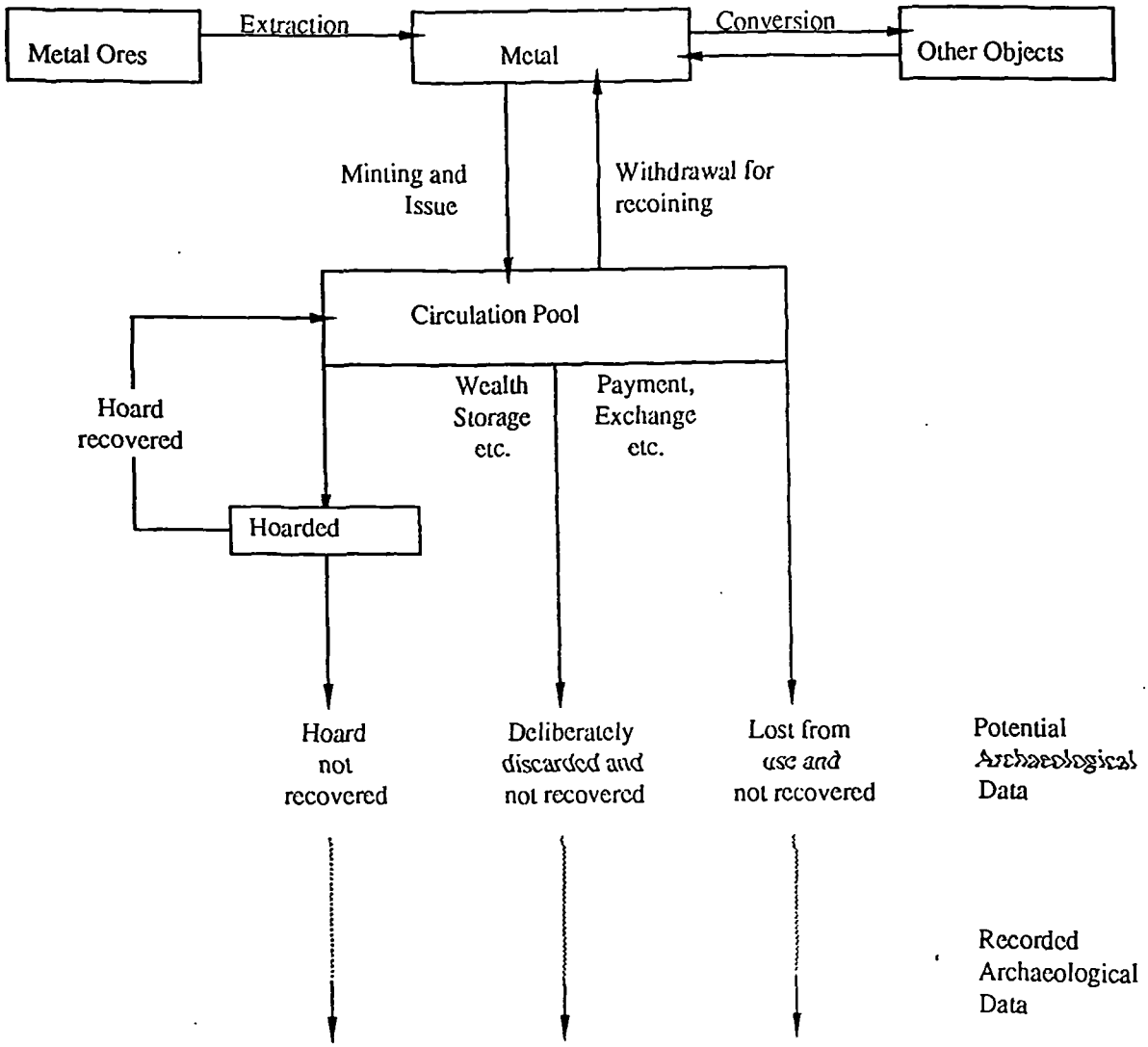


Fig. 21.01 Haselgrove's model of coin circulation

I would favour a less ethno-centric picture of circulation. In the present day, hoarding is a minimal activity because banking facilities exist. Our simple idea of the circulation pool consists of the coinage in our pockets, purses, in the till and perhaps the odd collection of 50p's for the meter at home. Coinage rarely hangs around at the bank, as the quantity received in and paid out each day usually balances fairly well. In antiquity, particularly Roman Britain, with its negligible evidence for any advanced banking facilities, the hoard of 50p's at home becomes much more significant. It becomes a dynamic store of wealth.

Collingwood pointed out that "...strictly speaking, coin is being hoarded whenever it is not being spent. The money in one's pocket, or in the till of a shop, is a hoard, even if none of it was there yesterday and none will be there to-morrow." (Collingwood 1930, 190). This view represents the hoard as a far more dynamic entity. This difference largely comes from a shift in emphasis in our terminology. Perhaps above ground we should refer to hoards as money-boxes, treasure-chests or cash-tills.

Robertson cites Cicero's *Pro Cluentio* (c. 179) which suggests that an *armarium* or money-chest was a familiar adjunct of a Roman household. This reference is by no means isolated in the classical literature. When the location of 'money' is mentioned, the most usual form is the triad of 'in land', 'out on an interest bearing loan' or 'in one's money-chest'. For example, Pliny in a letter about an Umbrian estate states: "You will ask whether I can easily raise the three million *sestertii* . Most of what I have is in land, but I have money out on loan and it will not be difficult to borrow. Besides, I can always have money from my mother-in-law, whose money-chest I can use as freely as my own." (Pliny, *Letters* , 3.19). Not to be out done, Trimalchio also had a money box, where he put ten million *sestertii* , because it could not be invested (*Satyricon* 54.3). Pliny, while in Bithynia, also had problems with investing money, and had to leave much lying idle in the city's money-chests (Pliny, *Epistles* 10.54). As Finley states: "This was a world which never created fiduciary money in any form, or negotiable instruments. Money was hard coin, mostly silver, and a fair amount of that was hoarded, in strong-boxes, in the ground, often in banks as non-interest-bearing deposits." (Finley 1973, 141) (though see section 4.52). We even have a description of some public hoards such as those in the temple of Apollo at Delos. In the strong room there were two treasuries, the 'sacred' and the 'public' chest. These consisted of a number of jars " on which was indicated the provenance of the contents or purpose for which it was earmarked" (Larson 1933-40, 341).

The 'circulation pool' is often talked about, but what in reality does it mean? It is all too easy to leave it as an abstract idea without contemplating the physical form that this media of circulating metal must have taken. The nature of the circulation pool can best be

contemplated by imagining life in Roman Britain suddenly frozen, with everyone stopped dead in their tracks. If we peer into this still frame and seek out the 'circulation pool', what would we find? A few coins might be in the process of being exchanged from one individual to another, a couple might be in flight as a coin is tossed to aid some decision-making process, slightly more might be in pockets being carried to or from market. But at any one time, the vast majority of coin would have lain in multiple individual accumulations or hoards.

The vast majority of silver coin would have lain in such deposits for most of their life-span; occasionally moving from one personal treasure-chest to another: via a hand, a purse, an exchange at the market or a payment to a tax official, and back into a money-box again - though this time someone else's. Smaller denominations, however, may tend to remain in the mobile purse or pocket, smaller numbers of which serviced and facilitated the exchange of larger denominations. With this image in mind I would redraw Haselgrove's diagram as fig. 21.02. As far as the circulation pool is concerned, the various denominations can be seen as spending unequal periods in different sectors of the hexagon, bronze coinage tending to stay to the left hand side, with precious metals to the right.

The next transformation to consider is the change from a collection of coinage in a money-box to becoming an unrecovered hoard available for us to find. The classic example of this transformation (though not the only one) is deliberate concealment. Robertson described a common motive, fear:

> "...a wealthy man who was about to set out on a journey and who feared either the dishonesty of those he left at home, or the hazards of the road, might conceal his treasure in a safer hiding place than his house until he returned."
>
> (Robertson 1974, 13)

Casey also suggested the same reason (Casey 1980, 53). This can be backed up, to some extent, by the classical literature. Robertson (1974,13) cited Plautus' play *Trinummus* , where a wealthy Athenian called Charmides did precisely this. Another sort of fear which has already been mentioned is that of warfare. Here we have the example of Cassius in Rhodes (Appian, *Historia Romana* iv, 73). In 42BC the people of Rhodes buried all their wealth in the ground on learning that Cassius was on his way; alas to no avail, since he made them dig it up again and surrender it all to him. Nonetheless, both are examples of temporary concealments.

The location of burial was of importance, it needed to be a memorable location, but not one that was entirely obvious or conspicuous. Pepys was incensed not only at finding his father had buried his savings in the garden during broad daylight (albeit on a Sunday

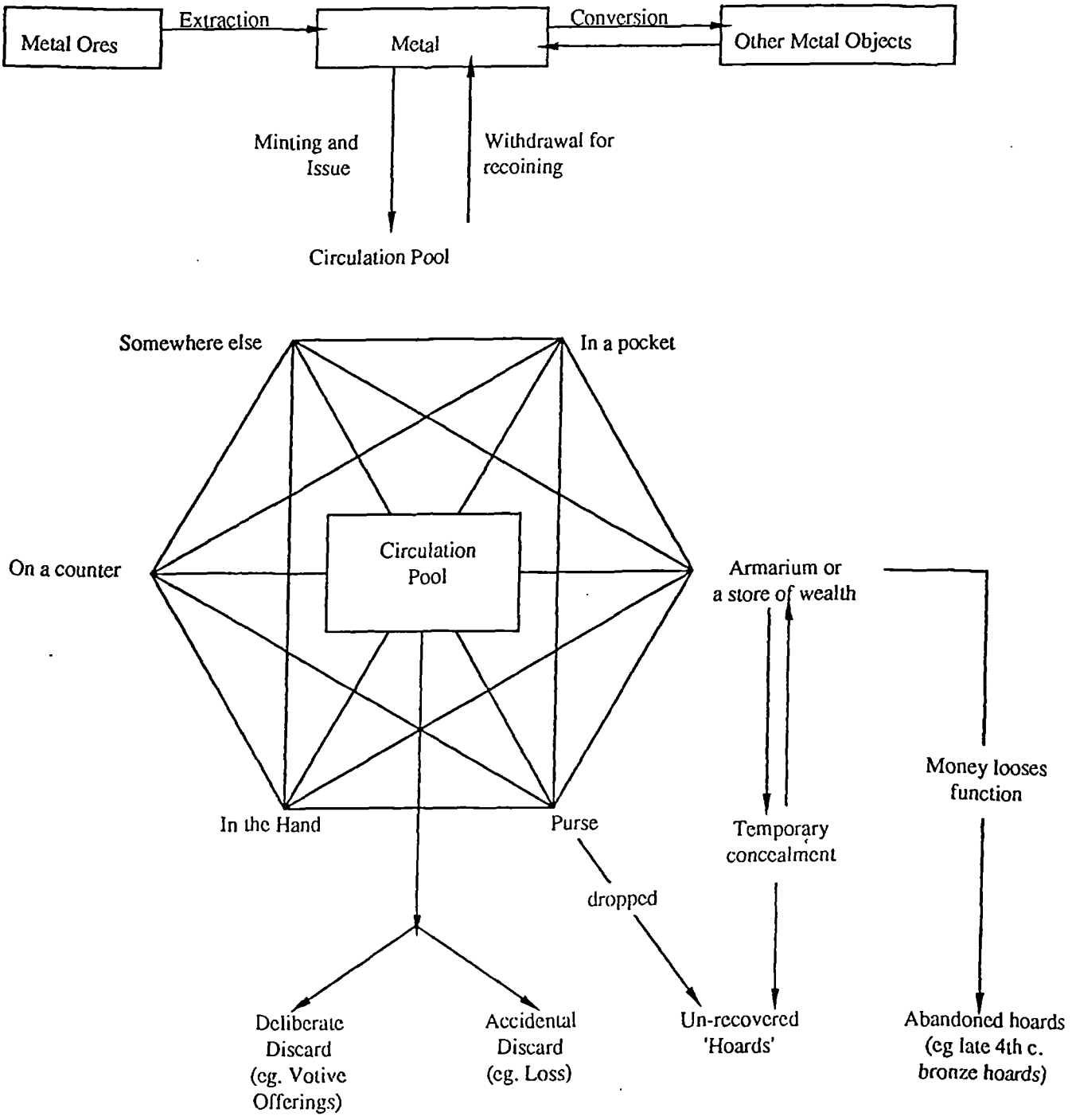


Fig. 21.02 Amended model of coin circulation

when everyone else was in church); but also that he had managed to forget where in the garden he had buried it. Robertson's study of hoards shows that the majority are found not on known settlement sites, but usually fairly nearby. However, there are exceptions:

> "Comparatively few hoards were deposited in inhabited sites, military or civil, and if they were, their position almost always shows that the owner took great care over their concealment - under the floor, in a hypocaust or pit, or in a disused ditch..."
>
> (Robertson 1956, 265)

This is the usual form of money-box to hoard transformation, and is directly expressed on fig. 21.02. The precise motive for concealment is unimportant here. However, there are other mechanisms. One case is that of abandonment hoards, where a currency has gone out of use. I do not intend to debate whether Gallic Empire hoards are such, since the sites of their concealment have not been noted to differ from the distribution of other hoards. However, this is not the case with late fourth century bronze hoards:

> "...it seems very likely that the hoard of copper coins lost, rejected or deposited after about AD 400, is the hoard most commonly encountered on Roman sites in Britain, (NB radiate hoards are far less commonly found on sites) and may eventually prove to be the most common type of Roman hoard. This would scarcely be surprising for it is the most obvious time when money might have been considered useless, hidden for 'the time being' and never recovered."
>
> (Reece 1974, 88)

In this case, the micro-distribution of hoards is different (at least in the south of England, though this may not be the case in the north, Casey pers. com.). The fact that the hoards are found on sites more frequently than before tells us a different mechanism is at work. Here it seems legitimate to assume the money simply lost its function. I would also wonder if it was particularly concealed, I would imagine that it simply remained where active money-chests were usually deposited in a household; whether that be in a pot on a kitchen shelf or under the floorboards. In our model of the system, the hoard would be created by a direct movement from the *armarium* to the archaeological record; not going via a concealment stage in the sense of earlier hoards.

Even though these transformation mechanisms are different, both can be seen as being family *armaria* without there necessarily being any differential selection processes having taken place prior to their deposition.

A third kind of transformation comes with the lost purse hoard. This is deposited from a different section of circulation pool. Many small collections may of course go unrecognized in site lists, as a leather bag may easily decay. On the other hand some may have been deliberate discards. At Birdoswald fort on Hadrian's Wall a purse hoard containing 28 *denarii* [S016] was found. It had been buried underneath the fort rampart.

It has been suggested that it was accidentally dropped just as the tons of rampart material were dumped on the bare earth site, and that once buried it was lost for ever. An alternative would be that it was some form of votive offering. Neither can be proved.

With our model, we have a large number of family *armaria* . As O'Neil says: "In the absence of organized banking facilities the practice of hoarding savings must have been well nigh universal in Romano-British times." (O'Neil 1935, 73). And in Robertson's view: "...unless the owner of a hoard was a miser, he must have been constantly taking money out of his savings, and again putting money in, or even spending his whole hoard and then starting to save afresh" (Robertson 1956, 268). This gives us a picture of the money-chest or unconcealed hoard, as being an important dynamic element of the currency pool. These ideas now need to be tested.

2.13 The micro-excavation of hoards

Earlier it was suggested that savings hoards might show chronological patterns in their make-up, with earlier coins being at the bottom, and later ones at the top. Conversely, if these were all dynamic collections of coin before deposition we would expect no such patterning to occur. Unfortunately this kind of analysis of a hoard is rare. Pots are often emptied out rashly in the excitement of the find. Nonetheless, at least five Romano-British hoards have been examined in this way. They are:

1.	Oliver's Orchard 1	[C 069]
2.	Oliver's Orchard 2	[C 070]
3.	Oliver's Orchard 3	[C 071]
4.	Aldbourne	-
5.	Tattershall Thorpe	[C 237]

The Oliver's Orchard Hoards:

> "The coins were...removed in batches according to the order in which they were removed from the pots, and it was possible to reconstruct an outline pattern of distribution within the containers. In hoards 1 and 3 the pattern was consistent, with the same mixture of coins in each layer within each pot. But in hoard 2 there was a noticeable difference in the balance between the earlier, finer coins and the later baser issues.
>
> ...it can be seen that the finest coins were concentrated in the upper part of the pot. At first sight this is rather surprising; it would seem to suggest that the contents of this pot were put together at the time of burial, with the fine coins, which had presumably been kept separate, being added at the end."
>
> (Bland and Carradice 1986, 65)

Hoards 1 and 3 showed a mixed structure, demonstrating that however the hoard had been gathered together, it had been actively mixed-up and used rather than slowly accumulated without ever being touched. Hoard 2 showed some patterning. The data (Bland & Carradice 1986, 70) has been drawn up, and is shown in fig. 21.03. Bland and Carradice made some inferences which cannot be derived from the hoard. We have

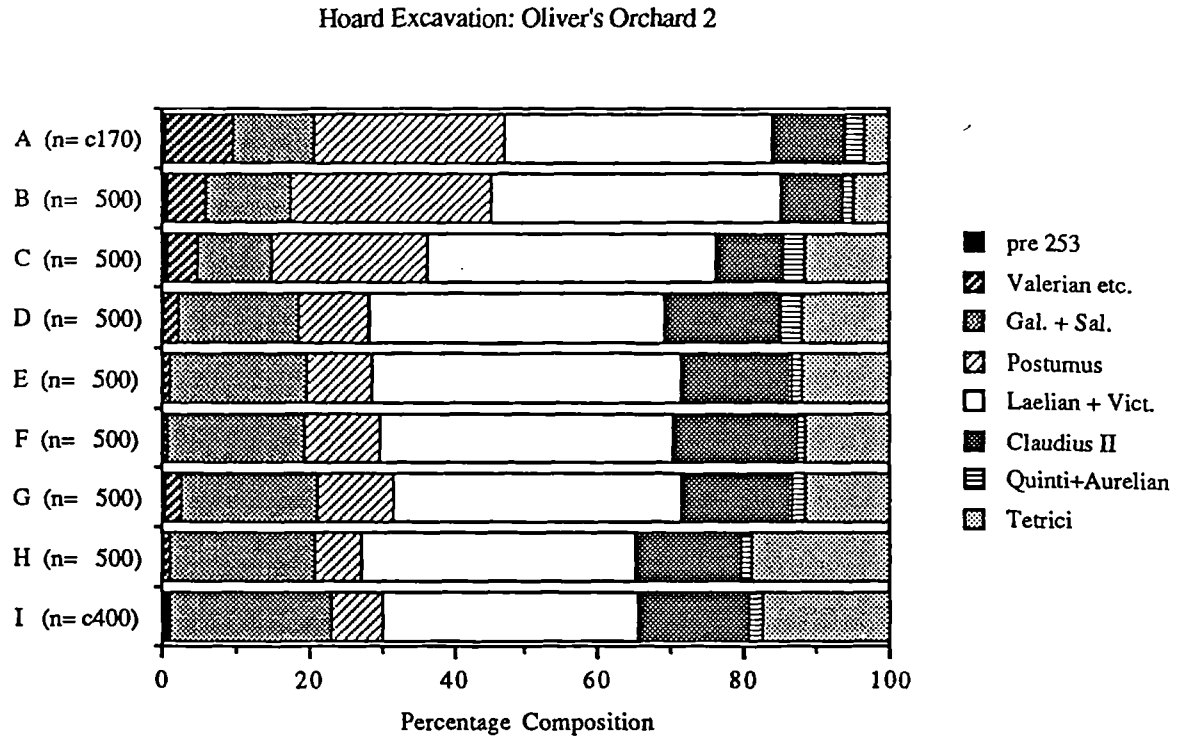


Fig. 21.03 The micro-excavation of the Oliver's Orchard hoard

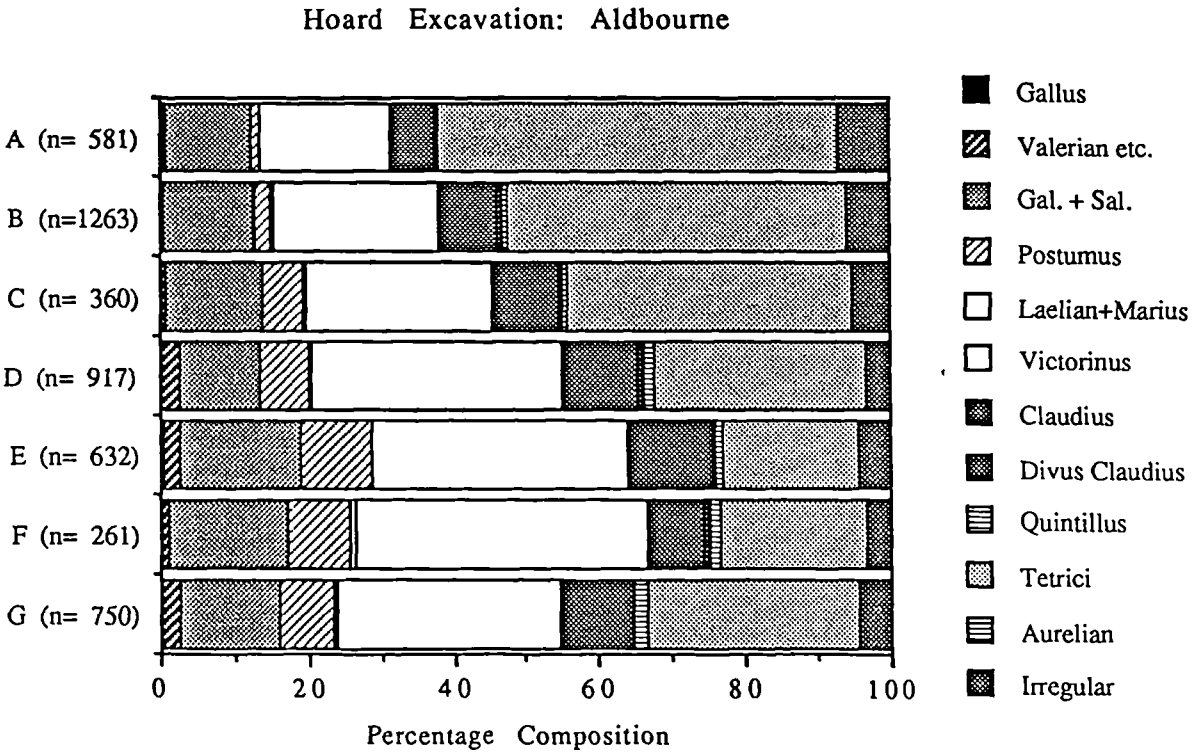


Fig. 21.04 The micro-excavation of the Aldbourne hoard

no way of knowing that the earlier coins of Valerian and his family were hoarded separately and only added at a later date. All that can be said is that this deposit is not a slow untouched accumulation of coins because the earliest coins are not at the bottom and the latest at the top.

The Aldbourne Hoard

The Aldbourne hoard of *antoniniani* and radiate copies contained over 4,700 coins; the latest official issues of which were Aurelianic and Tetrican coins of 273-4.

> "The distribution of Tetrican types is fairly consistent throughout the hoard and the latest types are present in all samples, so the accumulation of the hoard did not start before about 274. However, marked differences of composition can be observed between the uppermost and lowest parts of the hoard. The finest coins in the hoard (those struck before 260 and coins of Postumus struck before his debasement) are noticeably concentrated in the lower part of the hoard, but are virtually absent from the top."
>
> (Besly, 1984, 63)

The data (Besly 1984, 68) has been drawn up and is shown in fig. 21.04. Since the latest types occur at all levels, again we have a mixed up hoard. No steady accumulation of coins can be recognized. There is, however, some patterning: a higher proportion of the earlier and better coins were found at the bottom. This is exactly the reverse of the case in the Oliver's Orchard 2 hoard. Nonetheless this did not stop Besly interpreting the hoard as a 'savings hoard':

> "The differences of composition within the hoard suggest that Aldbourne may well be a savings hoard, rather than a single batch removed from circulation, in which case a date later than 274 may be suggested for its final deposit. The exact history of accumulation cannot be determined, owing to the arbitrary nature of the samples taken, but it seems that from about 274 the hoarder acquired several batches of coin; that which is represented by samples E and F being the best he could obtain at a time when the composition of the circulating currency was changing rapidly, and virtually all coins that were visibly silver were disappearing from circulation. The owner may have gathered his coins over a period, possibly of months, perhaps up to one or two years, but a date later than 276 for the final deposition of the hoard is possible though unlikely."
>
> (Besly 1984, 67)

This level of inference is well beyond what the hoard can legitimately be expected to provide. If anything, the changing composition of the hoard is reasonably gradual: no particular levels are very different from the last. The concept of acquiring 'batches' of coins, and putting them together certainly does not come from the evidence here.

The Tattershall Hoard

This hoard of about 5000 *antoniniani* and radiate copies contained coins up to Probus. The micro-excavated groups comprise the upper and lower half of the jar, and a scatter of

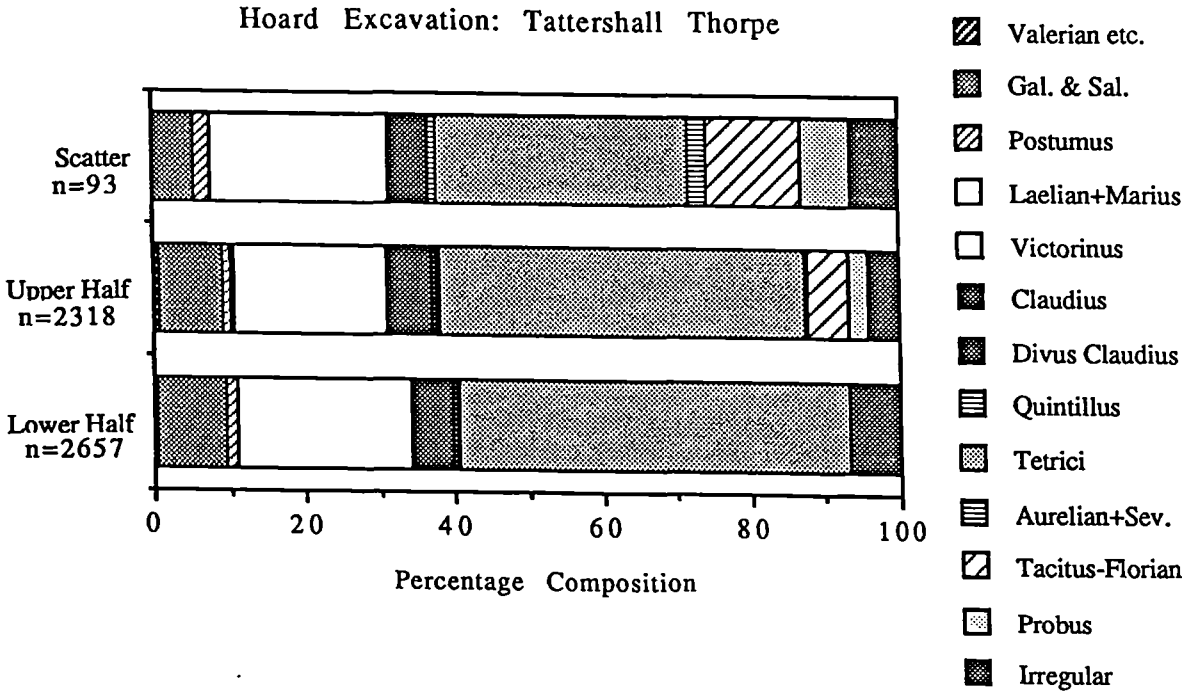


Fig. 21.05 The micro-excavation of the Tattershall hoard

93 coins which had been caught by the plough, and were not actually inside the hoard when excavated.

> "The overall composition of the upper and lower portions of the hoard are so similar in most respects, both in distribution of reigns and of types within reigns, that the hoard may be regarded as a single deposit, except in one important aspect. The 'reformed' coins of Aurelian, Tacitus, Florian and Probus were concentrated in the upper half of the hoard. It seems as though the 'reformed' coinages were gathered separately and added in a group to the top of the pot, an idea supported by the observation of some small clusters and rouleaux of post-reform coins in the upper portion of the hoard before cleaning. Segregation of pre and post-reform coins has been noticed before, in the Penard (Glamorgan) hoard, which closes with Carausius and is hinted at in the unpublished Kirmington (Lincs.) hoard, which included an apparently uncirculated batch of Lyon coins of Tacitus with many die-links."
> (Besly and Bland 1984, 106)

The data (Besly and Bland 1984, 106) has been drawn up in fig. 21.05. Unlike the Aldbourne hoard, the inference of a 'batch' of post-reform coins here is based on good solid evidence. However, this only tells us that the two denominations were hoarded and grouped separately. In the main body of the hoard we still have next to no vertical variation in the composition.

Conclusion

What does this analysis tell us? If we were looking for evidence of slowly accumulated savings hoards, then in our sample of five hoards we have failed. It could be argued that the hoarder may have tipped out his savings every now and then to count them. This is quite a reasonable suggestion. However, even if this were the case we would expect the differential selection factors between 'savings', 'emergency' and 'currency' hoards still to remain. Stirring up a hoard still would not alter the relative proportions of the different types of coin present. The next section moves on to search for these alleged differences.

2.14 Searching for emergency coin hoards

Hoards have been discovered from nearly all periods of the Roman occupation of Britain. Therefore, it would seem reasonable to suggest that there is such a thing as a 'background level' of hoard non-recovery. It would be unlikely that 'emergency hoards' were being deposited and lost due to warfare throughout all time periods, and that 'abandoned currency hoards' were being left all the time because the currency was so unstable. Because of this, periods of higher than normal non-recovery are sometimes equated with periods of warfare in Britain. One example of this is the Late Antonine period. Fig. 21.06 shows Robertson's chronological distribution of coin hoards in Britain. Undeniably there is a peak under Marcus Aurelius. To follow the theory, this peak should consist of some 'emergency' hoards as well as the normal background of 'savings

hoards'. This suggests that according to the 'emergency hoard - warfare' theory about 40% of the hoards should be 'currency hoards' and 60% should be emergency hoards.

According to the hoard typologies, the two types would reveal themselves by containing different proportions of various types of coin. The savings hoard would contain 'better' coins, since the hoarder had more leisure in which to choose and discard coins. This would generally mean that the hoard would have a more 'archaic' structure, since as a rule of thumb the earlier *denarii* contained a higher percentage of silver than the later ones. The emergency hoard, on the other hand, would have by comparison a more 'modern' structure, containing whatever was at hand at the time of impending disaster.

This can be tested by looking at the hoards themselves. The contents of hoards can be divided up into various chronological groups. This can then be run through a package such as Clustan (Wishart 1978), to see whether two groups of hoards form on numerical grounds. Since one of the principle reasons for variance is going to be the chronological distribution of the hoards within Marcus' reign, it would be as well to include in the analysis some earlier and later hoards, as a guide to the interpretation of the results.

The data comprises 55 *denarius* hoards from Trajan to Commodus. The hoard content was divided into the following groups:

1. Republican
2. Marc Antony
3. Augustus to Claudius
4. Nero
5. Civil War (Galba, Vitellius, Otho)
6. Vespasian & Titus
7. Domitian
8. Nerva
9. Trajan
10. Hadrian
11. Antoninus Pius
12. Marcus Aurelius
13. Commodus

These divisions are not perfect, but provide approximate guides. Ideally all the coins of Domitian would have been divided up into his various weight and alloy standards; and the Neronian coins would be divided up between the pre-reform and post-reform issues, but with many of the older coin reports this simply was not possible. But nonetheless, patterns should still appear. Of our 55 hoards, 37 are recorded well enough for this division above to be done precisely. With the other 18 it is possible that a few mis-attributions have been made. Mainly these will take the form of coins of Domitian not being divided into Domitian Caesar and Domitian Augustus, the former more properly being included under group 6. A similar problem arises with Marcus Aurelius, Faustina II and Commodus.

A nominal date has been provided for the deposition of each hoard. This is simply an average date given for the latest coin in the hoard. For example if the hoard ends with a coin of *c.* 176 to 180, the date has been given as 178. The data used has been provided in Appendix 2.11.

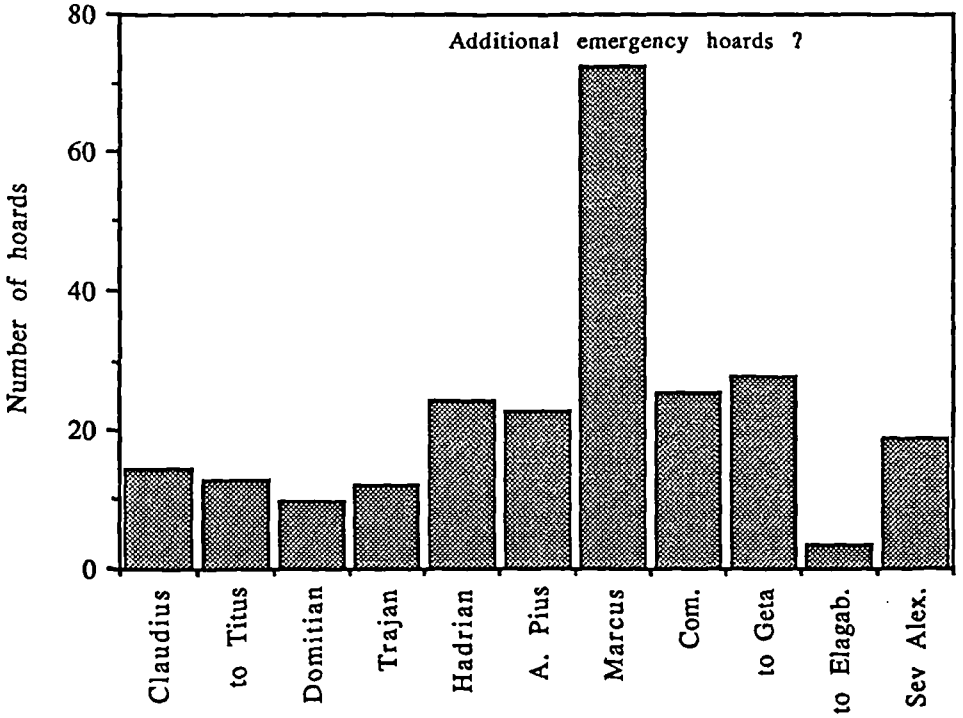


Fig. 21.06 Robertson's chronological distribution of British coin hoards

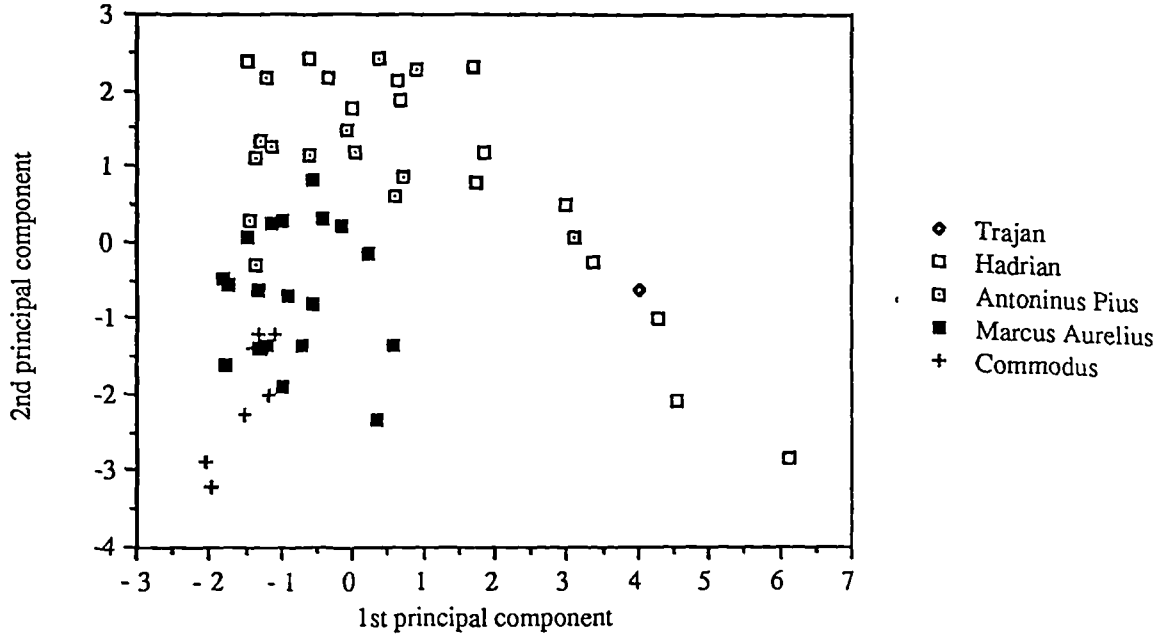


Fig. 21.07 The cluster analysis results

The model to be tested

If we have a division into emergency and savings hoards in the period of Marcus Aurelius then the picture we should get would be as follows: a sequence of hoards chronologically ordered representing the broad trend of savings hoards, with a blur between the boundary of hoards of Marcus Aurelius and Commodus. This blur would be the result of 'emergency hoards' which are suspected of having more 'modern' structures than contemporary savings hoards because of the savings hoard's predilection for earlier, better silver.

Analysis

The plot of the two principle components against each other is shown in fig. 21.07. These two variables account for 45% of the variance within the data. As can be seen, the hoards of Marcus Aurelius cluster quite well. There is a slight blur between the boundaries of hoards of Marcus Aurelius and Commodus, but then the same overlap exists between all the other chronological groups. A clear distinction between emergency hoards and savings hoards on numerical grounds as Reece sought (1987, 61) cannot be found here.

Interpretation

The increase in the number of hoards deposited ending with coins of Marcus Aurelius is undeniable, however, this analysis demonstrates that in this period where 'emergency' hoards are suggested, no ready distinction can be found between 'savings' and 'emergency' hoards. Therefore this does not appear to be a useful way of using and dividing our hoard evidence. The similarity and consistency between the hoards is far more striking than their diversity.

2.15 The equation of the hoard with the currency pool

The equation of the make-up of coin hoards with the contents of the circulation pool has been attempted and criticized by many people. Rogers made the link when examining the Corbridge and Liberchies hoards (Rogers 1975). On inspection of the *aurei* in the Liberchies hoard, he noted that the earlier coins were all slightly lighter in weight than the later coins because of wear. He even quantified this reduction in weight as being *c.* 0.024% p.a.. The Corbridge gold hoard, on the other hand, showed much less wear on the older coins. He concluded that the Liberchies hoard was that of a merchant, representing whatever was in circulation in AD166, the reason being that a savings hoard would rather have contained the better unworn pieces, whereas the Corbridge hoard was more likely to be a regular savings hoard.

One difficulty with this is the sheer unlikelihood of a large gold hoard being 'un tresor marchand'. The idea of any merchant's till consisting of large quantities of high value gold is hard to accept and would suggest a very large number of very high priced transactions. Surely the finite limits of justifiable inference which can be drawn from the data is that the gold from the Liberchies hoard in Belgium circulated (and was therefore worn) faster than the gold in Northern Britain. Even this inference, though, makes assumptions about the wear happening in the area of loss, ignoring the concept that gold can be highly mobile. The entire question of coin wear is returned to in Section 2.3. Secondly this particular example is all rather problematic since the Liberchies hoard was probably a Severan rather than an Antonine hoard (the later part not having been published yet, but having been commented upon in the trade). This explains the greater degree of wear on the Liberchies coins since they had been in circulation for around 60 additional years. nonetheless the form of Rogers' argument is what I am particularly interested in here.

Bruun on the other hand went to the other extreme; he stated quite correctly that "increasingly attempts to identify the composition of hoards with 'la circulation monetaire' necessitate some comments on the circumstances connected with hoarding and the validity of hoards as indicators of the mass of coins in circulation." (Bruun 1978, 114). He then went on to look at the occurrence on sites and in hoards of Constantine's billon 'Victoriae Laetae Princ Perp' coin of 311 and Licinius' coins marked with the value 12.5 (*denarii* ?). He discovered that in areas where the twelve and a half piece was found on sites it could nonetheless be absent from the hoards, with Constantine's coin being hoarded instead. This he took to demonstrate that hoards did not represent what was in circulation at the time. What this really demonstrates is not the blanket statement that 'hoards do not represent the coins that were in circulation', but that hoards of denomination X cannot tell us anything about the presence or absence of coins of denomination Y in circulation. It might still be possible for hoards of denomination X to faithfully reflect which of its own kindred were being handed around in the market place.

Other views of Coin Hoards and the Circulation Pool:

Many numismatists have expressed the view that if hoards are providing a consistent, regular picture, then they would feel able to correlate the pattern of coins of one denomination in hoards with what was in the circulation pool. For example:

> "Only when a number of hoards are of a similar pattern can we safely regard them as representative of the general circulating medium."
> (Grierson 1966, viii)

> "The proportions of coins of different reigns and types present in particular hoards are of course expressible as precise figures. These figures

> provide a very important guide to the relative commonness of these groups but they must not be taken as evidence of the presence of precisely those proportions among the coins in circulation unless this is borne out by a considerable body of homogeneous hoard evidence."
>
> (Archibald 1974, 236)

Crawford also saw this, though he qualified the equation of hoards with the circulation pool further by specifying that a large data base was needed, in order to remove various freaks and aberrations:

> "Equally important is the evidence provided by hoards for the study of coin circulation in its widest sense, not just the coinage in circulation at the moment when a hoard was deposited, but the whole pool of coinage which was available for circulation and which to a greater or lesser extent did pass from one person to another. Of course an isolated hoard may be a freak, the possession of a stray traveller, and inferences about circulation must only be based on a whole series of hoards."
>
> (Crawford 1983, 201)

If we wish to do this with Romano-British hoards then we need to establish whether homogeneity exists within the data, and gather a large enough corpus of hoards to iron out any variations. Both Robertson and Reece appear to be clearly of the view that the first criteria can be observed. Robertson stated that "...an analysis of well listed Romano-British hoards does show that a group of hoards of the same period had, as a rule, the same general composition..." (Robertson 1956, 270); and Reece in a quantitative study of a small group of hoards decided that there was such a thing as a 'normal' Severan silver hoard (Reece 1974a, 81).

In conclusion, if we can establish homogeneity within hoards of one denomination over a period of time, equating hoard content with the coinage in circulation seems reasonable. Indeed, recalling fig. 21.02, the vast majority of silver and gold 'in circulation' existed for most of its time in money-boxes and hoards. Analyses across denominations are much more dubious; and great care would therefore need to be taken where any coinage is going through a rapid transformation, such as the debasement of the *denarius* or *antoninianus* .

2.2 The Hoard Database

2.21 Database requirements
2.22 The hoard corpus
2.23 The classification of the data
2.24 The problem of the Faustinas

In this section the requirements of a hoard database are assessed (2.21). The hoard corpus is then introduced (2.22) with further comments about its structure and the codification of the database (2.23 & 2.24).

2.21 Database requirements

The quality of hoard publication has varied tremendously over the years, from the most rudimentary listing of 'a few emperors noted', to the most thorough treatment of works such as the Cunetio Treasure report (Besly & Bland, 1983). Yet even now, there is still no agreed way of publishing a hoard. Series such as the British Museum's 'Roman coin hoards in Britain' are inconsistent. Some hoards are published with the weights of the coin, whilst others are not. Some use Roman Imperial Coinage as the standard reference work, whilst others use the British Museum Catalogue. Somehow a database needs to systematize and contain this wide range of publication styles and levels of information.

The ideal form of a database depends upon its intended purpose and that is looking at large scale patterns in the circulation of coinage. So there is little point recording all hoards to the highest possible standard for the purposes of this work. Whilst a dozen hoards might be so recorded, the absence of such detailed information for hundreds of others would preclude any forms of large scale analysis being based on that level of information. If rarely published data, such as the weights of coins in hoards, are to be analysed (which they are in Section 2.3), then that information should be collected in a related but ancillary database. Similarly the full RIC identifications of coins have not been recorded. The reason is the same. Many hoards are recorded simply in the form of Emperor lists, and to maximize the number of hoards used in the forthcoming analyses it is to this lower common denominator that we must descend. In any case, full RIC identifications can be spurious. Ryan (1988) has shown that there is always a strong tendency for numismatists to identify a coin by the first similar type that occurs in the standard catalogue, rather than by its precise type, though the prefix 'As...' to the reference number in such cases is widely practised nowadays. This means that although published lists are a good guide to what is actually present, this does not mean that a second specialist would not arrive at a slightly different identification, despite the existence of detailed standard reference works.

2.22 The Database

The information is divided into two parts. First the corpus then the numeric data.

The Corpus (Appendix 2.21)

The rationale behind this database is the compilation of a large corpus of hoards from Britain such that a reasonable sample is achieved. The search has not been exhaustive for two reasons: first the older more obscure references which are most likely to have been missed are those which rarely contain any kind of useful information for these purposes anyway. Secondly such a corpus has long been in preparation by Professor A. Robertson, and it is not the purpose of this thesis to duplicate that work.

The breadth of the search for this corpus comprised:

Existing corpora:	Sutherland (1937)	Romano-British hoards in general
	Brickstock (1987)	4th c. hoards (particularly inc. Fel Temp issues)
	Sekulla (1980)	Hoards from Northern Britain
	Archer (1979)	4th c. precious metal hoards
	Shiel (1977)	Hoards including coins of Carausius & Allectus
Coin hoard series:	Coin Hoards from Roman Britain: Carson & Burnett (1979), Burnett (1981, 1984a, 1984b), Burnett & Bland (1986, 1987, 1989) and Bland (1982)	
	Coin Hoards: published by Royal Numismatic Society, London.	
Journals:	Numismatic Chronicle, British Numismatic Journal, Britannia and principle county journals.	
Listings:	Various hoards prior to publication by: P.J. Casey and R.J. Brickstock.	

All the hoards have been given an entry in a uniform format. The information in the corpus has been organized in the following way:

1. Location

   Place, County, National Grid Reference. Where the national grid reference is only given to four figures, this means that no specific information was forthcoming, so the reference can only be taken to be a general guide to the find-spot.

2. Date of discovery

3. Bibliographic references

   Primary references first, then further references as required. Not all of these references have been examined by the author. Some references when sought for appeared not to exist. These references have therefore been repeated without prejudice, though an indication that they are rather problematic has been incorporated.

4. A statement about the quality of the data
   Here it is stated whether RIC numbers exist in the original reference, or any other information such as coin weights, Elmer numbers or those from any other reference work. This is to enable anyone to assess the quality of information available about a hoard before following up the references.

5. Composition summary
   This is a breakdown by denomination of the number of coins present in the hoard. Indications may be given that the number is either approximate or a minimum figure. Where possible copies and genuine coins have been separated.

6. Terminus post quem:
   All hoards have been dated using a straightforward *terminus post quem* date or date range. The only exceptions to this are hoards terminating with coins before the invasion of Britain in AD 43 which have been given a nominal deposition date of AD 43, and the Icenian hoard series which have usually been assigned to the Boudiccan revolt of AD 60/61 (this is questioned later in section 4.1). The question of hoard dating is looked at in Section 2.6.

7. Reference number
   Each hoard is prefixed with a letter and a number. There are four letters used: B, S, A & C. In the cases of B, S & A this stands for the original corpora from which the information came (Brickstock, Sekulla and Archer). C series, which makes up the bulk of the database, are the further additions. The corpus is not a static body of hoard information just created for this thesis, rather it is continually being added to by new discoveries or older references which have subsequently come to light. Since the original ordering of the corpus was alphabetic, new insertions have been added into the sequence by the use of a letter. Eg. between C089 and C090 might be found C089n.

2.23 The Classification of the Data

The data appendices systematize all this information for hoards containing first to third century coins, published in their variety of formats, into a series of tables. The appendices are:

Appendix 2.22	*Denarii* in hoards
Appendix 2.23	*Antoniniani* in hoards
Appendix 2.24	'Bronze' coins in hoards

These tables are divided up by denominations. The appendices for *denarii* and *antoniniani* have the same format, though that for the *aes* is slightly different. With the *denarii* and *antoniniani* , those hoards which include fake coins have been given two entries. One for the genuine component of the hoard, and a second for the irregular coins. The irregular entries are denoted by the use of italics.

The first seven columns are summary data about the hoard:

1. The corpus reference number
2. The hoard name
3. The TPQ given for the hoard
4. The mean date from the above

4a. The type of coin present

This column (for the *antoniniani* table only) informs whether the data is for genuine coins, copies or both.

REAL Real coins only (as far as can be told).

COPY Copies only

R/C The total contents of the hoard without distinction between copies and genuine coins.

5. The status of the hoard

FULL All, or virtually all, the coins present within the hoard were identified.

PART Only a segment of the hoard was recovered and identified, therefore the data may be biased. Nonetheless the portion could still be representative.

NONE There was no reliable quantitative information about the hoard.

BIAS Only a selective portion of the hoard was described.

6. Count

OK The total number of coins in the hoard is more or less correct (whether or not all were identified). This information is provided for hoard size analysis. Therefore, if a hoard is recorded as having 100 coins in it, this is OK. If a hoard is said to have about 100 coins in it, this is OK; whereas if a hoard is said to contain over one hundred coins, this information is of no value. The idea of this is to get the order of size correct: 1000 vs 1005 coins makes little difference, 20 vs 25 coins does. The figure, therefore, is not necessarily exact.

No - Though there may be some information about a sample of the coins from this hoard, the original total number is not known.

7. Number

The total number of coins in the hoard. This is not the same as the total number of coins recorded in the tables, since the tables may only be recording PART of

the hoard. Even where the tables are recording the FULL information, the numbers may not be the same since illegible coins have been excluded from the tables.

If there is a discrepancy between a published summary and the catalogue in any respect, the catalogue has been taken as definitive.

All the further columns contain the breakdown of the number of coins of each emperor present. The emperors have been coded as follows:

Table 2.21: *Denarius* Codes

CODE	PRINCIPALS	Dates or relationship	Examples of infrequent coins	
A Den. 1	Republican	up to Augustus (excl. Den. 2)		
B Den. 2	Mark Antony	(40-31bc)		
C Den. 3	Augustus	(37bc-ad14)		
	Julia	Daughter of Augustus		
	Agrippa	Husband of Julia		
	Tiberius	(14-37)		
	Gaius	(37-41)		
D Den. 4	Claudius	(41-54)		
Den. 5	Nero	(54-68)		
E Den. 6	Galba	(68-69)		
Den. 7	Vitellius	(69)		
Den. 8	Otho	(69)		
Den. 9	Civil War	(68-69)		
F Den. 10	Vespasian	(69-79)		
	Domitilla	Wife of Vespasian	Mallerstang	S 114
Den. 11	Titus Caesar	(69-79)		
Den. 12	Titus Augustus	(79-81)		
	Julia Titi	Daughter of Titus	Chalfont St Giles	C 052
	Div. Vespasian	Commemorative	Bletchley	C 022
Den. 13	Domitian Caesar	(69-81)		
G Den. 14	Domitian Augustus	(81-96)		
	Domitia	Wife of Domitian		
Den. 15	Nerva	(96-98)		
H Den. 16	Trajan	(98-117)		
	Plotina	Wife of Trajan	Londonthorpe	C 158
Den. 17	Marciana	Sister of Trajan		
I Den. 18	Hadrian	(117-138)		
	Antoninus Pius Caesar		Bristol, 1937	C 032
Den. 19	Sabina	Wife of Hadrian		
	Matidia	Daughter of Marciana	Naseby	C 184q
Den. 20	Aelius	Adopted son of Hadrian		
J Den. 21	Antoninus Pius	(138-161)		
Den. 22	Faustina I	Wife of Antoninus Pius		
Den. 23	Faustina II (under A.P.)	Wife of Marcus Aurelius		
Den. 24	Faustina II (under M.A.)	Wife of Marcus Aurelius		
Den. 25	Marcus Aurelius Caesar	(139-161)		
	M. Aurelius with A. Pius	-	Bletchley	C 022
K Den. 26	Marcus Aurelius	(161-180)		
Den. 27	Div. Pius	Commemorative		
Den. 28	Lucius Verus	(161-169)		
	Lucius Verus with M.A.	-	Silchester	C 223
Den. 29	Lucilla (under M.A.)	Daughter of Marcus Aurelius		
Den. 30	Lucilla (under Com.)	Daughter of Marcus Aurelius		
Den. 31	Commodus Caesar	(175-177)		

L	Den. 32	Commodus Augustus	(177-192)		
		Div. Marcus Aurelius	Commemorative	Bristol, 1937	C 032
	Den. 33	Crispina	Wife of Commodus		
	Den. 34	Clodius Albinus	(195-197)		
	Den. 35	Pertinax	(193)		
	Den. 36	Didius Julianus	(193)		
		Manlia Scantilla	Wife of Didius Julianus		
	Den. 37	Didia Clara	Daughter of Didius Julianus		
M		Den. 38	Septimius Severus (193-211)		
		Div. Pertinax	Commemorative		
	Den. 39	Geta Caesar	(198-209)		
		Julia Domna with Geta	-	East Anglia	C 089n
	Den. 40	Geta Augustus	(209-212)		
	Den. 41	Julia Domna (Sept.Sev.)	Wife of Septimius Severus		
N	Den. 42	Julia Domna (Cara.)	Wife of Septimius Severus		
	Den. 43	Plautilla	Wife of Caracalla		
	Den. 44	Caracalla Caesar	(196-198)		
	Den. 45	Caracalla Augustus	(198-217)		
O	Den. 46	Macrinus	(217-218)		
	Den. 47	Diadumenian	(218)		
	Den. 48	Elagabalus	(218-222)		
		Aquilia Severa	Wife of Elagabalus	Edlingon Wood	C 093
	Den. 49	Jul. Soaemis	Mother of Elagabalus		
	Den. 50	Julia Paula	Wife of Elagabalus		
	Den. 51	Julia Maesa	Grandmother of Elagabalus		
P	Den. 52	Severus Alexander	(222-235)		
		Orbiana	Wife of Severus Alexander		
	Den. 53	Julia Mamaea	Mother of Severus Alexander		
	Den. 54	Maximinus I	(235-238)		
		Maximinus Caesar		Caister by Yarmouth	C 041
Q	Den. 55	Balbinus	(238)		
		Pupienus	(238)		
	Den. 56	Gordian II Africanus	(238)		
		Gordian III	(238-244)		
		Philip I	(244-249)		
		Otacilla Severa	Wife of Philip I	Dorchester	C 087
	Den. 57	Gallienus	(253-268)		

Table 2.22 *Antoninianus* codes

Ant. 1a	Caracalla	(214-217)
Ant. 1b	Julia Domna	Mother of Caracalla
Ant. 2	Macrinus	(217-218)
Ant. 3a	Elagabulus	(218-222)
Ant. 3b	Julia Measa	Grandmother of Elagabulus
Ant. 4	Maximinus I	(235-238)
Ant. 5a	Balbinus	(238)
Ant. 5b	Pupienus	(238)
Ant. 6	Gordian III	(238-244)
	Sabinia Tranquillina	Wife of Gordian III
Ant. 7a	Philip I	(244-249)
	Ot. Severa	Wife of Philip I
Ant. 7b	Philip II	(247-249)
Ant. 8	Trajan Decius	(249-251)
	Herennia Etruscilla	Wife of Trajan Decius
	Herennius Etruscus	Son of Trajan Decius (251)
	Hostilian	Son of Trajan Decius (251)
Ant. 9a	Treb. Gallus	(251-253)
Ant. 9b	Volusian	(251-253)
Ant. 10	Aemilian	(252-253)
	Cornelia Supera	Probably the Wife of Aemilian
Ant. 11a	Valerian I	(253-260)
	Mariniana	Wife of Valerian
Ant. 11b	Valerian II Caesar	(253-255)
Ant. 11c	Saloninus	(259)
Ant. 11d	Gallienus (Joint Reign)	(253-260)
Ant. 11e	Salonina (Joint Reign)	(253-260)
Central Empire		
Ant. 12a	Gallienus (Sole Reign)	(260-268)
	Quietus	(260-261)
Ant. 12b	Salonina (Sole Reign)	(260-268)
Ant. 13a	Claudius Gothicus	(268-270)
Ant. 13b	Div. Claudius	(post 270)
Ant. 14	Quintillus	(270)
Gallic Empire		
Ant. 15	Postumus	(259-268)
Ant. 16	Laelianus	(268)
Ant. 17	Marius	(268)
Ant. 18	Victorinus	(268-270)
Ant. 19a	Tetricus I	(270-273)
Ant. 19b	Tetricus II Caesar	(270-273)
Central Empire Again		
Ant. 20a	Aurelian (pre reform)	(270-)
	Severina	Wife of Aurelian
Ant. 20b	Aurelian (post reform)	(-275)
Ant. 21	Tacitus	(275-276)
Ant. 22	Florianus	(276)
Ant. 23	Probus	(276-282)
Ant. 24a	Carus	(282-283)
Ant. 24b	Carinus	(283-285)
	Magnia Urbica	Wife of Carinus
Ant. 24c	Numerian	(283-284)
Ant. 25	Diocletian	(284-296)
	Maximianus	(286-296)
	Constantius Caesar	(293-296)
	Galerius	(293-296)
	also any of these emperors minted by Carausius	

cont...

Table 2.22 cont.: *Antoninianus* codes

British Empire		
Ant. 26	Carausius	(287-293)
Ant. 27	Allectus	(293-296)

The *denarii* and *antoniniani* have all been phased into groups. The function and use of these divisions are described below and in each individual section as required.

2.24 The problem of the Faustinas

The divisions used here are not strictly chronological. The reason for this can best be explained by reference to the coinage of the Faustinas. As has already been mentioned, while some coin reports are very detailed others simply comprise lists of emperors and members of their families present. Frequently an entry such as 'Faustina, 9 *denarii* ' is found. This is a problem. First there were two Faustinas, Faustina I (Senior) was the wife of Antoninus Pius, while Faustina II (Junior) was the wife of Marcus Aurelius. Not only this, but both Antoninus Pius and Marcus Aurelius minted coins for Faustina II; so here even an entry like 'Faustina II, 9 *denarii* ' would leave us in ignorance as to how many related to Antoninus Pius' reign and how many to Marcus Aurelius'. A division of the data into strict chronological slices, decided by imperial reigns is not going to work with this quality of data. There are two options. First to estimate how many might have been produced in each reign on the basis of other hoards with better details and then on this basis allocate the coins accordingly. Secondly, one could maintain the integrity of the data by lumping all the Faustinas into one group (that of Antoninus Pius), making the definition between the broad chronological groups slightly blurred. The second option has been preferred since it does not tamper with the original data.

The case of the Faustinas is by no means the only example of this kind of confusion. Frequently it is hard to distinguish in older reports between coins issued by individuals as Caesars or Emperors; or in the case of Domitian between him as a Caesar under Vespasian or Titus. Pragmatic decisions have to be made as to how to classify this poor quality of data. These decisions and the number of cases in which they have had to be made are given in table 2.23. To take one example: if no distinction is made between coins of Titus Caesar and Titus Augustus then the number of coins present is indicated in the column for Titus Augustus and the value 0 is also placed in the Titus Caesar column instead of the column being left blank. This acts as a missing data marker.

Table 2.23: The classification of poor quality data

No differentiation between	Place data under:	Place missing data marker under:	No. of Cases
Titus, Caesar or Augustus	Titus	Titus Caesar	13
Domitian, Caesar or Augustus	Domitian	Domitian Caesar	16
Marcus Aurelius, Caesar or Augustus	Marcus Aurelius	Marcus Aurelius Caesar	11
Faustina II, A.Pius or M. Aurelius	Faustina II (AP)	Faustina II (MA)	12
Faustina I or II	Faustina I	Faustina II (AP) & (MA)	5
Antoninus Pius, dead or alive	Antoninus Pius	Div. Pius	1
Lucilla, under M. Aurelius or Commodus	Lucilla (MA)	Lucilla (Comm.)	1
Commodus, Caesar or Augustus	Commodus	Commodus Caesar	4
Caracalla, Caesar or Augustus	Caracalla	Caracalla Caesar	1
Julia Domna, under Severus or Caracalla	Julia Domna (Sept.Sev.)	Julia Domna (Cara.)	6
Geta, Caesar or Augustus	Geta Caesar	Geta	2
Philip I & II	Philip I	Philip II	1
Valerian I & II (Caesar)	Valerian I	Valerian II Caesar	5
Gallienus, Salonina or Saloninus	Gallienus	Salonina (Sole reign)	9
		& Saloninus	6
Gallienus (Sole or Joint reign)	Gallienus (Sole Reign)	Gallienus (Joint reign)	17
Salonina (Sole or Joint reign)	Salonina (Sole Reign)	Salonina (Joint reign)	15
Claudius, dead or alive	Claudius II	Div. Claudius II	24
Tetricus I & II	Tetricus I	Tetricus II	18
Aurelius, pre or post reform	Aurelius pre reform	Aurelius post reform	33
Post Aurelian but pre Carausius, but with ... no other details	Probus	Tacitus, Florianus, Carus Carinus & Numerian	1
Diocletian, under Carausius or not	Diocletian	-	1
Maximianus, under Carausius or not	Maximianus	-	1

2.3 Coin Wear and the Velocity of Circulation of Coinage

2.31 Introduction
2.32 How can wear be quantified ?
2.33 Previous work on coin wear
2.34 The development of a new model
2.35 An example: the *denarii* of Vespasian
2.36 Rates of Wear of all *denarii* in Britain
2.37 The circulation of *sestertii*
2.38 Conclusions

In this section the contribution that coin wear can make to reconstructing the circulation pattern of coinage is addressed. The work of Rogers and Duncan-Jones is examined where it is always assumed that the rate of wear did not vary (2.33),. Learning the lessons from these analyses a different way of looking at coin wear is attempted allowing for the chronological variation in rates of wear (2.34-36). In the light of this some of Duncan-Jones' work on the circulation of sestertii *is reassessed (2.37).*

2.31 Introduction

The first analysis based on our database examines the wear on coins. This variable gives us direct access to information about the handling of coinage The more a coin is handled, moved or disturbed, the more abraded it will get and therefore the more worn.

> "Differential rates of wear can be distinguished between coins of the same denomination circulating at different periods and among the various denominations struck at any one time and circulating together: the later the period, the greater the wear; the higher the denomination the less the wear."
> (Archibald 1974, 237)

As Archibald makes clear, wear is variable. Low value coinage may circulate and get worn faster than higher value coins, also one type of coin may circulate and get worn at different rates at different times. Here the chronological and denominational differences are stressed, however there is no reason why similar patterning and changes might not be seen were the information to be divided up spatially as well. Coins may have circulated faster in the core of a circulation system, whilst moving slower in peripheral areas.

The more a coin is handled, the more one would expect it to become worn. This seems to be a reasonable working hypothesis. If it is the case, then it should be possible to use coin wear as an index of the degree of handling of coinage. The faster coin is being worn, the more use it must be getting in the system. This equation is very straight forward, almost simplistic. It is possible to raise some objections to it. For example, 'handling coinage' and 'money moving round the economy' are not necessarily the same thing. The contents of a hoard might by counted out once a month by its owner, thus abrading one coin against another. If for any reason the owner decided to count out his money once a week instead of once a month then we would observe a four-fold

increase in wear without any corresponding increase in the amount of work the coin was doing in the monetary system. The example is perhaps trivial, but other potential causes of wear on coin must be born in mind. Nonetheless, wear is one of the few direct measures of coin use we have access to, so it is worth proceeding on the working hypothesis referred to above.

2.32 How can wear be quantified ?

There are two principle ways, the description of the abrasion on a coin and its weight. Casey (1986,150-1) proposed the following system for describing abrasion:

> "The condition of the coin is that in which it was at the moment of loss; subsequent corrosion is ignored in trying to ascertain this state. Different workers have slightly different ways of indicating the condition. ... A range of conditions, all ultimately subjective, may be evident:
>
> UW - Unworn
> SW - Slightly worn
> W - Worn
> VW - Very Worn
> EW - Extremely worn
>
> Whilst of no absolute chronological value, the condition of wear should be recorded to give a general impression of the amount of use seen by the coins overall."

The benefit of this method is that it can differentiate between wear on coins and corrosion on coins. Whilst a coin might have lost weight by corrosive processes while it was in the ground, it might have been relatively unworn when it was lost. This can be told from the prominence of the features on the coin: does the head still stand proud or has it been worn almost level with the rest of the coin. However, the technique suffers principally because it is subjective, particularly on just such corroded specimens. Also it is rarely used in the publication of coin lists, whilst coin weight details are becoming more common (eg. the British Museum's Coin Hoards from Roman Britain series).

Coin weights are at least objective. However, like the description of wear, there are problems. Weight cannot differentiate between coins which are worn and coins which have become light by corrosion. Also, if conservation has been required on the coins, which weight should be used: the pre or post cleaning weight ? In all, weight has the two-fold advantage: different individuals can come up with consistent results and weights are now being published for a lot of coins.

Whilst we can weigh coins, this must not lead us into the temptation that we know their original weights when first issued. This can be estimated, and many authors have done so for most Roman coin issues, but the precise minting standard and the variation around that standard is not known. This must be taken on board in all analyses of coin weights.

2.33 Previous work on coin wear

Two authors have attempted to use coin weight as a means of understanding the way coin circulated: Rogers (1975) and Duncan-Jones (1987). Both had in common the analysis of the Corbridge and Liberchies (Belgium) *aureus* hoards, yet both looked at the data with very different goals in mind.

Rogers examined the weight of all the *aurei* of different dates in the two hoards. The pattern which emerged was that the Corbridge hoard contained heavier coins than the Liberchies hoard (the basic pattern of the data is shown in fig. 23.01 derived from Duncan-Jones' summary statistics). Working on the basis of a uniform rate of wear on the coins over time he fitted a straight line to the data implying a 0.0017 gms p.a. rate of weight loss from *aurei* in the Liberchies hoard. This he saw this as being an unselected hoard representing the general gold circulation pool at the time. Corbridge, however, did not correspond to such a nice even line, and it contained heavier coins. This he concluded was a function of selection.

Two critical points emerge from this. Uniformity across provinces is assumed: gold in northern Britain it is thought should show the same degree of wear as those in Belgium, if not selection must be the explanation rather than differential circulation rates. Secondly the straight line fitted to the data assumes an invariable rate of wear on gold from the Flavian period to the AD160s. But is this a fair assumption to make? The rate of circulation and wear on coins might well have varied during this period.

Duncan-Jones' analysis took this idea of regional variation on-board and examined a third gold hoard, this time from Portugal, along with the other two. However, he maintained the idea of a uniform rate of wear over time. His methodology is important and worth repeating, even though some of his uses of the data were decidedly suspect. As with Rogers, he uses the Liberchies hoard which is now known to be about sixty years later in date than the proportion of it published so far, but again it is the method and the assumptions made which I want to lay emphasis on here.

All three hoards were of the AD 160s. For each hoard the median weight of a series of selected Imperial issues was calculated (Table 2.31 and fig. 23.01). The short lived higher weight standard coins of Nero were quite reasonably excluded from the analysis. Regression analysis was then carried out fitting a line to these 'median weights' to see at what rate *aurei* were worn in each of the three hoards. Worryingly 'deviant data' was left out of this analysis for no clearly stated reason other than it did not fit in with the pattern expected. Also some median values derived from a small sample size which did not fit the pattern were excluded (Neronian coins in the Portuguese hoard), whilst

other small sample medians which did fit the general trend were included (coins of Marcus Aurelius in the Liberchies hoard). The trends therefore ended up almost fitting a straight line with very high correlations (R) of almost 1 (R = 0.88, 0.98 and 0.93). However, this masks the fact that much of the deviation in the data had already been removed by reducing subsets of the data down to their median values in the first place.

Despite some very suspect use of statistics the trends were clear to be seen. The *aurei* from Portugal seemed to be showing the greatest rate of wear over time, followed by Liberchies then Corbridge. This at least suggests that there is a regional factor to be considered in the rate at which coin circulated. Yet as with Rogers, a uniform rate of wear is assumed by the imposition of a straight line upon the data. If there was any chronological variation in the rate of circulation of coinage, then this type of analysis will not be able to reveal it.

Table 2.31: Median weights in 3 gold-hoards (From Duncan-Jones (1987) Tables I-III) Raw data represented in fig. 23.01 (including 'deviant cases')

		Corbridge (159/60)		Liberchies (166)		Portugal (168)	
'Date'	Emperor	Weight	Sample	Weight	Sample	Weight	Sample
66	Nero	7.155	(10)	7.02	(67)	(7.225)	(4)
74	Vespasian	7.19	(25)	7.06	(82)	7.05	(23)
108	Trajan	7.195	(48)	7.095	(66)	7.20	(28)
128	Hadrian	7.22	(40)	7.14	(76)	7.25	(25)
150	A. Pius	7.20	(24)	7.16	(44)	7.22	(64)
164	M. Aurelius	-	(0)	7.20	(7)	7.28	(22)
Regression Analysis:							
Equation: Weight =		7.11327 + 0.00081624t		6.92221 + 0.00165468t		6.89422 + 0.0025382t	
Correlation (R) =		0.88		0.98		0.93	
No. of cases used =		4		6		4	
Deviant cases omitted:		A. Pius (deviant)		-		A. Pius (deviant) Nero (sample size)	
Rates of Weight Loss:							
Weight loss per year:		0.0008162 gms		0.0016547 gms		0.0025383 gms	

Duncan-Jones went on to analyse three silver hoards by the same method, again leaving out deviant data. The three hoards from Britain (Londonthorpe c.AD153), France (La Magura AD196) and Rumania (Viuz-Faverges c.AD 252) showed similar rates of wear. Following this he looked at *sestertii* from one hoard in the Garonne; however, here a very non linear relationship was found which led to an interpretation of a change in issue weight of the coin. This we will return to later.

2.34 The development of a new model

What then are the specifications we require of a new model of the rate of wear on coins?

1. It must not look at all the coins of different emperors together as they may have been issued to slightly different weight standards AND their differential metallic composition may cause one series to wear faster than another.

2. The method must take account of the possibility of a chronologically variable rate of circulation of coins.

3. If looking at more than one province it must account for the possibility of differential rates of circulation in different areas.

There are 15 *denarius* hoards from Britain published with good weight information. Most of them are from the British Museum's 'Coin Hoards from Roman Britain' series. The hoards are:

C 221	Scole	c. AD 61	-	Wervin, Cheshire	c. AD 157
C 103	Eriswell	c. AD 61	C 249	Waddington	c. AD 161
C 179	Mildenhall	c. AD 80	C 257	Westgate	c. AD 170
C 130	Howe	c. AD 87	C 001	Aldworth	c. AD 177
C 064	Cirencester	c. AD 94	C 010	Barway	c. AD 186
C 246	Verulamium	c. AD 117	C 120	Great Melton	c. AD 195
C 158	Londonthorpe	c. AD 155	C 004	Akenham	c. AD 221

The full information on these coins is contained in Appendix 2.31 where the Emperor, RIC number and weight for each is recorded (where known). The ideal would be to examine the decline in weight of each Emperor individually, alas the data is not sufficient to enable that to be done satisfactorily. So the following groups have been used:

GROUP 1	Republican	Den 1-2
GROUP 2	Claudius to Nero	Den 4-5
GROUP 3	Civil War	Den 6-9
GROUP 4	Vespasian	Den 10-11, 13 (Domitian Caesar)
GROUP 5	Titus	Den 12, 13 (Domitian Caesar)
GROUP 6	Domitian to Nerva	Den 14-15
GROUP 7	Trajan	Den 16-17
GROUP 8	Hadrian	Den 18-20
GROUP 9	Early Antonine	Den 21-23, 25
GROUP 10	Later Antonine	Den 24, 26-37
GROUP 11	Early Severan	Den 38-45
GROUP 12	Macrinus and Later	Den 46-54

Note 1: Because of the generally high quality of hoard reports in the British Museum volumes it has been possible to differentiate between Domitian Caesar (Den 13) coins under Vespasian and Titus, therefore the database has been enhanced to take account of this for this analysis.

Note 2: The early Julio-Claudian coins have been omitted from this analysis since their numbers in circulation after the Neronian reform of the silver are too small to enable any reliable statistics to be created from them.

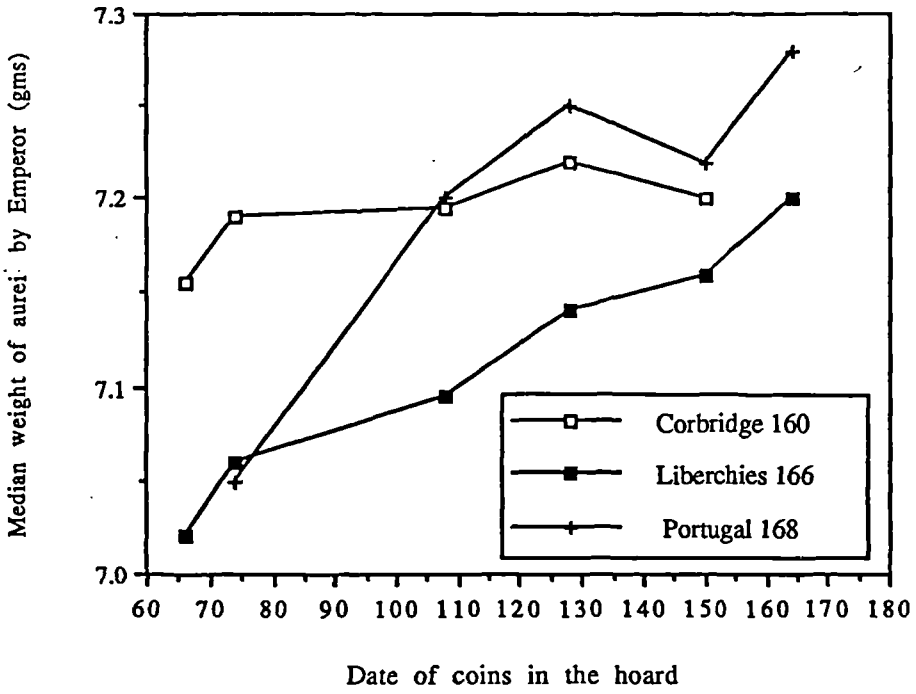


Fig. 23.01 Duncan-Jones study of three gold hoards: including the 'deviant' data points

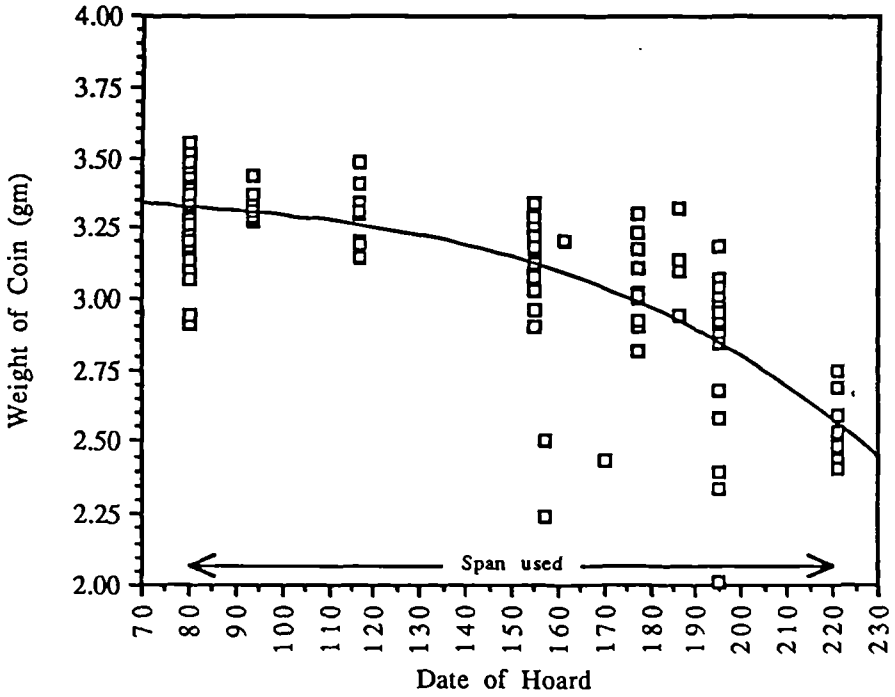


Fig. 23.02 The weight of Vespasian's *denarii* in hoards

$W = 3.4493 - 0.0028\,t + 0.00002762\,t^2 - 0.0000001489\,t^3 \quad R = 0.74$

2.35 An example: the *denarii* of Vespasian

Duncan-Jones and Rogers both examined all the Emperors within an individual hoard. Here let us look at it the other way. Let us follow the progressive weight loss of the coinage of one Emperor throughout the circulation life of the series. Fig. 23.02 shows just this for the coins of Vespasian. Each square represents an individual coin found in a hoard. Since each coin will have had an individual circulation life no reason is seen to compress this data into an average weight for each hoard. The full variation in the data should be allowed to show through. As one would expect, as time goes on the coins gradually get lighter and lighter. However, what is also apparent is that the rate of this decline does not appear to be uniform. It appears to accelerate. This pattern needs to be quantified. Rogers and Duncan Jones both fitted straight lines to such data, this would be entirely inappropriate here, since it is the observation that there is a change in the gradient that is interesting. Instead we can fit some simple polynomial curves to the data. In doing this all the data has been used, not just the medians from each hoard. This means that our degrees of correlation (R) will be much lower than Duncan Jones' values of nearly one, simply because the data has not already been smoothed as his selection of the medians did. What order of polynomial should be used? The higher the order, the more varied the shape of the curve fitted will be. However, a high order curve may not necessarily provide us with a useful description of the trends in the data, even though the mathematical correlation with the data will be better. This can be explained by reference to fig. 23.03.

In this case, though the trinomial (third order polynomial) passes very close to all the data points its relationship to the trend we are examining is minimal, and better represented by a simpler binomial (second order polynomial) or even a straight line. This problem, however, only occurs with some of the late series to be examined later, where there are only a few hoards containing data, in these cases a lower order curve has deliberately been used. Whichever, this curve only represents a crude guide to the patterning in the data, but it should be able to identify broad trends in it.

For Vespasian the following curve can be fitted:

Weight of coin = $W = 3.4493 - 0.0028\,t + 0.00002762\,t^2 - 0.0000001489\,t^3$ $(R = 0.74)$

This equation can tell us the normal weight of a *denarius* in a Romano-British coin hoard at date t. However, we are more interested in describing the rate of change of that weight. This is achieved by differentiating the equation above; differentiation of the equation is a way of calculating the slope of the curve:

Rate of change of weight = $dW/dt = - 0.0028 + 0.00005524\,t - 0.0000004467\,t^2$

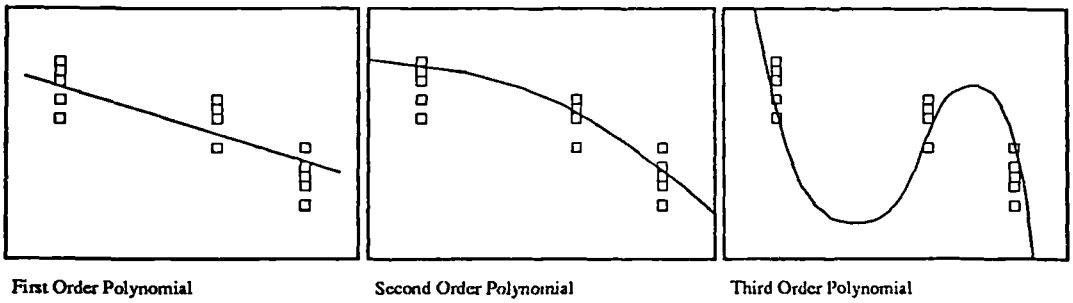


Fig. 23.03 Problems of fitting high order polynomial curves to hoard data

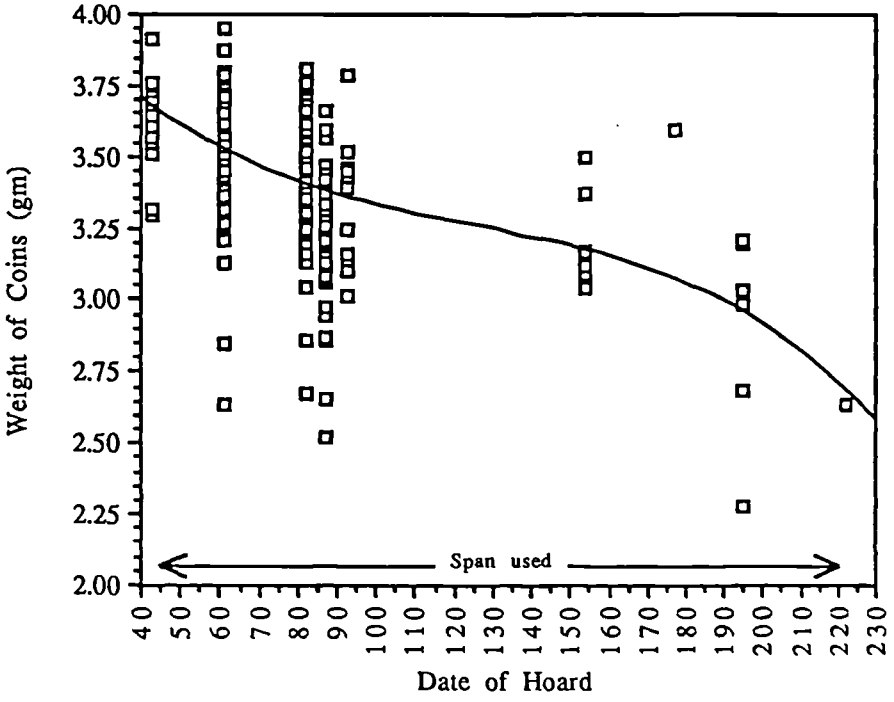


Fig. 23.04 The weight of Republican *denarii* in hoards
$W = 4.2904 - 0.0194\,t + 0.0001330\,t^2 - 0.0000003517\,t^3$ $R = 0.52$

2.36 Rates of Wear of all *denarii* in Britain

The Vespasianic coins have shown that there is a chronological variation in the rate of coin wear. This pattern should also be reflected in the other coin series to which our attention now turns. The same procedure has been carried out with all the remaining groups. The curves are shown in figs. 23.04-23.10.

Table 2.32: Curves derived from the weights of *denarii* in hoards of different date:

Republican:	W=	4.2904	-0.0194 t	+0.0001330 t^2	-0.0000003517 t^3	R = 0.52
Claudio-Neronian:	W=	5.549	-0.0501 t	+0.0003501 t^2	-0.0000008153 t^3	R = 0.84
Civil War Issues:	W=	4.6009	-0.0288 t	+0.0002142 t^2	-0.0000005617 t^3	R = 0.70
Vespasian:	W=	3.4493	-0.0028 t	+0.00002762 t^2	-0.0000001489 t^3	R = 0.74
Titus to Nerva:	W=	4.9956	-0.0345 t	+0.0002388 t^2	-0.0000005788 t^3	R = 0.45
Trajan:	W=	2.0784	+0.0148 t	-0.00004897 t^2		R = 0.17
Hadrian:	W=	3.8765	-0.0043 t			R = 0.25
Antoninus Pius:	W=	-1.373	+0.0556 t	-0.0001676 t^2		R = 0.38
Later Antonine:	W=	-3.4629	+0.0767 t	-0.0002231 t^2		R = 0.38

Table 2.33: Differentiations of the equations in Table 2.32, representing the rate of wear on coins:

					Valid for:
Republican:	dW/dt=	- 0.0194	+ 0.0002660 t	- 0.0000010551 t^2	AD 45-220
Claudio-Neronian:	dW/dt=	- 0.0501	+ 0.0007002 t	- 0.0000024459 t^2	AD 60-195
Civil War Issues:	dW/dt=	- 0.0288	+ 0.0004284 t	- 0.0000016851 t^2	AD 80-195
Vespasian:	dW/dt=	- 0.0028	+ 0.00005524 t	- 0.0000004467 t^2	AD 80-220
Titus & Nerva:	dW/dt=	- 0.0345	+ 0.0004776 t	- 0.0000017364 t^2	AD 80-195
Trajan:	dW/dt=	+ 0.0148	- 0.00009794 t		AD 155-195
Hadrian:	dW/dt=	- 0.0043			AD 155-195
Antoninus Pius:	dW/dt=	+ 0.0556	- 0.0003352 t		AD 155-220
Later Antonine:	dW/dt=	+ 0.0767	- 0.0004462 t		AD 175-220

How well do the results of all these coin series compare? Do all the series experience fast rates of wear at the same time? Is there any consistency in the patterning? What would be helpful is some kind of composite picture representing all these curves. The reason why we studied the *denarii* in Emperor groups was so that we made no assumptions about all the *denarii* being issued at the same standard throughout the Principate, however now we have got 'rate of wear' equations from our graphs it is possible to amalgamate the information since these equations place no reliance upon any supposed minting standard. The only remaining provision being that the

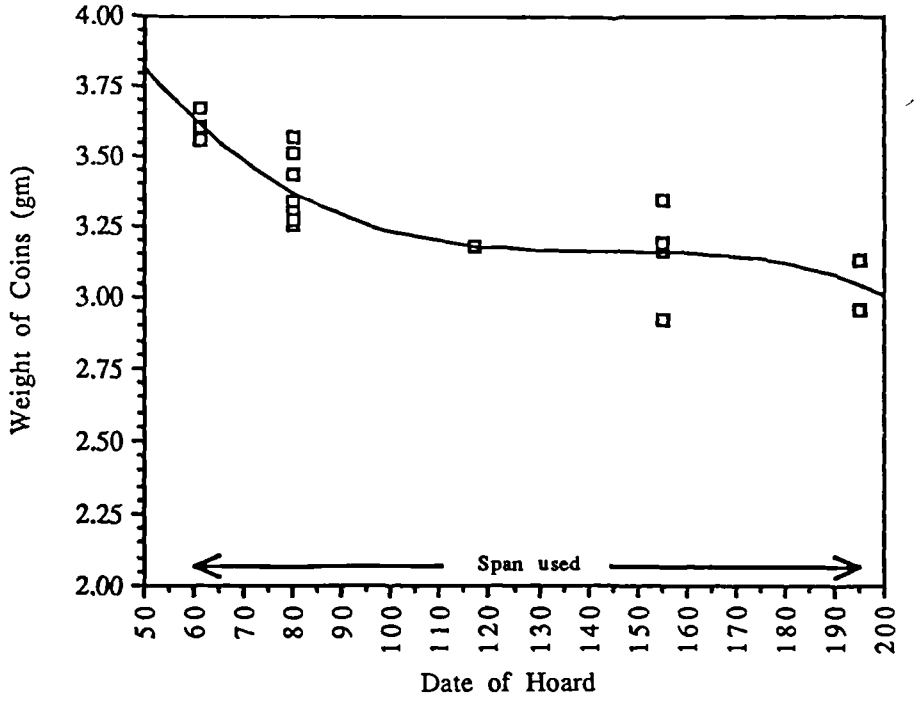


Fig. 23.05: The weight of Claudio-Neronian *denarii* in hoards
$W = 5.549 - 0.0501\,t + 0.0003501\,t^2 - 0.0000008153\,t^3$ $R = 0.84$

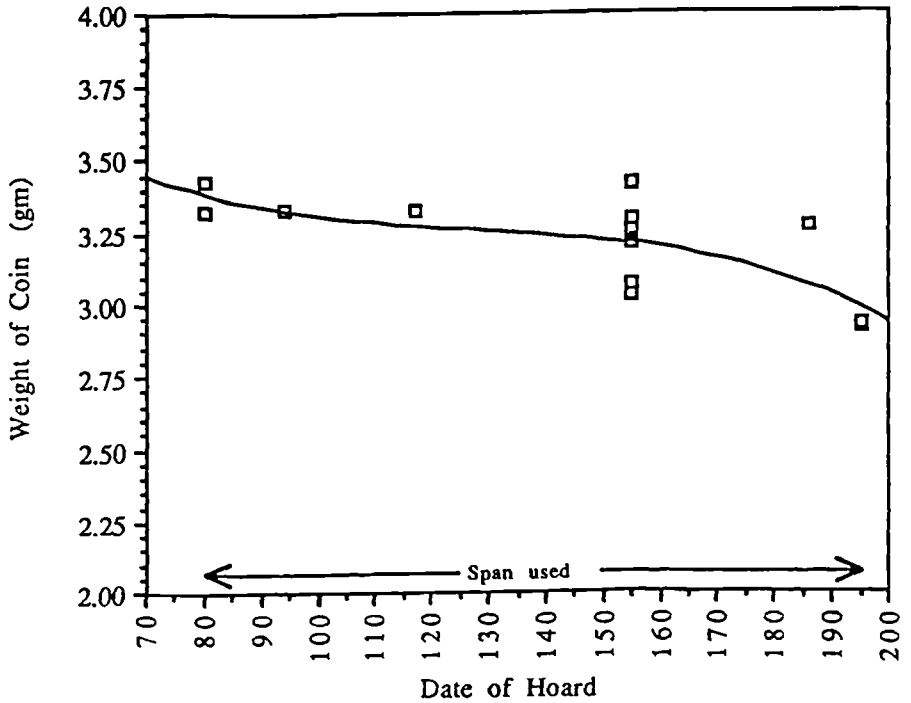


Fig. 23.06: The weight of Civil War *denarii* in hoards
$W = 4.6009 - 0.0288\,t + 0.0002142\,t^2 - 0.0000005617\,t^3$ $R = 0.70$

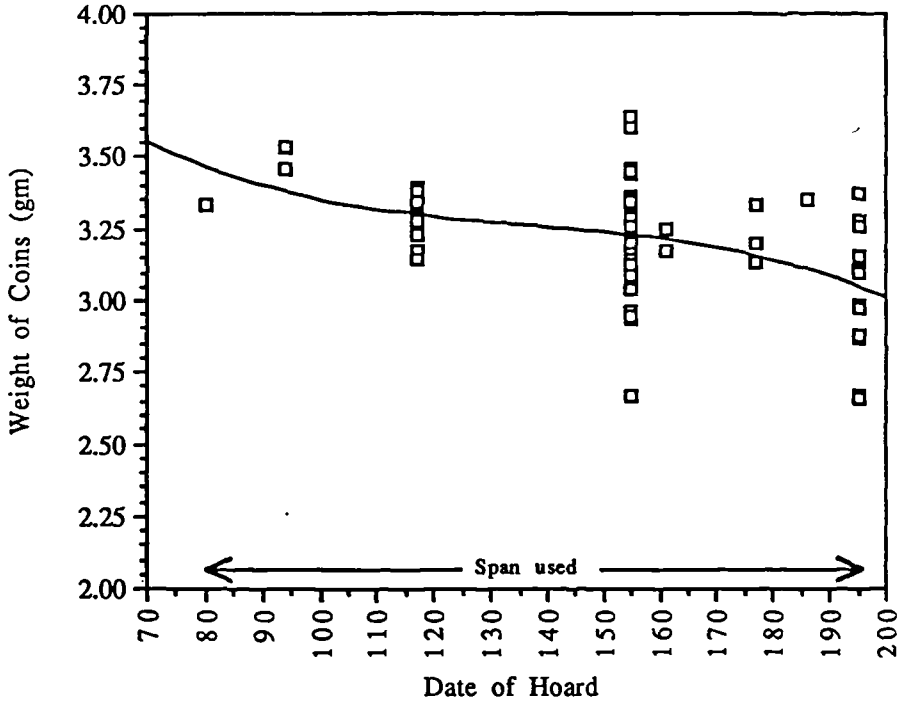


Fig. 23.07: The weight of *denarii* from Titus to Nerva in hoards
$W = 4.9956 - 0.0345\,t + 0.0002388\,t^2 - 0.0000005788\,t^3$ $R = 0.45$

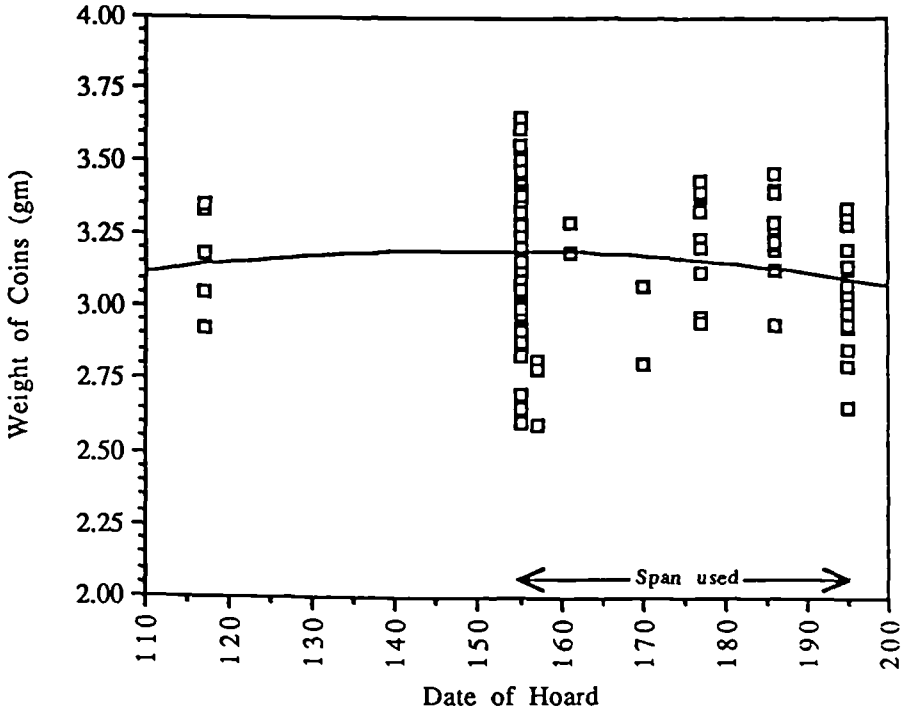


Fig. 23.08: The weight of Trajanic *denarii* in hoards
$W = 2.0784 + 0.0148\,t - 0.00004897\,t^2$ $R = 0.17$

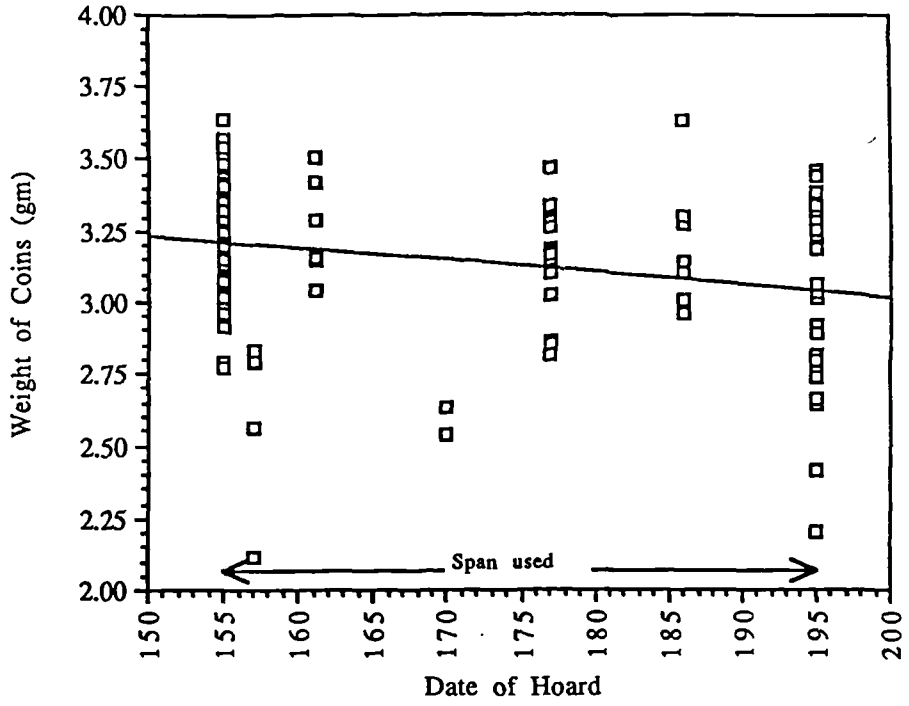


Fig. 23.09: The weight of Hadrianic *denarii* in hoards
W= 3.8765 -0.0043 t R = 0.25

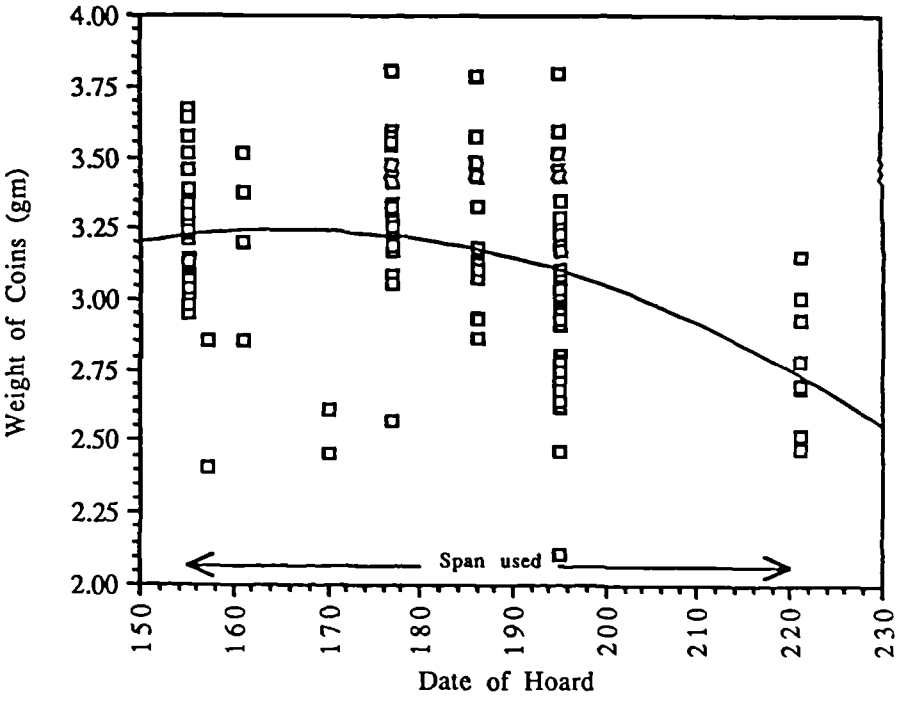


Fig. 23.10: The weight of Early Antonine *denarii* in hoards
W= -1.373 +0.0556 t -0.0001676 t^2 R = 0.38

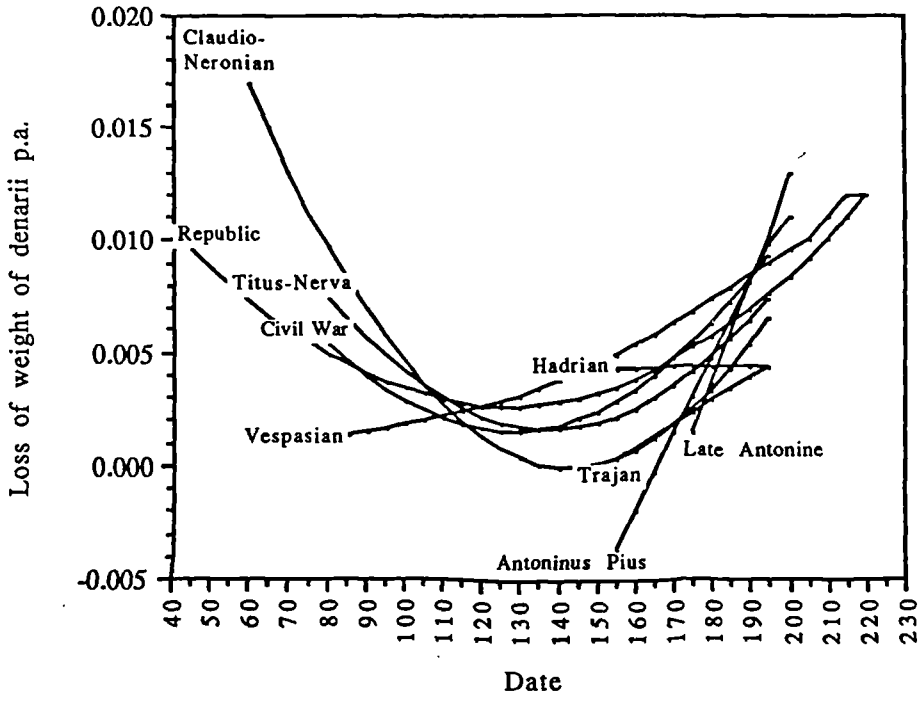


Fig. 23.11: The rate of wear of *denarii* amongst the nine individual coin groups

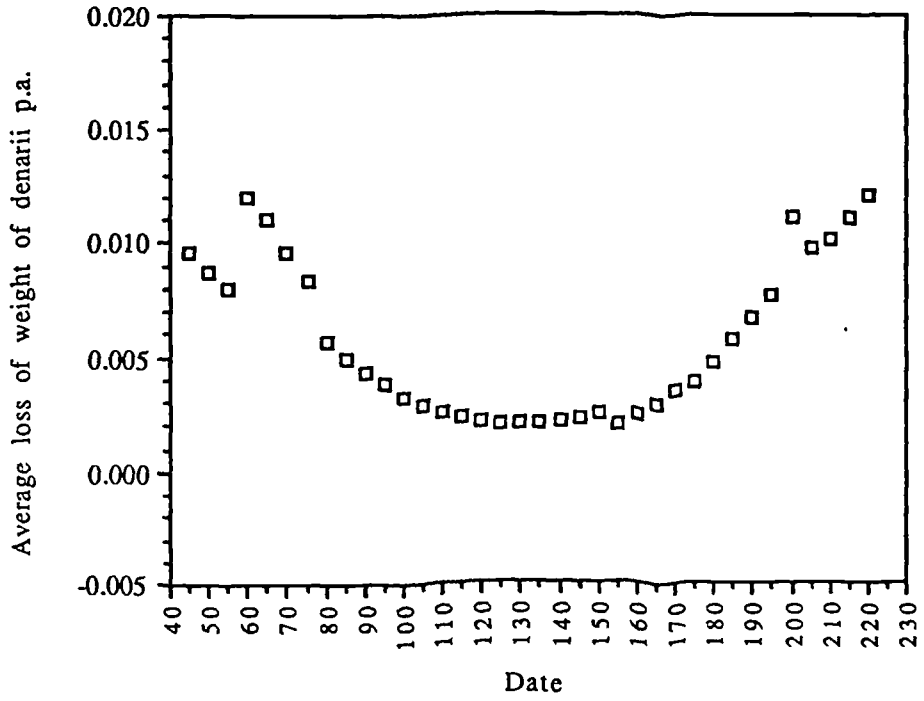


Fig. 23.12: The rate of wear of *denarii* in Britain, averaged from all the coin groups

composition of the *denarius* is known to have changed over time, and therefore the durability of the metal might have altered with it.

Fig. 23.11 shows the rate of wear curves for the nine series. From this graph it is clear that the general trend is very systematic, with the rate of wear declining up until the early second century AD, and then starting to rise again. The nine curves have been averaged in fig. 23.12. If the graph is taken at face value then the implication is that instead of a steadily developing monetary economy in Britain, with *denarii* circulating faster and faster, what we have is the reverse to start with. *Denarii* start off by being handled and worn a great deal (c. 0.010 gms pa), although this rate declines to a quarter (0.0025 gms pa) by the early-mid second century, only then to start to rise again. This pattern is not what one might have expected, however it is derived from concrete data rather than a complicated model. Nonetheless, corroboration from another method of calculating the rate of circulation of coinage would be welcome.

It must be noted that in fitting polynomials to the data, just as in fitting straight lines, a certain degree of information is suppressed. The result will end up as a simple curve rather than a variable squiggle by definition of the method. The curve in fig. 23.12 therefore only represents the general trend, it can have no claim to be a precise detailed representation of the changing wear rates of *denarii* in Britain.

2.37 The circulation of *sestertii*

As mentioned above, Duncan-Jones also did some work on the *sestertii* in the Garonne hoard. Though in France rather than Britain, a re-interpretation of his results has a bearing upon the results of the *denarius* survey above.

Duncan-Jones found the fitting of a straight line to these weights more difficult than in his previous analyses. This he explained away by conceiving a change in the weight standard of *sestertii* . This meant it was easy to explain away the low weight of the later *sestertii* because they were seen to have been minted to a lower weight standard. However, instead of looking for different minting standards, how would different rates of wear affect the pattern? Fig. 23.13 shows models for this kind of graph, where different issues of different dates are shown from a single hoard. The steeper the gradient, the faster the rate of wear must have been (fig. 23.13a). However, the gradient would only be a straight line had the coins circulated throughout their life at a uniform rate. Otherwise variation in the line would be expected (fig. 23.13b). Using this very simple model how could we reinterpret the weight of *sestertii* in the Garonne hoard (Table 2.34 and fig. 23.14)? What we have is a uniform rate of circulation from the mid 70s to AD 110-120. At this point the rate of wear in *sestertii* falls off. There are three possible interpretations:

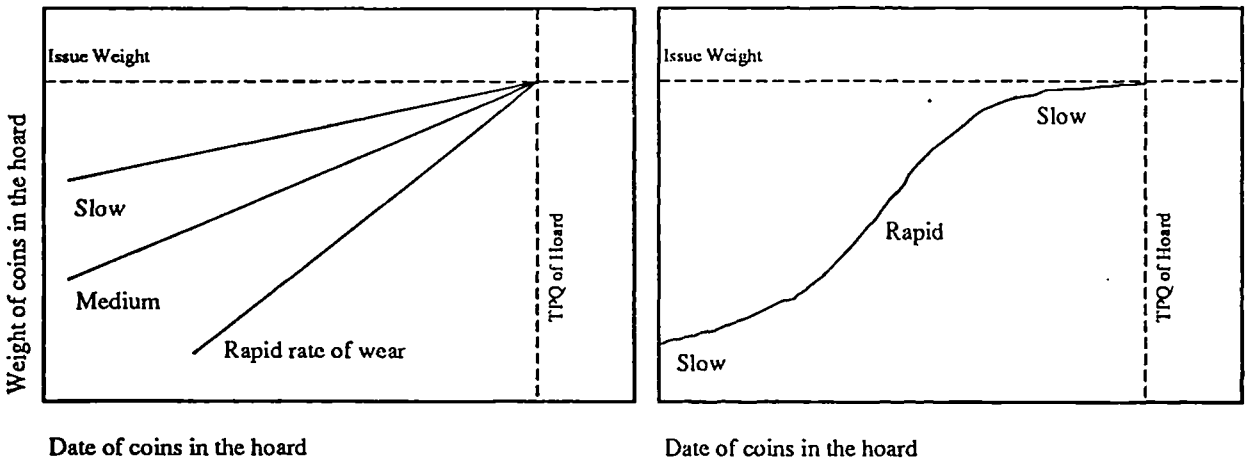


Fig. 23.13
Differential rates of wear and its effect on the weight of coins from a single hoard

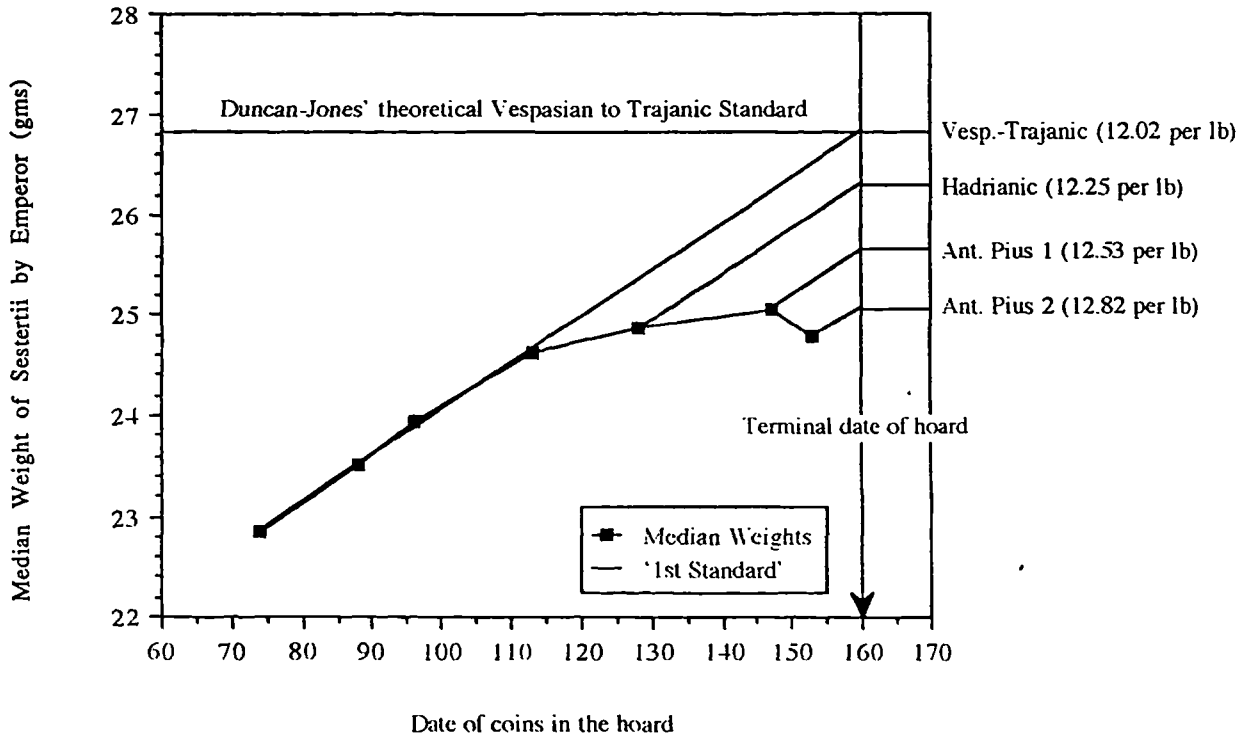


Fig. 23.14: The weight of *sestertii* in the Garonne hoard

1. In the Antonine period the rate of wear on *denarii* gradually increased, at the same time the rate of wear on *sestertii* can be interpreted as decreasing. Perhaps this reflects the *denarius* being handled more than *sestertii* as the *denarius* slowly became the more useful coin; in the same way that *sestertii* gradually took over from *dupondii* , *asses* and the other smaller bronze coins.

2. Perhaps the change in the rate of wear has nothing to do with contemporary changes in the handling of *denarii* . It may be related to the large numbers of *sestertii* now in circulation. If there were more *sestertii* in circulation (and coins of Hadrian and Antoninus Pius are by no means rare) perhaps on average each coin would have been handled less, therefore the rate of wear might have been reduced (assuming the average number of transactions remained the same).

3. Or perhaps the minting standard of *sestertii* did change and was reduced by Hadrian and then twice by Antoninus Pius.

If any, the author prefers the second interpretation, but a far wider range of *sestertius* hoards would have to be examined first, and the problem of estimating intended minting standards would have to be addressed.

Table 2.34: Median weights of Sestertii in the Garonne hoard
(From Duncan-Jones (1987) Tables IX-XI)
Data represented in fig. 23.14
The 'No. of *sestertii* struck per pound' is derived from the intersects on fig. 23.14

Emperor	Dates	Median Weight (gms)	Interpreted No. of Sestertii struck per pound
Vespasian	69-79	22.85	12.02
Domitian	85-91	23.52	12.00
Nerva	96-97	23.95	12.00
Trajan	112-114	24.64	12.01
Hadrian	128-129	24.865	12.25
A. Pius (1)	145-148	25.08	12.53
A. Pius (2)	149-156	24.785	12.82

2.38 Conclusions

It is likely that precious metal coinage was extremely mobile. Therefore it would be prudent to ask whether the weight of *denarii* in Britain is actually telling us anything about Britain *per se* , or is it possible that the wear on them is a far more general indicator of what is happening in the empire as a whole? Did the wear being measured actually take place in Britain, or did it take place in the whole of the Empire, with the coin simply terminating its European tour by being fossilized in a hoard in Britain ? There is no intrinsic evidence that will tell us this. The fact that changes in the rate of wear of *denarii* in Britain and *sestertii* in Gaul takes place at the same time suggests

that changes are taking place on a multi-provincial scale. Also Duncan-Jones' analysis of the Londonthorpe, La Magura and Viuz-Faverges *denarii* hoards of Britain, Rumania and France suggested similar rates of wear in each; though as noted there were problems with his methodology.

For the moment the conclusions drawn from this section are:

1. From the conquest to the early second century *denarii* slow down in their rate of circulation in Britain.

2. From the early second century to the early third century *denarii* may slowly increase in their rate of use in Britain. No information beyond this date is possible from this analysis.

3. This pattern may reflect a wider picture than Britain alone, depending upon how mobile silver was between provinces.

4. *Sestertii* in Western Gaul show a decrease in use in the early to mid second century, which *may* relate to an increase in the numbers of *sestertii* in circulation at the time. However, this conclusion is not particularly secure.

5. Corroboration from a different form of analysis would be welcome.

2.4 Uniformity and Variability in Hoards

2.41 The 'normal' hoard
2.42 The creation of a bench-mark
2.43 Variability in hoards and its meaning
2.44 Quantifying variability: Cramer's Contingency Coefficient
2.45 Interpreting variability
2.46 Conclusions

A broad pattern of similarity is found amongst British denarius hoards of the same date (2.41 & 2.42), however, this is not to say that their composition is entirely uniform. Reasons for variation in hoard structure are discussed (2.43), and contingency tables are used to see if this variability is consistent over time (2.44). It is not, and reasons are sought for this (2.45 & 2.46).

2.41 The 'normal' hoard

If we are to study *denarius* hoards in Britain then we need some kind of bench-mark against which to say 'this hoard is typical for a hoard of that date' or 'this hoard is exceptional in its construction'. Furthermore, if we to are equate *denarius* hoards with slices through the circulation pool, frozen in the form of a 'money-chest' which for what ever reason were not recovered, then an idea of the changing structure of coin hoards would inform us about the changing structure of the circulation pool as a whole. However, as has been noted above, this can only be justified if there is such a thing as the 'normal hoard' with all hoards showing a reasonably consistent pattern.

So are hoards predictable in their composition ?. Reece's analysis of seven Severan hoards in Britain (Reece 1974a) quite clearly showed that they could be. All had a very similar composition within the limits of the analysis. So similar that 14 years later he reflected that:

> "the important point is that in the hoards discussed in this paper there are no eccentric hoards, they are all alike. The really eccentric hoard, such as that from Falkirk, stands out very prominently."
>
> (Reece 1988, 101)

From Reece's work we can move forward beyond an analysis of seven hoards of more or less one date, to a study based on the entire span of the *denarius*' duration in Britain and with all the hoards drawn from our database for which reasonable data exists. The specifications for the level of information we require is that we can describe the hoard in terms of the Emperor groups noted above (Section 2.2). Further there must be enough information in the publication to tell us that the details represent all the coins that were found, or virtually all; otherwise selective fractions of the hoard may have been spirited away distorting the data. Imitation *denarii* have to be excluded from the information and the sample size has to be above some minimum figure which has arbitrarily been set here at five coins.

Total number of hoards in data-base:	784
Hoards containing genuine *denarii* :	212
Hoards where the number of coins are known:	187
Hoards where there are sufficient details:	148
Hoards where there are more than five *denarii* :	125

Our aim is to obtain an overall picture of the changing composition of hoards. Cumulative frequency graphs have been used plotting all the coins issued up to a certain emperor. This has been done in preference to plotting the proportion of each emperor in hoards individually since it makes better use of the data where the quality of information about a hoard is imperfect. For example: frequently, in the Antonine period, it is impossible to tell how many coins relate to the reign of Antoninus Pius and Marcus Aurelius. The reason for this is that coins may be published simply as 'Faustina' without any clue as to whether they belong to Faustina I (Antoninus Pius) or Faustina II, let alone whether if of Faustina II they were issued under Antoninus Pius or Marcus Aurelius. A similar problem occurs with coins of Marcus Aurelius as Caesar or Augustus and Antoninus Pius whether in his primacy or posthumously. Were the plots to be done individually then data from such hoards could be used in neither an Antonine curve, nor one for Marcus Aurelius as their values would be suspect. However, if the information is presented cumulatively, though we might not be able to use the information for a curve of coins up to Pius' death, we can at least use it for the next graph of coins up to the end of Marcus Aurelius for which the total will be correct, whatever the actual ratio of Antoninus Pius to Marcus Aurelius coins.

Cumulative frequency graphs were drawn showing the proportion of coins up to a certain series occurring in hoards at different dates. This was done for each coin series. Examples are shown in figs. 24.01-04. The data are given in Appendix 2.41.

As can be seen, there is a reasonable degree of consistency in the data, the curve for coins up to Trajan (fig. 24.02) showing the best results. If we examine this one closely, up until Trajan's reign coins of his and earlier issues represent 100% of the *denarii* in all the hoards. Only after this when new issues arrive of later emperors does this proportion drop until the mid third century when virtually all Trajanic and earlier *denarii* have disappeared from the circulation system. The curves for Vespasian (fig. 24.01) and Marcus Aurelius (fig. 24.03) show a similar picture. In the case of coins up to Elagabulus (fig. 24.04) the pattern is more dispersed, though one can imagine that by AD 280 they probably represent about 40% of the coins in circulation; though by this stage one must remember that there were probably hardly any *denarii* left in circulation at all, and the data comes from only a small sample recovered in large *antoninianus* hoards. The degree of scatter in the illustration probably reflects both this sample size effect and the variable residual nature of those *denarii* left in circulation at that date.

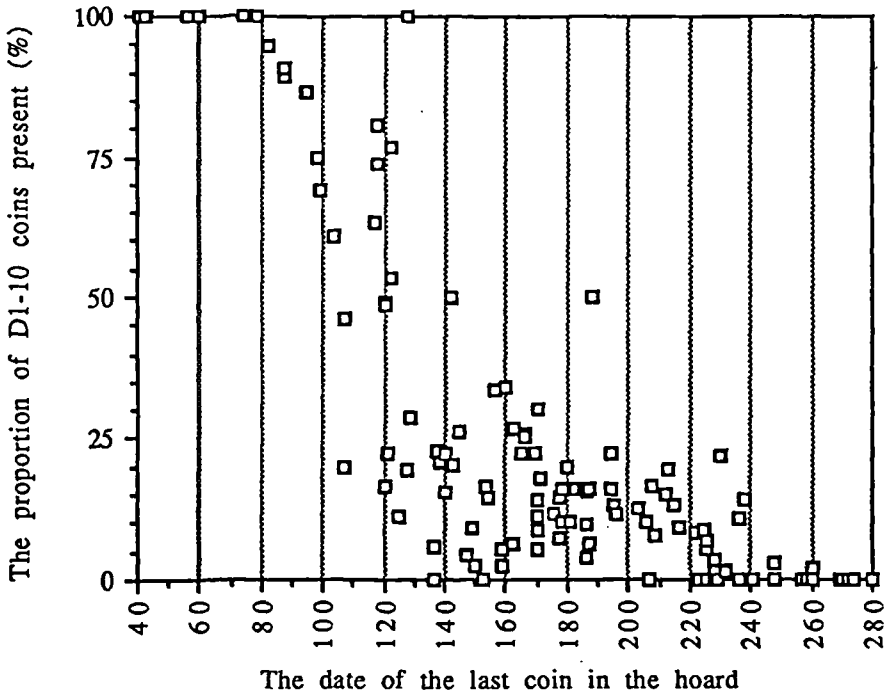


Fig. 24.01 The proportion of *denarii* up to and including Vespasian (D 10) in hoards

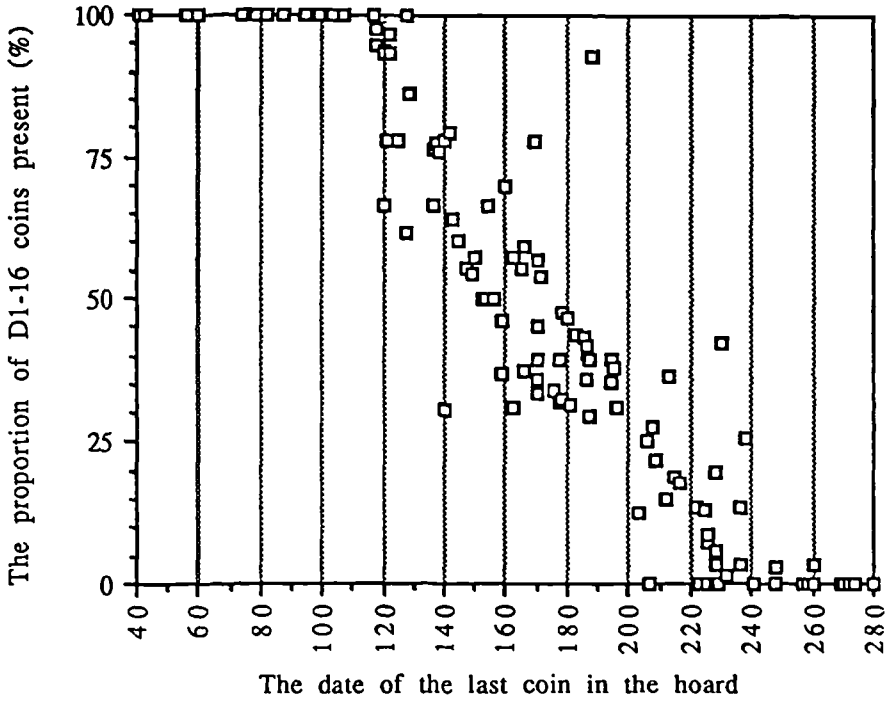


Fig. 24.02 The proportion of *denarii* up to and including Trajan (D 16) in hoards

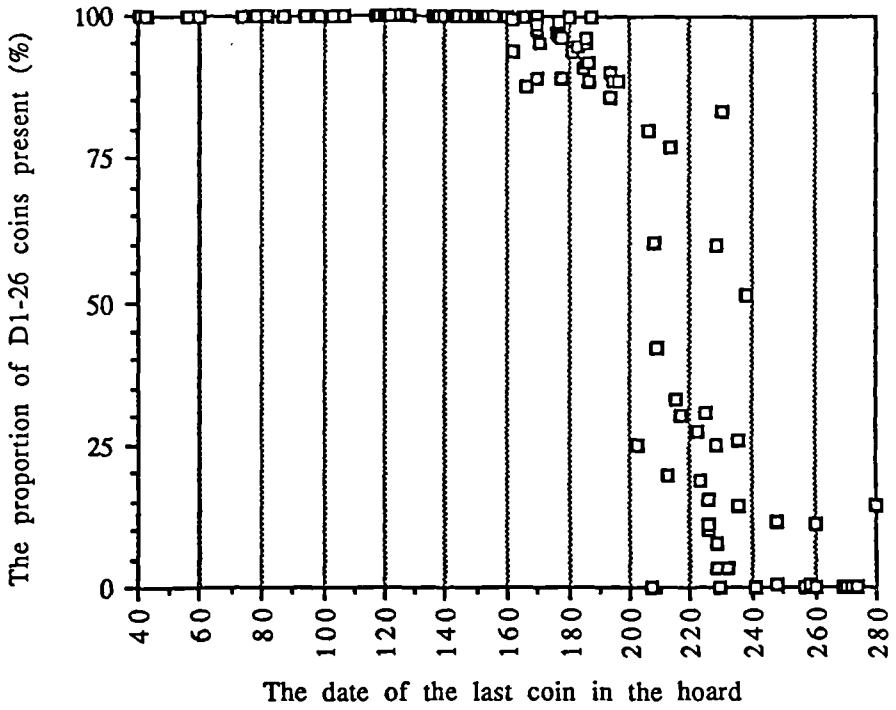


Fig. 24.03 The proportion of *denarii* up to and including M. Aurelius (D 25) in hoards

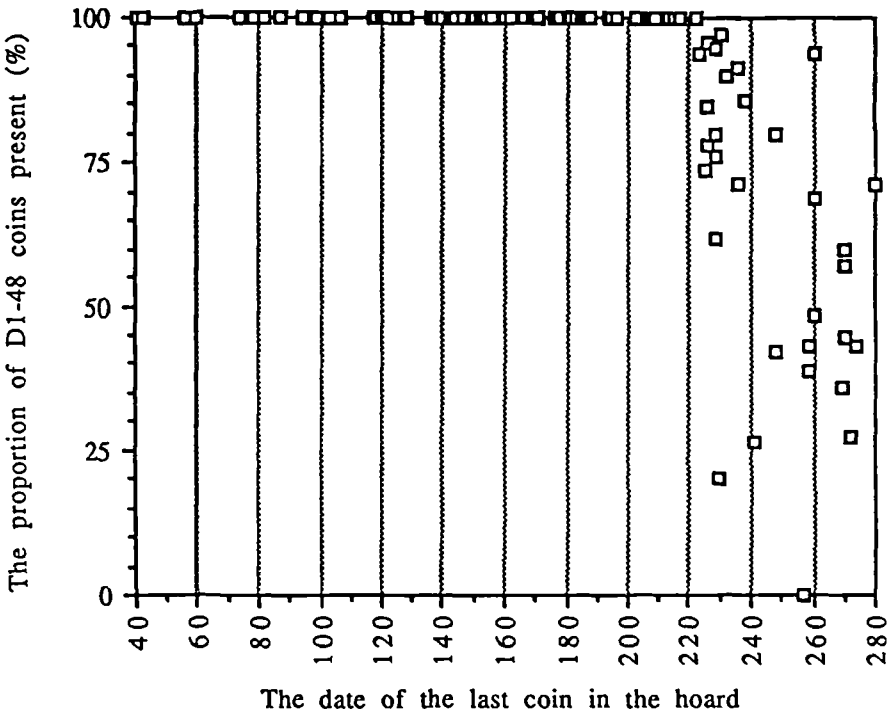


Fig. 24.04 The proportion of *denarii* up to and including Elagabulus (D 48) in hoards

What is clear is that there are broad general trends in the composition of *denarius* hoards. Reece's comments above for Severan hoards stand true just as much for all *denarii* hoards in Britain.

2.42 The creation of a bench-mark

From these curves we can create a bench-mark of 'the standard composition of *denarius* hoards in Britain'. This is intended to act as a useful yard-stick against which to measure individual hoards.

First, some kind of line needs to be fitted to the cumulative composition curves. The idea of fitting a simple mathematical curve to them would be inappropriate. There is absolutely no reason why any of the graphs illustrated should conform to a simple mathematical curve. Occasions such as the sudden input or withdrawal of a coin series in circulation would cause a step in the line which a fitted curve would in all probability smooth out. Instead, various interpolation techniques have been used and curves have been fitted to short sections of each graph. The final results are shown in fig. 24.05. The data for this is given in Appendix 2.42.

This illustration will now serve as our bench-mark representing 'normal hoard composition'. Comparison of the well defined lines to the spread of data shown in the proceeding illustrations should warn us that there is still much variation in the data, and the bench-mark only represents a guide to the average composition. The study of this variation we return to in section 2.43. But for the moment let us assess what this illustration tells us in its own right about the nature of the mixed circulation pool.

Fig. 24.06 shows us the same information as fig. 24.05, except that here it has been separated out into the individual coin groups. While looking at these one must remember that they do not represent *how many* coins of that series were in circulation at any one time, but rather the *proportion* which were. The difference is very important as they are not the same thing at all. For example, the proportion of the number of *denarii* of Groups B and F (Mark Antony and Vespasian) rise markedly around AD 120-140. This probably has nothing to do with more coins of these issues coming into Britain. In fact both rises relate to the sharp withdrawal of earlier Republican *denarii* from circulation at around this time. The difference between graphs of the proportional make up of the currency pool and the actual money supply is explored much further in Section 3.4, but for the moment let us remain with the hoards.

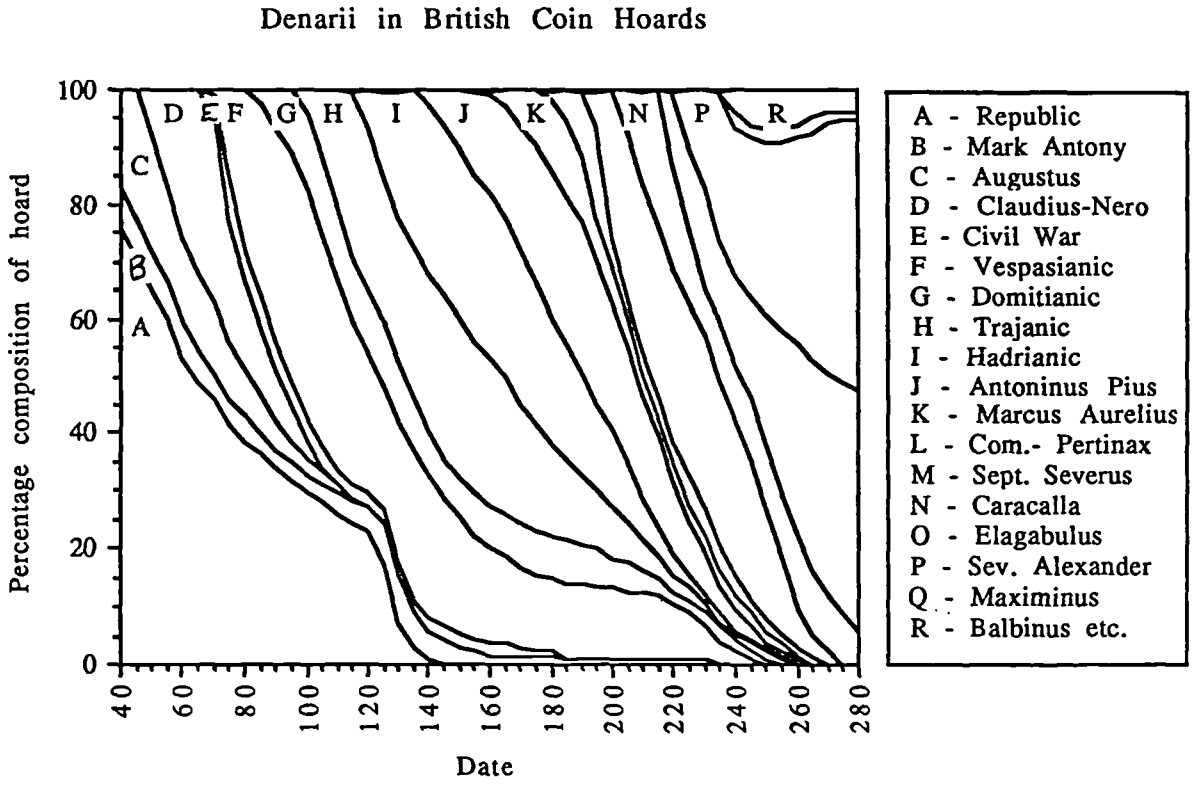


Fig. 24.05 The proportion of *denarii* in British coin hoards

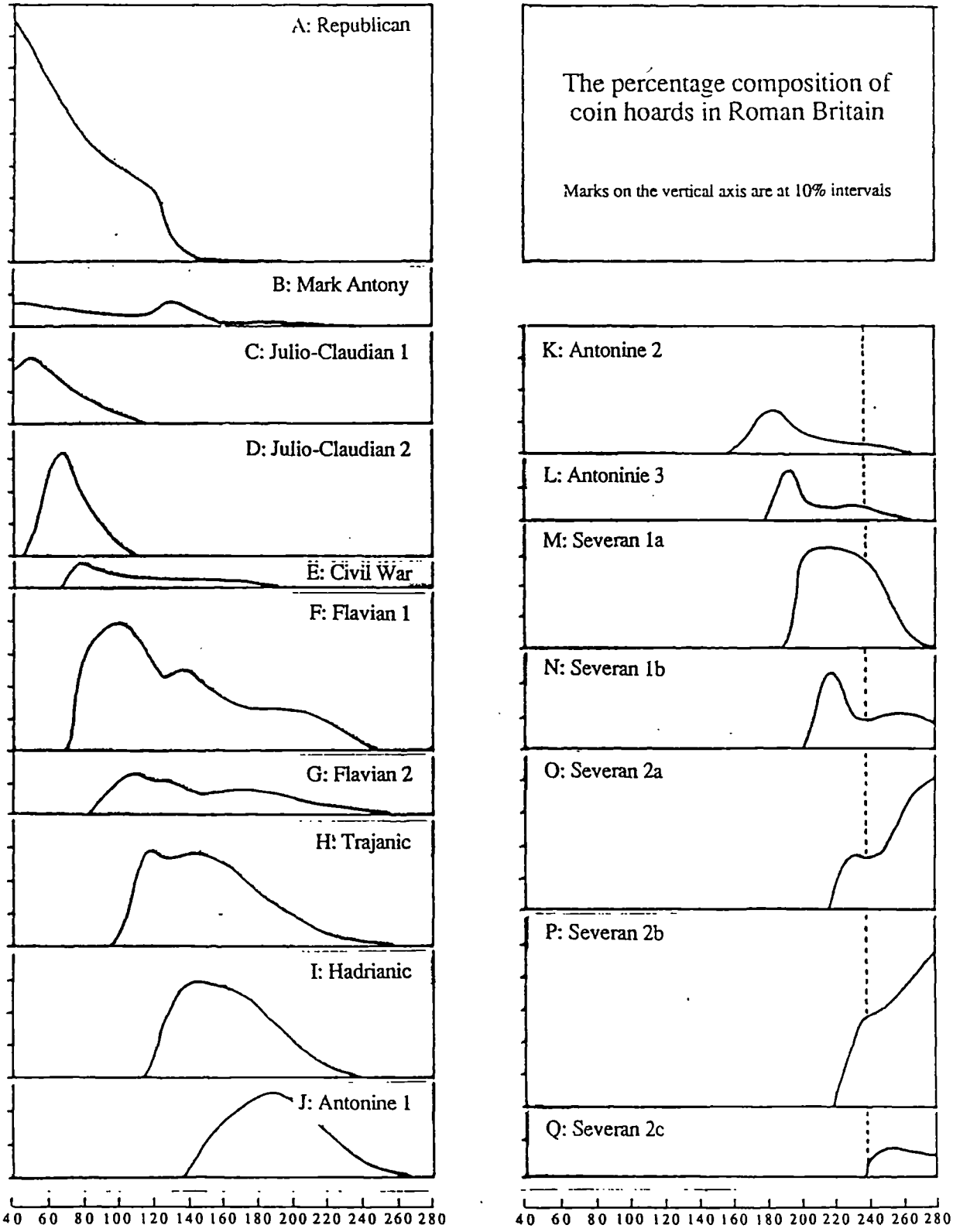


Fig. 24.06 The proportional content curves for each *denarius* group (A-Q)

2.43 Variability in hoards and its meaning

The preceding section has demonstrated that the *denarius* hoards of Britain do have a fairly regular structure. There is such a thing as the 'normal hoard'. However, the graphs did not show every hoard of each particular date to be totally uniform. Variation around the norm still exists, not all the points on the graph corresponded to a smooth line. The question posed here is what does this background variation mean and does it have any significance ?

First a chronological change in the degree of uniformity can easily be shown by examining side by side two of the hoard composition graphs (fig. 24.02 & 24.01). The first, of *denarii* up to Trajan, shows a tightly clustered line. This demonstrates a high degree of homogeneity during this period (c. AD 120-230). However, the earlier graph of *denarii* up to Vespasian shows slightly more variation (c. AD 100-190). So it appears that variation in the uniformity of hoards has a chronological dimension. So what does similarity/dissimilarity in hoards mean?

Roman *denarii* entered Britain for a number of reasons. Some may have been to pay the army and the provincial administration, whilst other may have arrived in exchange for exports to the continent. The balance between these and other possibilities is not known and possibly not knowable. However, enter Britain they did. Let us take a hypothetical example: the arrival of the new *denarii* of Hadrian. Some may have been directly shipped to the North of Britain and the provincial capital of London for regular state expenditure, whilst others may have been issued in irregular localities, such as wherever Hadrian spent the night in his brief tour around the country. From their release into circulation, transactions with other individuals would have slowly spread their distribution beyond the issuing points to other areas of the province. This picture is entirely conjectural, and yet it serves to demonstrate that whatever function coinage is serving, whatever the mechanism by which it is put into circulation, it has to enter somewhere, from whence it diffuses. This is expressed in fig. 24.07.

In a circulation pool to which a new issue is added, initially there will be a geographical inequality in the distribution of the coins. Slowly, as transactions and mixing takes place, these coins will have a wider and wider distribution. If there were no new injections of money then eventually the circulation pool would become totally uniform, with the only variation in it being due to random chance. The faster the velocity of circulation of coinage, the quicker this smoothing out would take place. However, the Roman monetary system was not comprised of single issues with long pauses in between: the system was far more dynamic with new issues being minted virtually all

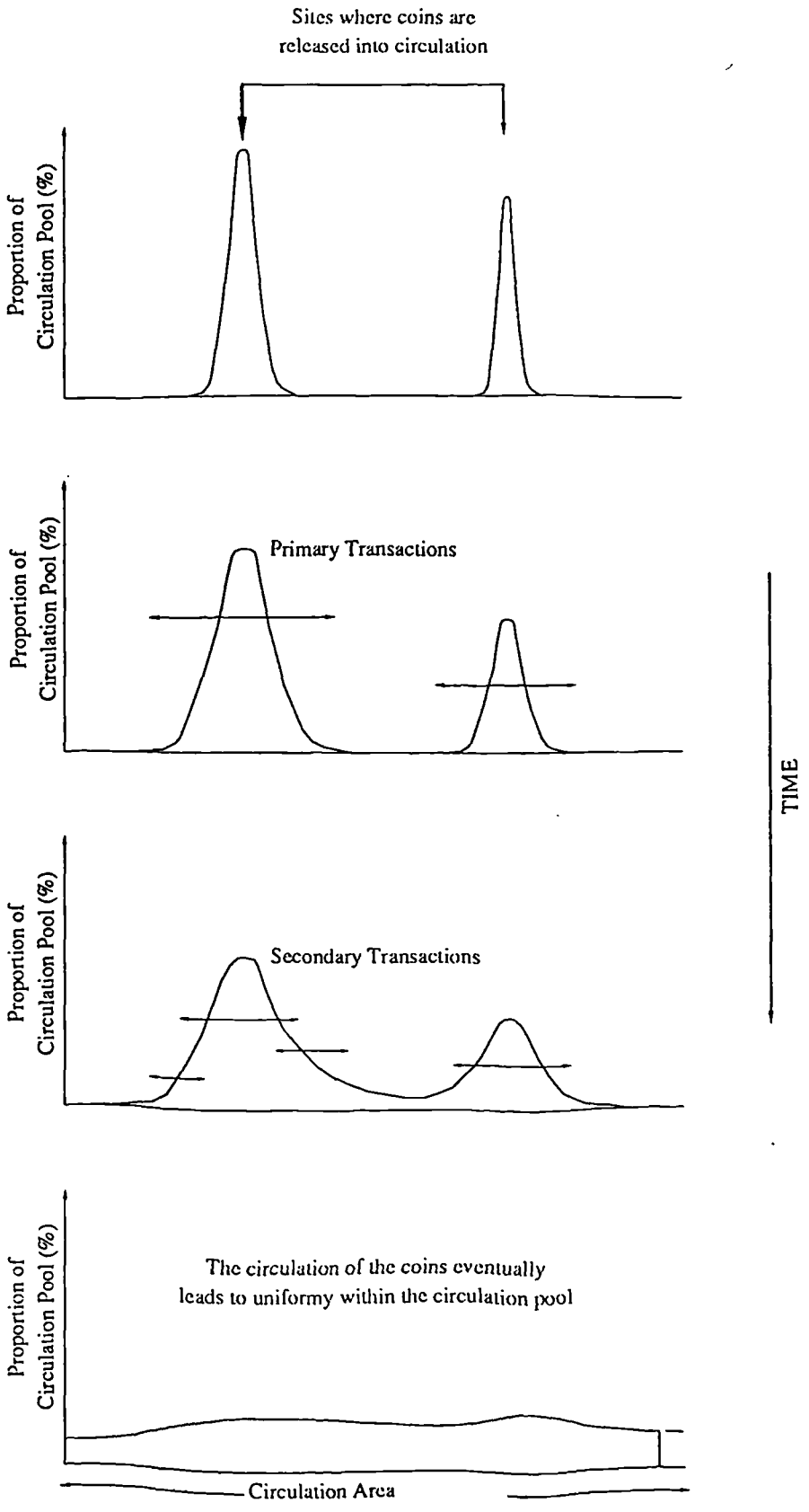


Fig. 24.07 The geographical spread of coinage after issue

the time. Once one issue had been entered into the system a new one would start. This means that a state of equilibrium in the circulation pool is never quite reached.

If coin hoards are a slice of the circulation pool, albeit selected by denomination, then their similarity to each other or dissimilarity would provide an index of the degree of irregularities in the pool. One way we would interpret our observations would be:

Observation	Interpretation
Hoards with variable composition	Coins are circulating slowly and/or New issues are continually being produced
Hoards with uniform composition	Coins are circulating very quickly and/or No new issues are coming out

If we could quantify this somehow, then we might have at our disposal a second means of examining the velocity of circulation of coinage, though one which has certain advantages over coin wear. One question raised in the coin wear analysis was whether the wear had been created by the circulation of that coin in Britain, since it might have been reflecting much broader inter-provincial trends. The advantage of the hoard analysis is that unless the hoard has been buried very far from its home, its structure is more likely to have a direct relevance to the situation in Britain than wear.

2.44 Quantifying variability: Cramer's Contingency Coefficient

If we were comparing just a couple of hoards to see if their composition was similar, then an obvious method to be used would be the chi-squared test. However, here we have a larger number of cases spread out chronologically. What we want to do is look at the hoards for each decade and measure the variation in them. As this is the initial study simply to see if such variation exists, what we require is an established statistical test. The test to be used is a measure of association of data in a contingency table. It is called Cramer's Contingency Coefficient (Φ). The value of the statistic is one if all the cases (hoards) bear no relationship to one another, and it is zero if all of them are exactly the same.

Table 2.41 shows a contingency table containing the four *denarius* hoards with suitable data from the 130s. The data has been grouped into four categories based on the groups outlined above in section 2.2.

The test statistic looks at the actual number of coins in each group in each hoard and compares them with the expected number had all of them been drawn from the same

general population. From the test statistic Cramer's contingency coefficient can be derived. A full introduction to the test is given in Appendix 2.43.

Table 2.41: *Denarius* hoards of the AD 130s represented in a contingency table

	Ref.	Name	Date	B-F	G	H	I-J	Total
Hoard 1	C 261	Weston	136	0	1	7	4	12
Hoard 2	S 114	Mallerstang	136	18	22	65	33	138
Hoard 3	C 236	Swaby	137	52	37	48	41	178
Hoard 4	S 037	Carlisle	138	13	15	19	15	62
Total				83	75	139	93	390

In the case of the coins from the AD 130s the value of Φ was 0.0224. Since this is close to zero, this suggests a very high degree of similarity between the hoards. We can proceed to do this analysis for all the other decades from the 40s to the 280s. The results are shown in Table 2.42.

Table 2.42: Cramer's contingency coefficient values for *denarius* hoards

Date Range	Φ	T	q	No. of Hoards	Date of Hoards
40s	0.1703	101.64	3	5	43.6 ±2.6
60s	0.0110	3.56	3	3	60.0 ±0.0
70s	0.2219	75.25	4	4	76.0 ±2.3
80s	0.0101	7.80	3	3	85.3 ±2.9
90s	0.1248	16.22	3	3	97.0 ±2.6
100s	0.0133	2.51	2	2	107.0 ±0.0
110s	0.1344	43.96	4	4	117.8 ±0.4
120s	0.0860	78.95	4	9	123.0 ±3.3
130s	0.0224	26.27	4	4	136.7 ±0.9
140s	0.0804	37.65	4	7	144.1 ±3.0
150s	0.0227	40.44	4	7	154.7 ±3.4
160s	0.0164	39.92	4	6	164.0 ±3.3
170s	0.0280	78.14	4	10	173.1 ±3.4
180s	0.0119	51.23	4	9	184.5 ±2.6
190s	0.0199	47.82	4	5	195.0 ±1.0
200s	0.0154	99.05	4	4	206.7 ±2.6
210s	0.0638	133.91	4	4	214.2 ±2.2
220s	0.0130	146.12	4	11	226.3 ±2.2
230s	0.0755	478.79	4	4	234.0 ±3.6
240s	0.0255	51.96	3	3	245.7 ±4.0
250s	0.0111	26.80	3	3	258.3 ±1.1
260s	0.0871	199.64	4	5	261.8 ±4.0
270s	0.3304	67.40	4	11	272.1 ±2.7
280+	1.0000	196.00	3	3	290.0 ±8.6

2.45 Interpreting variability

This information has also been displayed graphically in figs. 24.08-09. Together with the value of Φ, other information has been presented on these graphs. Fig. 24.08 shows the number of hoards looked at in each decade. Where the number of hoards is larger, the more reliable the statistic is going to be. Therefore one might note with caution the degree of similarity of the hoards in the 60s, 80s, 100s, 240s and 250s. Another factor which would bias the value of Φ would be the dates of the hoards. For example, a decade with five hoards all of one year is bound to show more similarity than a decade

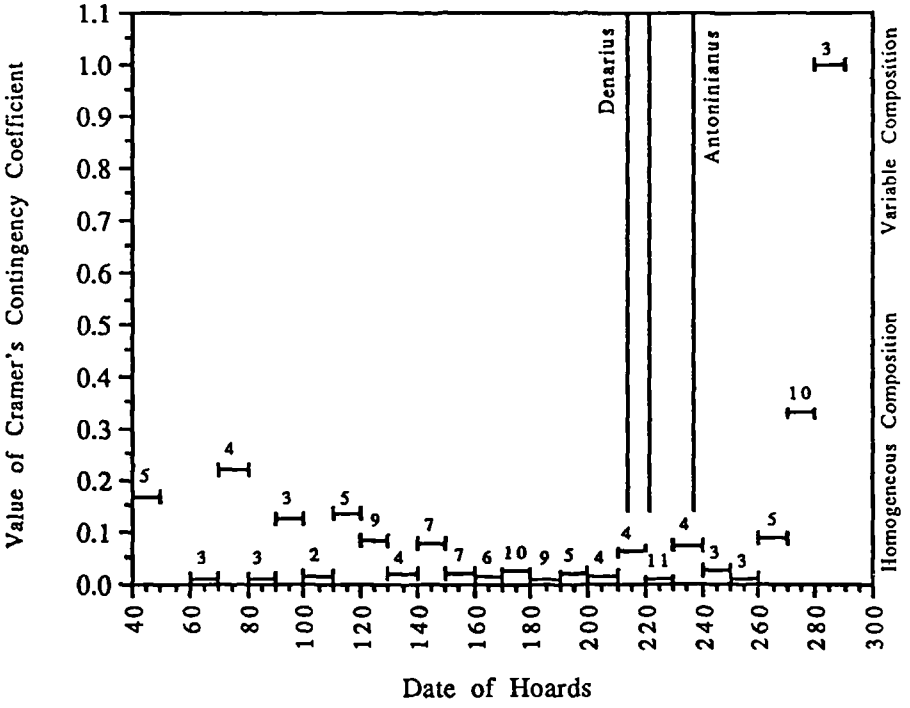


Fig. 24.08 The similarity of *denarius* hoards: sample size and 10 year blocks displayed

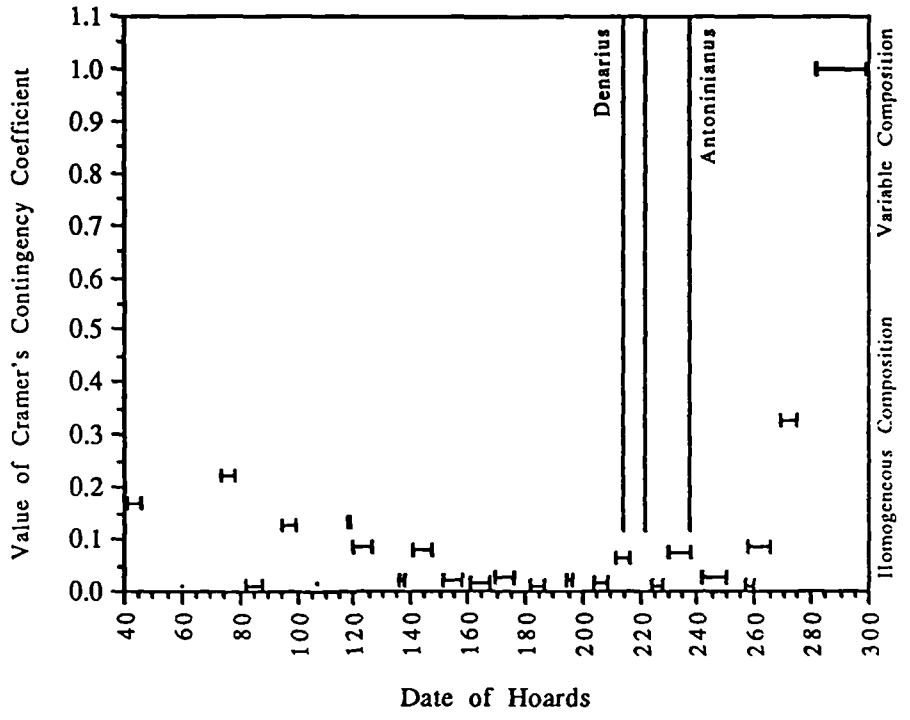


Fig. 24.09 The similarity of *denarius* hoards: standard deviation of date ranges shown

where there were five hoards spread evenly throughout the period. One simple way of demonstrating the spread of dates in the samples of any particular decade would be to present the standard deviation. Any particular clustering would show by a standard deviation of less that about ± 3.0 years. This actual value is shown on fig. 24.09 using error bars. Again the values that this means we must note with caution are those of the 60s, 100s, 110s, 130s, 190s and 250s, all of which are about ± 1 or less. With these problems in mind let us look at the general trends of the graph.

1. Invasion to mid second century

   No systematic picture emerges: some periods show very similar hoards whilst others show more diversity. However, it should be noted that all three of the low values are cases of small sample size or narrow date ranges. All we can really say is that the hoards are generally more dissimilar than in the following period.

2. Mid second century to early third century

   Here the hoards are consistently very similar, suggesting a high rate of circulation. This fits with the coin wear data which suggested that from the early second century onwards a consistent increase in the rate of circulation could be observed.

3. Early to mid third century

   During the period where the *antoninianus* was introduced, given up and introduced again the hoards show no tremendously systematic picture, except that the hoards were probably more diverse in composition than in the preceeding period, suggesting a slowing down in the circulation rate of *denarii* .

4. Mid third century onwards

   From the 260s the number of *denarii* in hoards is very small anyway, and those samples that do exist are very diverse in composition largely due to the very small numbers involved.

The results are not entirely satisfactory. We can see that there are chronological changes in the similarity/dissimilarity of hoards. This tells us that an analysis of variation in hoard structure is probably worthwhile as the variation is not entirely due to chance. Were it entirely a random effect then no chronological pattern would have been expected.

The problems with this method is its reduction of the data. All the variety of hoards within a decade are compressed into one statistic. This statistic is also prone to variation caused by the dates of the hoards and the size of the sample of hoards. Also there is a fair degree of subjectivity in the division of the data into coin groups; changing the groupings alters the value of Φ slightly. Finally, within that 10 year block changes might be taking place which the resolution of this method makes it impossible to detect.

2.46 Conclusions

In this section we have established a background picture of how *denarius* hoards in Britain are made up. This gives us for the first time a broad idea of the changing composition of the money in circulation.

It was noted that though the general picture was created using an average of all the individual hoards, naturally each individual hoard does not necessarily correspond precisely with this. Each hoard is slightly different. That difference must reflect something, be it random sampling variation, selection in hoarding, or else regional differences in the circulation pool.

It was considered that the faster coinage moves around the system the fewer irregularities would exist in the circulation pool and the closer to the general picture each individual hoard would be. The analysis of coin wear had shown a variation in circulation rates, so a chronological dimension was looked for in hoard similarity/dissimilarity.

Some chronological differences were found, using Cramer's Contingency Coefficient, indicating the period of highest similarity was the mid to late second century. This corresponded to the period of increased circulation rates indicated by the wear analysis. However, the rest of the study was not particularly enlightening. Nonetheless it served to show that the degree of variation in hoard composition might be a useful source of information, though a more 'tailor-made' technique would be required to obtain the information, one which looked at individual hoards rather than groups of hoards. Such a technique is developed in Section 2.5.

2.5 Hoard Structure

2.51 Introduction
2.52 How can we illustrate structure?
2.53 Structure and the 'normal' hoard
2.54 The quantification of structure
2.55 Analysis: Chronological
2.56 Analysis: Spatial
2.57 Conclusions

The aim of this section is to expand upon some of the ideas introduced in section 2.4. Here we want to examine in detail hoard structure. Two new methods are developed to quantify the structure of hoards (2.51 to 2.54). This information is then analysed for chronological (2.55) and geographical (2.56) trends; both of which are found.

2.51 Introduction

Reece's analysis of Severan hoards (Reece 1974a, 81) noted that some hoards had a higher proportion of new coins in them than others. From the examples that he used, this appeared to be related to how far away from a source of supply a hoard was accumulated. Thus Carrawburgh had the highest proportion, which immediately tempted an association with military pay. Bristol had the next highest, while other sites, with fewer and fewer Severan coins, were seen as representing stations further and further along the exchange network of *denarii* until finally the most obscure rural site was eventually reached. This was simply an idea offered on the basis of a very small number of hoards. Nonetheless it is suggestive of the potential information which hoard structure might contain.

The analysis did however have a number of weaknesses. The idea itself was interesting and the results potentially very informative, but in this case there were some problems with its execution. The principal problem was that the hoards were not all of one date, but rather ranged over a period of a decade and a half. Since Septimius Severus' coin took time to come into circulation then we would expect later hoards to contain a higher proportion of his issues than earlier hoards, and as the table below shows this is precisely what we see here. The time taken for Severan coins to enter circulation far better explains the variation in this data than Reece's supply model. The occasion for such a steep rise in the number of his coins late in his reign may have been his visit to Britain (208-211), where he was said to have brought with him a lot of money (according to Dio 76, 11, 1).

Table 2.51: Five Severan hoards

Hoard	*T.P.Q.*	*% Coins of S. Severus*
Handley Wood	194-195	0.5
Silchester	194-195	0.8
Portmoak	196-197	1.9
Bristol	208	33.0
Carrawburgh	210-212	73.0

Despite this unfortunate finding, this kind of question about whether hoard structure can tell us anything about coin supply is one which should be pursued. However, we are forewarned that this requires a finer chronological precision than simply that of an emperor's reign.

2.52 How can we illustrate structure?

Looking at one particular chronological group of hoards, as Reece did, meant that the quantification of 'structure' was easy, one simply took the proportion of coins of Septimius Severus in the hoard as the variable. However, we need a method which can be applied over a far wider time-span than Septimius Severus' reign. Structure can be defined in many ways; in the fourth century dividing by the mint marks can have interesting results. Here the major differences in *denarius* hoards are due to their age profiles. This being the case, one way of visually expressing hoard structure would be a cumulative frequency graph. An example, the Parwich Hill hoard, is shown in fig. 25.01. For the moment ignore the 'white' line, and just examine the 'black' curve for the hoard itself. The construction of the curve is very straight forward. The hoard contained about 80 *denarii* , 79 of which were well recorded. The TPQ for the hoard was AD 161-180. The coin numbers are transformed into percentages then cumulative percentages. This information is then displayed on a graph (fig. 25.01) which shows what proportion of the hoard is earlier than a particular date. For example we can note that about half the assemblage dates to before AD 110. Naturally, by the time the terminus post quem of the hoard has been reached, 100 % of the coins in the hoard are represented.

Table 2.52: The Parwich Hill hoard, data for fig. 25.01

Emperor group	Number of coins	Percentage	Cumulative Percentage	Date Range
Mark Antony	1	1.53 %	1.53 %	40 BC to 31 BC
Julio-Claudian 1	0	0.00 %	1.53 %	37 BC to AD 41
Julio-Claudian 2	2	3.08 %	4.61 %	AD 41 to 68
Civil War	1	1.54 %	6.15 %	AD 68 to 69
Vespasianic	5	7.69 %	13.84 %	AD 69 to 81
Domitianic	13	20.00 %	33.84 %	AD 81 to 98
Trajanic	22	23.08 %	56.92 %	AD 98 to 117
Hadrianic	23	24.61 %	81.53 %	AD 117 to 138
Antoninus Pius	9	13.85 %	95.38 %	AD 138 to 161
Marcus Aurelius	3	4.62 %	100.00 %	AD 161 to 177
TOTAL	79	100.00 %		

If each *denarius* in the hoard could be dated to an individual year, then this curve could be made even more precise. However, the emperor groups above have been used because most of the data will not sustain a more detailed analysis, therefore the temptation to use finer date ranges would only have reduced our potential data-base.

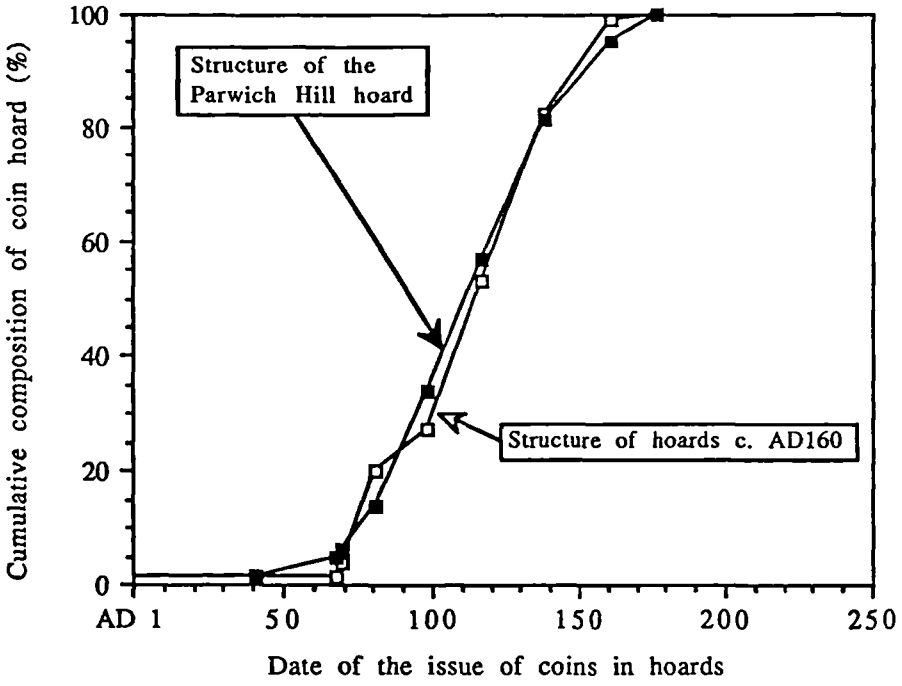


Fig. 25.01: Hoard structure of the Parwich hoard: an almost normal hoard

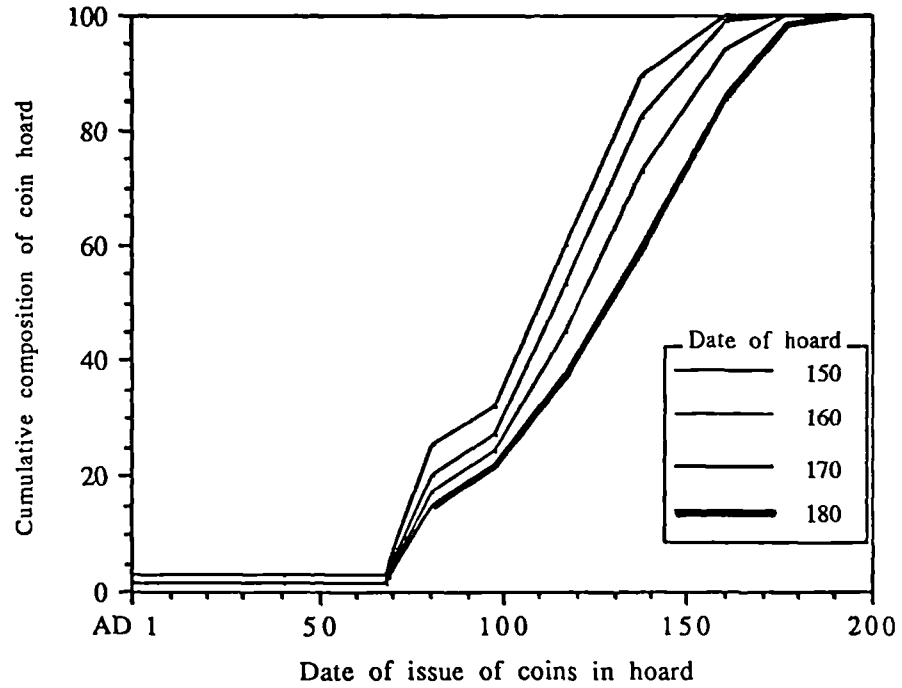


Fig. 25.02: Normal hoard structure from AD 150-180

Secondly, whilst individual issues may alter in date as numismatic studies further our knowledge, the dates of Emperors are reasonably fixed points and unlikely to change.

2.53 Structure and the 'normal' hoard

We now have a way of visually describing hoard structure. Not only can graphs like this be used to describe the structure of an individual hoard, but the data from fig. 24.05 (Appendix 2.42) can be taken to represent the structure of the 'normal hoard' of any particular date as well. This means it is possible to compare individual hoard's structures with the average hoard structure of any particular date.

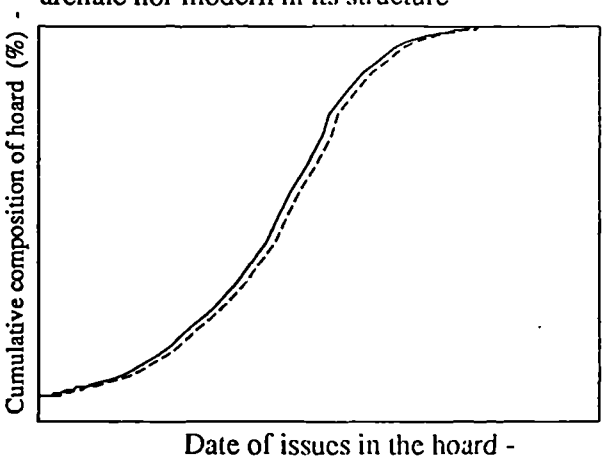
The Parwich Hill hoard dates to some time after AD 161-180. Fig. 25.01 compares its structure to that derived from our bench-mark of the date *c.* 160, the earliest possible date of the hoard. The two curves are very similar: of course there are slight differences, but it does tend to suggest that the Parwich Hill hoard is fairly 'normal' in its own right; it shows no marked deviation from our bench-mark, though the similarity to AD 160 rather than 170 or 180 suggests that the hoard was buried earlier rather than later within its *terminus post quem* range.

Here we have compared the Parwich Hill hoard with the structure of 160, however in principle it could be compared with the normal structure of any particular date; the curves for 150, 160, 170 and 180 are shown in fig. 25.02. This is where we start using our bench-mark as a metrological device. Individual hoards can be compared against it to see it their structure is 'normal' or not. But far more than this simple distinction, we can look for specific types of deviation. Here the concept of 'archaic' and 'modern' hoards is introduced. An archaic hoard is simply a hoard which contains a higher proportion of older coins in it that a hypothetical 'normal' hoard of the same date; and a modern hoard is a hoard which contains a higher proportion of newer coins than the 'normal' hoard of that date. This sounds very straightforward, but actually defining a variable to measure it is not quite so simple. First let us examine how an archaic or modern hoard would reveal itself. The four possibilities are shown in fig. 25.03. These illustrations are all versions of that above drawn for the Parwich Hill hoard. The individual hoard structure is compared against the normal hoard structure of the same date.

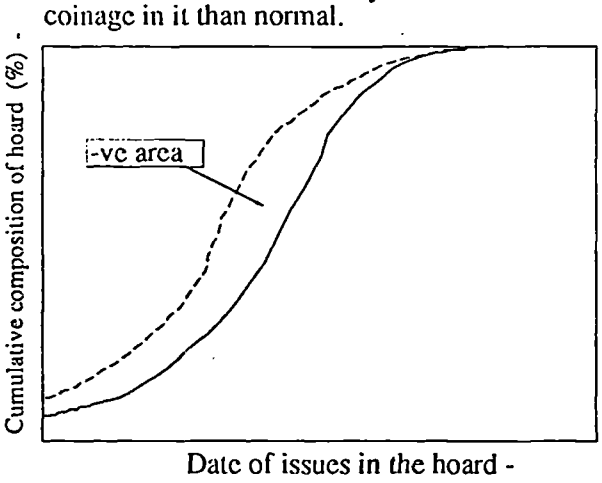
CASE A: The Normal Hoard

Here the structure of the specific hoard follows very closely the normal pattern, so that there is no gap between the lines.

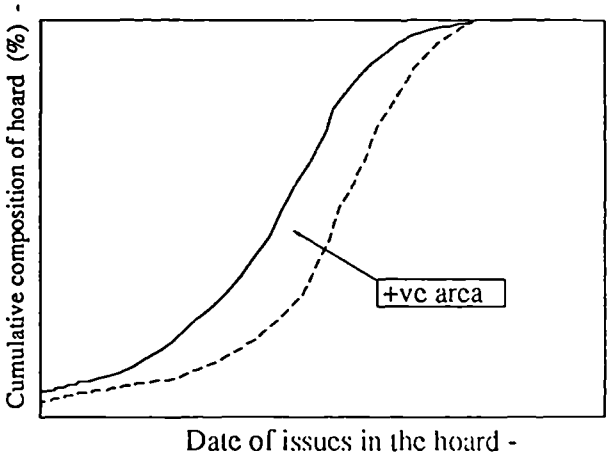
Case A
A hoard which is neither relatively archaic nor modern in its structure



Case B: ARCHAIC
A hoard which has relatively more older coinage in it than normal.



Case C: MODERN
A hoard which has less older coinage in it than normal.



Case D: AVERAGE but variable
A hoard which has relatively more older and newer coinage in it than normal; but little in between.

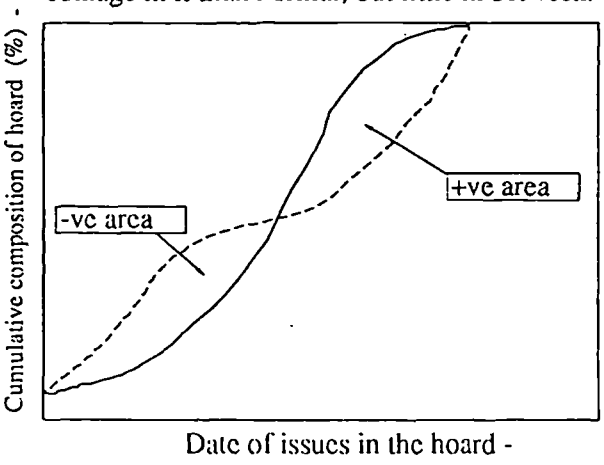


Fig. 25.03: Four models of hoard structure

CASE B: The Archaic Hoard

Here, because there are proportionally more older coins in the hoard, the specific hoard indicated by the dashed line lies above the normal hoard curve. The gap between has an area. The more archaic the hoard is, the greater this area will be.

CASE C: The Modern Hoard

The opposite is the case with a modern hoard. Because there are proportionally more newer coins, the curve is depressed until the final stages where it catches up with the normal hoard structure. Again the area between the two lines will be greater the more different the modern hoard is, though this time the area is on the opposite side of the normal curve.

CASE D: The Average but variable hoard

Here we have a mixed situation: a hoard with a lot of older coin, and a high proportion of newer coin, though few of the intervening years. On average therefore it is neither archaic nor modern, the two areas on either side of the curve balance themselves out. However, the hoard is still divergent from the norm.

A good example of an Archaic hoard is given to emphasize the point. The Falkirk hoard is very untypical in its construction. Its latest coin dates to AD 230, though it is far more like a hoard of the 180s. Fig. 25.04 shows the large area between the normal and Falkirk curves.

2.54 The quantification of structure

By giving these areas above and below the line different signs we can create a series of variables which define structure in relation to our bench-mark. If we make areas above our bench-mark curve negative, and areas beneath the curve positive, then archaic hoards would have a negative net area value, and modern hoards a positive net area value. Our Case D hoards would appear close to zero, since the areas on both sides of the normal curve would balance themselves out. In order to cater for our Case D hoards, a second variable can be created: the gross area value. Here the areas on either side of the curve are added together irrespective of their sign.

Definitions:

Gross Area Difference (GA Value)

The absolute total area between the Specific hoard curve and the 'normal' hoard curve.

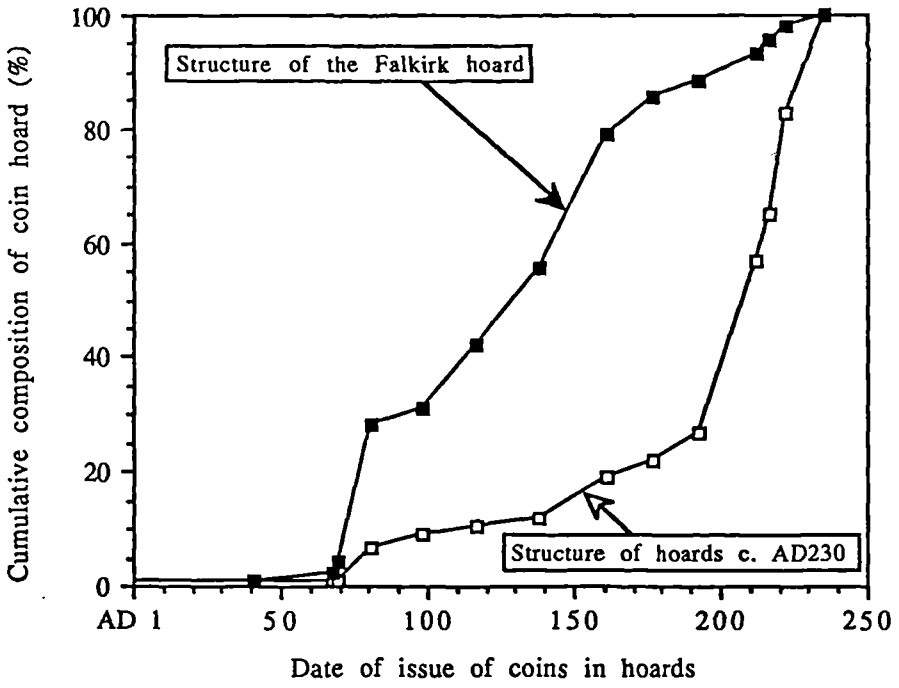


Fig. 25.04: Hoard structure of the Falkirk hoard: an archaic hoard

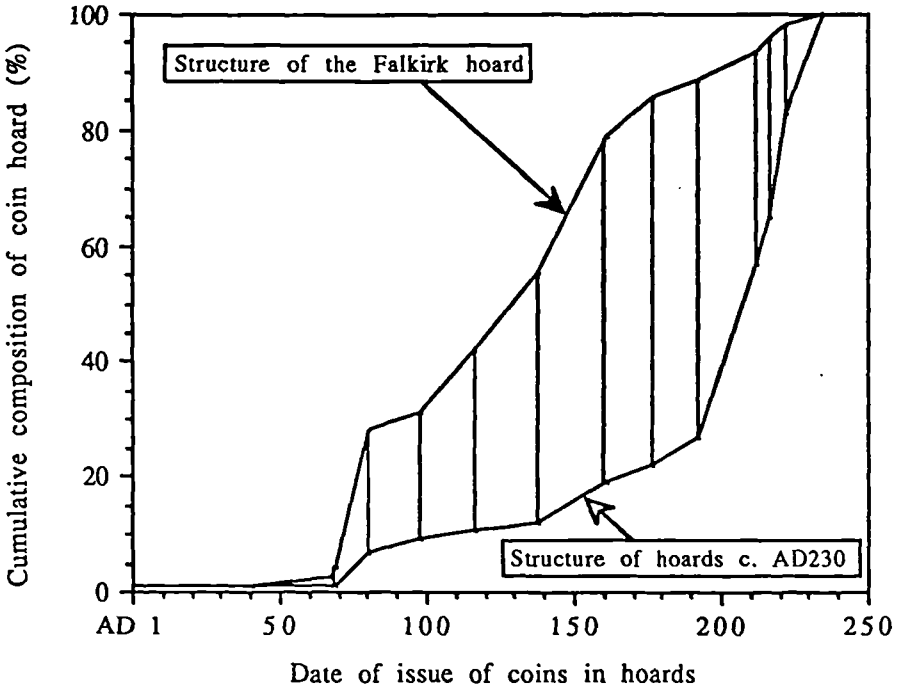


Fig. 25.05: The calculation of hoard structure: the Falkirk hoard

Net Area Difference (NA Value)

The total area between the 'normal' and specific hoard curves beneath the 'normal' hoard line less the area above the 'normal' hoard line.

Table 2.53: Gross area and net area values in each type of hoard

Hoard type:		Gross Area Difference	Net Area Difference
Case A:	A normal hoard	0	0
Case B:	An archaic hoard	+	-
Case C:	A modern hoard	+	+
Case D:	An average but variable hoard	+	0

These values can be calculated by dividing the area between the curves into segments. This has been shown for the Falkirk hoard in fig. 25.05. The area of each individual segment can be measured and the results of all added together to form the GA Value, or else the sum of all the archaic areas taken away from all the modern areas to give the NA Value. In the case of the Falkirk hoard the Gross Area Value was 6283, whilst the Net Area Value was -6283. The negative value of the Net Area indicates it to be an extremely archaic hoard.

This would all be far too time consuming to calculate by hand for each hoard, so the process has been converted into a computer program. The mathematical and geometric basis of it is given at the start of Appendix 2.51, followed by a description of the program and the program itself. The package looks at a specific hoard and contrasts it against the normal structure of the same date and calculates the Gross Area and Net Area values.

There are two different ways of defining how archaic or modern a hoard is. The Falkirk hoard provides a good illustration of this. Either you can look at the hoard and compare it to the structure of hoards at that same date and get in Falkirk's case a very large negative value for the Net Area Difference (indicating it is massively archaic). Or else one could search through time to see at which date the Falkirk hoard would have been happiest. The Falkirk hoard is in fact most like a hoard of around 182, though it must have been deposited in the 230s. This means that its structure is about 48 years behind the times. The second method has the advantage that it conveys an immediate impression of the degree of antiquity or modernity shown by a hoard which a value of the Net Area Difference does not. However, the Net Area Difference is perhaps a better indicator as it compares a hoard with its immediate chronological contemporaries. In the following both methods have been used.

Definitions:

METHOD 1: This is the straightforward quantification of the Net Area Difference at the TPQ date of the hoard.

METHOD 2: This is the calculation of the 'best fit date' of the hoard, as judged by the date at which the Net Area value is closest to zero. The difference between the best fit date and the TPQ date of the hoard is then calculated to see if the hoard is archaic or modern. This result is expressed in years. It is positive if the hoard is modern and negative if archaic.

It would be timely here to look at a few case studies where both these methods and the problem of TPQ ranges can be worked through:

Table 2.54: Hoard structure analysis, worked examples

				Method 1	Method 2	
Hoard Name	Type	TPQ	best fit date	best fit date within TPQ	difference	
Falkirk	Very Archaic	230	182 NAD = 26	230 NAD = -6283	-48 years	Fig. 25.06
Mildenhall	Normal	80-85	80 NAD = 59	80 NAD = 59	0 years	Fig. 25.07
Dewsbury	Modern	117-139	151 NAD = -35	138 NAD = 1186	13 years	Fig. 25.08
Parwich	Slightly Archaic	161-180	157 NAD = -35	161 NAD = -238	-4 years	Fig. 25.09

Fig. 25.06 shows the change in value of the Gross Area Difference through time for the Falkirk hoard. At the *terminus post quem* date for the hoard the deviation is great, and as one would expect as we move back in time to the 180s the deviation decreases. The net area deviation reaches zero in 182; however, the gross area difference reaches a minimum slightly later in date: around 185. The two ways of measuring the 'best fit date' (henceforth BFD) do not always absolutely agree. Though rarely is there more than a couple of years difference. Throughout this analysis the BFD has been defined as when the net area value is closest to zero. Both our Method 1 and Method 2 results give us large negative values indicating the antiquity of the hoard.

In the case of the Mildenhall hoard (fig. 25.07) our data does not provide us with a single date *terminus post quem* , but rather a date range. In this case we have to decide which section of the *TPQ* range we test the structure of the hoard against for Method 1. In practice what has been done is to test the similarity of the hoard to every date within its *TPQ* range; and the benefit of the doubt has been allowed to the hoard by allocating it to the best date within the range permitted. It just so happens that the BFD is just within the *TPQ* range, so this is taken to be the 'nominal' date for the hoard. Here the range is 80-85, and the 'best fit date' is 80.

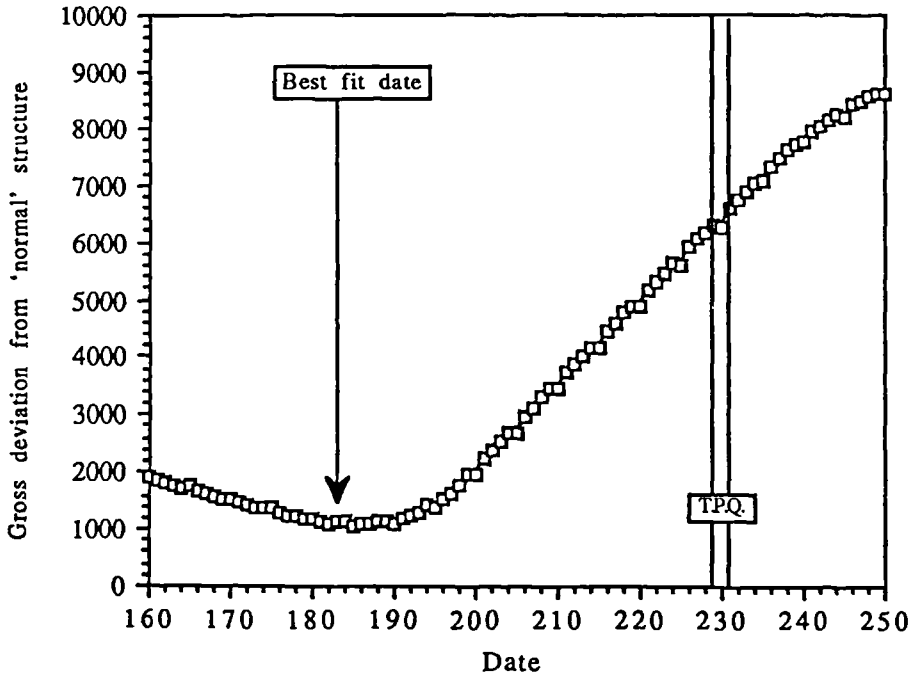


Fig. 25.06: A very archaic hoard: Falkirk (1,931 *denarii*)

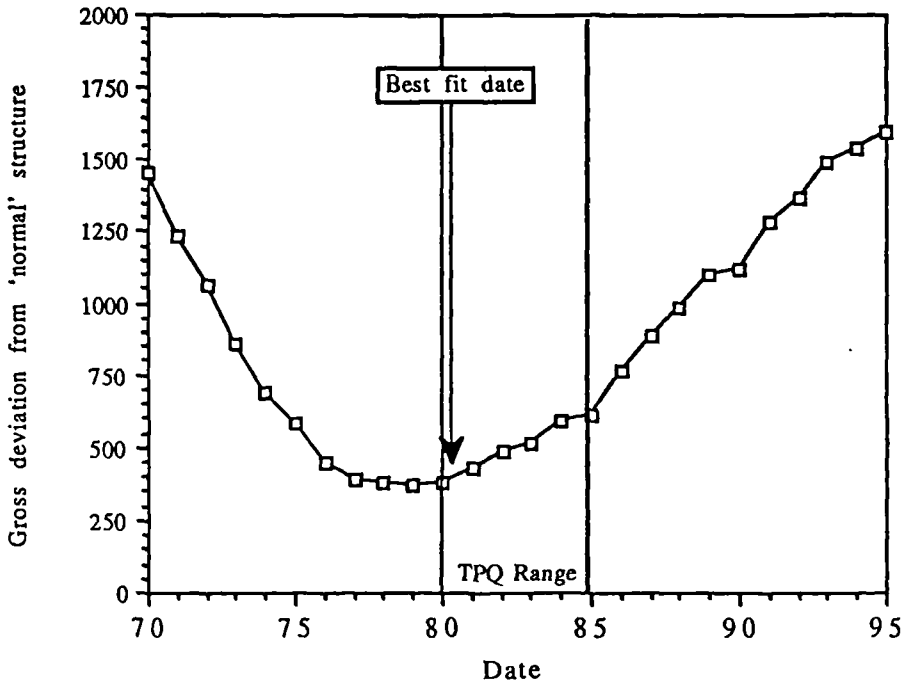


Fig. 25.07: A normal hoard: Mildenhall (277 *denarii*)

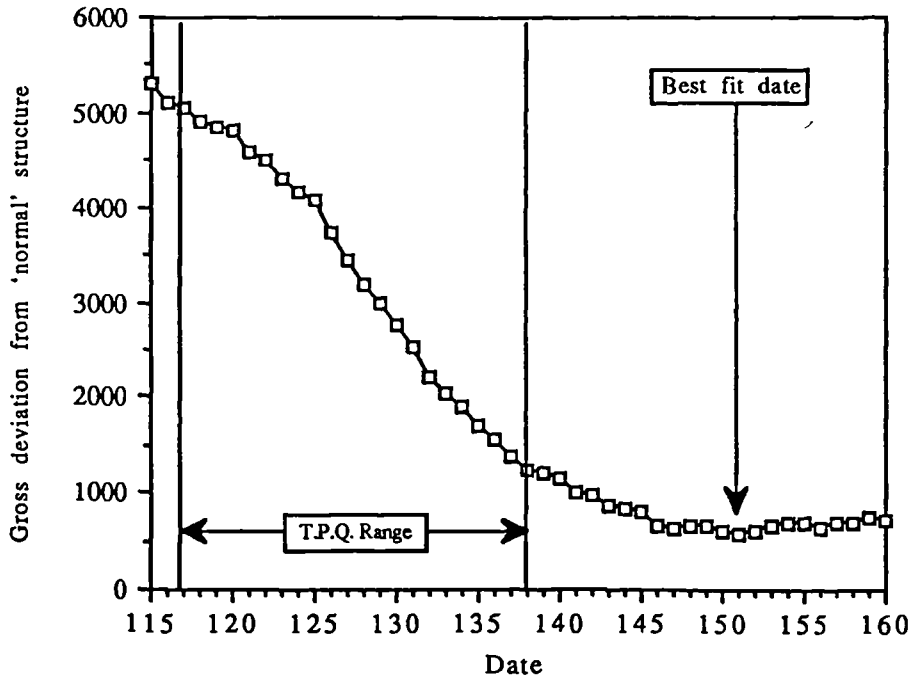


Fig. 25.08: A modern hoard: Dewsbury ((26 *denarii*)

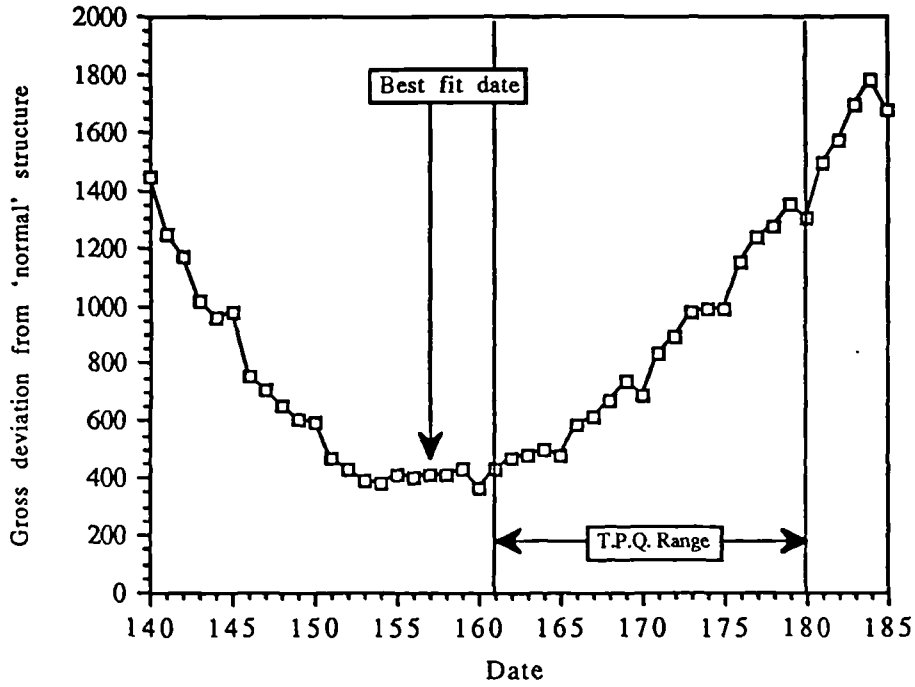


Fig. 25.09: A slightly archaic hoard: Parwich (80 *denarii*)

Mildenhall, however, is a normal hoard. In the case of an archaic or modern hoard the 'best fit date' will by definition be outside the *TPQ* range. Here the closest date to the BFD is therefore taken within the *TPQ* range given. Thus for Dewsbury, though the *TPQ* is 117-139, the BFD is found at 151; so 139 is taken as the nominal date of the hoard. The situation for Parwich Hill is the reverse (fig. 25.09). Here the BFD is found to be four years before the *TPQ* range starts, so the earliest date in the *TPQ* range is taken.

In practice this creation of a nominal date for a hoard within its own *TPQ* range had to be done with about 45 % of the hoards used in the analysis. The procedure is a useful device, but there are biases caused by it. The bench mark itself was created using all the hoards together with more than five coins in them. In the cases where the hoards had a *TPQ* range there the mid point was simply taken. Therefore when the individual hoard is tested against the composite picture which it helped to make up there is a very slight tendency for the BFD of the hoard to veer towards the mid point of the *TPQ* range. In fact only six BFDs are found within the *TPQ* ranges, so this effect on the results is minimal.

All the cases where a nominal *TPQ* has been established from a *TPQ* range are outlined in Appendix 2.52.

The raw results are outlined in Appendix 2.54.

2.55 Analysis: Chronological

Back in section 2.4 it was suggested that the more similar hoards were, the faster the circulation pool was moving around. Alas the analysis using Cramer's contingency coefficient was constrained by its comparison of hoards of different dates together in ten year blocks. This was the same weakness as Reece's analysis using Severan hoards mentioned above, since much of the variation came from chronological changes rather than anything else.

Instead of comparing one hoard directly against another of a different date, here the hoards have been tested against the general pattern of the same date. The general pattern having been formed by averaging and interpolating hoards of all dates so that a continuum has been created from the invasion to 280.

The raw results for Methods 1 and 2 are shown in figs.25.10 & 25.13. The format of each graph is the same. Each hoard larger than five coins is shown as an individual square. Those appearing above the line are modern hoards in comparison to our bench-mark. Those appearing below the line are relatively archaic. The three vertical lines are

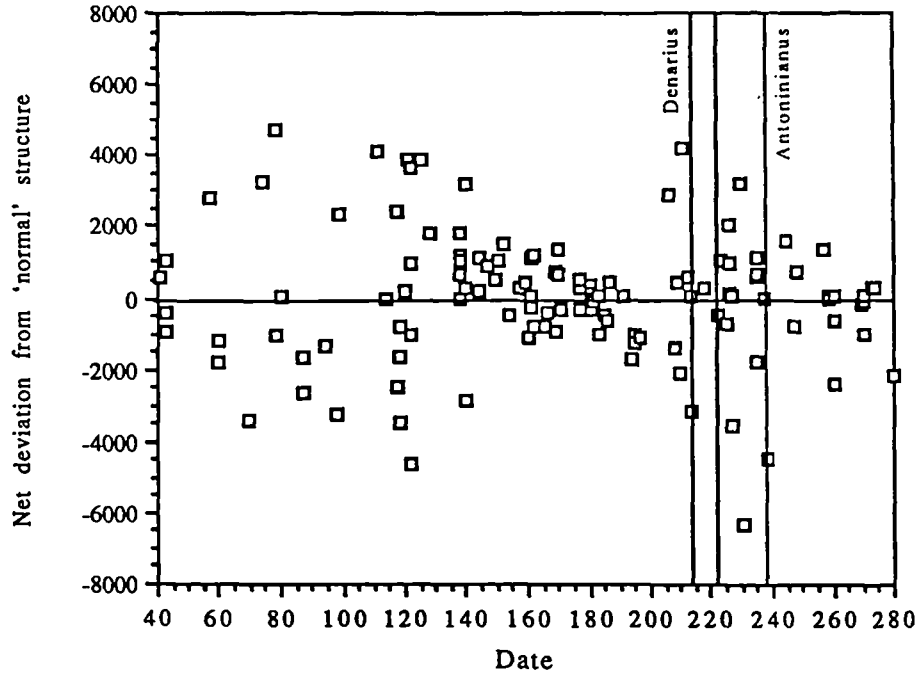


Fig. 25.10: The 'net deviation' of all the hoards against time

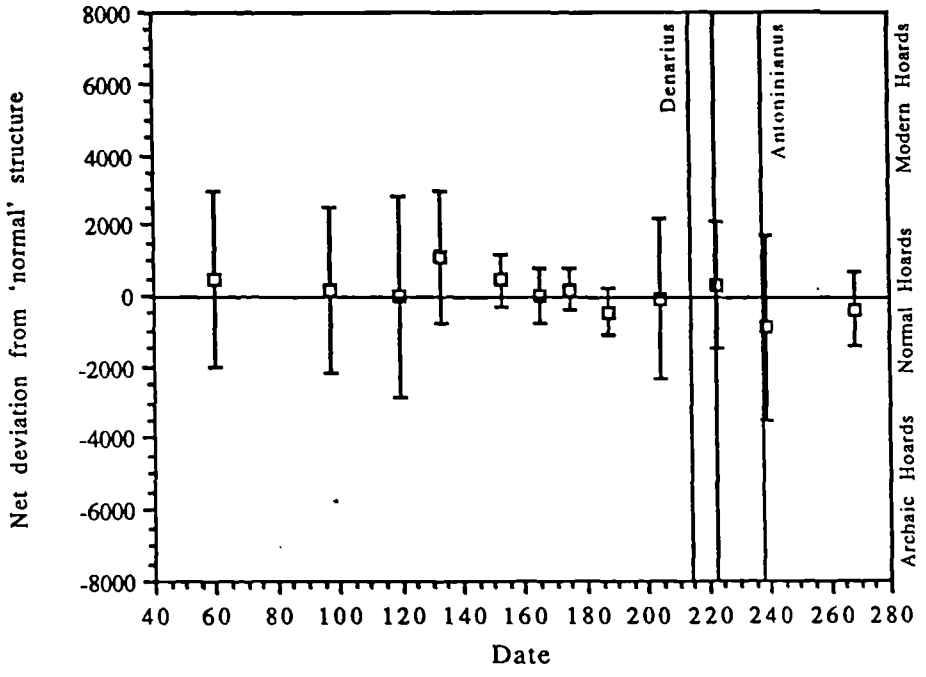


Fig. 25.11: The range of the 'net deviation' of hoards against time (1)

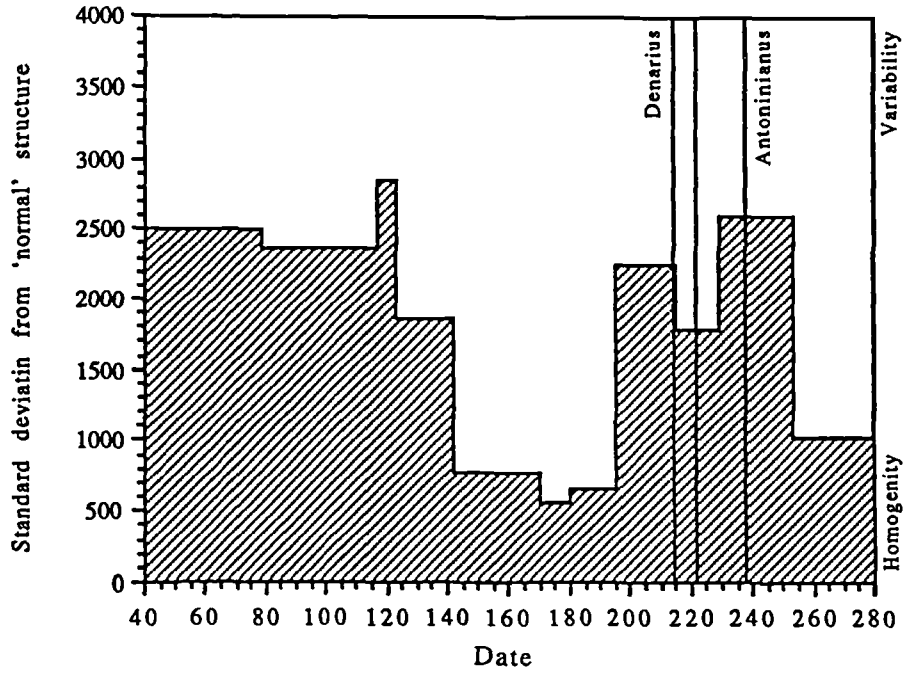


Fig. 25.12: The range of the 'net deviation' of hoards against time (2)

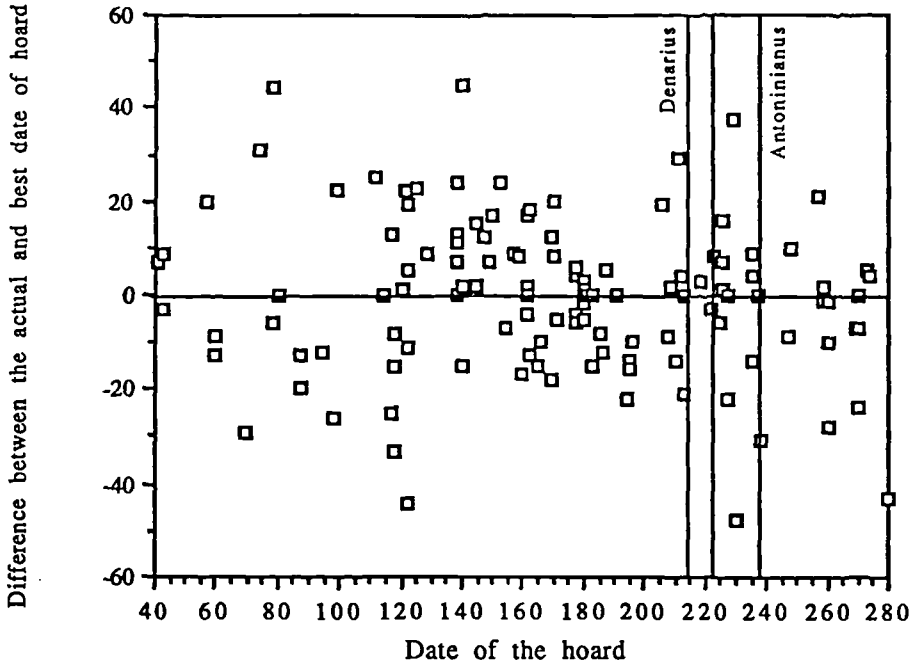


Fig. 25.13: The 'date differential' of all the hoards against time

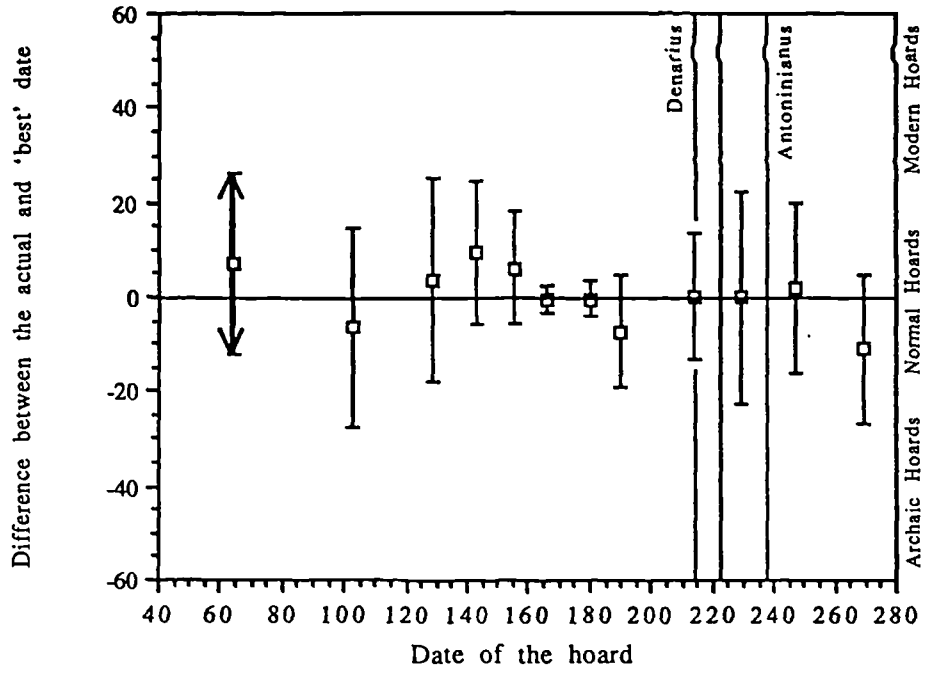


Fig. 25.14: The range of the 'date differentials' of hoards against time (1)

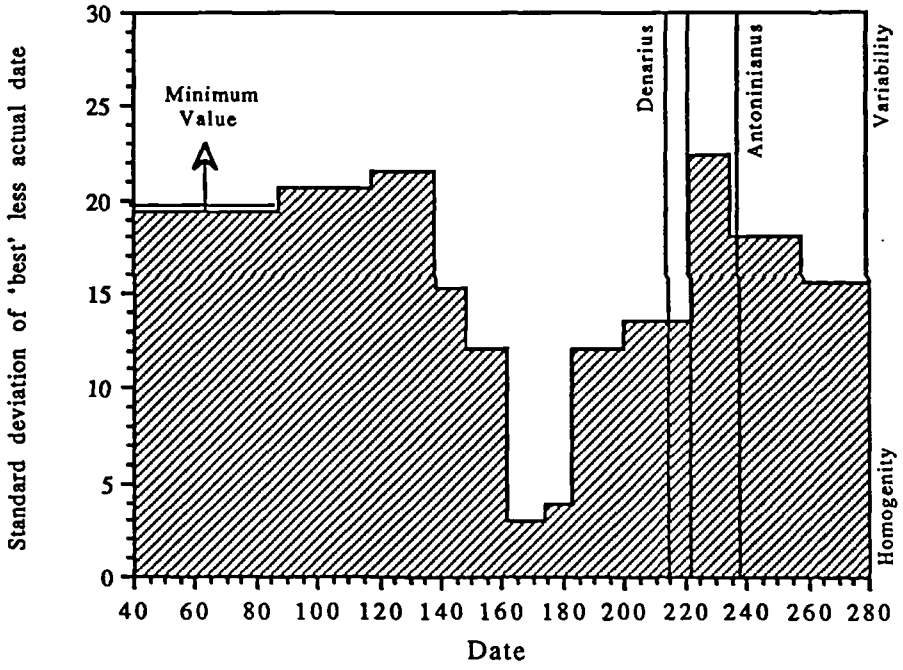


Fig. 25.15: The range of the 'date differentials' of hoards against time (2)

simply added to assist visual perception of the effect of the end of production of the *denarius* and the institution of the *antoninianus* . The first line at 215 represents Caracalla's introduction of the new coin, whilst the second and third represents the *antoninianus*' suspension from production during 222-238. However, it is stressed that all the information on the graph comes from *denarii* only.

The general trends on both the graphs are similar, suggesting that both methods of measuring the degree of divergence from the 'normal' hoard are complementary. The trends are:

Conquest to AD 80:	A growth in the variability of hoards	(velocity of circulation falls)
AD 80 to AD 120:	A sustained high variability in hoards	(velocity of circulation low)
AD 120 to AD 200	A decline in the variability of hoards	(velocity of circulation rises)
AD 200 to AD 220:	A growth in the variability of hoards	(velocity of circulation falls)
AD 220 onwards:	A decline in the variability of hoards	(evening out as production ceases)

The degree of deviation on these graphs can be summarized by calculating the standard deviation of the data over various date ranges. These values are calculated in Appendix 2.55, and shown in figs.25.11, 25.12, 25.14 & 25.15. Here the hoards have been taken in blocks of ten and the deviation over that time period calculated. The results are shown in two ways, firstly as error bars (figs.25.11 & 25.14), then as the standard deviations themselves. Unfortunately because there are few early hoards, the early similarity of hoards in the 40s and 50s is not shown up very well on the summary graphs, but can be seen clearly on the raw data plots.

The interpretation of this is that at the period of conquest we have *denarii* circulating around very rapidly, hence many of the regional imbalances in the circulation pool were ironed out leading to relatively uniform hoard composition. However, this phase did not last very long, so that by the late first - early second century hoards were very variable, indicating a slow movement of coinage around the system. Things appear to have picked up again, with hoards reaching their peak of uniformity in the mid to late second century. Then came the large Severan injection of *denarii* into circulation. This high velocity of circulation could not be sustained. The rate falls rapidly as an increased number of coins move around the system doing the same amount of 'work' as the previously smaller number did. Then finally the *antoninianus* is introduced. Hoards at this point become more similar; however, changes in the velocity of circulation need not explain everything. As noted in section 2.4, a cessation of new *denarii* put into circulation would lead to uniformity eventually being established in the circulation pool. This is exactly what we see after the takeover of the *antoninianus* . The *denarius* component of hoards slowly becomes uniform as any imbalances in the

circulation pool are removed. An alternative interpretation would be that the similarity of hoards still reflects a high velocity of circulation of *denarii* explained by the coins having a premium value over the baser *antoniniani* . I prefer the former explanation.

We now have two different models which purport to describe changes in the rate of circulation of *denarii* in Britain: the coin wear analysis and this hoard structure analysis. Is there any correlation between the two ?

The conclusions from the coin wear study were:

1. From the conquest to the early second century *denarii* slow down in their rate of circulation in Britain.

2. From the early second century to the late second century *denarii* slowly increase in their rate of use in Britain, no information beyond this date being possible from this analysis.

Both analyses therefore come to the same conclusions for this period, though both are based on very different sets of data; one on the weight of coins and the other on the structure of hoards. This strongly suggests that the models are correct. Beyond this date, the wear analysis cannot corroborate this method. So though there is a sharp increase in the diversity of coin hoards in the very late second/early third century we cannot hope to verify this with coin wear evidence unless far more large *denarius* hoards are weighed.

2.56 Analysis: Spatial

In the introduction to this section I noted Reece's idea that the structure of hoards might reveal where new coinage was entering the circulation system. As it happened the variation in his selection of hoards could be better explained by other variables such as their date; but the idea itself is nonetheless worth pursuing. We now have a variable which can tell us if a hoard is archaic or modern, so let us plot these geographically to see if any picture emerges. The data have been split up into four chronological periods of about fifty years. AD 100 and 150 have been used as arbitrary divisions, whereas AD 196 has been used since the division of the province which took place around about then may have influenced the arrival of *denarii* into Britain. The plots are very simple. They show the 'Net Area Difference' value. A large black circle represents a very modern hoard, a large white circle correspondingly represents a very archaic hoard (Eg. see Falkirk blotting out most of the lowlands of Scotland in fig. 25.19); whilst a normal hoard is a simple dot.

Map 1 Fig. 25.16 AD 43 - 99

The picture here is confused by the chronological spread and changes in troop deployment in the province. The most notable deviant hoards come from outside the South East, particularly from Yorkshire, and by dividing these up chronologically a clear picture begins to emerge.

Dating to the conquest of the South East there are three hoards from Yorkshire which at this stage was beyond the main army presence. These are the Lightcliffe & Almondbury hoards (AD 43+) both possibly part of the same hoard (cf Allen 1963); and the Honley (AD 69) hoard. All three have archaic structures. This suggests that new coinage was not being directly sent beyond the imperial frontiers at this stage.

In the early 70s all of Yorkshire came under direct Roman control and a major military centre established at York. A series of forts were also occupied in East Yorkshire along the Brough on Humber to York road. It is during this period of a high army presence that two hoards with relatively modern structures can be found: York (AD 74) and Binnington Carr (AD 78). The more modern structures appear to coincide with the presence of the army.

As the years pass there are two more hoards which fit the pattern. A hoard of AD 98 comes from Mereclough in Lancashire at the southernmost edge of any hypothesized militarily occupied zone. It has an archaic structure. A second hoard of about the same date comes from Corbridge (AD 99): not surprisingly, because of the presence of the army, it has a modern structure.

So the pattern of modern hoards where the army was located, and relatively archaic hoards elsewhere appears to be true on the basis of the hoards from the north of Britain. Elsewhere, Usk (AD 57) has a hoard with a modern structure again quite happily relating to the presence of the army. Otherwise in the south-east most hoards are very similar. Could this lack of variation result from money circulating here fairly rapidly in this early period?

Map 2 Fig. 25.17 AD 100 - 149

There is a slight tendency for modern hoards to occur in the military areas. Six of the eight on Hadrian's Wall are modern, so are all the ones on the Antonine Wall. However, there are exceptions such as one of the Birdoswald hoards, which is fairly archaic. Surprisingly there is no sign of London as the provincial capital producing any great bias towards new coin around it; however, the data are fairly sparse. The picture here is generally slightly more blurred that in the earlier period.

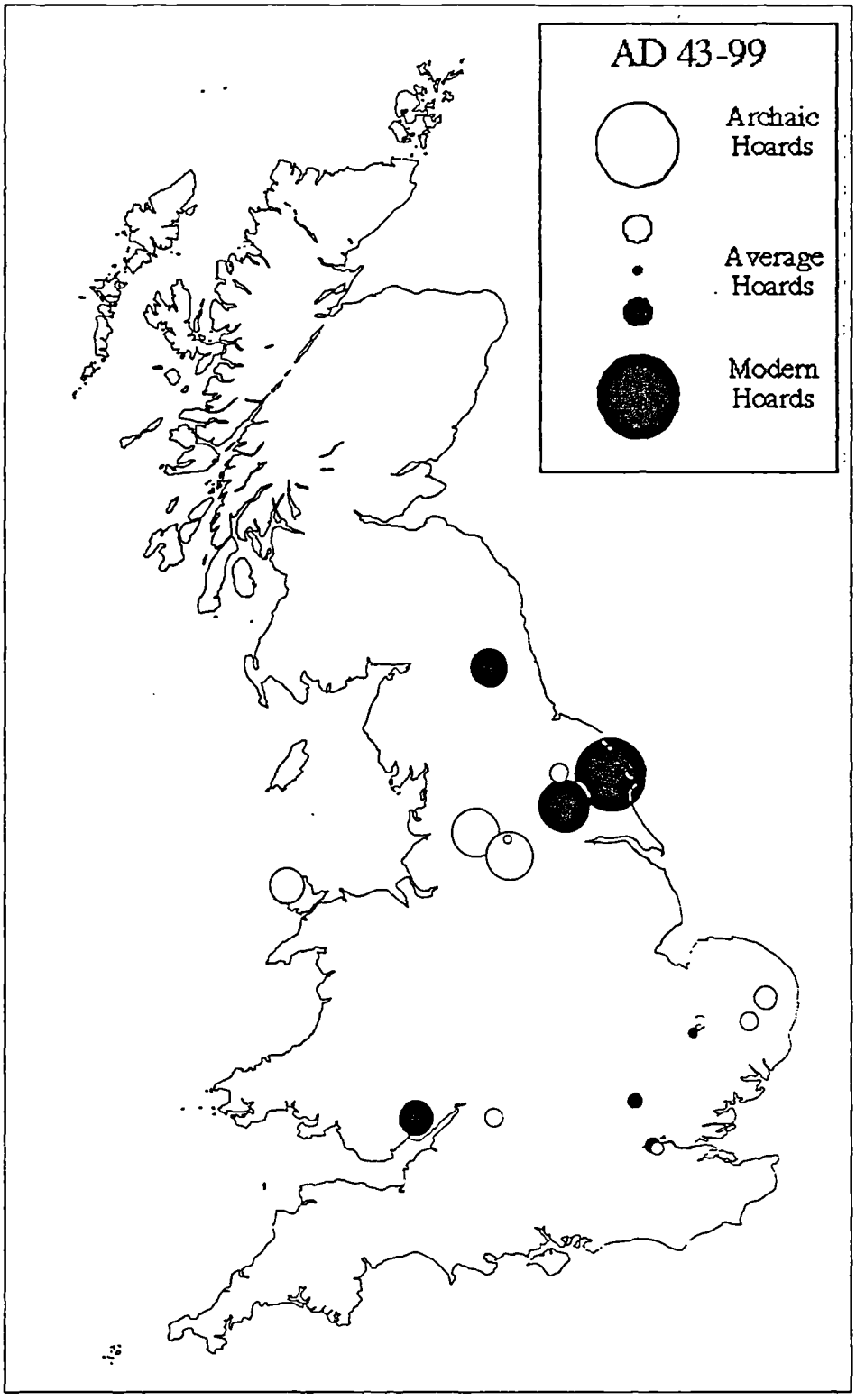


Fig. 25.16: The structure of hoards in Britain AD 43 - 99

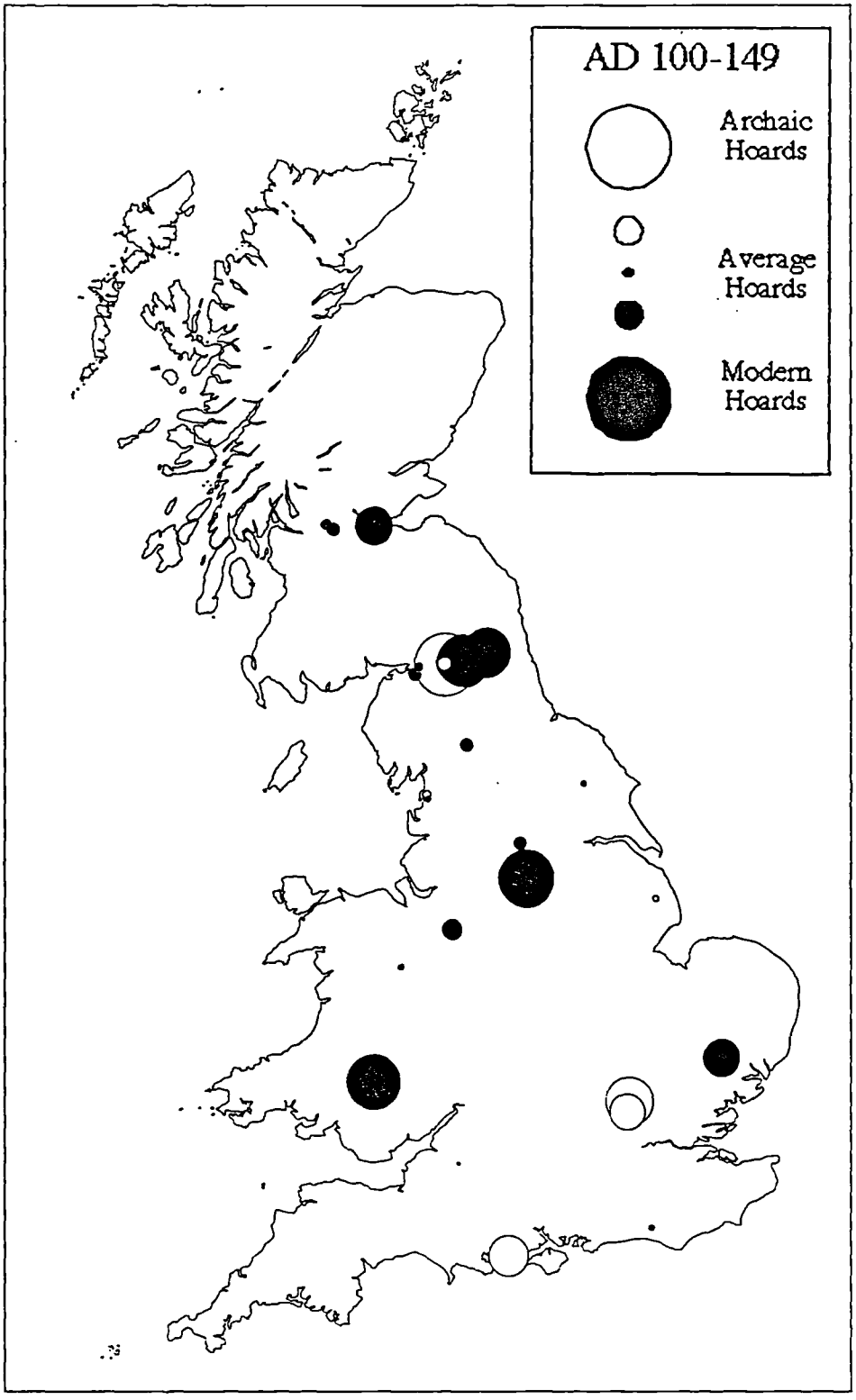


Fig. 25.17: The structure of hoards in Britain AD 100-149

Map 3 *Fig. 25.18* *AD 150 - 196*

In this period no systematic picture emerges. This period also coincides with the mid to late second century fast rate of circulation. It is possible that *denarii* are being exchanged so quickly across the province that any regional imbalances are disappearing very rapidly.

Map 4 *Fig. 25.19* *AD 196 - 238*

At this date we get a great slowing down in the rate of circulation of coinage with the massive Severan input of *denarii* . Therefore this is the date at which we would expect to see the most regional differentiation. Also by this time the province had been divided and the new border may have had restrictive effects on trade and the movement of coin. The picture we get is of a preponderance of new coin on the northern frontiers, and at Segontium. However, further north, in 'barbaricum' and south away from the army most of the assemblages are relatively archaic. The illustration again shows just how exceptional is the Falkirk hoard. London, however, still does not figure.

Map 5 *Fig. 25.20* *AD 238 +*

These are the hoards which contain *denarii* dating to after the coins replacement by the *antoninianus* , no particular patterning is to be found.

The maps do generally show that where the army was situated there tended to be more modern hoards. The difficulty in finding a pattern in the fastest circulation rate period of the mid to late second century does however seem to suggest that coins were moving around so quickly that no regional biases due to supply were sustained for very long. The conclusion that new coin entered circulation where the army was is not particularly startling, but it does place the generally held belief on a sound footing. What is more interesting is the absence of London showing itself on any of the maps. One might have expected new money to have come in to pay the provincial administration, but it appears that this was not the case. The simplest answer is that provincial administration was funded by taxation in the province itself, recycling the existing coin in circulation and passing some of the share on to the military. The military, on the other hand, may have had an entirely separate pay mechanism being paid centrally in new coin and taxes raised in a series of provinces rather than Britain alone.

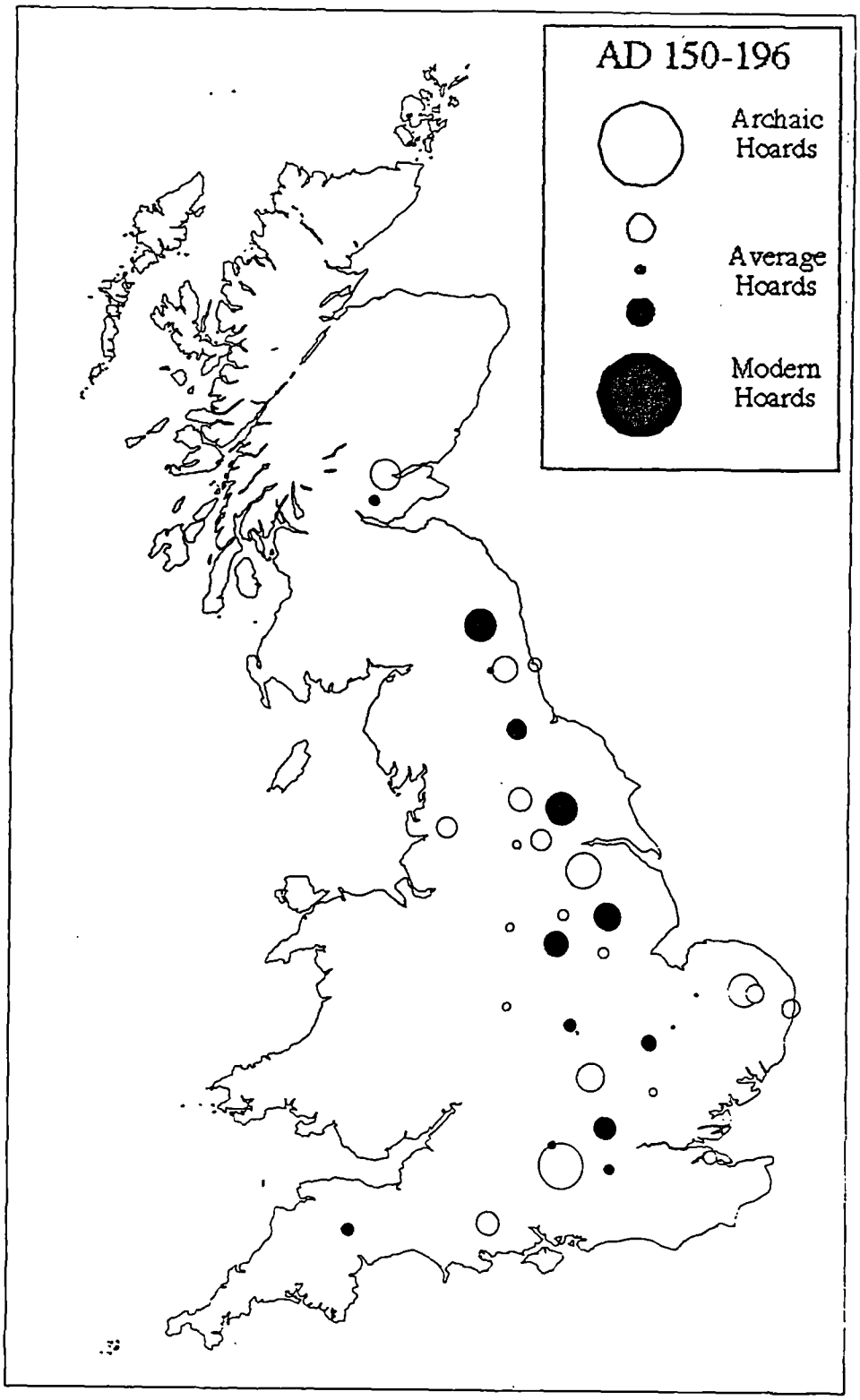


Fig. 25.18: The structure of hoards in Britain AD 150-196

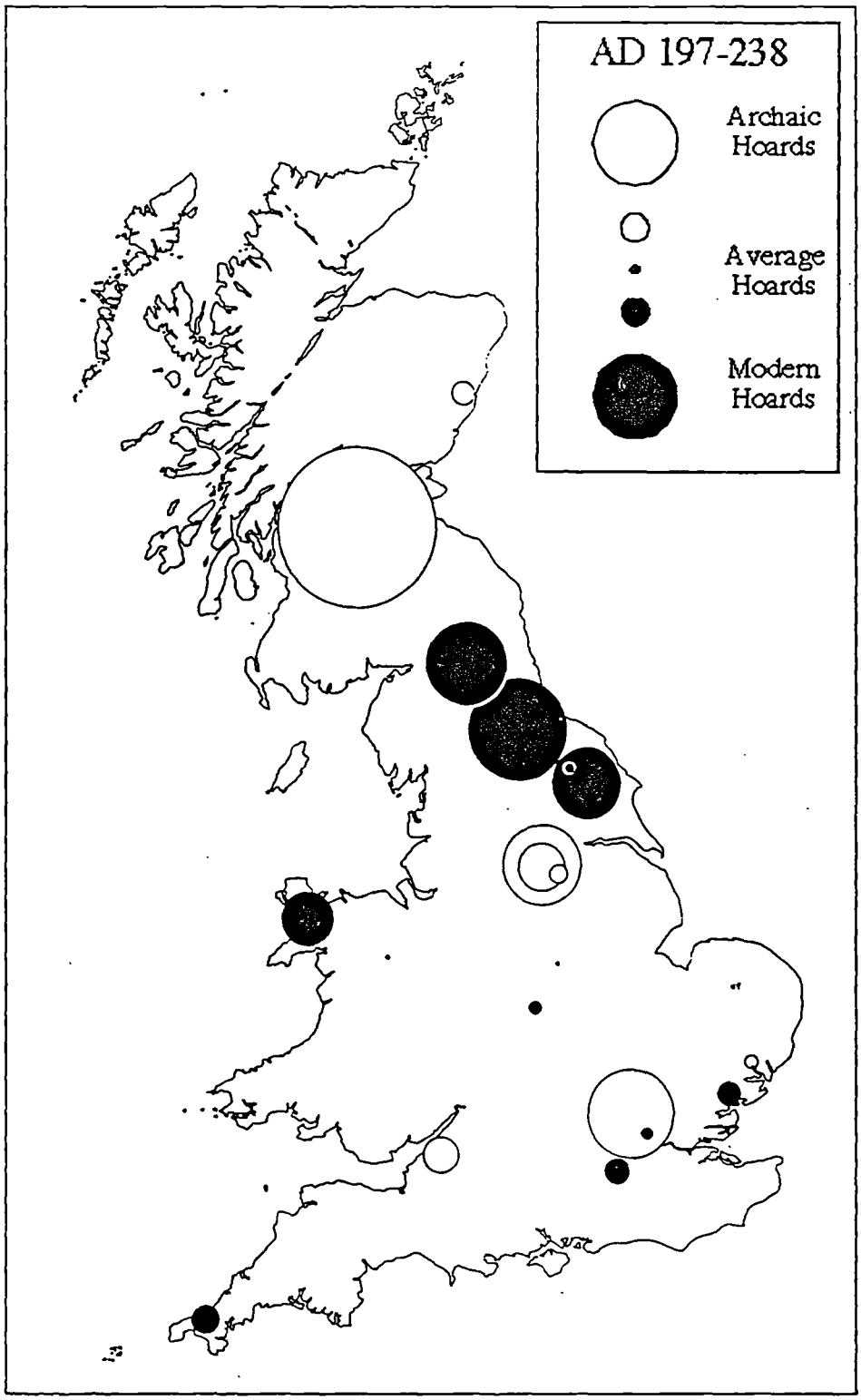


Fig. 25.19: The structure of hoards in Britain AD 197-238

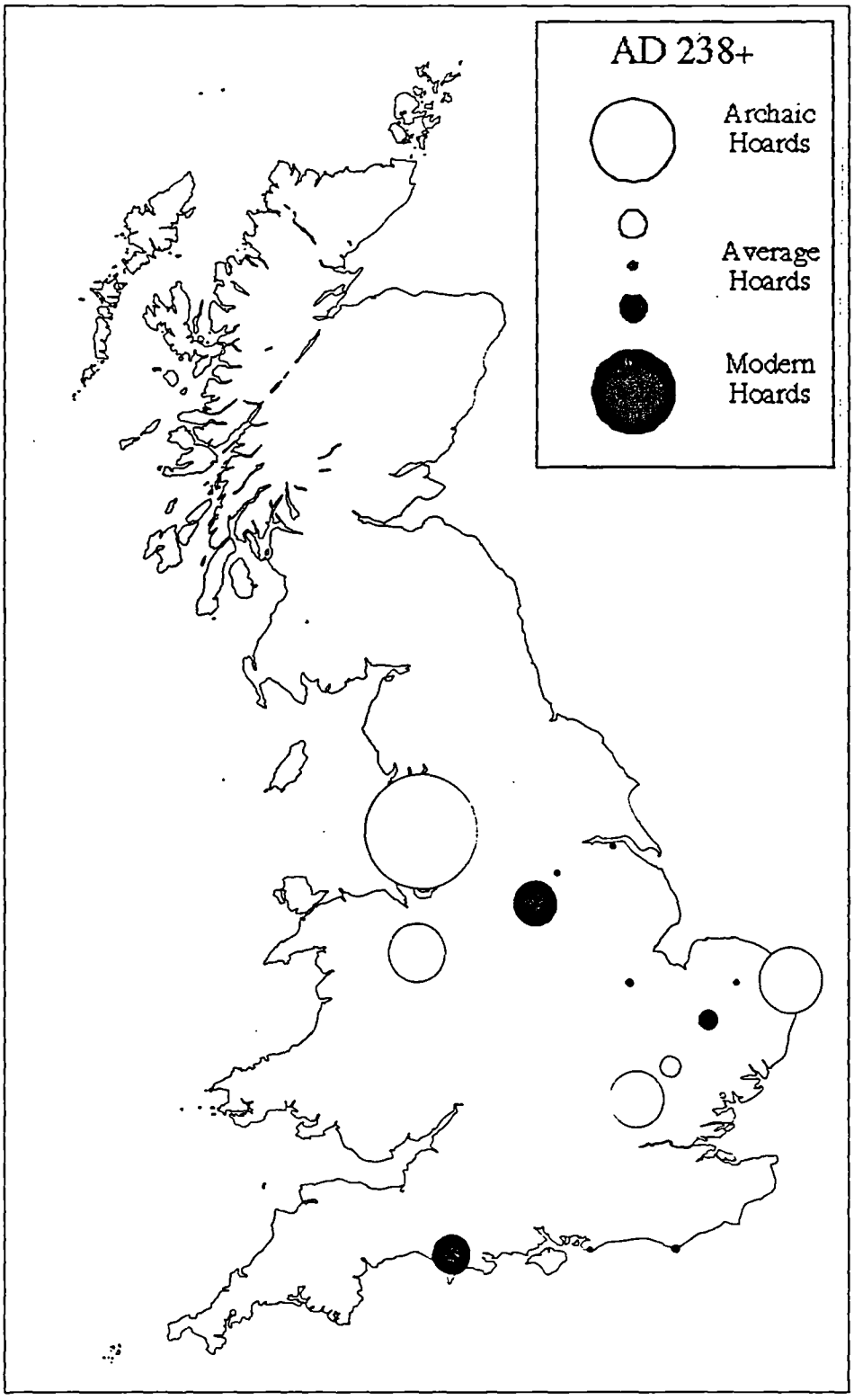


Fig. 25.20: The structure of hoards in Britain AD 238+

2.57 Conclusion

The methods of analysis outlined above are relatively simple once mechanised. The results concerning the velocity of circulation of *denarii* appear to correspond with the analysis based upon coin wear (Section 2.3). Great chronological variations can be seen in the variability of construction of coin hoards, and in their geographical distribution.

2.6 Hoard Size

2.61 The data
2.62 Hoard size and hoard structure
2.63 Hoard size and rank order graphs
2.64 Results and interpretation
2.65 Where are the big hoards ?
2.66 Conclusion

This section looks at the information to be derived from the size of hoards Three main questions are asked. Is there any difference between the structure of large and small hoards ? (2.62) Is there any change in the relative numbers of big and small hoards through time? (2.63 & 2.64) And is there any geographical pattern to the distribution of abnormally large hoards in Britain? (2.65) But first the quality of the database is assessed (2.61).

2.61 The data

So far the internal structure of coin hoards has been examined without reference to their size. If hoards are selections of temporarily concealed and accidentally lost household money-boxes, then their size may contain a great deal of information on the amount of money that people were holding onto at any one time. Simple questions can be asked, for example: as the years passed on, did people store more and more money? Even if they had done so, this might not have reflected any real increase in 'wealth'. It is possible that a growth in hoard size might have been perfectly counterbalanced by a decline in the value of the coinage as a result of the debasement of the *denarius*. Secondly, if there was a growth in the size of hoards, was this an overall increase or did just the largest hoards get bigger, while the 'average hoard' remained the same size? The discovery of such patterns as this would have consequences regarding the changing social structure of Roman Britain. These are the kind of questions addressed in this section. However, first the database: we know the size of more hoards than those for which we have good structural information. Though not necessarily all those with good structural information can be used, since many comprise only segments of hoards whose original total size is unknown.

From our database, the number of hoards known to contain *denarii* is approximately 212. Of these only 160 have any reliable guide as to their size (let alone any further detail). Even here, some have no reliable details given of the latest coin in the collection. If we wish to analyse the size of *denarius* hoards, then we have only 156 to work with within the AD 40-280 period. Furthermore, if we wish to look at both size and structure, then we are further reduced to the 117 hoards which were included within our ancient and modern study.

2.62 Hoard size and hoard structure

Were larger hoards more archaic than smaller ones? The reason for this question lies in the possibility that hoards were static treasures slowly accumulated over many years, rather than dynamic money-boxes, to and from which money was constantly added and withdrawn. If the static model is correct then larger hoards should contain a higher proportion of older coin, their accumulation having begun at an earlier date. This idea can be tested by looking at a graph of hoard size against a scale representing the archaic or modern nature of hoards. Two such variables exist. Fig. 26.01 shows hoard size against the Net Area Deviation of each hoard compared with the 'normal' structure of its day. Fig. 26.02 uses the second method, measuring the antiquity or modernity of a hoard by the difference between its 'best fit' data and its actual *terminus post quem* . The pattern of both graphs is the same. Two trends can be found. First there is a broader scatter of the data above and below the line where smaller hoards are concerned. Secondly the smaller hoards do tend to appear slightly more modern in construction, and the larger hoard slightly more archaic. This second trend would tend to support the proposition that larger hoards tend to have been accumulated over a longer period. However, other reasons can be found to explain the pattern.

Here the effect that sample size has on the analysis must be taken into account. This all relates to the dating of hoards using a simple *terminus post quem* . To begin with the final coin in each group was taken to represent the date of closure of each hoard. If the coin could not be related to the issue of any one particular year but several, then the mid-point of its date range was taken to represent the date of deposition of the hoard. On the basis of this date the bench-mark of hoard composition through time was constructed (Section 2.42). Using the bench-mark the structure of each individual hoard was assessed. The composition of a hoard of one date was compared with the bench-mark, which gave an average picture for that time. The problem with this procedure is that the TPQ of a hoard might not have been its actual date of concealment; it only represents it earliest possible date of concealment.

In a large hoard the date of the final coin, the TPQ, is liable to be a fairly good indicator of the hoard's date of closure. In the case of a small hoard errors are more likely to occur. Because of the smaller sample size, there is more chance that such a hoard might not contain the latest issues in circulation. This would leave the hoard with an artificially early TPQ. The consequence of this is that in our structure analysis it would be compared against a falsely early date, showing it to have an erroneously modern structure. Hence one effect of sample size in our analysis would be to make small hoards appear slightly more modern than 'normal', and conversely larger hoards would

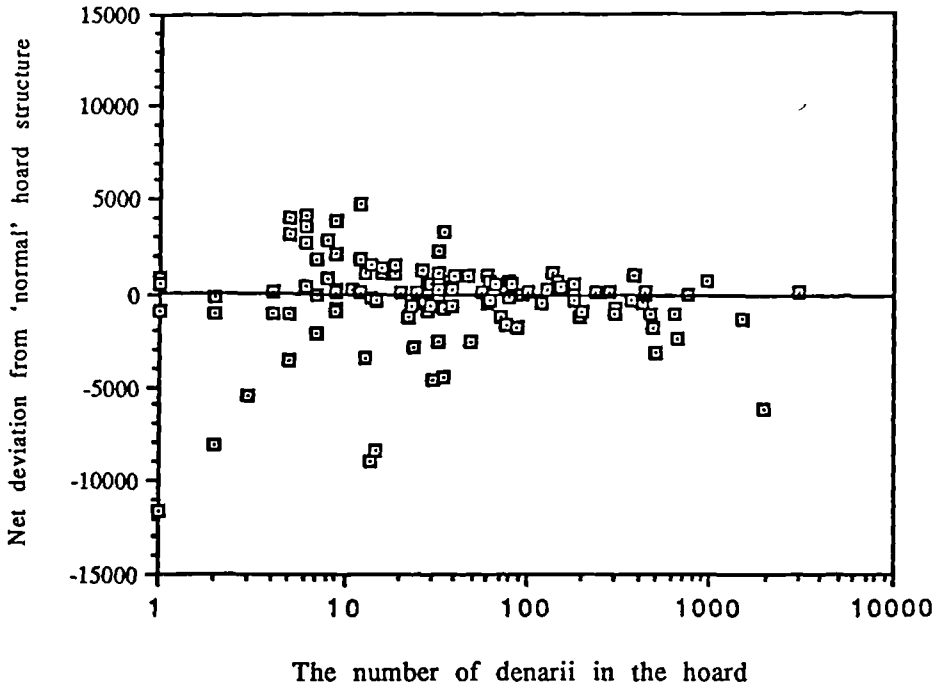


Fig. 26.01: Hoard size and hoard structure (using the Net Area Difference variable).

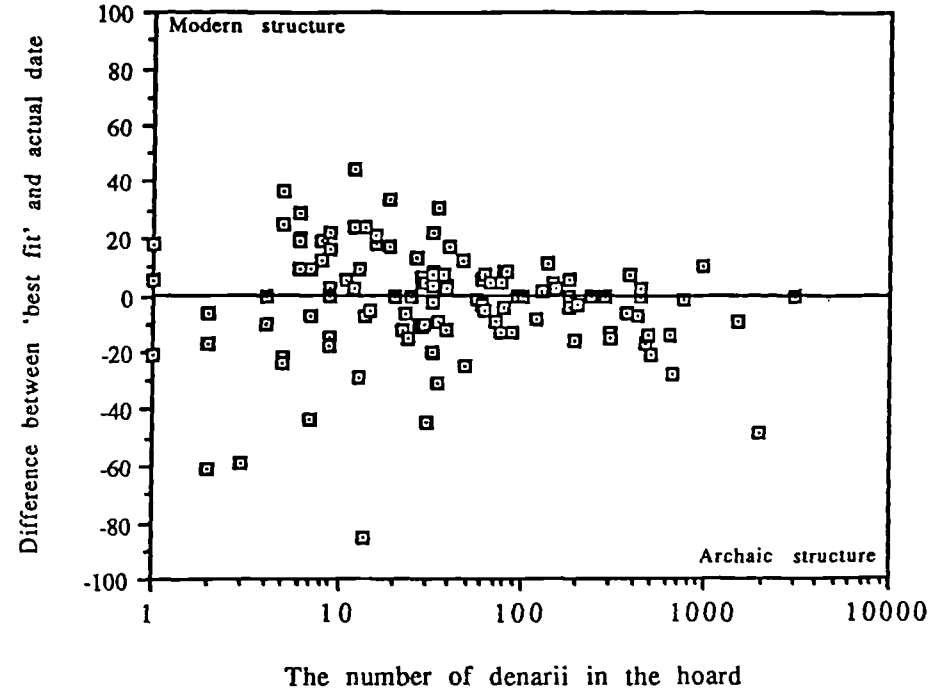


Fig. 26.02: Hoard size and hoard structure (using the 'best fit date' variable).

appear slightly more archaic. A second effect is simply that the cumulative composition curves of smaller hoards are going to be much coarser than those with larger samples; therefore smaller hoards will show a greater variation around the norm than larger ones, simply due to the lack of precision caused by the small sample size. Both these trends are those observed in figs. 26.01 and 26.02.

This trend for small hoards to appear modern, and larger hoards to appear relatively archaic is simply a symptom of the way hoards were dated in the analysis using a simple *terminus post quem*. It does not mean that larger hoards are more archaic because they have been accumulated over a longer period. There is no evidence for this proposition which cannot be explained by sampling error.

2.63 Hoard size and rank-order graphs

Now the size of hoards are examined in their own right. When all imitation coins and partial hoards have been removed we come down to the information displayed in fig. 26.03 (data in Appendix 2.61). The first impressions are of a gradual rise in the size of hoards throughout the first and second century, until the introduction of the *antoninianus* . At this date the number of *denarii* in hoards falls off. However, this is by no means the whole story. Though the size of the largest hoards certainly increases, there is still a strong undercurrent of hoards with less than 100 coins in them. What we have is not an average hoard size with a normal distribution around it, but more of a skewed distribution with lots of smaller hoards with only a tail of larger ones. Fig. 26.04 shows this by plotting the mean and median size of hoards. That the median is always well below the mean indicates that the average size of hoards is not a very meaningful variable. Even so, there does seem to be a gradual increase in *denarius* holdings, though this is only particularly noticeable at the end of the second century; just when there was a large Severan input of *denarii* into circulation.

For the moment, however, it is the changes in the distribution of *denarius* holdings that I wish to look at. The best way to examine this is to divide up the hoards into broad chronological groups. Here approximately fifty year periods have been used. Within these bands the hoards can be ordered by size to produce a rank-size graph. An example for the first half of the second century is given in fig. 26.05.

This kind of graph illustrates the equality or inequality of *denarius* holdings as recovered by coin hoards. The more concave the curve is, the more unequal the distribution of coinage is. By forming these graphs it is possible to test various ideas about changes which might have been taking place in Roman Britain at that time. Two such changes are the degree of social stratification in society and the level of

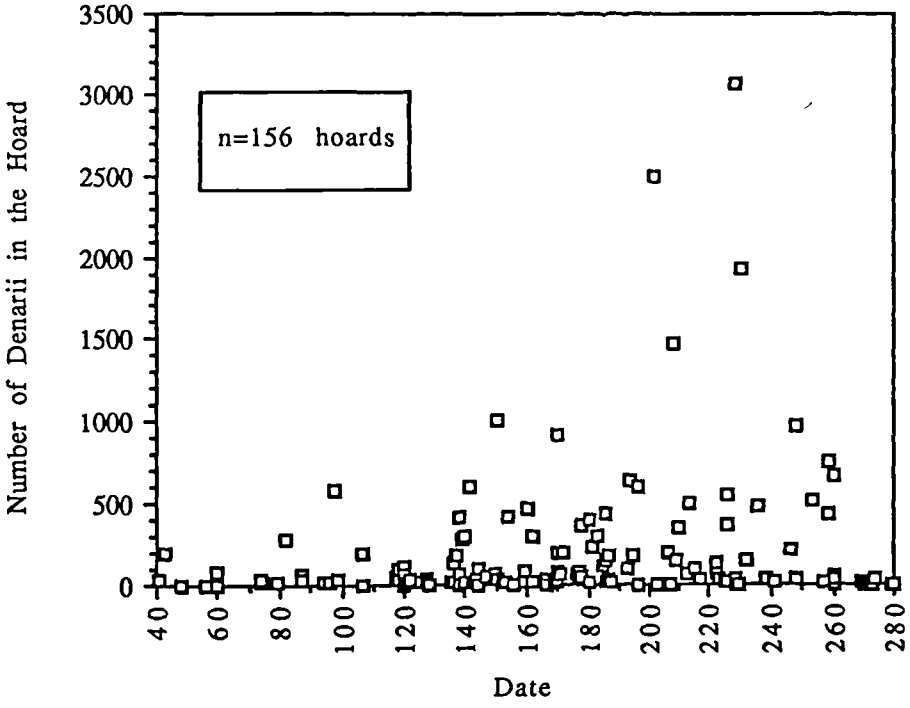


Fig. 26.03: The size of *denarius* hoards: AD 40-280.

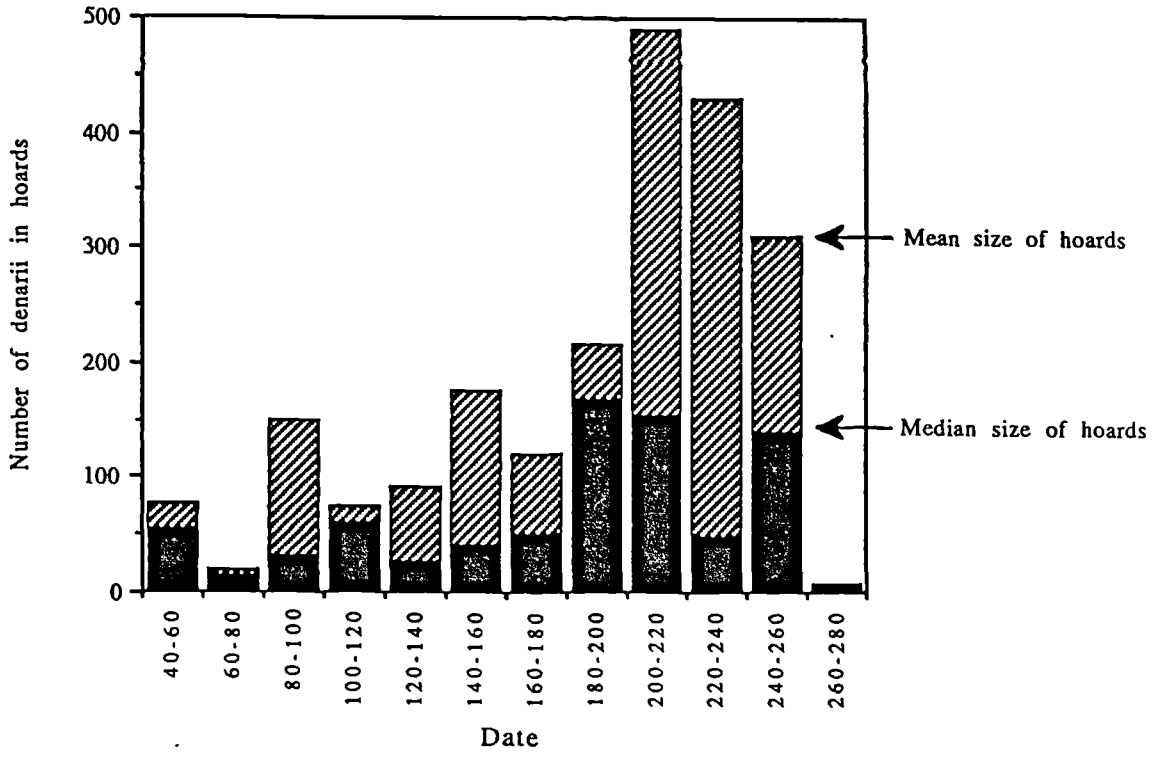


Fig. 26.04: Mean and median hoard size: AD 40-280.

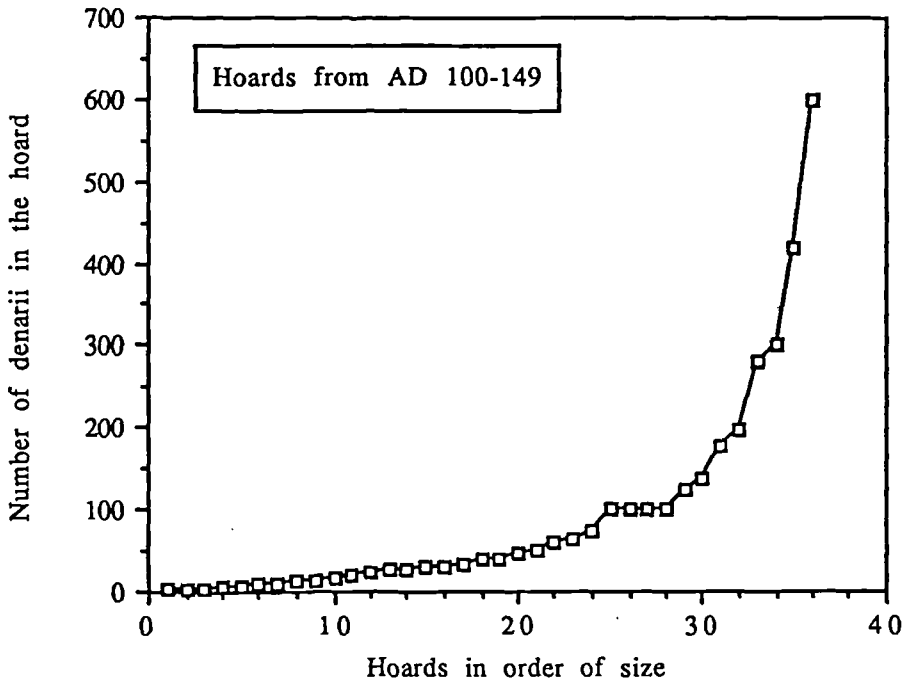


Fig. 26.05: Rank-size graph: hoards in AD 100-149.

monetization of society. How would we expect the idea of 'the rich getting richer' and 'the trickle down model' to manifest themselves in such a graph?

The rich getting richer:
If this were the case then we would expect that the larger hoards gradually got larger still relative to the smaller ones around at the time. This would have the effect of making the rank-size curve more concave (as explained in fig. 26.06).

The trickle-down model:
If the use of coinage slowly spread to more and more people, it would be fair to assume that novices to the monetary economy would enter it at the lower end, with small holdings. This means that relatively more people with small holdings would start to exist, also leading to a more concave rank-size curve (again explained in fig. 26.06).

The converse to both of these is also true. We would expect both a decrease in social stratification and a reduction in the participation of the monetary economy to reveal themselves in the trend towards a less concave curve. Both these variables (which ever way they operate) seem quite likely phenomena that might be expected in Roman Britain. What then are the results?

2.64 Results and interpretation

Fig. 26.07 shows the changes from the conquest to the early third century. The curves have been adjusted so that they can all be plotted on the same scale. 100 represents the size of the largest hoard in each period. In the first century the largest hoard contained 580 coins whereas in the later second - early third century the largest contained 3062 coins. By converting them all to a scale of 0 to 100 enables comparisons to be drawn. Similarly the horizontal axis has been adjusted to take account of the different number of hoards in each period. The result is one of virtually no change in the relative distribution of *denarius* holdings in the first to early third century at all. Over two hundred years roughly the same proportion of people have large hoards to those with smaller holdings.

There are two alternatives: either society in Roman Britain is totally stable, and monetization is reaching no more people in the early third century than it did in the first century; or else both 'trickle-down' and 'the rich getting richer' models are both in play, but in different directions.

The possibilities are as follows:

1. Totally stable social structure and no changes in the degree of monetization.

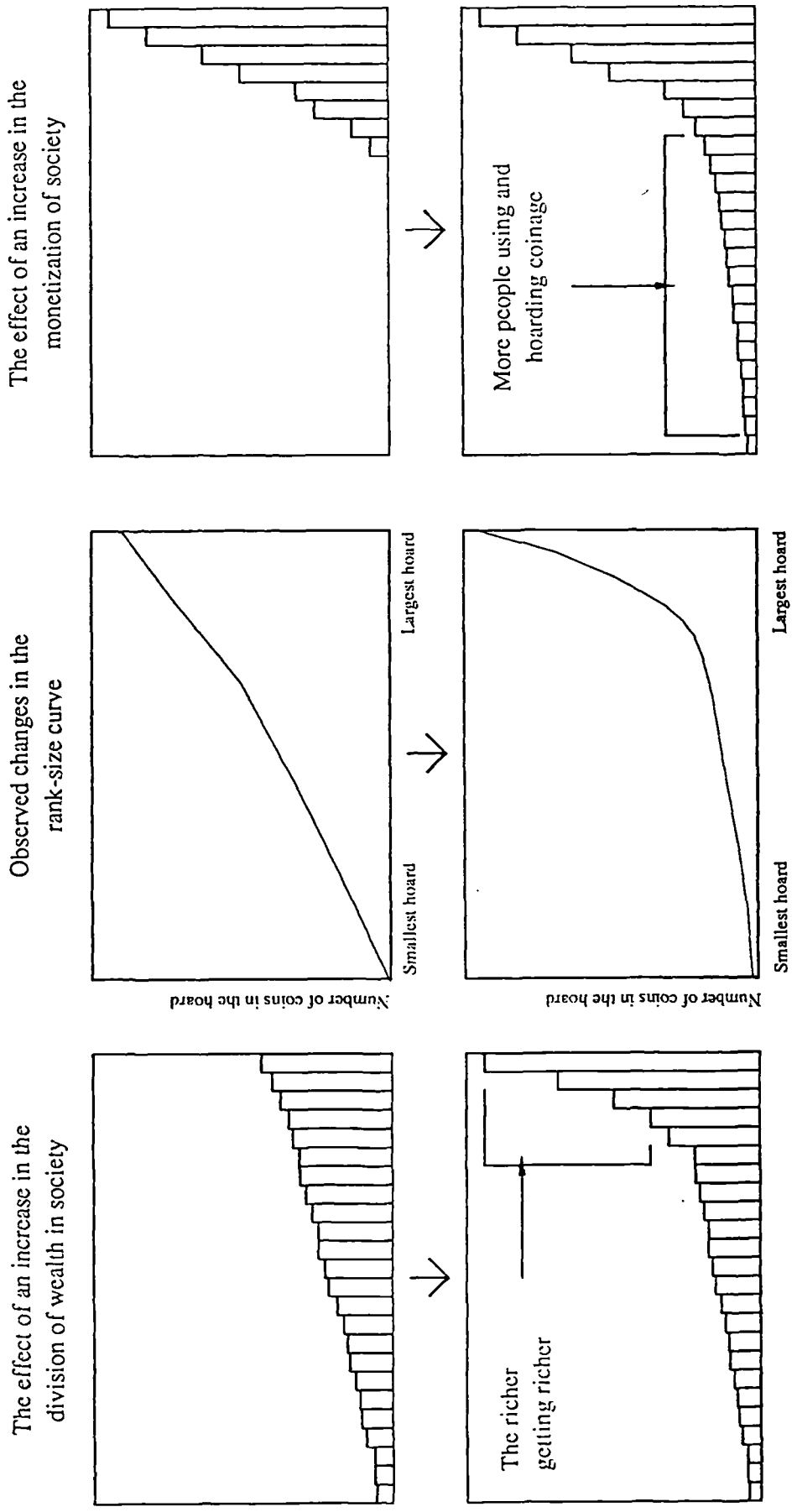


Fig. 26.06: Two models exploring the changes in an hoard rank-size graph.

2. The rich are getting richer (increased social stratification) leading to a concave curve; whilst there is a contraction of the number of people handling money, counteracting the concave effect of the former. However, it seems difficult to imagine an actual contraction in coin use during this period, so I find this alternative unlikely.

3. There is an increase in the number of people using coinage, but the effect on the curve is counteracted by a decrease in social stratification. The rich are by no means getting richer; rather the increase in monetization and other effects of the post conquest changes lead to a gradual breakdown of the pre-existing social divisions rather than a fossilizing and extension of them.

There is no definite way to decide between the options to explain the similarity of the rank-size curves. If one sees the growth in the degree of material culture in Roman Britain and the large number of coins found on sites (as well as the growth in the number of hoards) as all indicating a growth in some form of monetary economy; then it is difficult to accept either options one or two. We would have to envisage a decrease in social stratification going hand in hand with the monetization of the economy if we are to explain the stability of the shape of the curve. But is such a perfect balance between the two likely? I tend towards the notion of stability (Option 1), though as stated there is no definite way of distinguishing between the options.

It is possible to continue this analysis beyond the duration of the *denarius* into the lifetime of the *antoninianus* . The data are provided in Appendix 2.62. Here we do have differences in the shape of the curves. The first, from the decline of the *denarius* until AD 265 is much less concave than any of the earlier curves. The hoards in 276-85 show a similar distribution to the *denarii* , but those for 266-75 and 286-99 are more concave. The lack of single simple trend warns against any detailed interpretation from period to period. The nature of the collapse of the monetary system in the late third century might also distort the picture. I only wish to draw attention to one feature of the graph, that of the curve for the years up to AD 265. During this period coinage in Britain was in very short supply. The *denarius* had stopped being issued and *antoniniani* had not arrived in the country in any significant numbers (this is dealt with in section 4.4). If there was a shortage of coinage then we might expect a decrease in the level of monetization, as some people returned to alternative exchange mechanisms without using coins. This would be shown by a less concave curve, which is what appears. From the sole reign of Gallienus in the 260s this shortage was alleviated with vast numbers of debased coins; and a reversal to a more concave curve is found.

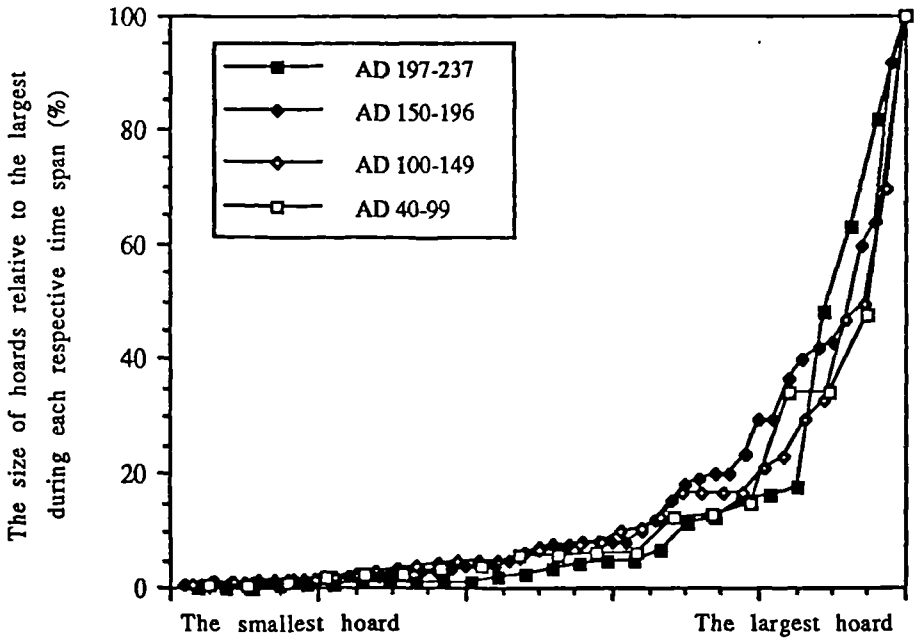


Fig. 26.07: Composite rank-size graph: *denarius* hoards in AD 40-300.

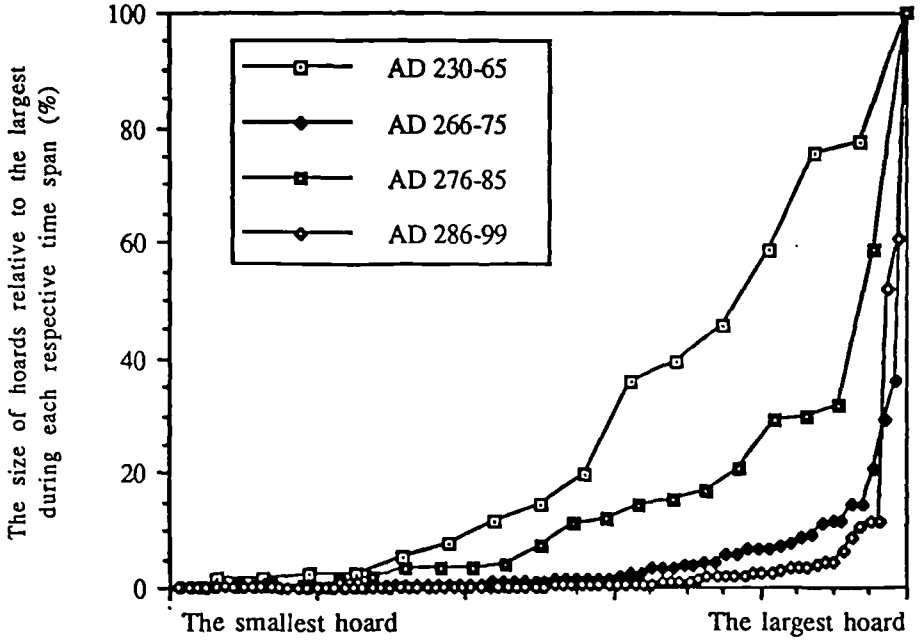


Fig. 26.08: Composite rank size graph: later third century hoards.

However, these events and the changes in the shape of the curve may be entirely fortuitous. This interpretation is highly subjective, but is offered nonetheless.

2.65 Where are the big hoards ?

In the preceding sections it has been assumed that the spread of differently sized hoards across the country was uniform. If all the large hoards were in the South of Britain, whilst all the smaller ones were in the North then analysing rank-size graphs for the country as a whole would be meaningless. This therefore needs to be examined.

The hoards in each of the period groups have been divided up into quartiles. The first quartile represent the smallest hoards, whilst the fourth represents the largest (Appendix 2.63). The country has been divided up into three regions.

Zone 1: The south east of England, where the most highly developed Iron Age monetary systems existed.

Zone 2: A band around Zone 1 where the less developed tribal coinages of the Corieltauvi, Iceni, Dobunni and Durotriges were spread.

Zone 3: The areas where there were no monetary systems established prior to the Roman conquest.

The relative proportion of hoards from each zone is shown in fig. 26.09, divided up by hoard size and chronological group. No consistent regional trends appear, except possibly in the first period (AD 43-99). Here all the hoards from Zone 1 are in the largest category (the 4th quartile). This might indicate more money was circulating in the areas which already had a developed monetary system established. However, as the trend is not repeated in the subsequent periods the conclusion must be highly tentative. Otherwise there is no evidence for any regional concentrations of the larger *denarius* hoards in Britain.

2.66 Conclusions

1. There are no structural differences between large and small hoards other than those which can be explained by sampling error.

2. There is a uniformity in the distribution of *denarius* holdings from the conquest to the introduction of the *antoninianus* . Either this reflects a tremendous degree of social stability in this period with no increase in the proportion of the population using money; or else an increase in the role of money in society is being matched

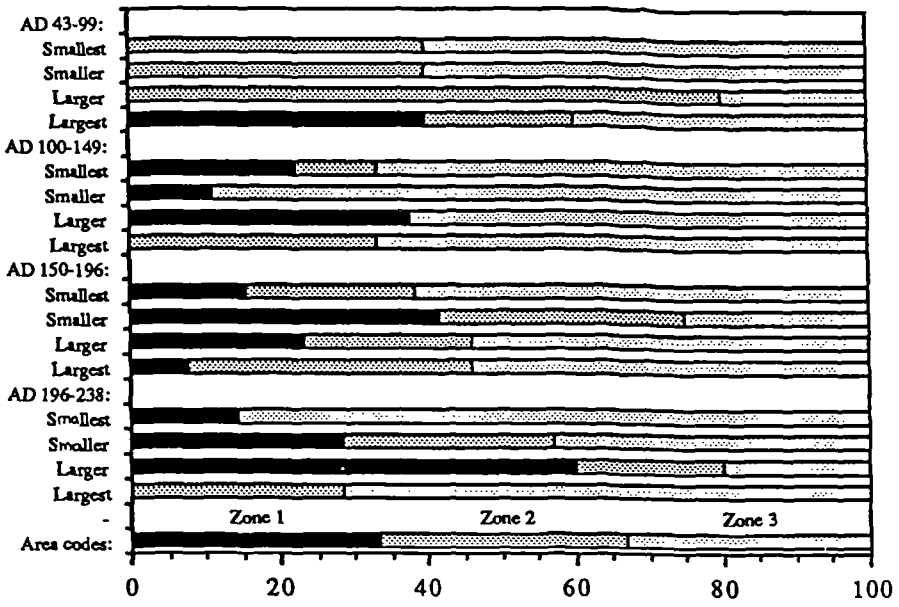


Fig. 26.09: The location of *denarius* hoards, divided up chronologically and by size.

by a decrease in the degree of social stratification. The data cannot distinguish between these possibilities, but the author prefers the former.

3. The shortage of coinage between the demise of the *denarius* in 238 and the large scale production of the *antoninianus* in the 260s might have resulted in a temporary decrease in the number of people operating within the monetary economy. However, this interpretation of the evidence is very tentative.

4. The only regional pattern to be found in the distribution of different hoard sizes is that all the hoards in the more highly developed South-East of the country in AD 43-99, were in the largest size range analysed. This might indicate more money being in circulation in this region in the period than elsewhere as a function of the replacement of the Iron Age currency by Roman coins. However, the pattern is not sustained beyond AD 100. The conclusion is again tentative.

Section 3: Site Finds and the Circulation Pool

3.1 Historical and Conceptual Survey

This chapter examines the ways numismatists have used the evidence of site finds. It then investigates the variables which have been taken to determine how and why coins are lost and not recovered.

3.2 Site find database

In this section the site find database is discussed, its origins (3.21), its extension (3.22) and its structure (3.23).

3.3 Site find analysis

In this section the differential deposition of coin on different types of site is examined. Interpretations are made relating the nature of deposition to the integration of sites within the monetary economy. However, the study is essentially a traditional analysis based upon the static view of coin circulation (fig. 31.01). The limitations and problems of such an analysis are discussed and the need for a more dynamic model of circulation dynamics is called for.

3.4 A new model of coin circulation

In this section we explore various concrete suggestions made to tackle the problem of residuality. These include Muller's, Collis', and Crummy and Terry's models (Muller 1968; Collis 1974; Crummy and Terry 1979). An entirely new model of circulation dynamics is called for, one which uses evidence and data that is already available and one which fulfils the criteria that it can be tested and validated or nullified. One is then created: first expressed in words and ideas, then in mathematical terms and expressions.

3.5 Testing the model

In order to use the model for the analysis of *denarii* in Britain we need the following information. First a representative sample of *denarii* deposited on British sites needs to be established (3.51). Secondly metrological and metallurgical details are required to establish a preferential recovery factor (3.52). Thirdly a routine for generating the model has to be established (3.53). And finally the results have to be compared with extant knowledge and tested to see if they bear any relation to reality (3.54 -59).

3.1 Historical and Conceptual Survey

3.11 Introduction
3.12 Previous studies of site lists
3.13 Variables effecting coin loss
3.14 The alternative view of coin loss
3.15 Conclusions

This chapter examines the ways numismatists have used the evidence of site finds. It then investigates the variables which have been taken to determine how and why coins are lost and not recovered.

3.11 Introduction

In many ways hoards and site finds are complimentary. Hoards often contain the higher value coins in circulation, whereas site lists are dominated by the smaller denominations. Nonetheless there is some overlap. This is especially so in the fourth century, where the rapidly changing billon and bronze coinage can be found both in hoards and as site finds in large numbers. Conversely, *siliquae* , best known from hoards, are rare as stray losses.

Site finds, as a phenomenon, are deposited by the action of a different set of factors to those governing hoard accumulation and loss. Here we have a different set of processes at work on our 'circulation pool', and this means that there might be a second way of modelling back to our original coin population. If so, we need to have a thorough understanding of how coins are lost and why they are not recovered.

3.12 Previous studies of site lists

In his study in 1935, O'Neil explicitly divided 'site lists' from other categories of numismatic data. He separated them from isolated stray finds and individual excavation lists, as well as from hoards. He examined a group of site lists comprising Silchester, Wroxeter, Caerwent and Verulamium. Each list was converted into a percentage break down of various coin periods. Then comparisons were made between the sites. As we would now expect, consistencies were found in the variations in the chronological proportions of coins found on the sites. Thus O'Neil pointed out that these major variations in the numbers of coins found on sites in different periods was not a function of differential levels of occupation, but rather a function of supply.

Over the years, O'Neil's simple coin periods for analysing Romano-British site finds have become elaborated and extended. Casey and Reece have both devised series of coin periods which have become a fairly standard way of dividing up the data, and Haselgrove has extended them back into the Iron Age period for Celtic coinage (1987).

The division of the data into percentages has also seen a number of changes. While the method is straightforward, simple histograms with the data did not take into account the differing lengths of each coin period. To counter this, Ravetz (1964) added a correcting factor by dividing the number of coins in each period by the length of the period. This method, used first on fourth century coins, has since been extended to become, like the coin periods above, a standard way of visually summarizing site find data (Casey 1974, 41).

The equation used is: $$\frac{\text{Coins per coin period}}{\text{Length of coin period}} \times \frac{1000}{\text{SITE TOTAL}}$$

So far this is all a logical extension of O'Neil's first steps. The '1000/Total', like the conversion into percentages, standardizes the data from different sized site lists, and the rest simply creates a good visual illustration of how many coins were being lost on the site, and of which date.

O'Neil, as stated, looked at four town sites, and believed he saw a background picture of 'coin-supply'. Any comparison of a group of 'coins per thousand' histograms will confirm that there are indeed great similarities between different sites (cf. Casey 1986, 91-94). Reece took the next logical move to quantify variation from this background level (Reece, 1983). He took a number of site lists and averaged them to create what could be taken to represent a 'normal' site. The variation of the sites in each coin period was expressed as a standard deviation. Individual sites (Lincoln in this case) could then be compared against this data. Deviations greater that one standard deviation could be noted as significant, representing marked changes in the supply/use of coin on the site to what one might expect. Reece's method is not without its mathematical problems (Reece 1988a, 22). Also systematic trends frequently emerged which were of an order of magnitude less than one standard deviation, so technically they were not 'significant'. Finally the use of standard deviation assumed a normal distribution in the coin population, an idea which was not proven. Nonetheless since systematic trends did emerge, on a purely pragmatic basis, this method was useful.

The methodology above, though developed for coinage, can and has been used for other types of material culture. The 'coins per thousand' approach was used on brooches by Brown (1986), and this technique was then extended in a similar manner to Reece's analysis of variance by Creighton (1990).

The whole series of models form a continuum of developing theory and ideas. Nonetheless, at their foundation is a problem which nearly all numismatists would

admit to: the model is static. The histograms only convey what was lost, they do not tell us when that loss took place. As Casey says:

> "We have already seen that individual coins can have long lives, up to several centuries in some cases, and to this extent confining the study of coins to the display format of the histogram does some violence to the evidence. The very rigidity of the boundaries of the visual display is an illusion because it fails to show the way that coins of each defined period are present in the currency of any later period. We must face the problem of how to establish how long a coin might be in circulation before becoming incorporated in an archaeological context."
>
> (Casey 1986, 105)

Another criticism would be that the graphs rarely present a visual image of the types of denominations lost. No distinction is made between the loss of a *denarius* and the loss of an *as* ; and yet in terms of economic reconstruction, surely this information must be taken into account. This is not to say that the histograms are of no worth, far from it. It is merely to state that if we are trying to reconstruct a pattern of the money supply, then we cannot start from this junction, based as it is on a static image of circulation dynamics.

Haselgrove (1987, 37) illustrated the differences between the static and dynamic images, redrawn here as fig. 31.01. When there was a regular recall of the coinage, as in Anglo-Saxon England, the static model has a good approximation to reality. However, in a system where Republican *denarii* were still circulating in the second century AD, the longevity of coin circulation must be taken into account. Casey's coin periods for Roman Britain start with Claudius in Period 1 (AD 43-54) (Casey 1974, 43); despite the fact that in Claudian to Domitianic hoards, coins of the Republic and Mark Antony often account for well over half of the *denarii* present (cf. Reece 1974, 83). The problem of longevity cannot be ignored. It needs to be tackled. Haselgrove's illustration was largely derived from Collis (1974), where a larger set of illustrations were presented looking like schools of hump-backed whales. They represented the growth in the volume of coinage as a coin series entered circulation, and its slow tailing off, as it was either unsystematically recalled or was lost. Reece went some way to demonstrating this type of curve for the *denarii* of Antoninus Pius in hoards from 138 to 268 (Reece 1974, 83).

3.13 Variables effecting coin loss

With this idea of a dynamic system in mind, somehow coins were lost. Here we are talking specifically about accidental loss and non-recovery, not votive deposits. Site lists at 'temple sites' or from votive wells such as Coventina's Well cannot be examined in the same category, as here discard was deliberate and premeditated (cf. Casey 1989).

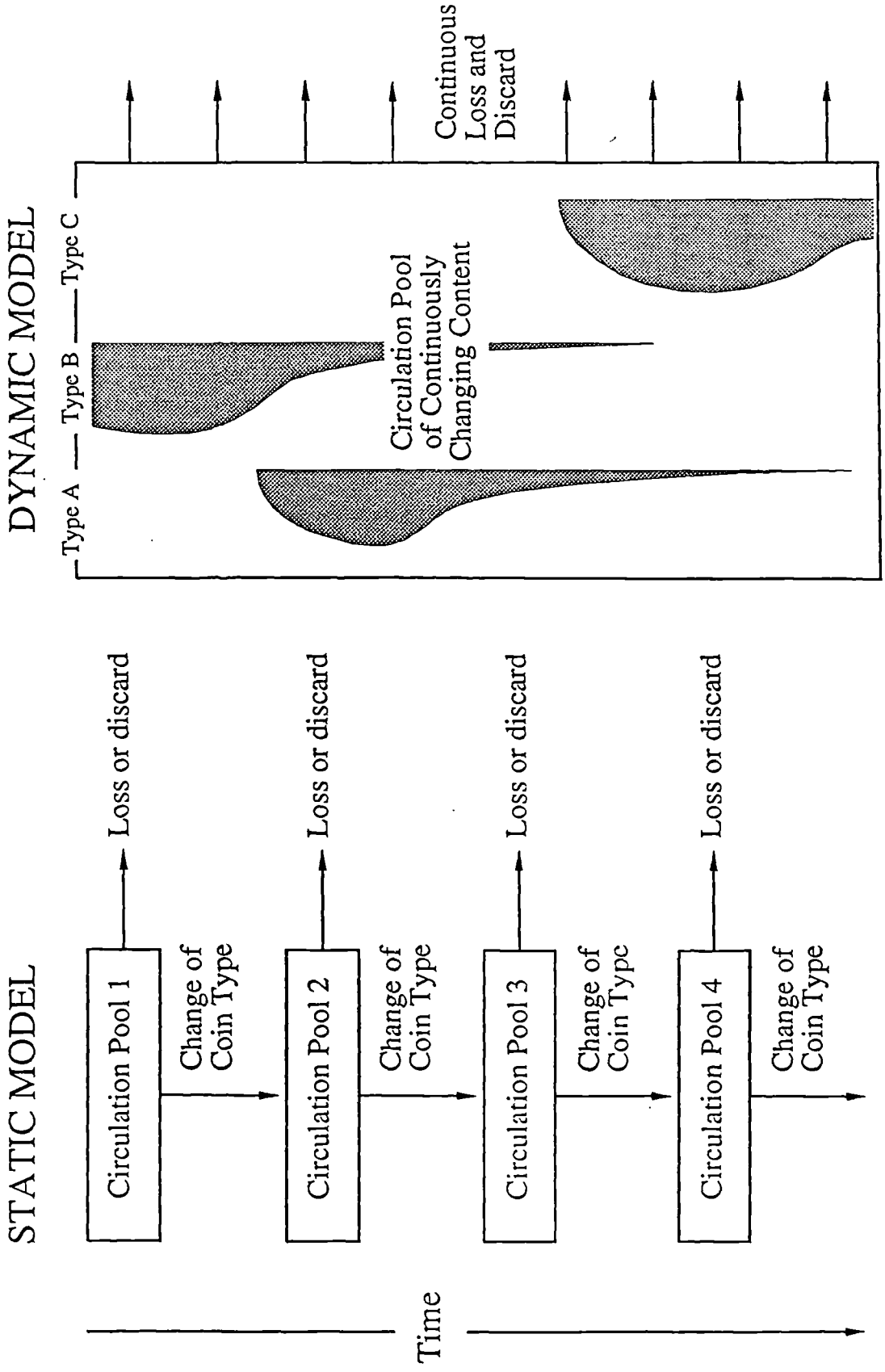


Fig. 31.01: The static and dynamic models of coin circulation (after Haselgrove 1987)

Casey (1986, 69) identified 5 variables effecting coin loss:

1. The size of the issue
2. The intrinsic and relative value of the coin
3. The size of the coin
4. Political factors
5. Economic factors

The first, 'size of issue', is straight forward. The more coins of one type in circulation the greater the chance of one being lost. So all other things being equal, loss is proportional to the size of issue.

The second factor is also straightforward, though not so easy to quantify. We have already noted the truism that site finds generally consist of a larger proportion of low value denominations than hoards. This can partly be put down to differential retrieval factors. More time would be spent looking for a lost *aureus* than for a dropped *semis* . One could imagine that loss is approximately inversely proportional to value, however, though this relationship seems to be one of common sense, it relies on an assumption about human actions. A complicating factor would be the changing value of coins. *Sestertii* in the first century AD may have been worth more than their successors in the third unless they maintained their value against the declining 'silver' *denarii* and *antoniniani.*

The third variable is similar to the second, in that the larger a coin, the more likely it is going to be seen and retrieved. Also, the less likely it is going to be lost through a hole in the pocket, purse or whatever in the first place. One could therefore suggest that loss is inversely proportional to coin size; but again this is untested, though with common sense (for what it is worth) behind it. The colour of the metal would also have an effect. A silver coin showing up better in the mud than a bronze coin. On the other hand, as fieldwalkers and farmers will know, a circular object on the ground in the soil, has a way of standing out to the eye from quite a distance, because of its regular geometric form, whatever the colour.

The fourth factor is 'political'. The main way that this affects us is in the Roman practise of *damnatio memoriae* :

> "The concept of 'damnatio memoriae' was reserved in Roman law for the extinction of the memory of those whom, in their lifetime, the state had been unable to control. This effectively meant emperors whose actions were more than usually inimical to the interests of the senatorial order, but whom these same senators had treated with awed deference in their lifetime. The list of emperors subjected to *damnatio* is long... We know that the coinage of Caligula was melted down, as was that of Geta, the brother of Caracalla."
> (Casey 1986, 29-30)

This may result in either too few coins being lost, as their life-span in circulation would have been curtailed, leaving a shorter period over which they had to be lost in; or it may result in more coins being lost, as people discarded politically unacceptable coins. No simple relationship between coin loss and 'political factors' can be created here.

The fifth factor is the economic situation. This again may have particular effects when coinage reforms take place and earlier issues are demonetized. Here pre-reform coins may appear to be lost in greater quantities than expected due to the discard of demonetized issues; or conversely in smaller quantities because the reform would have prematurely removed them from circulation as above. Again no simple relationship can be established.

One factor which Casey does not relate here is the length of time for which a coin was in circulation. If we add together three descriptives: 'the number of coins in circulation', 'the longevity of circulation' and 'the denomination and metrology of the coin', then we have a triad which can explain a lot of the variation in coin loss.

Coin loss triad:

1. Loss is proportional to the size of the issue in circulation at any time
2. Loss is proportional to the longevity of circulation
3. Retrieval is related to the denomination and metrology of the coin.

The withdrawal of coinage after a 'damnatio memoriae' or a coinage reform would be catered for by the effect on variables one and two. Both values would be restricted, so the subsequent number of coins of that series lost would be reduced. The main factor which this would not take into account would be the deliberate discard of redundant coin. This was a particularly important factor in the fourth century, though not so during the more stable period of the Augustan system until its collapse in the late third century. Variable three has been left fairly vague, underlining that it is difficult to make comparisons between different denominations. Nonetheless, the retrieval factor will be returned to at a later stage.

3.14 The alternative view of coin loss

There is, however, a rather different view of how and why coins are lost which has some currency at the moment. The differences between the standard view expressed above, and the following view have not yet been made explicit, nor have its implications been thoroughly explored. The alternative model has been proposed in the writings of Reece (1984; 1987, 30); these have been accepted in some quarters without the assumptions behind them being critically examined.

The basic tenet of the view is that "...on Roman sites, most coin finds may reasonably be regarded as losses from use..." (Haselgrove 1987, 36). This seems to have the great benefit of common sense behind it. It also contains implications of great advantage to the economic historian: if coin losses accurately reflect those coins which were exchanged most often, there exists the potential to reconstruct patterns of monetary inflation from changing patterns of denominational loss. But is this idea correct? Reece expressed the idea most clearly:

> "On a modern market stall nearly every purchase involves a pound coin going in one direction, safely into the till, and a handful of small change being returned; if any coin is dropped it is likely to be part of the small change and the chances of it remaining lost are directly related to its value."
>
> (Reece 1987, 30)

This suggests two primary factors determining loss: the number of exchanges a particular type of coin takes part in (the more exchanges, the greater the chance of loss), and the retrieval factor mentioned earlier. If we account for the retrieval factor, then we should be able to get back to the rates of exchange of the different denominations in the market place.

> "If the denarius is worth 64 times the value of the quadrans, and losses depend mainly on the number of times coins change hands and the value of the coin, then for denarii and quadrantes to be found in equal numbers denarii will have to change hands 64 times as often as quadrantes. But they are not found in equal numbers, there are ten denarii to each quadrans, so the denarii have changed hands 640 times the rate of quadrantes. This state of affairs can only have happened if there was a very large quantity of silver coin compared to the tiny amount of very small change."
>
> (Reece 1987, 31)

If this is the case with *denarii* and *quadrantes* , then what is the situation like with the full range of denominations? To examine this, it would be worthwhile to look at a series of site lists from near the heartland of the empire, in a period where some actual prices are known. The area chosen has been Italy in the mid first century AD.

Let us use Reece's own data from a series of sites in Northern Italy (Reece 1973). Here Reece's lists are divided into four groups: AR (*denarii* , and possibly a few *quinarii*); AE1 (*sestertii*); AE2 (*dupondii* and *asses*) and AE3 (*semisses* and *quadrantes*). The data are as follows:

Table 3.11: Site finds from Northern Italy in periods 1 and 2a

	Period 1 (up to AD41)				Period 2a (AD41-54)			
Site Name	AR	AE1	AE2	AE3-4	AR	AE1	AE2	AE3-4
Pavia	5	15	125	15	0	4	24	7
Padova	28	22	57	4	1	8	11	5
Verona	125	78	160	14	10	17	27	13
Este	44	25	123	11	1	6	27	7
Udine	11	10	28	2	2	3	4	2
Aquileia	126	38	471	77	5	9	225	38
Cividale	13	7	71	5	0	3	19	9
Portogruaro	7	5	69	10	0	0	15	9
Venezia	7	25	49	12	3	4	4	7
Adria	5	5	31	0	0	1	5	0
Faenza	17	12	75	2	0	3	15	7
Bologna 1	106	58	158	14	12	25	34	24
Bologna 2	56	47	68	4	6	13	11	4
Ravenna	15	21	54	17	1	4	3	2
Arezzo	11	15	56	17	0	2	2	2
Cortoria	14	18	95	17	0	8	23	4
Siena	13	27	137	40	1	4	14	8
Ostia	0	0	23	7	0	0	6	3
Total	603	428	1850	268	42	114	469	151

Table 3.12: Site finds from Northern Italy in periods 2b and 3

	Period 2b (AD54- 69)				Period 3 (AD69-96)			
Site Name	AR	AE1	AE2	AE3-4	AR	AE1	AE2	AE3-4
Pavia	5	11	32	4	25	13	99	3
Padova	26	21	28	4	96	23	82	6
Verona	62	86	114	37	244	109	277	42
Este	6	11	14	0	14	24	67	1
Udine	13	6	9	1	16	12	21	2
Aquileia	49	21	55	5	210	58	333	4
Cividale	2	3	8	1	7	11	19	0
Portogruaro	7	3	5	1	9	11	22	0
Venezia	4	21	14	4	20	26	25	6
Adria	2	4	7	0	24	4	25	0
Faenza	3	3	9	0	15	8	36	2
Bologna 1	73	42	57	15	259	94	194	25
Bologna 2	36	62	83	12	127	106	229	25
Ravenna	10	17	12	7	31	20	38	10
Arezzo	4	14	15	3	10	8	18	1
Cortoria	7	10	26	8	20	23	56	9
Siena	7	38	48	5	42	37	117	6
Ostia	16	1	6	0	94	3	30	0
Total	332	374	542	107	1263	590	1688	142

Table 3.13: Site finds from North Italy; summary of Tables 3.11 and 3.12.

	AR	AE1	AE2	AE3/4
Period 1 (up to AD41)	603	428	1850	268
Period 2a (AD41-54)	42	114	469	151
Period 2b (AD54-69)	332	374	542	107
Period 3 (AD69-96)	1263	590	1688	142
Total:	2240	1506	4549	668

Table 3.14: Site finds from North Italy; table 3.13 expressed in percentages.

	AR	AE1	AE2	AE3/4
Period 1 (up to AD41)	19.2%	13.6%	58.7%	8.5%
Period 2a (AD41-54)	5.4%	14.7%	60.4%	19.5%
Period 2b (AD54-69)	24.5%	27.6%	40.0%	7.9%
Period 3 (AD69-96)	34.3%	16.0%	45.8%	3.9%
Total:	25.0%	16.8%	50.8%	7.4%

Each *denarius* was worth worth 16 asses ; so let us give 'AR' in our retrieval factor a value of 16. 'AE1' consists of *sestertii* , worth 4 *asses* . 'AE2' consist of *dupondii* (2 *asses*) and *asses* , so let us call this class 1.5 *asses* . 'AE3/4' consists of fractions, largely *semisses* and a few *quadrantes* , so let us call it 0.4 *asses* . If we multiply each by its retrieval factor, we will get to a relative breakdown of how many coins of each denomination were originally lost in each period.

Table 3.15: Modified number of coins originally lost in Northern Italy.

	AR	AE1	AE2	AE3/4
Period 1 (up to AD41)	9648	1712	2775	107
Period 2a (AD41-54)	672	456	703	60
Period 2b (AD54-69)	5312	1496	813	42
Period 3 (AD69-96)	20208	2360	2532	56
Total:	35840	6024	6823	267

Table 3.16: Modified no. of coins originally lost in Northern Italy (as a percentage).

	AR	AE1	AE2	AE3/4
Period 1 (up to AD41)	67.7%	12.0%	19.5%	0.8%
Period 2a (AD41-54)	35.5%	24.1%	37.2%	3.2%
Period 2b (AD54-69)	69.3%	19.5%	10.6%	0.6%
Period 3 (AD69-96)	80.3%	9.4%	10.1%	0.2%
Total:	73.2%	12.3%	13.9%	0.6%

According to Reece's idea, this would mean that about 73% of the coins exchanged were silver *denarii* . This figure seems remarkably high, unless we are willing to see the modal transaction value as being particularly expensive which goes contra to the evidence of graffiti from sites such as Pompeii. If the average transaction was less than one *denarius*, then we would expect smaller denominations to be dropped just as often; since there would be at least one 'bronze' coin given in change, if not more.

I do not accept this model of coin deposition, but let us examine some other evidence first. Burnett (1987, 118) referred to a judgement by Hadrian referring to market exchange taking place in Pergamum. There are a number of problems surrounding this inscription, but one thing it does make clear is that the medium of the market stall was

bronze coin. The prices of fish were marked in terms of bronze, and in the unusual case of a *denarius* being offered, less preferential rates of fishes per *as* came into play because the market-holder would have to exchange the coin at a money-changer's who would take a commission. In this case the idea of a modal transaction above the value of a *denarius* cannot be sustained. A second point would be that if *denarii* accounted for 70% of coin exchanges, why is it a commonplace that lower denomination coins are usually more worn than higher ones? Surely this model has to be mistaken.

This idea does not seem to work, there seem to be far too many *denarii* being lost compared with the number we would expect. If loss is proportional to the number of exchanges of a coin, then that loss must be taking place at the moment of exchange. Yet this is surely the moment when the coin is being closest observed, with two people's eyes fixed on it, and therefore loss - or rather non-recovery - would be far less likely. What then can account for the over presence of *denarii* ? One possibility would be that loss is much more of a random process than it is given credit for. Retrieval factors can only come into play when the loss has been noticed; and they are only going to become effective when the approximate location of the loss is known.

In the present day market place, people carry with them some small value coinage and larger notes, as well as a method of access to much larger sums of money: a cheque book or a credit card. In the ancient market place, the main medium was coin. Access to larger sums of money, should they be needed, could only be obtained by carrying higher value coinage. If loss acts randomly upon what a person is carrying then this hypothesis would give us our apparent over-representation of *denarii.* However, it is a difficult idea to test. One way would be to examine the coinage found on people buried in Pompeii.

The problem with the Pompeii evidence is the ever present possibility that the money found on a person might be an *armarium* being unsuccessfully rescued from the ensuing disaster. This must be born in mind and there is no easy way round the problem. However, 'hoards' do not often contain great mixtures of denominations. So if we find a mixed group of coins in a purse on a body we may have the evidence we are after.

Table 3.17: Mixed denominational 'hoards' from Pompeii; after Bolin (1958, 81):

[1] 1936, by a skeleton in amphitheatre:	Silver	131	(82.9%)	'Bronze'	27	(17.1%)
[2] 1879, by a skeleton:	Silver	36	(54.5%)	'Bronze'	30	(45.5%)
[3] c.1879, near to the above skeleton:	Silver	38	(97.4%)	'Bronze'	1	(02.6%)
[4] Sept 1908, in a purse:	Silver	46	(73.0%)	'Bronze'	17	(27.0%)
[5] Museo Nazionale 113076-113124	Silver	101	(-)	'Bronze'	+	(-)
[6] Museo Nazionale 124730	Silver	130	(70.6%)	'Bronze'	54	(29.4%)
Total (excluding no.5):	Silver	381	(74.7%)	'Bronze'	129	(25.3%)

The first three groups are all found near skeletons, and the fourth comes from a purse hoard. The last two are also included as they are mixed groups of coin of a similar size to the first, though their exact provenance is insecure.

These date to AD79, and were made up of a mixture of coinage dating back to the Republic. It is therefore legitimate to compare their composition to the aggregate picture of Italian town coin loss provided by Reece's data above. The towns gave an impression of 25.0% of the coins lost being *denarii* , or else 73.2% if you add in a factor for preferential recovery. This second figure is very similar to the average make up in the coins from Pompeii, which was 74%.

This suggests that loss of different denominations is related directly to the proportions being carried around at the time; and not related to how often a particular denomination was being exchanged. The high numbers of *denarii* lost (many of which were recovered) relates to the need for individuals to carry larger numbers of higher value coins than we do today; because they, unlike us, did not have recourse to other financial mechanisms like the cheque book.

3.15 Conclusions

There are problems with the examination together of different denominations. Therefore in any model reconstructing the circulation of money the different denominations should be kept apart as far as possible so as not to include subjective assumptions about preferential recovery. However, the similarity of the breakdown of coins carried around in Pompeii and the reconstruction based upon site lists is encouraging.

The relationships which seem the most secure are the following: 'The more coins of series A in circulation, the more that will be lost'; and 'the longer coins of series A stay in circulation, the more that will be lost'. Preferential recovery is the third, though it is a relationship best avoided if possible as it includes too many unknown variables of human behaviour. Any new model must take account of these.

3.2 Site find database

3.21 Introduction
3.22 The enhancement of Ryan's database
3.23 Database structure

In this section the site find database is discussed, its origins (3.21), its extension (3.22) and its structure (3.23).

3.21 Introduction

What is required is a representative sample of coins recovered from different types of sites throughout Britain. One large database already exists, developed principally for an analysis of fourth century coin, but containing first to third century data nonetheless. This was by collected Ryan (1988). This section describes how his database has been enhanced and extended to more than double its original size to cover a broader range of site both geographically and in terms of function.

3.22 The enhancement of Ryan's database

The primary basis of the database used in this thesis is an extended version of that compiled by Ryan (1988). His database comprised 8957 first to third century coins from 190 different sites. The sites were predominantly in the south of England, and therefore the corpus was lacking in military sites. To a lesser extent it also lacked material from *civitas* capitals and other major towns. Though some further data from the south of England has been included (principally Wroxeter), the majority of the additional sites are therefore from the North. Most are sites whose coins have been identified by Richard Brickstock and John Casey at Durham. The bibliographic details of these are given in Appendix 3.22. The bibliographic details of Ryan's original database can be found in Ryan (1988) by reference to the three figure site codes mentioned below.

The first to third century database now comprises 18,823 coins from 215 sites. The sites have been divided up into eight types. These are not the same categories as Ryan used. The new categories are: cemeteries, temples, villas, rural sites, military sites, and three classes of town site. The town sites have been divided into three categories: public towns, which comprise *Colonia* , Verulamium (a *municipium*) and *Civitas* Capitals; small towns and small towns where there has at any time been a military installation. These divisions have been done on the basis of the tables in Millett (1990). The sites are all listed in Appendix 3.21.

Table 3.21: Additions to Ryan's database

	Number of sites		Number of coins	
Type of site:	Ryan	Additional	Ryan	New Total
Cemetery	5	0	44	44
Military	3	13	121	1,107
Small Town with Fort	11	4	538	6,796
Small Town	9	1	531	572
Public Town	10	4	644	3,103
Villa	84	1	2,509	2,523
Temple	27	1	2,816	2,868
Rural	41	1	1,754	1,810
Total			8,957	18,823

3.23 Database structure

A number of changes were required to the original database. Ryan's principle interest was fourth century coinage. Here each coin generally had a unique reference number in RIC or LRBC. In the first to third century this is not the case. Some RIC numbers may refer to different denominations, though with the same obverse and reverse types; only the metal and/or unit size changes. Hence *aurei* and *denarii* sometimes cannot be told apart, similarly with certain types of bronze coinage. With the database being compiled for a fourth century analysis, the denomination column was sacrificed in the economy of space. Here it has been reinstated. Where possible all coins where there might have been any doubt as to which denomination they were have been traced back to their original publication. Alas frequently in vain as all toomany site lists simply give RIC numbers alone. Because this database specializes in first to third century coin, the mint column, especially important in fourth century studies, has been retained, though left unused. This is in the interests of compatibility with Ryan's database. Another new column is the 'accession number'. This is to facilitate cross referencing back to the original site list, should it be necessary. The number for all the new additions refers to the site list catalogue number. Checking Ryan's database made it all to apparent how useful a facility such as this would have been.

One major unsystematic error was found in the original database. This was the entry of coins of Gallienus. Gallienus and Salonina have two principle issues of coinage. One in their joint reign, and one in their sole reign. Both have separate RIC number sequences. This means that whether the coin is sole reign (SR) or joint reign (JR) must be specified. Frequently it was found that the database has bronze coins of Gallienus (SR) found on sites, however these are quite rare in Britain. On checking the original source, many of these were found to be JR, and others were quite probably misrecorded in the original site list. Two problems emerge. First the denominations of each coin looked up from the RIC number could be wrong; secondly the period the coins are ascribed to might be wrong. Gallienus (JR) is in Reece period 12 whilst Gallienus (SR) is in Reece period 13. To counter this problem two steps have been taken. First all the coins of Gallienus and

Salonina have been studied as one chronological group, thus precluding the possibility of any chronological mistakes. This is a pragmatic division rather than an ideal division which would lie precisely where Reece placed it. Secondly the references for every coin has been looked up under both JR and SR. In most cases both indicate the denomination to be an *antoninianus* ; however in the cases where a difference emerges the original reference has been sought.

Finally the most noticeable difference between this database and Ryan's is that instead of number codes being used for the catalogues and the degree of identification of each coin, a text string has been used. Though this takes up more space on disc, the advances in computer technology means that it is still perfectly possible to handle these larger files easily; and the words rather than codes makes the interrogation of the database easier.

Below are seven entries in the database. In this example the site database and the coin find database have been combined, though normally the site name, county and type of site would be stored in a second file, the site simply being referred to using its number. The columns are detailed down below:

Table 3.22: An example of seven entries from the database.

	Site	Site Name	County	Site Type	Acc.No.	Denomination	Ruler	Ruler Name	Boss
1.	501	Bloxham	OXON	C	1215	Sestertius	599	MARCUS AURELIUS	599
2.	501	Bloxham	OXON	C	2694	Antoninianus	703	POSTUMUS	703
3.	501	Bloxham	OXON	C	69	As	510	GAIUS	510
4.	536	Chichester	SUSW	C	1109	As	595	FAUSTINA I (A.P.)	594
5.	536	Chichester	SUSW	C	1360	Sestertius	608	CRISPINA (COMM)	606
6.	536	Chichester	SUSW	C	471	As	540	DOMITIAN (VESP)	538
7.	833	Hassocks	SUSE	C	311	Dupondius/As	538	VESPASIAN	538

	RP	Status	Catalogue	Volume	Cat No.	Letter	Number	Location	Note	Mint
1. cont.	8		RIC	3	1038		1	-	0	0
2. cont.	13	Copy	None	0	0		1	-	0	0
3. cont.	1	Copy as	RIC	1	30		1	-	0	0
4. cont.	7		RIC	3	1162	A	1	251	0	0
5. cont.	9		RIC	3	669		1	4TM	0	0
6. cont.	3	As	RIC	2	723		1	76	0	0
7. cont.	4		None	0	0		1	-	0	0

Field descriptions

Site: The site code. This number refers to Ryan's reference number for the site (Ryan 1988) or one of the additional sites referred to in Appendix 3.21.

Site Name: The name of the site

County: The county the site is in (post boundary changes)

Site Type: The functional type of site:

C = Cemetery, F = Military, U = Urban (Civitas capitals Etc.), S = Small towns, M = Towns either with an early fort or a strong military influence, T = Temple, V = Villa, R = any other rural site.

Acc.No.: For sites in Ryan's original database this was a numerical sequence given to the corpus as a whole. In the case of additional sites to the database, this refers to the original catalogue entry number to make cross referencing back to the original source easier.

Denomination: *Quadrans, As, Dupondius, Dupondius/As, Sestertius, Aes, Quinarius, Denarius, Antoninianus, Aureus*

Ruler: This is the code for the face on the coin (see Appendix 3.23)

Ruler Name: This is the name of the face on the coin (see Appendix 3.23)

Boss: The senior authority issuing the coin, eg. the Emperor in the case of a Caesar (see Appendix 3.23)

RP: The Reece period of each coin

Status: Blank or: As..., Var..., Copy..., Copy as....

Catalogue: The primary catalogue (if any), usually RIC or Crawford. All republican coins have been converted to Crawford, some references remain as BMC or Cohen references, though wherever possible Cohen references have been converted to RIC as well. If no catalogue identification has been made then 'none'.

Volume: The volume of the above catalogue. Not so important for 1st to 3rd century coins (except RIC 1 new and old edition), but vital for fourth century identifications.

Cat No.: Catalogue entry number

Letter: Catalogue entry letter (if any)

Number The number of coins of this type

Location The stratigraphic location of these coins (if any)

Note Reference to any notes on the entry kept elsewhere

Mint The mint at which the coin was issued. This column has not been used in this study, but is again vital for work in the fourth century.

3.3 Site find analysis

3.31 The relative deposition of coin on sites
3.32 Interpretation
3.33 Denominational analysis
3.34 Warning

In this section the differential deposition of coin on different types of site is examined. Interpretations are made relating the nature of deposition to the integration of sites within the monetary economy. However, the study is essentially a traditional analysis based upon the static view of coin circulation (fig. 31.01). The limitations and problems of such an analysis are discussed and the need for a more dynamic model of circulation dynamics is called for.

3.31 The relative deposition of coin on sites

From the data in Appendix 3.21 the proportion of coin deposited on each type of site in each period can be established. This is shown in fig. 33.01. The first impression is of the overall regularity of the shape of the histograms. Though there are differences in the proportions between the various classes of site, the general tendencies are the same. The high presence of later Julio-Claudian coins on military sites is the most marked deviation. This period is mainly represented by Claudian copies (which are discussed further in section 4.1). Their dominance is partly a function of the inclusion of Usk in the database. However, it should be noted that this pattern shows through even though many of the rest of the military sites are from further north, in areas not occupied until after these issues had disappeared from circulation.

The military sites stand out in other periods as well. From the Republic until the early Severan period there is a higher proportion of coin lost on this kind of sites than any other. The only exception comes when examining the issues of Mark Antony, but even here his *denarii* are most prominent on small town sites where military establishments had existed. From the later Severan period onwards this trend is reversed, with forts displaying far fewer coins lost in virtually all periods. The single exception is the reign of Carausius and Allectus (the 'British Empire'). This pattern can be seen clearly on the graph, however direct comparisons between other classes of site are not so easy.

A second way of examining the differential deposition would be to look at the ratio of the number of coins lost on one type of site to that on another. Figs. 33.02-9 show just this. The construction of fig. 33.02 will be explained, then the trends in all of the studies summarized.

Fig. 33.02 shows period by period the ratio of coins in the database found on military sites, to those found in the public towns. For example, 19 Republican coins were found at forts, whilst 15 came from the public towns. The ratio is therefore 19/15 = 1.26. If

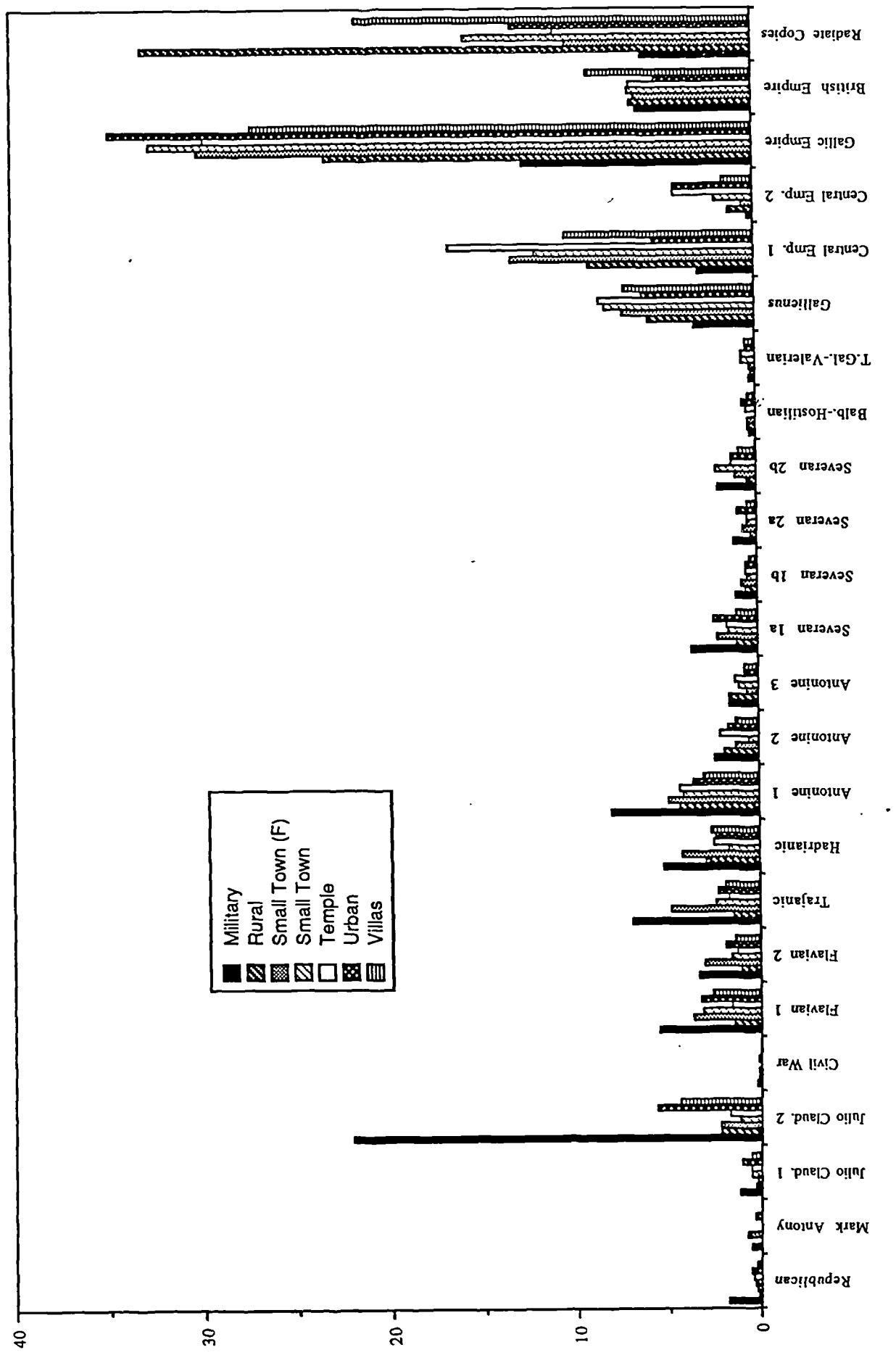


Fig. 33.01: The proportion of all 1st to 3rd century coins on sites.

the value increases from one date to another, it means that relatively more coins are being deposited on military sites than on town sites. If it decreases the pattern is reversed. It is a very simple use of the data. However, occasionally because of the small sample size some ratios can appear abnormally large or small. The only cases where this has happened has been in Mark Antony's coinage, during the civil war and the issues of Balbinus to Hostilian. In the case of the civil war coins here, 2 came from forts, whilst none were found in our sample of public town sites. This gives a ratio of infinity. Such values as infinity and zero, due to one of the sites having no coins of one period have been excluded from the histograms. What is important, however, is not the absolute values on any of these graphs, but any systematic trends which show up within them. Fig. 33.02 shows clearly that there is a shift in emphasis from coin loss on military sites to coin loss on Public Towns over time.

Fig.	Comparison between:	Trend
33.02	Military sites and public towns	Relative to military sites, there is an increase in coin deposition in the public towns during the 1st to 3rd century. The trend is weak to start with, however, the main change takes place from the early Antonine to the late Severan period. From Balbinus onwards the pattern is relatively stable, with a slight trough during the later Central Empire, balanced by a peak during the British Empire. The whole trend suggests a shift in the use of Roman coinage from the military to town life.
33.03	Small and public towns	Relative to public towns, there is a slight increase in coin deposition in small towns during the 1st-3rd century. The rise is clearer at the beginning than later on. This is consonant with the view of small towns being later developments than the civitas capitals.
33.04	Military sites and small towns with military associations	There is a rapid decline in the ratio of coin. This represents the temporary early nature of a lot of the forts in small towns of Southern Britain. The initial decline is matched by a second from the late Antonine period to the reign of Balbinus and Hostilian.

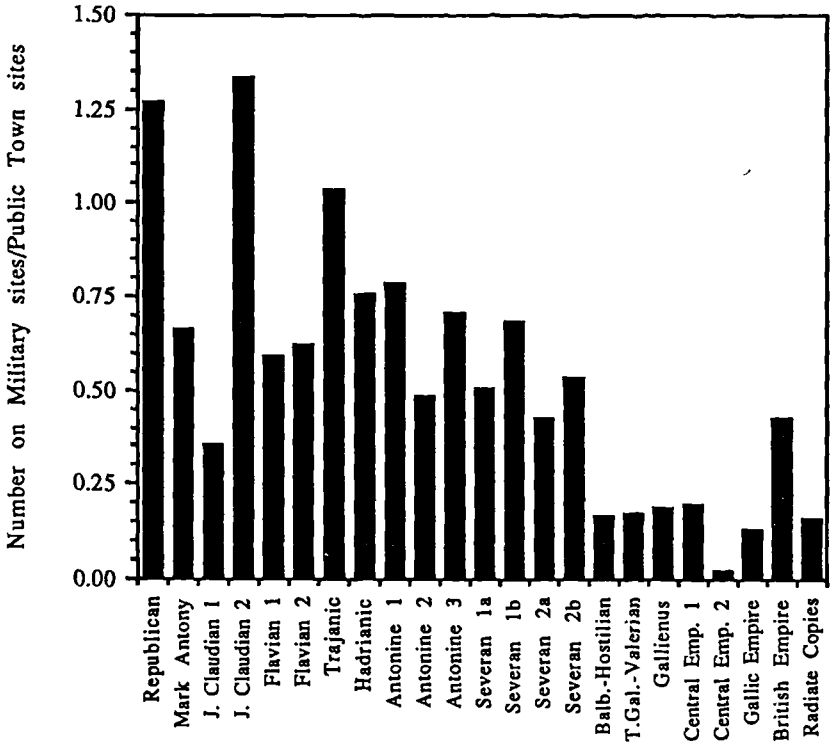


Fig. 33.02: The ratio of coins found in military sites and public towns.

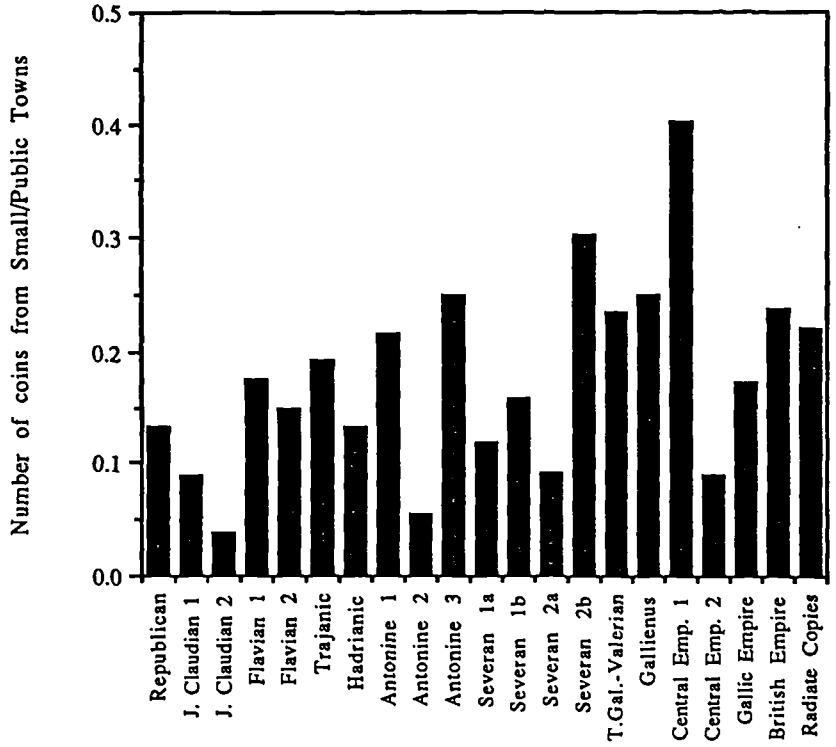


Fig. 33.03 The ratio of coins found in small towns and public towns.

33.05 Small towns with and without early forts

The small towns with military associations show a higher proportion of coin loss in the earlier period, this confirms the trend in figs. 33.02 & 33.04. Also it reflects the fact that many of the forts in the small towns were early affairs during the period of conquest, therefore it is in this early period when more coins would be deposited on sites.

33.06 Villas and public towns

The pattern here is slightly more complicated. From the conquest to the Hadrianic period there is a shift in deposition from public towns to villas, however, this falls in the Severan Period. Deposition on villas is strong again in the later third century, though with the exceptions of coins on the later Central Empire and Gallic Empire.

33.07 Villas and small towns

The ratio of coins between small towns and villas is virtually uniform. The large two value of Julio-Claudian 2 is a factor of a small sample size.

33.08 Rural sites and public towns

As with villas and public towns, the trend is not very clear cut. There is a shift from deposition in public towns to rural sites through to Antonine 3. In the Severan period fewer coins are found on rural sites. This grows again in the later third century, but as with villas, this excludes coins of the Later Central Empire and Gallic Empire. The trends are similar to those for villas and public towns, though the data are a little more variable.

33.09 Rural sites and small towns

There is a similar growth in the conquest to Antonine period, and a similar decline in the Severan period. However, the resurgence of deposition in the later third century is only marginally observed.

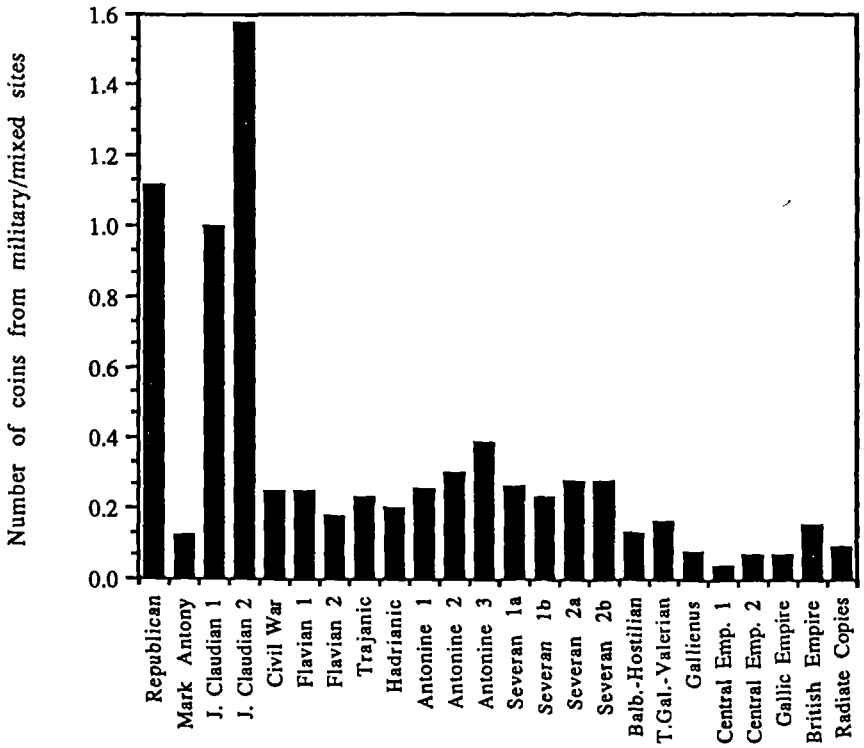


Fig. 33.04:
The ratio of coins found in military sites and small towns with military associations.

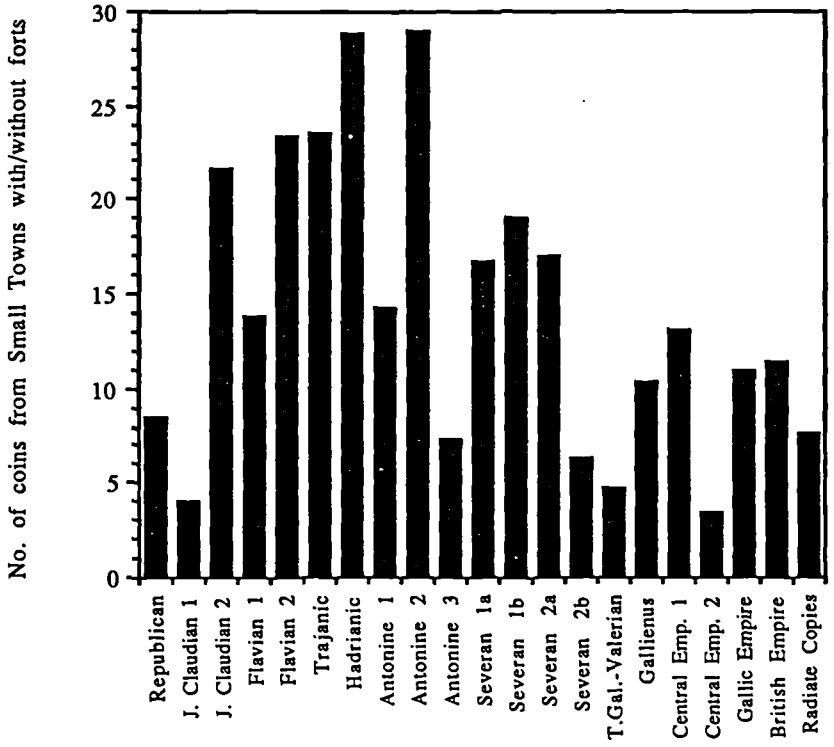


Fig. 33.05
The ratio of coins found in small towns with and without military associations.

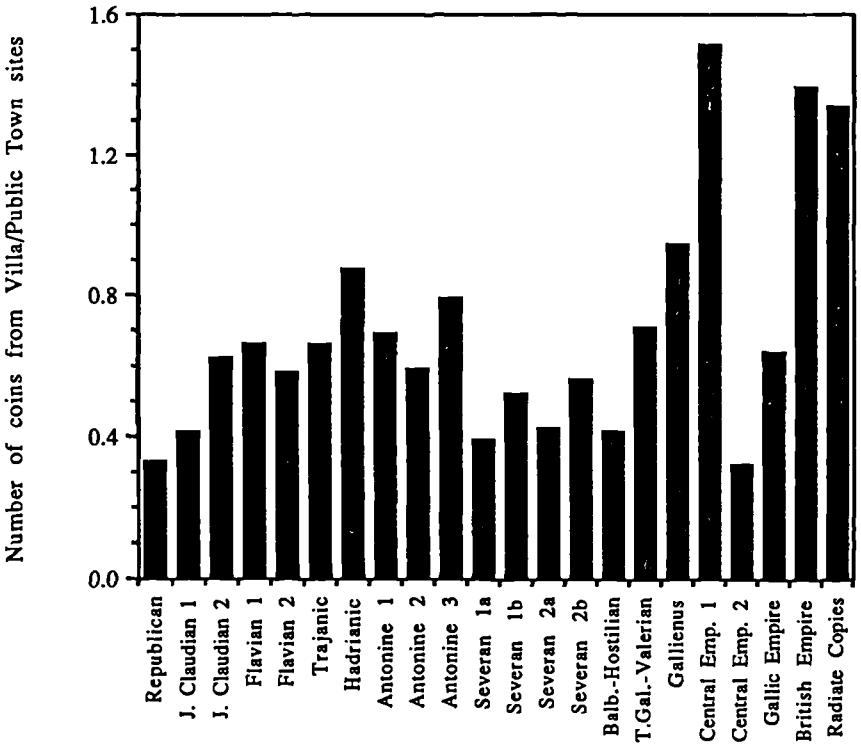


Fig. 33.06 The ratio of coins found in villas and the public towns.

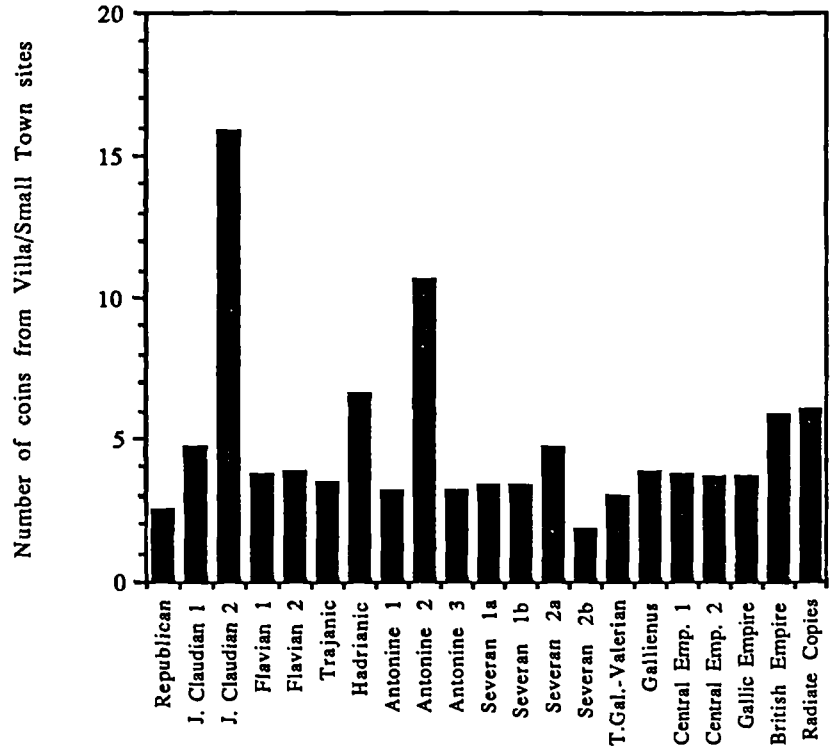


Fig. 33.07 The ratio of coins found in villas and small towns.

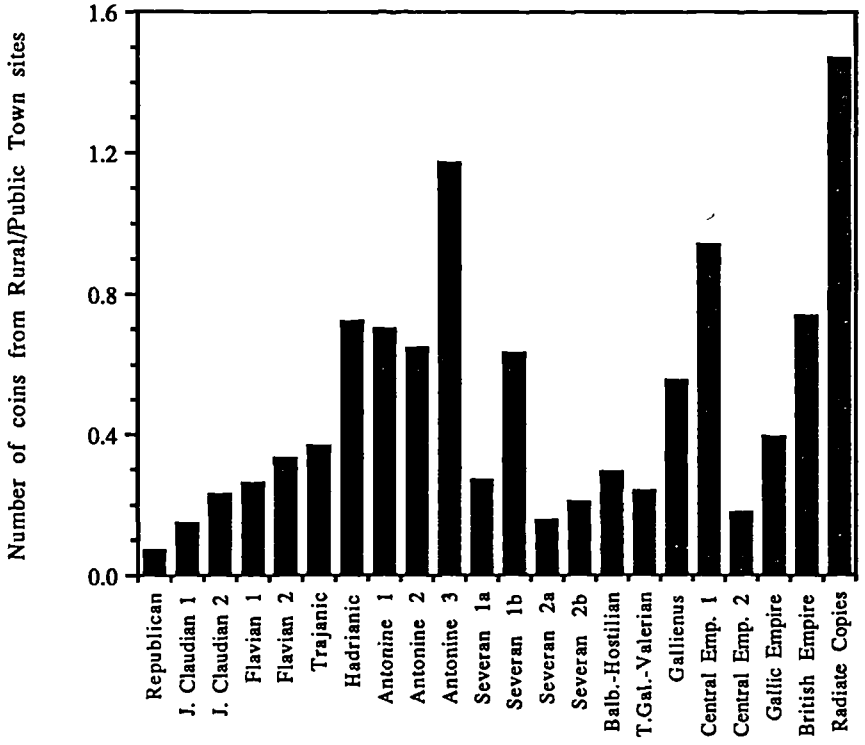


Fig. 33.08 The ratio of coins found on rural sites and in public towns.

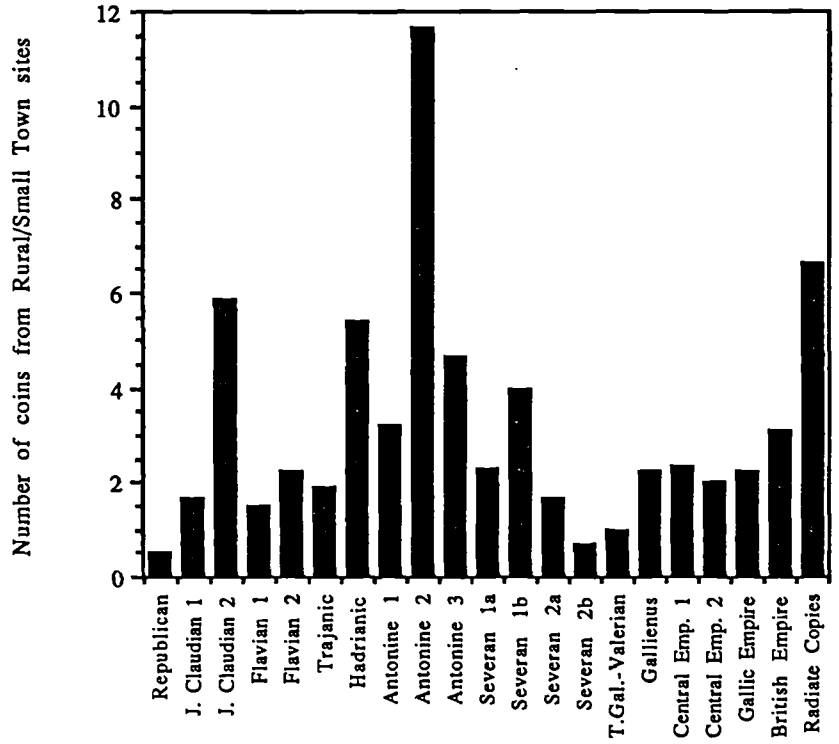


Fig. 33.09 The ratio of coins found on rural sites and in small towns.

33.10 Villa and rural sites

Here there is a clear shift in deposition from villas to rural sites from the conquest until Antonine 3. Then there is a slight reversal followed by a further decline.

In a lot of these cases the trends show a tripartite division. From the conquest to the Hadrianic or Antonine period, from then up to Balbinus and Hostilian, and from then up to the end of the third century. The trends have been schematized in fig. 33.11. There are three types of relationship shown. A solid arrow indicating a clear shift in emphasis of deposition from one type of site to another; a dashed arrow, indicating a less clear trend; and a dotted line indicating a stability in the ratio of coin deposition between the two.

3.32 Interpretation

Fig. 33.11 looks at the changing pattern of deposition of coinage on sites in three phases from the conquest to the late third century. First, what are the stable elements of the system? The only continuous link is that between small towns and villas. This shows a stability throughout the first to third century. This does not mean that equal numbers of coin were lost at each kind of site. All it means is that if the numbers of coin lost in the small town increased, so did that of the villas. The match possibly indicates a close relationship between the integration of both settlement types into the monetary economy.

Other rural sites have a flexible relationship with both villas and small towns. It appears that there was a relative increase in deposition on rural sites up until the mid second century, however then for a century this pattern reversed, only to be restored in the mid third century. One possible interpretation is that the initial rise reflected the growth in the countryside of the number of people handling coin. By the mid second century small towns and villas were becoming more prevalent. More villas were being constructed and small towns were playing a more important role in the distributional system. We have also established that in the second half of the second century *denarii* were circulating at their fastest ever rate. If this reflects an increase in the development of monetization then to see deposition at towns increase (both public and small towns) would be reasonable as more market transactions would be taking place here. In summary, the extension of the use of coinage first spreads into the rural population as more people are required to handle money to pay taxes; then later this extension of the monetary franchise stimulates the development of new market centres and larger productions of surpluses, which we see represented in the development of the small towns and villas. The shift in the ratio of coin deposited from rural sites to small towns

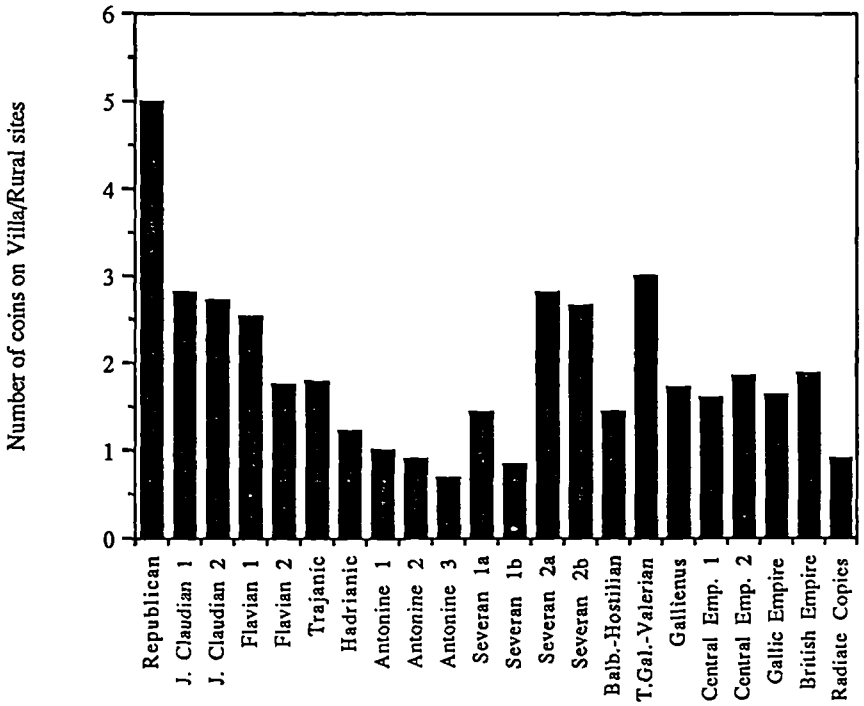
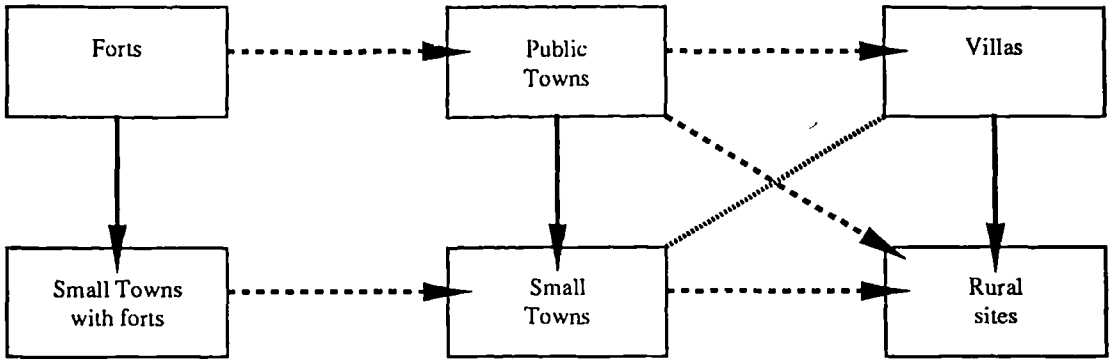
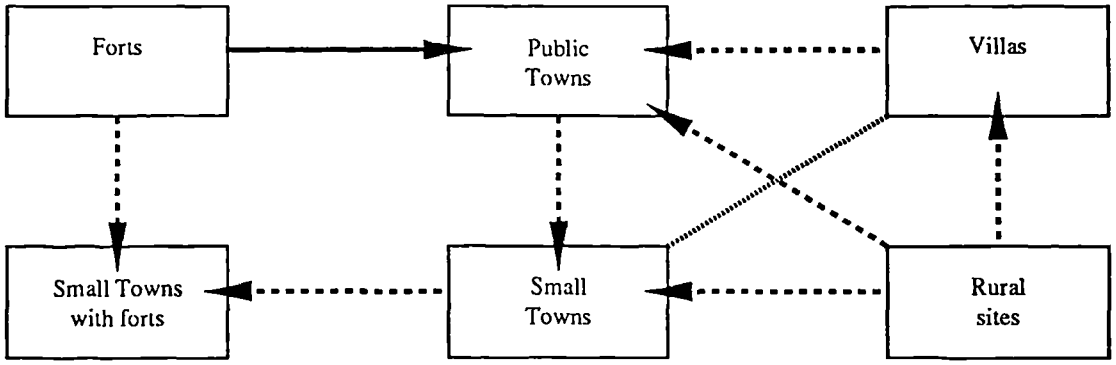


Fig. 33.10 The ratio of coins found in villa and on rural sites.

The shift in emphasis of coin loss from the conquest to the Hadrianic period:



The shift in emphasis of coin loss from the the Early Antonine to the Late Severan period:



The shift in emphasis of coin loss from Balbinus to the late third century:

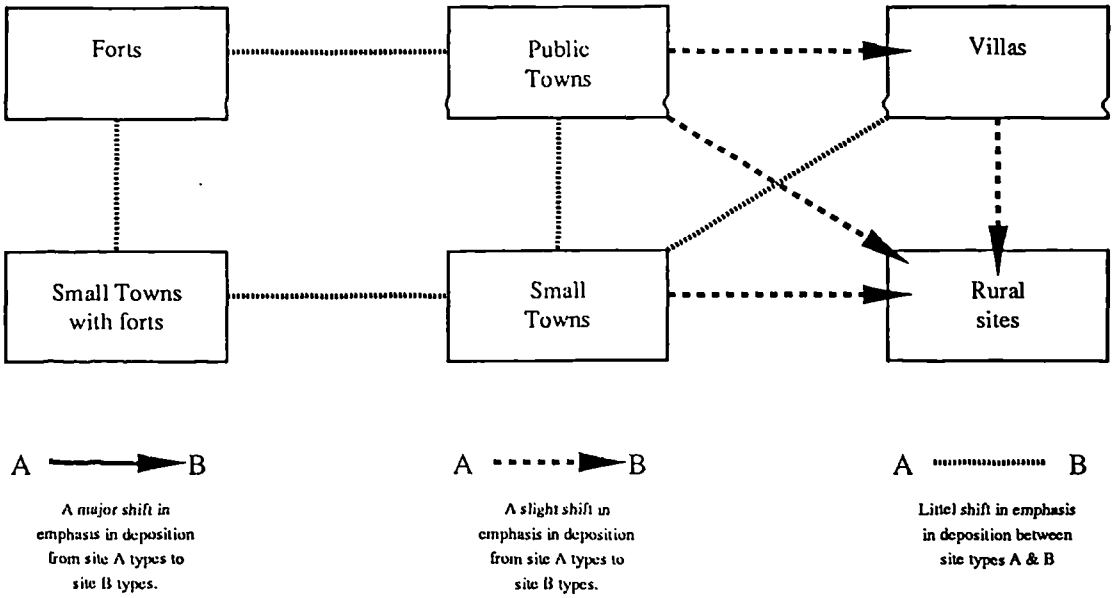


Fig. 33.11 The change in emphasis in coin loss on different types of site.

and villas is therefore more a factor of the later date of these market centres, than of any decrease in the participation of the countryside in the monetary economy. Of course this is only one possible interpretation.

In the later third century more coin is again found on rural sites. This comes with the mass production of *antoniniani*. It is noticeable that rural settlements have a higher proportion of radiate copies than any other type of site. Not far behind come villas. One explanation is that radiate copies were an acceptable medium of exchange in unofficial transactions, just as many tokens were in the 17th century. In the regulated markets of the towns such coin may not have been of as much use; however, out in the countryside they might have been acceptable. Hence most would be found on rural sites, then villas, then small towns and only then in the public towns. On the other hand people may have only realised they had been given fake coin in their change when they got home from the market and then just thrown it away. Both are quite possible. However, it is difficult to believe that owing to the large numbers of radiate copies that these were not an acceptable medium for many purposes.

The relationship between small towns and public towns shows the gradual rise of the small town in the economic system, though stability in the amount of coin deposition at each seems to have been achieved by the mid third century.

Forts also change substantially in their relationship to the other settlements. Initially there is a higher proportion of coinage being deposited there, but eventually an equilibrium is reached with the public and small towns in the mid third century. Since the army was one of the primary entry points in Britain of Roman coinage this early dominance is not unexpected; though as Roman coin use spread through the country after the conquest, one would expect the ratio to decline, as it does.

Basic coin loss, however, is only half the story. We may be able to see changes in the levels of deposition on rural and military sites, but what of the particular denominations that were being lost on each? Can this enhance our picture of the changing role of the different settlement types in the monetary economy ?

3.33 Denominational analysis: by site type

Some of the coins in the database are of unknown denomination, these therefore have had to be excluded, reducing our sample size slightly but not significantly. Other coins are recorded simply as *aes* . This means a division into *antoniniani, denarii, sestertii, dupondii* and *asses* is possible but very restrictive in its use of data. For looking at large scale trends a simple division into 'bronze' and 'silver' has been used (even

though many of the bronze coins were made of no such alloy, and many of the later silver coins were very base). The division is simple but useful.

The proportion of 'silver' from each period on each type of site has been established and is shown in Table 3.31 and figs. 33.12 & 33.13. The table only goes up to Valerian as after this virtually all the coins produced are of one denomination: the 'silver' *antoninianus* .

Fig. 33.12 looks at the relationship between military and town sites. The civil war coinage was principally one of *denarii*, these coins were only found on the military sites, and small towns with military influences. In the Flavian period these two types of site also had more silver present on them than the towns, and the mixed towns and forts seem to continue with a silver rich assemblage into the late Antonine period. The small towns and public towns have similar proportions of silver up until the Trajanic period, from whence the small towns tend to have a more silver deficient assemblage. This lasts into the start of the Severan period, when the provision of bronze coinage becomes very deficient on all types of site.

In summary what we see are town sites assemblages containing more 'small change' than military sites. Small towns with early forts belonging to the second category. Public and small towns have similar assemblages until the Trajanic period when more 'small change' starts to be deposited on small town site. This trend is seen continuing into the later third century where it vanishes due to the introduction of a virtually unidenominational currency system.

Fig. 33.13 looks at the relationship between town and country. The values for small towns and public towns are repeated here alongside rural sites and villas. The picture is generally very mixed. Up into the Flavian period there is a slight predilection for silver on country sites. The most early Julio Claudian silver is found on these sites, and Rural sites contain the most Claudian and Neronian silver. Civil war coinage is only found on the rural sites, and in the Flavian period villas have the highest proportion of silver. The trend, however, is not strong. From the Hadrianic to the early Severan period public town sites have the highest proportion of silver. Then as before, with the irregular supply of bronze to the provinces the picture gets a bit mixed.

In summary what we appear to see is country sites starting off with a more silver rich assemblage, whilst town sites produce marginally more 'small change'. In the Antonine period this picture reverses itself, and this position is possibly sustained into the later third century, though again this trend is weak.

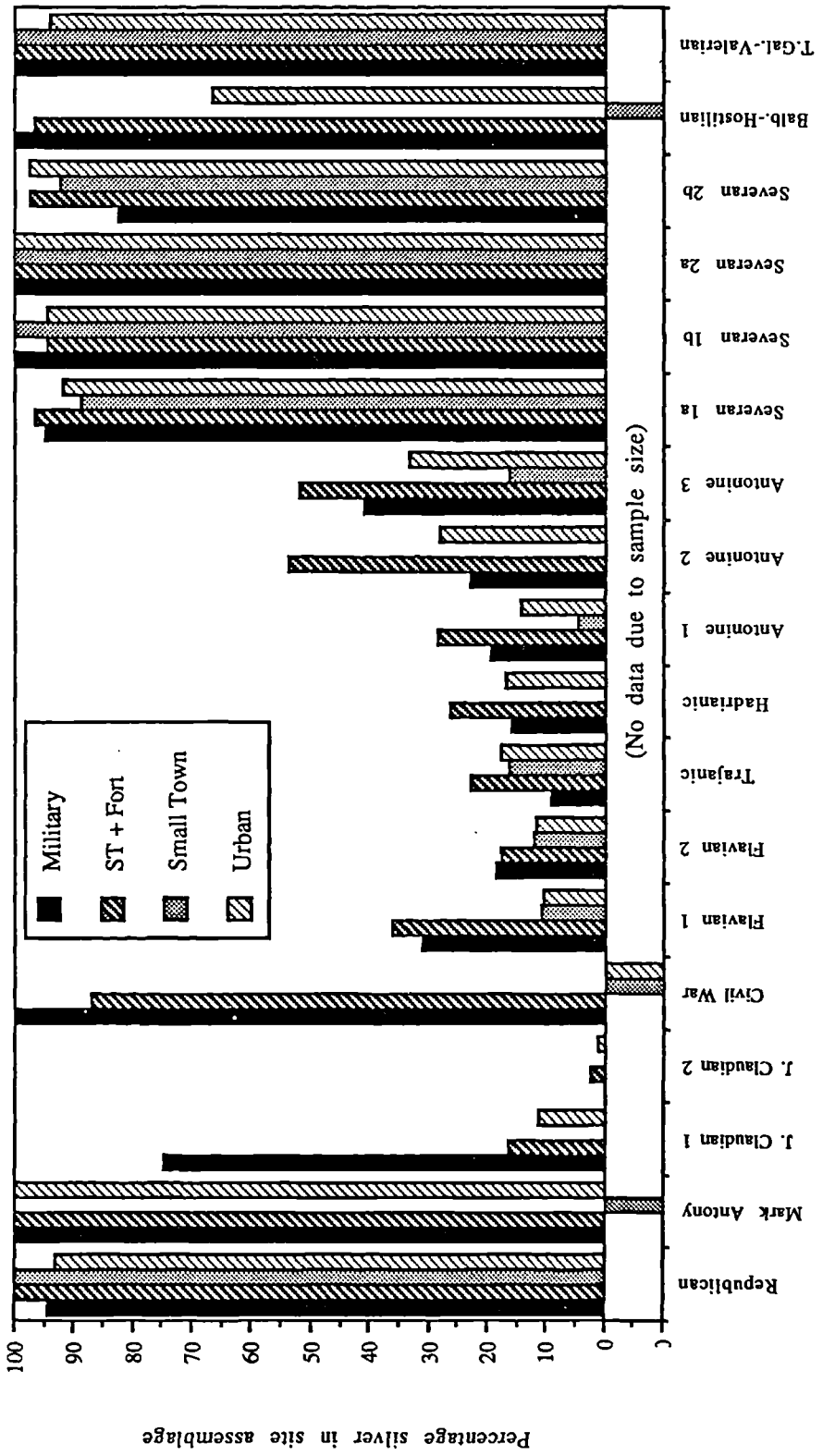


Fig. 33.12 The proportion of silver deposited on military and town sites.

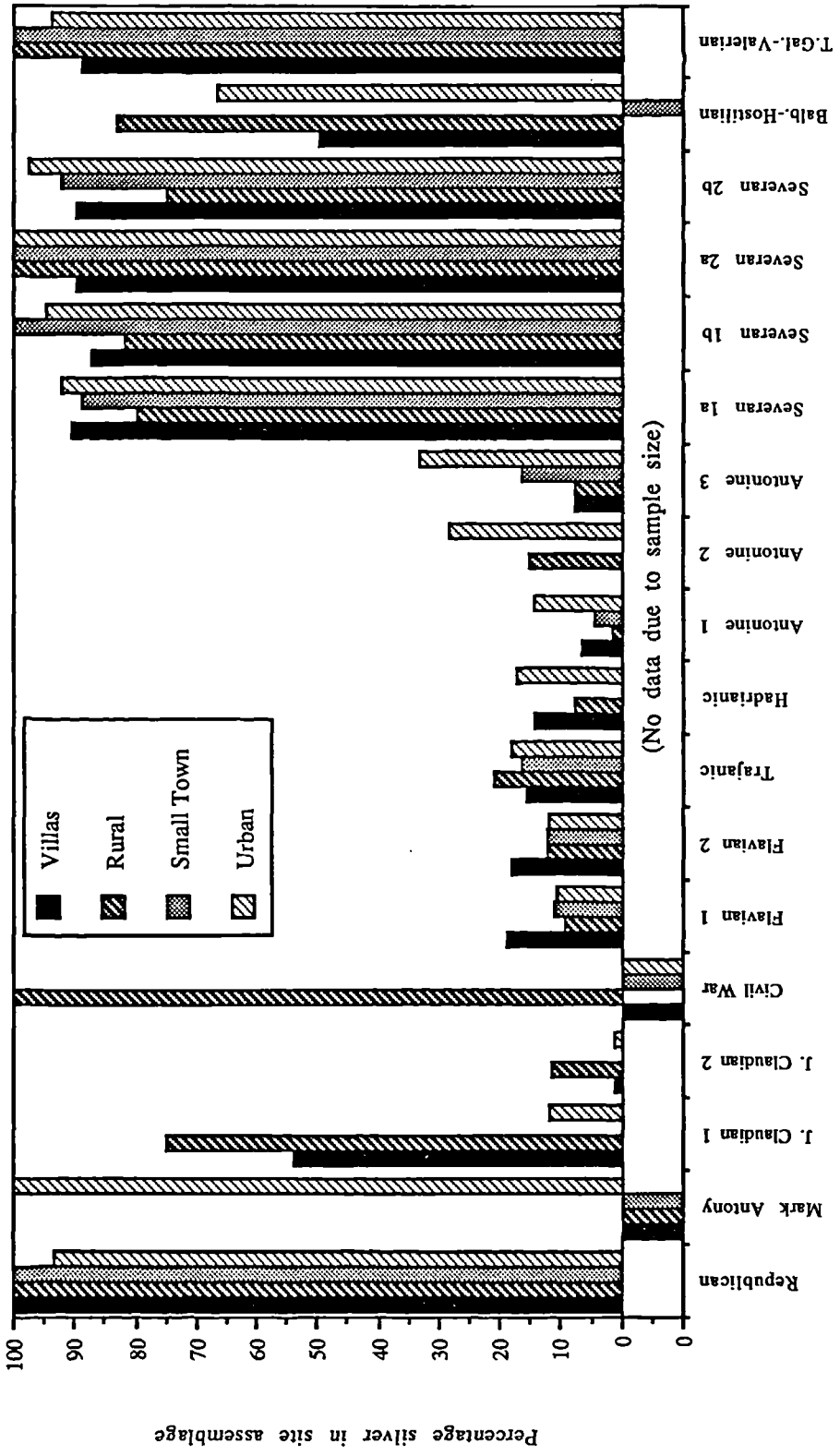


Fig. 33.13 The proportion of silver deposited on town and country sites.

Table 3.31: The proportion of silver coins in site assemblages, divided by the type of site.

Group	Period	Villa	Rural	Military	ST + Fort	Small Town	Public Town	Temple
A	Republican	100.00	100.00	94.74	100.00	100.00	93.33	100.00
B	Mark Antony	-	-	100.00	100.00	-	100.00	-
C	J. Claudian 1	53.85	75.00	75.00	16.67	0.00	11.76	6.67
D	J. Claudian 2	1.09	11.43	0.00	2.65	0.00	1.14	4.26
E	Civil War	-	100.00	100.00	87.50	-	-	50.00
F	Flavian 1	18.92	9.52	31.15	36.40	11.11	10.68	28.21
G	Flavian 2	18.18	12.50	18.92	18.18	12.50	11.86	17.14
H	Trajanic	15.63	21.05	9.21	23.31	16.67	18.06	34.15
I	Hadrianic	14.29	7.89	16.07	26.57	0.00	17.33	25.00
J	Antonine 1	6.52	1.64	19.54	28.74	4.55	14.41	9.73
K	Antonine 2	0.00	15.38	23.08	54.02	0.00	28.30	12.96
L	Antonine 3	7.69	7.69	41.18	52.27	16.67	33.33	16.22
M	Severan 1a	90.48	80.00	94.87	96.64	88.89	92.21	84.44
N	Severan 1b	87.50	81.82	100.00	94.74	100.00	94.74	88.89
O	Severan 2a	90.00	100.00	100.00	100.00	100.00	100.00	69.23
P	Severan 2b	90.00	75.00	82.61	97.53	92.31	97.67	75.68
Q	Balb.-Hostilian	50.00	83.33	100.00	96.67	-	66.67	71.43
R	T.Gal.-Valerian	88.89	100.00	100.00	100.00	100.00	94.12	100.00

In conclusion, analysing the proportion of silver in site assemblages by the type of site shows some variation. However, this variation is not clear cut. Those trends which do emerge are as follows:

1. From the conquest to the Trajanic period town sites contain a higher proportion of bronze coins in their assemblage than either military or rural sites.

2. From the Hadrianic period possibly continuing into the later third century, military sites continue to have the most silver. However, small towns and public towns now have more silver than the rural and villa sites. Even so small towns are closer in their make-up to rural and villa sites than the public towns are.

3.34 Warning

The analysis gives a vaguely consistent picture of money moving into the countryside and back into towns as towns develop. However, how real is any of this? The entire procedure is based upon the static view of coin circulation (cf. fig. 31.01). These neat chronological divisions we know are false, coins could circulate for generations before being melted down or lost. Given that the principle foundation of this analysis is false, can the results be trusted at all? The answer is probably not. What is really needed is a dynamic model of coin circulation, not a static one.

3.4 A new model of coin circulation

3.41 Muller's model
3.42 Collis' model
3.43 Crummy and Terry's model
3.44 The requirements of a new model
3.45 The development of a model
3.46 The model in mathematical terms

In this section we explore various concrete suggestions made to tackle the problem of residuality. These include Muller's, Collis', and Crummy and Terry's models (Muller 1968; Collis 1974; Crummy and Terry 1979). An entirely new model of circulation dynamics is called for; one which uses evidence and data that is already available, and one which fulfils the criteria that it can be tested and validated or nullified. One is then created; first expressed in words and ideas, then in mathematical terms and expressions.

3.41 Muller's Model

> "...before we can use coins except for the roughest kind of dating, we must not only have a large number of them and work according to sound general principles, we must also know how long they were in circulation: that is, what interval must be assumed between the time when they were minted and the time when they were lost."
>
> (Collingwood 1930, 187)

The feelings of pessimism expressed in the 'Coins and the Archaeologist' (Casey and Reece, 1974) papers some 44 years later suggest that Collingwood's simple question has yet to be answered. Residuality has been talked about, ideas have been suggested, but that extra step to convert those ideas into working models has not been taken except in the case of Muller (1968). His idea was neatly summarized by Crawford:

> "The principle involved may be roughly stated thus: the occupation can be identified as beginning with the first year for which the available coinage in the area is fully reflected on the site. For coinage may be presumed to begin to disappear from circulation by loss or hoarding immediately after being issued. If then a site comes into use on 1 January of a certain year, the coinage issued in that year will be the first one which is available in its entirety as a preliminary to representation on the site. If one plots, year by year, for the site and for the area as a whole, the volume of coinage as a percentage of the totals from the site and from the area, the date at which occupation of the site begins is indicated by the point where the two graphs coincide for the first time."
>
> (Crawford 1983, 202)

This is expressed in fig. 34.01. The model tries to establish a clearly defined 'start date' for the use of coinage on a site. However it requires that coinage is either fully used or not used at all. It would neither be able to cope with sites with variable levels of occupation and hence coin deposition; nor with changing levels of integration with the monetary economy. Nonetheless, the model is one which can be applied directly to coin data as it already exists; albeit in the restricted historical quest for the 'start date' of

Roman sites. Its best use would be in dating the start of military sites; but its use for other types of settlement could be questionable.

3.42 Collis' Model

We need models which can cope with a much broader range of questions than 'when did coin use on this site begin?' Collis (1974) presented two important ideas in his paper. First he created a visualization of a dynamic currency system. These images were similar to those which Haselgrove used (fig. 31.01; Haselgrove 1987, 35). Secondly he suggested a way of solving the residuality problem. He thought about using hoards as a basis, but dismissed them because of the variable nature of selection factors, as he perceived them. Instead he saw the future in seriation analysis of archaeologically associated groups of coinage:

> "The only way is to use the evidence of associations... [This can come] from pit groups and other associated finds which were lost over a short period of time. Every time two or more coins are found together in a pit or feature we have an association. There must be hundreds of such associations published and dozens more found each year, but no one has yet started to gather this body of data together"
>
> (Collis 1974, 182)

Alas, they had not gathered the data in 1974, nor have they since. Collis' plea for data went largely unheeded. However seriation is not the best method on a number of grounds. First the sheer quantity of data realistically needed is far more than a couple of hundred associations. Reece divided up Romano-British coinage into twenty-one periods, all about twenty years long. If we only ascribe our data to this coarse framework, and take into account the different denominations (as their longevity certainly differed) then we have at least fifty categories of data. This would require far more than a couple of hundred associations of a couple of coins on archaeological sites to achieve a sensible seriation. As Collis says: "To build up a trustworthy seriation, hundreds if not thousands of observations are needed of coins found in close association and obviously lost at the same time. The more observations, the less important become the statistical errors..." (Collis 1974, 182). Yet to be realistic, this would still only be with a coarse division of the data into coin periods. Individual emperors would require even more data.

Apart from the problem of gathering enough data, most seriation packages require various assumptions to be made about the data. Most seriation programs assume the categories of evidence to have normal distributions across time. Collis would certainly recognize that this is not the case. Coins (it is thought) have a rapid growth in the number in circulation and a long slow tail off. Perhaps this is more similar to a binomial distribution than an normal distribution. Yet even if a package were to sort the

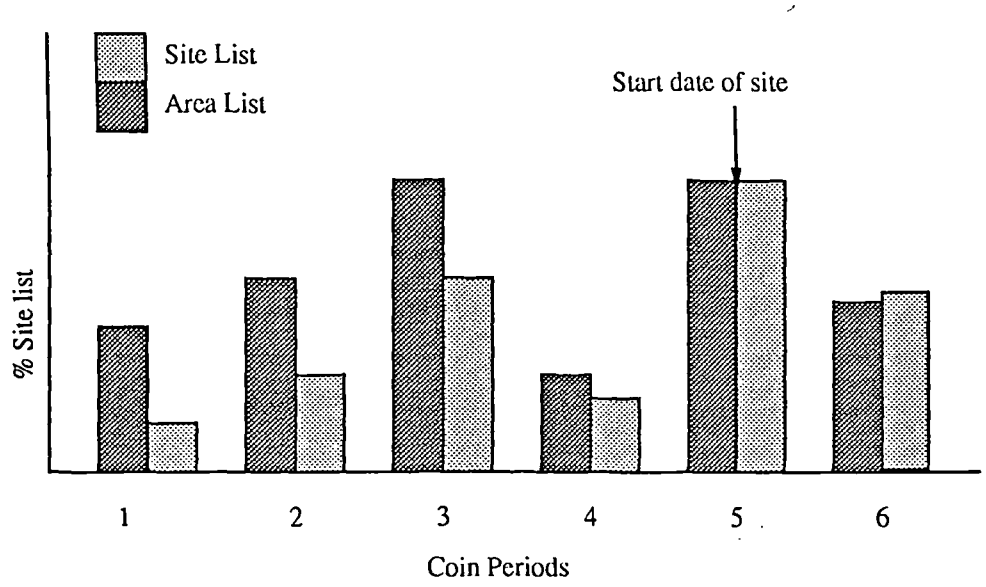


Fig. 34.01: Muller's model

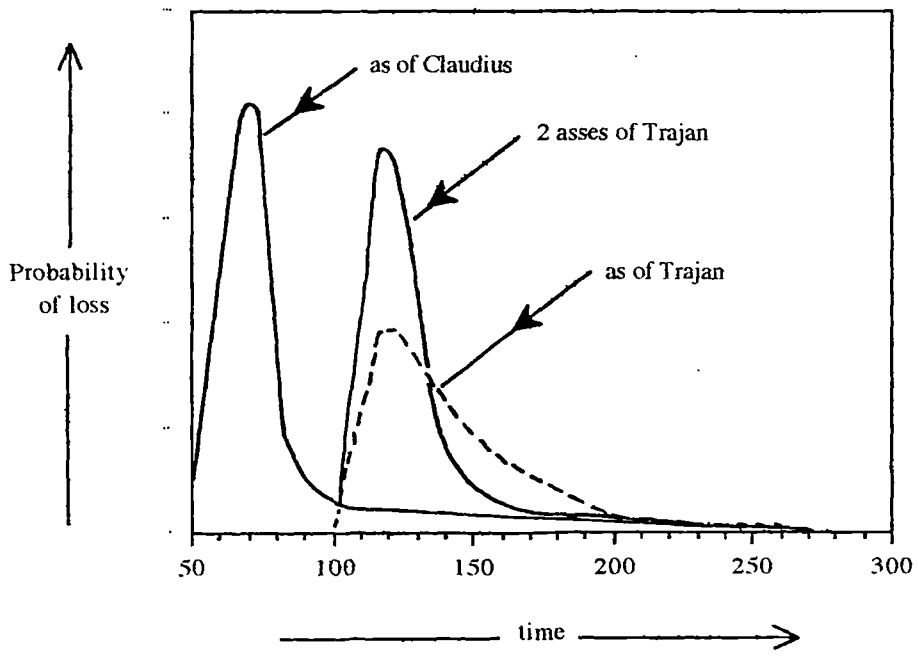


Fig. 34.02: Crummy and Terry's model: the frequency of some specific coin types in hoards through the Roman Period (Crummy & Terry 1979)

data on the basis of binomial distributions this too would be to force on the data a pattern which might not be there. Whereas the coins of Antoninus Pius might have a curve which approximate to a binomial distribution, others such as Republican coinage in Britain most assuredly do not (Reece 1974, 83).

The method has potential. Unfortunately it requires an enormous amount of as yet uncollected data. Also the seriation method would order the data by forcing it into preconceived patterns which might not be appropriate.

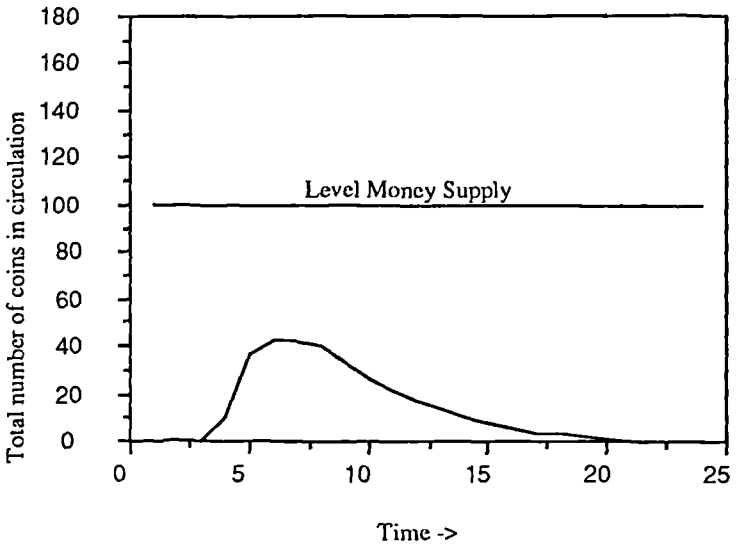
3.43 Crummy and Terry's Model

Crummy and Terry were also extremely interested in the possibilities of seriation (Crummy and Terry 1979). They called for the use of seriation on primary deposit groups of coinage as Collis had done, but then went on to mention another suggestion, based on hoard evidence:

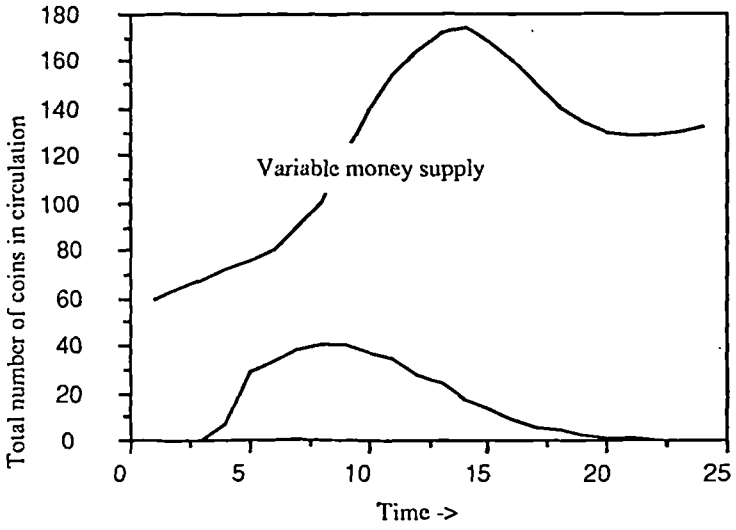
> "...we could probably obtain a graph for most types of coin showing frequency of loss against time by plotting for each type of coin the percentages present in coin hoards of various dates [cf. fig. 34.02]. In this case, one of the graphs represents the various grades of copies of Claudian asses, another graph a Trajanic as and a third curve two Trajanic asses. The area under each curve between any two points in time expressed as a proportion of the whole area under the curve represents the probability that any coin of that type from a class 1 context was dropped between those two times. Further, the area common to all these curves provides the means of calculating the probability of finding two Trajanic asses and one Claudian copy in the same class 1 context. As can be seen, the occurrence of such a possibility is small, so that in a case like this either the excavator is wrong in assuming that the context is class 1, or he or she was very unlucky."
>
> (Crummy and Terry 1979, 55)

The illustration, of course, did not come from real data. The authors qualified their suggestion by saying that of course hoards were highly selective and the study of hoards was full of all kinds of difficulties, but nonetheless their idea is very appealing. The possibilities it offers are exactly what archaeologists require. Whether there would ever be enough early imperial bronze hoards in Britain to construct such a graph is highly questionable; but it might be possible with *denarii* or with different emperors grouped together into coin periods.

Although the basic approach and ideal is correct, there lies in the method a much more serious error. The graphs they conceived did not show 'the frequency of loss against time' from which they could derive their probabilities as they imagined. The vertical axis, it must be remembered, is the percentage of coin present in hoards - not the absolute number in circulation. The probabilities can only be derived from the curve if it is assumed that the total number of *asses* in circulation in Britain remained constant, with losses and withdrawals from circulation exactly equalling the volume of newly



(A) The 'skew-curve' shaped distribution of a coin series in a period of level money supply; here the curve shown as a proportion of the money supply would have the same profile as it does now.



(B) Here, where the money supply varies, there becomes a difference between the profile of the actual skew curve shown here; and its shape if drawn a proportional scale. If the curve here was redrawn on a proportional scale, the profile would be exactly the same as the figure above. Distortion occurs.

Fig. 34.03 Distortions left in Crummy and Terry's model

minted coin entering circulation. This is highly unlikely, especially in early Roman Britain, where one might expect a growth in the volume of circulating coinage as society became more 'monetized' (though see section 4.3). Fig. 34.03 shows this kind of distortion. In fig. 34.03a the total volume of coins in circulation is constant, and so the two curves are identical; whereas in fig. 34.03b the total volume of coinage in circulation is rising, so our 'percentage in hoards' vertical axis is only a crude approximation to reality.

3.44 The requirements of a new model

The arguments over seriation require a new model not to make any assumptions about the shape of a coin loss curve. Many will perhaps be classic skew-curves (Collis 1974, 178), but not all of them will be. Political and economic forces may distort the shape of many of them, as specific coins are selectively called in. Also, the new model must take into account the variation in the total volume of coinage in circulation, and hopefully quantify this, as money-supply figures are potentially of great interest to us. And naturally, it must not go beyond the limits of the data as outlined in the previous sections.

The other main point is that the model should not just be a construction of one precarious piece of conjecture built upon another. It must be able to be tested:

> "...The crux of scientific procedure is that hypothesis (that is, the possible explanations or the possible laws) are formulated tentatively and then tested empirically. To test these trial explanations or possible laws, one first infers implications from them. These implications should pertain if the hypothesis is correct. Then one checks to see whether or not what these statements describe is actually the case.
>
> In the archaeological literature this procedure is often referred to as 'the hypothetico-deductive (H-D) method'..."
>
> (Watson et al. 1984, 12)

In order to avoid any kind of circularity, the data set the model is tested against must not have been used in any way to create the model in the first place. Only if predictions are derived from such a model, and these predictions compare well to the evidence, can our model be taken as validated... or at least, not invalidated:

> "...justification of a knowledge claim by formulation and testing of its implications ('It's so because these tests did not disconfirm it') is essential. One should not simply assert the truth of a knowledge claim ('It's so because I say so'). Formulation and empirical testing of hypotheses justify knowledge claims about the subject matter; untested assertions of knowledge claims do not."
>
> (Watson et al. 1984, 12)

3.45 The development of a model

To develop the model we will first hypothesize a monetary system with only one denomination. This consists of a series of issues from Coin Series 1 (C_1) to Coin Series n (C_n), this we will say has taken place over a number of years, from year 1 (T_1) to year t (T_t).

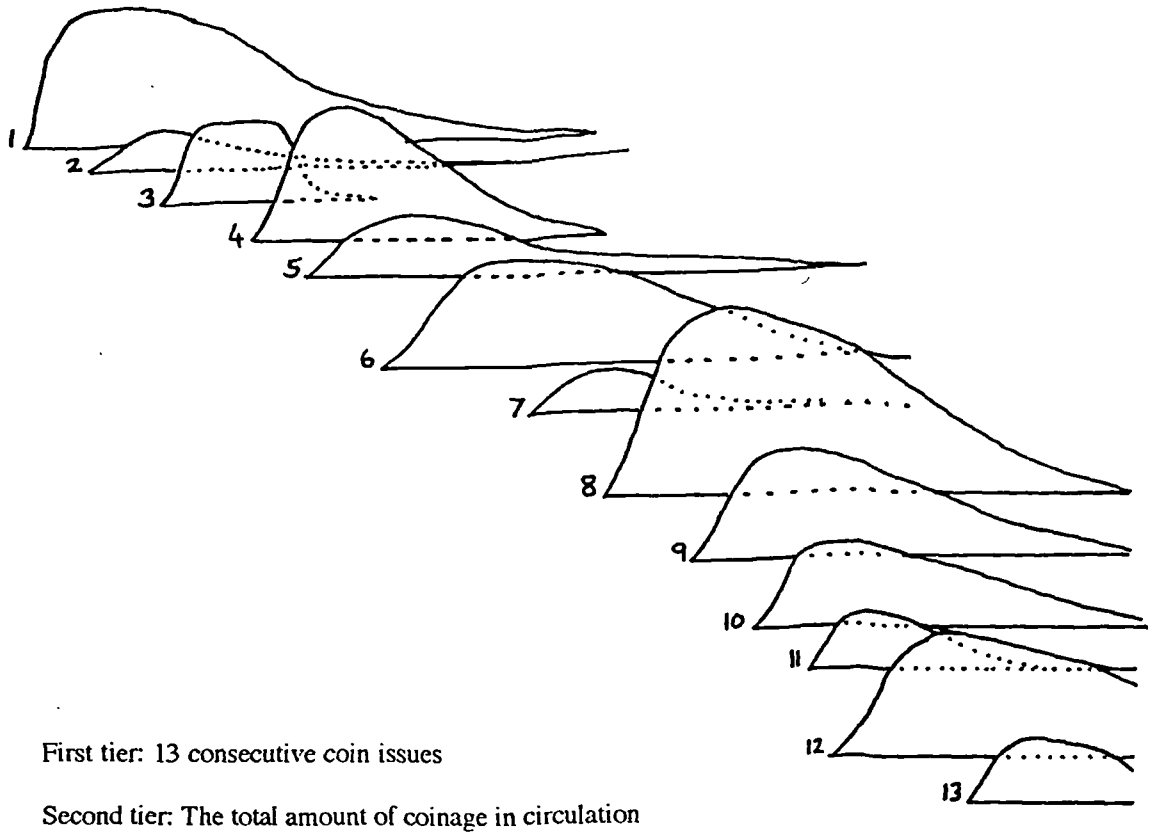
Unlike Collis' illustrated model (Collis 1974) where he had a series of penny issues all of which had identical 'number of coins in circulation' curves, reality will ensure that every issue will have a different curve. This diversity is expressed in fig. 34.04. The first tier of the diagram shows the skew-curves as Collis and Haselgrove would recognize them. They show the number of coins of each series in circulation over a period of time. As will be noticed, these cover a wide variety of shapes. Some issues are larger than others, others have irregular shapes. Coin Series 3, for instance, has been truncated as if the issuing authority behind it had become proscribed or undergone 'damnatio memoriae'; or it may be that the issue had more silver in it and was preferentially withdrawn from circulation.

The second tier shows the aggregate picture of the entire money supply. This simply comprises the earlier curves added together. The vertical scale here is the actual number of coins in circulation. It is, of course, simply an ideal construct. This is our eventual aim. If we ever had a picture like this we would have our money-supply figures and the means of quantifying residuality. However we do not have this kind of information for the present day, let alone for the Roman period.

The third tier shows the type of illustration which Crummy and Terry envisaged, though with all the coin series added together. It has exactly the same information content as the second tier, except that it is entirely devoid of any notion of the *total* volume of coinage in circulation, or of that total's variability. The vertical axis is the percentage composition of the circulation pool. Crummy and Terry equated this with the percentage composition in hoards.

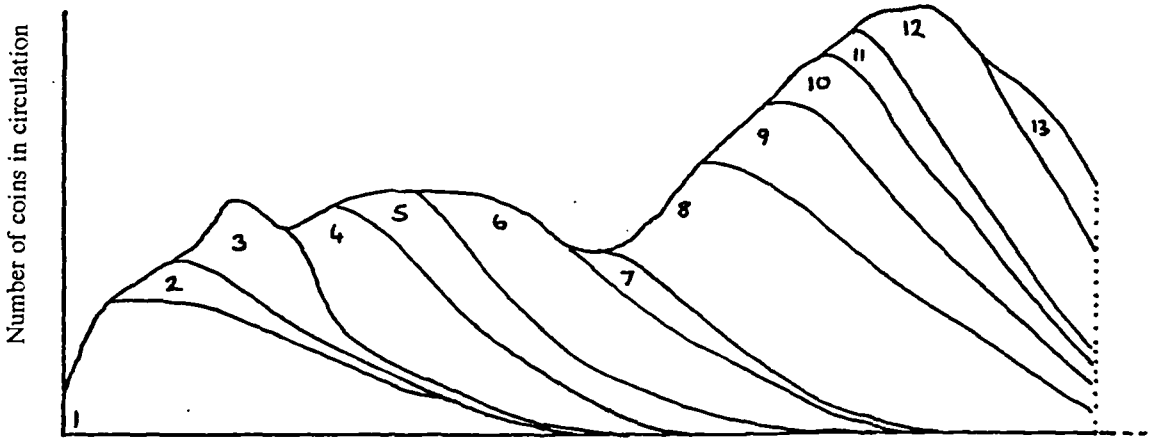
With this illustration in mind, what information do we know already? On the basis that hoards can sometimes be equated with the circulation pool, then we can draw the third tier for any individual denomination. For example, we did this for denarii in the first to third century in Britain (Section 2.4, fig. 24.05).

Unfortunately, as stated above, this tier is devoid of any notion of the total volume of coinage in circulation, or of its variability. Somehow we need information which can act as an input to convert our third tier to our second tier. This cannot come from



First tier: 13 consecutive coin issues

Second tier: The total amount of coinage in circulation



Third Tier: The proportional composition of the circulation pool

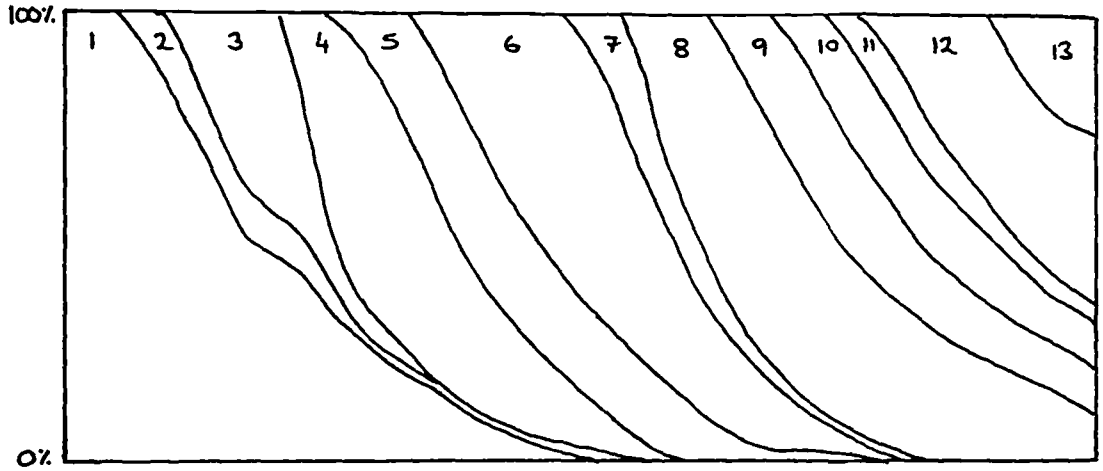


Fig. 34.04: The composition of the circulation pool

hoards. To use the total number of coins found in hoards of different dates to reconstruct the volume of coinage in circulation would be an entirely spurious exercise. The number of hoards found today, and their non recovery in antiquity, need have no direct relationship with the volume of money in circulation.

What does our second tier actually tell us? It visually describes the variation in the number of coins of any series in circulation over a period of time. Here I want to introduce the concept of 'coinage availability'. This is a variable which can be ascribed to any coin series. It is measured in coin-years (NOT 'coins per year'). One coin-year is a single coin in circulation for one year. Two coin-years could either be two coins in circulation for one year each; or one coin in circulation for two years. And so on. The two axes on our first and second tier model are 'time' and 'number of coins'. It therefore follows that areas on these graphs can be measured in such terms.

In our discussion of coin loss, we took our primary variables determining loss to be:

1. Loss of series A coins is proportional to the number of series A coins in circulation.
2. Loss of series A coins is proportional to the length of time the coins remain in circulation.
3. Loss of different coins *may* be inversely proportional to their intrinsic worth, due to preferential recovery.

The first and the second variable together state that 'loss is proportional to the number of coins and their duration in circulation'. Therefore if 1000 coins were in circulation for 10 years (10,000 coin-years), we would expect just as many to be lost as if there were 2000 coins in circulation for 5 years (also 10,000 coin-years), all things being equal. This requires no leap of logic, but is a direct consequence if variables 1 and 2 are believed. The areas on our first and second tier graphs are just such areas; though instead of being rectangles of X coins present over Y years, they are curves. Nonetheless, the argument is the same: the larger the area, the more coins are likely to have been lost, the smaller the area, the fewer the coins. Loss (leaving aside the variable for preferential recovery for a moment) is directly proportional to the 'coinage availability'.

This means that site finds can in theory provide us directly with information concerning our second tier. If the coins of each denomination are divided up into their different series, then the ratios of their abundance will equal the ratios of the areas on our first or second tier illustrations. The mathematics of this is described later; what is important at the moment is to convey the idea.

Now we have to account for the preferential recovery of different denominations. This exercise can only be done by looking at one specific denomination at a time, so this

problem is not great. If desired, it is perfectly possible to add in a correcting factor to site lists to account for preferential recovery. This could be based on the metrology and metallurgy of the coins as established by Walker (1976, 1977, 1978) for *denarii* .

From the ratios of the areas in our first and second tier, together with the information contained in our third tier graph, a full reconstruction of our second tier money supply can be created (the mathematics are described later). This can be done twice: first without taking into account a preferential recovery factor, and secondly with one. This would leave us with two sets of reconstructions of the money supply which could be tested against the data. There are three ways in which this can be done:

1. Excavated coin groups

As Collis suggested, excavated coin groups could be used to form a basis of a seriation analysis reconstruction of residuality; so can they be used to test this model? Crummy and Terry (1979) suggested ways in which a model like our second tier could be used to test the probability of finding a group of coins together. Crummy and Terry used the hypothetical example of a Trajanic and two Claudian *asses* . We could use real assemblages from primary contexts. The model which gave the real groups the highest probability of existing would be deemed best. However primary contexts are rare, and the chance of finding enough with multiple *denarii* in them is unlikely.

2. Sites occupied for short periods

A site, or group of sites (such as the Antonine Wall), which is known to have been occupied between relatively well-known limits can help us. If the date limits are inserted into our two models, each will predict the assemblage of coinage expected from the site. This can then be tested using chi-squared tests, against the actual assemblage present.

3. Coin Wear

This is a notoriously difficult aspect of coinage (see Section 2.3). Wear need not be proportional to the amount of time a coin was in circulation, since it is quite possible for a coin to have remained stationary in a hoard for long periods, while others ran around in circulation. Nonetheless, it is another possible way of seeing if our models approximate to reality. Large site lists, with consistent wear details recording them, can be analyzed. By dividing our second tier models into the individual coin series (tier one), we can hazard an approximation to the wear profile of the coins we would find on site. Again the two predictions can be compared to reality, and the best fit model chosen.

The details of each method are explained in Section 3.5. Ideally all should consistently point to one of the two models being preferential to the other.

3.46 The model in mathematical terms

The mathematical description of the model uses *denarii* in Britain as an example. The graphs which help explain it (figs. 32.04 to 32.09) are entirely conjectural. The circulation of the coins is looked at from AD 40 to AD 280.

Fig. 34.05 One of our aims is the creation of notional index of the money-supply figures for *denarii* in Britain. This notional index we shall call 'K'. K will have different values at different dates, and will be K_t at date 't'. This index needs to be anchored. Let us define K as being of unit value in AD 50. i.e.:

K_t = the notional index of the number of *denarii* in circulation at date t.

$$K_{50} = 1$$

The illustration shows the variation in the money supply figure K over time (to be precise, the graph in fact shows the variation of K multiplied by a factor of 100 - this does not materially effect the shape of the curve). As stated above, the graph is purely hypothetical at this stage. The Graph is the equivalent of our second tier illustration in fig. 34.04, though without the detailed breakdown shown.

Fig. 34.06 This illustration shows the make-up of the currency pool in terms of the different coins series or emperors that go to form it. C_n stands for Coin Series 'n'. Each coin series or emperor has a different integer value for n. For the sake of simplicity the earliest series is called C_1 and the rest, in order of their occurrence, are numbered sequentially. For our study of denarii C_1 would be Republican coins, C_2 *denarii* of Mark Antony etc..

Fig. 34.07 The previous graph can also be drawn as a proportional breakdown of what is in circulation (third tier), instead of on a relative scale (second tier). This graph can be derived from coin hoard data.

Fig. 34.08 This graph now needs to be described mathematically.

C_nT_t is defined as the percentage of the circulation pool taken up by coin series 'n' at time 't'. Therefore, at one date, say AD85, the following equation is true:

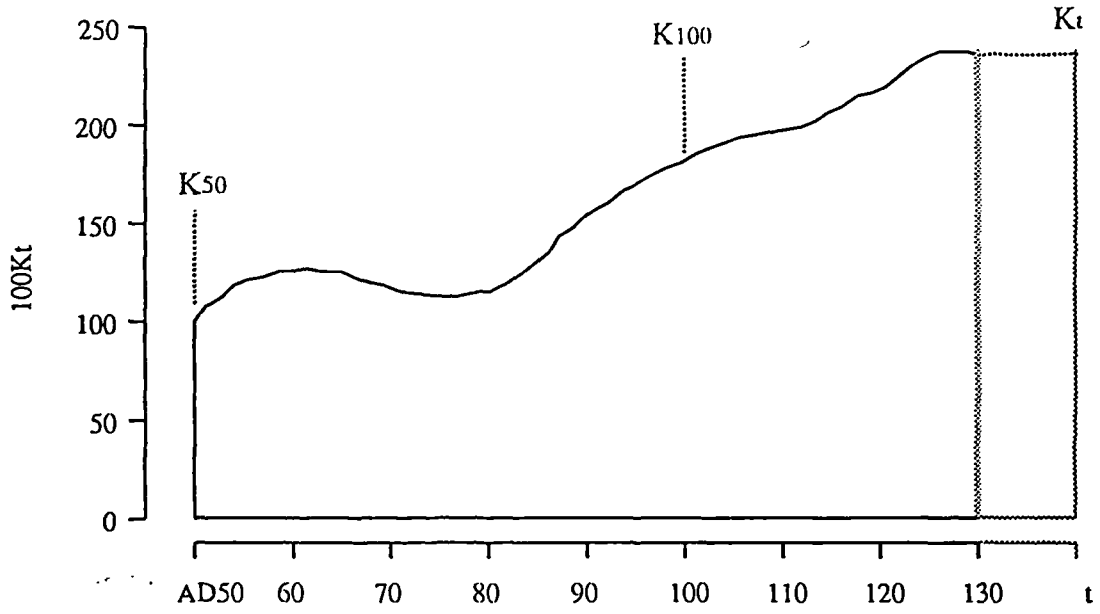


Fig. 34.05 K_t: the money supply index

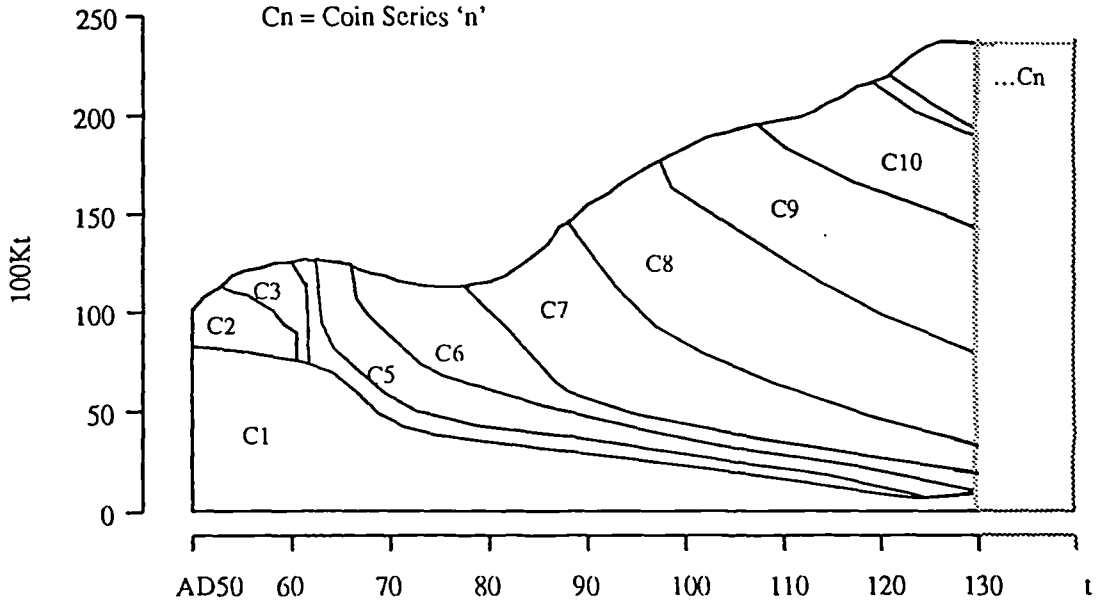


Fig. 34.06 The composition of the money in circulation

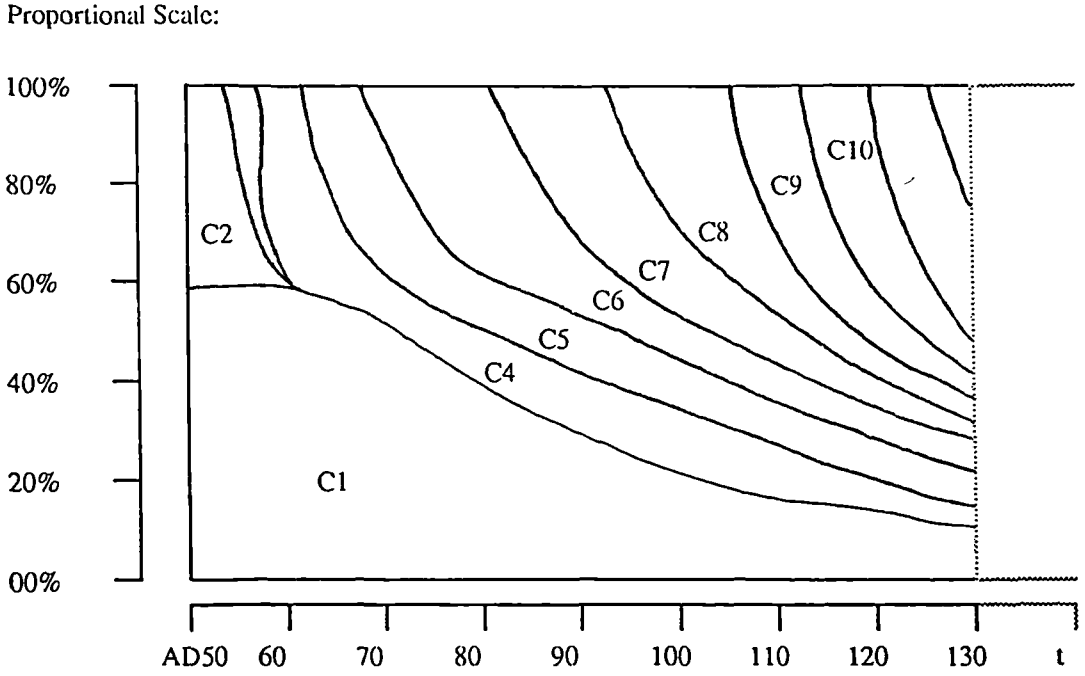


Fig. 34.07 The proportional composition of the circulation pool

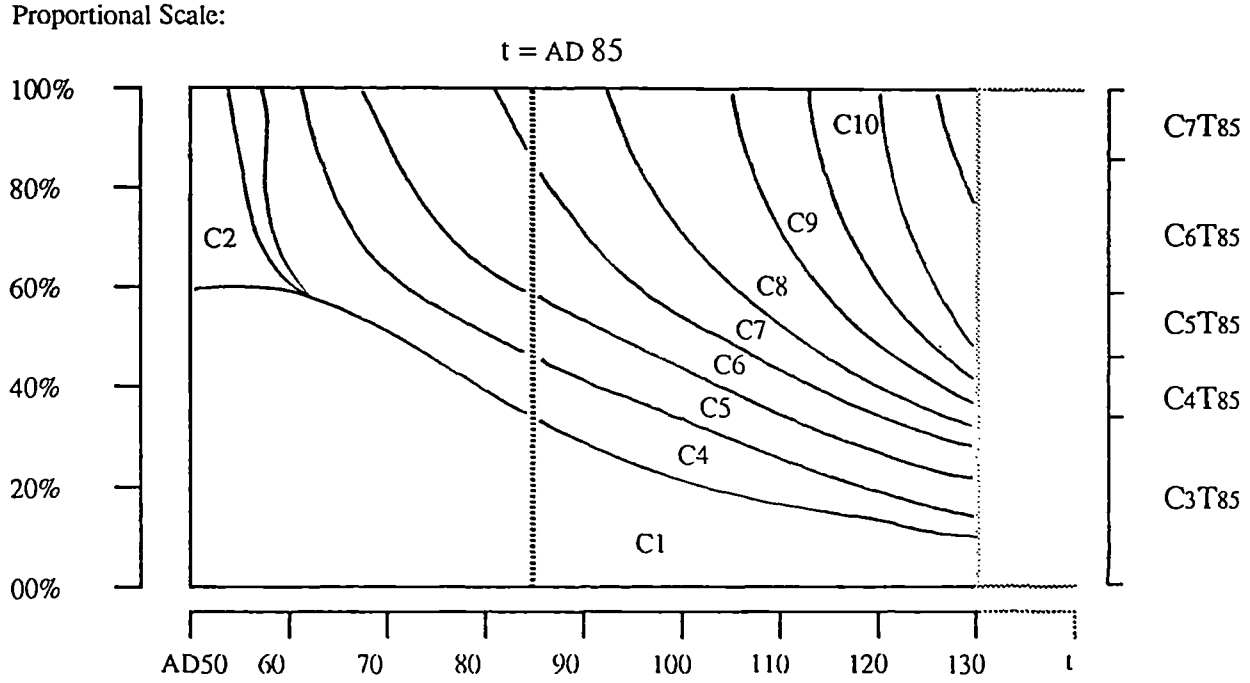


Fig. 34.08 Definition of C_nT_t

% of Coin Series 1 at AD85 +	C_1T_{85} +
% of Coin Series 4 at AD85	C_4T_{85}
% of Coin Series 5 at AD85	C_5T_{85}
% of Coin Series 6 at AD85	C_6T_{85}
% of Coin Series 7 at AD85	C_7T_{85}
100%	100

Or, in a shorthand form, for the year 't':

$$100 = \sum_{n=1}^{n=\infty} C_nT_t$$

The limits being the first to an infinite number of coin series is simply justified. In the case of AD85, the values of C_2T_{85}, C_3T_{85}, were zero, so they would not get counted, and likewise since series C_8 and above had not come into circulation yet, their values would also be zero.

In order to transfer our image of fig. 34.08 to fig. 34.06, we need to multiply all our C_nT_t values by our money supply index, K_t. Hence, it follows that:

EQUATION 1

Relative number of coins of C_1 around in AD85 +	$K_{85} \times C_1T_{85}$ +
Relative number of coins of C_4 around in AD85	$K_{85} \times C_4T_{85}$
Relative number of coins of C_5 around in AD85	$K_{85} \times C_5T_{85}$
Relative number of coins of C_6 around in AD85	$K_{85} \times C_6T_{85}$
Relative number of coins of C_7 around in AD85	$K_{85} \times C_7T_{85}$
Relative number of all coins around in AD85	$K_{85} \times 100$

Or, in a shorthand form, for the year 't':

$$100K_t = K_t \sum_{n=1}^{n=\infty} C_nT_t$$

Fig. 34.09 The areas on this graph express the availability of coin in coin-years; 'numbers of coins' and 'time' being the two axes. We need to establish the availability of each coin series to be lost. Therefore we need to create a formula which quantifies the area of each coin series on our second tier graph.

This can be approximated by dividing the area up into a number of vertical strips. Here we have arbitrarily decided to make the strips 5 years wide. The total area will be equal to the sum of all the individual strips. The area of each equals the height of each side added together and divided by two, then multiplied by five.

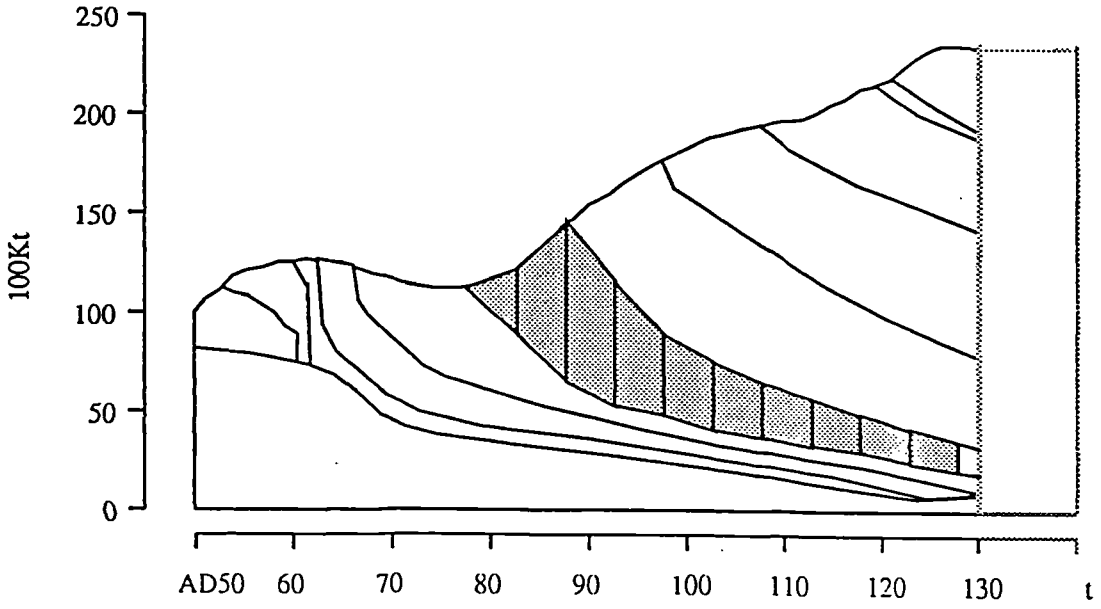


Fig. 34.09 The area on the graph representing Coin Series 7

Using the example of C_7; the area of a strip between date t and t+5 is:

$$\frac{((K_t \times C_7T_t) + (K_{t+5} \times C_7T_{t+5}))}{2} \times 5$$

The total area can therefore be established by equation 2:

EQUATION 2

Area covered by C7 in the 5 years in AD 80-85 +	$((K_{80} \times C_7T_{80})+(K_{85} \times C_7T_{85})) \times 2.5$
Area covered by C_7 in the 5 years in AD 85-90	$((K_{85} \times C_7T_{85})+(K_{90} \times C_7T_{90})) \times 2.5$
Area covered by C_7 in the 5 years in AD 90-95	$((K_{90} \times C_7T_{90})+(K_{95} \times C_7T_{95})) \times 2.5$
Area covered by C_7 in the 5 years in AD 95-100	$((K_{95} \times C_7T_{95})+(K_{100} \times C_7T_{100})) \times 2.5$
...etc	...
Area covered by C_7 in the 5 years in year t to t+5	$((K_t \times C_7T_t)+(K_{t+5} \times C_7T_{t+5})) \times 2.5$
Area covered by C_7 =	$2.5 \times \sum ((K_t \times C_7T_t)+(K_{t+5} \times C_7T_{t+5}))$

It follows that the availability or area of any coin series 'n' on the graph from AD 40 to AD 280 can be expressed as:

$$= 2.5 \sum_{t=275}^{t=40} ((K_t \times C_nT_t)+(K_{t+5} \times C_nT_{t+5}))$$

$$= 2.5 (K_{40} \times C_nT_{40} + K_{280} \times C_nT_{280}) + 5 \sum_{t=275}^{t=45} (K_t \times C_nT_t)$$

Equation 1 is the summary of the hoard data input. Equation 2 is our angle on the site find data input, though it has not been expressed in quite such terms yet. The two equations can be combined since they share a number of expressions in common. The combination (Equation 3) horizontally adds up to the areas of each coin series (Equation 2); vertically they add up to 100 multiplied by our money supply variable (equation 1), though with an additional constant of 5 years thrown in:

EQUATION 3

Area of C_1 =	$2.5 \times K_{40} \times C_1T_{40}$	$+ 5 \times K_{45} \times C_1T_{45}$	$+ 5 \times K_{50} \times C_1T_{50}$	$+...2.5 \times K_{280} \times C_1T_{280}$
Area of C_2 =	$2.5 \times K_{40} \times C_2T_{40}$	$+ 5 \times K_{45} \times C_2T_{45}$	$+ 5 \times K_{50} \times C_2T_{50}$	$+...2.5 \times K_{280} \times C_2T_{280}$
Area of C_3 =	$2.5 \times K_{40} \times C_3T_{40}$	$+ 5 \times K_{45} \times C_3T_{45}$	$+ 5 \times K_{50} \times C_3T_{50}$	$+...2.5 \times K_{280} \times C_3T_{280}$
Area of C_4 =	$2.5 \times K_{40} \times C_4T_{40}$	$+ 5 \times K_{45} \times C_4T_{45}$	$+ 5 \times K_{50} \times C_4T_{50}$	$+...2.5 \times K_{280} \times C_4T_{280}$
Area of C_5 =	$2.5 \times K_{40} \times C_5T_{40}$	$+ 5 \times K_{45} \times C_5T_{45}$	$+ 5 \times K_{50} \times C_5T_{50}$	$+...2.5 \times K_{280} \times C_5T_{280}$
Area of C_6 =	$2.5 \times K_{40} \times C_6T_{40}$	$+ 5 \times K_{45} \times C_6T_{45}$	$+ 5 \times K_{50} \times C_6T_{50}$	$+...2.5 \times K_{280} \times C_6T_{280}$
etc...	etc...			
Area of C_n =	$5 \times K_{40} \times C_nT_{40}$	$+ 5 \times K_{45} \times C_nT_{45}$	$+ 5 \times K_{50} \times C_nT_{50}$	$+...2.5 \times K_{280} \times C_nT_{280}$
Total area =	$2.5 \times K_{40} \times 100$	$+ 5 \times K_{45} \times 100$	$+ 5 \times K_{50} \times 100$	$+...2.5 \times K_{280} \times 100$
Total area =	$250 (K_{40} + K_{280})$	$+ 500 \sum K_t$ (where t = 45 to 275)		

This equation describes the make up of the number and types of *denarii* in circulation in Roman Britain.

Which of the variables do we know ?

Values of K_t This is the variable we are interested in finding out, since it represents an index of the numbers of *denarii* in circulation in Britain at date 't'.

Values of C_nT_t These we can create from drawing a third tier illustration from hoard data. For *denarii* in Britain this was done in Section 2.4 (fig 24.05, Appendix 2.42).

Area of C_n This represents the availability of coin series 'n'. This we have taken to be proportional to the number of coins lost, with the potential of adding in a factor to represent preferential recovery. For the moment, let us imagine we can get find a value to fit into this variable. If that is the case, then the only unknowns left are the values of K_t. Hence we have a long series of simultaneous equations to solve. Once done, we have a picture of the variation of the Romano-British *denarius* supply.

Obtaining values for 'area of C_n'

Firstly, a corpus of site losses has to be built up which reflects the standard pattern of coin loss in Britain. The specific way each corpus has been created is explained as each denomination is analyzed. The final form of the data will be a percentage breakdown of that denomination into their respective coin series:

Let SF_n be the percentage of coin series 'n' in our site find corpus for that denomination.

Hence:

Percentage of coin series 1 in list	=	SF_1 %
Percentage of coin series 2 in list	=	SF_2 %
Percentage of coin series 3 in list	=	SF_3 %
Percentage of coin series 4 in list	=	SF_4 %
Percentage of coin series 5 in list	=	SF_5 %
etc...		
Percentage of coin series n in list	=	SF_n %
Total number of coins in list	=	100 %

If no 'preferential recovery' factor is to be included, then this set of figures can continue in the analysis unadjusted. However if preferential recovery is called for then a modifying variable is required. Let this be R_n, for coin series 'n'.

In the case of *denarii* , the higher the silver content, the more coins we would expect to be recovered, therefore fewer would be found as site finds. A good approximation to

this would be to say that the chances of a coin being totally lost is inversely proportional to a coins silver content.

Therefore to get from our values of SF_n (which represent what was lost after the better coins had been recovered), to a variable representing what was initially lost, we need to multiply our SF_n value by a variable representing the intrinsic value of each coin series.

This is done by multiplying all our values of SF_n by R_n, which we shall define as the silver content in grammes of a series 'n' *denarius* . Then the modified values of SF_n can be reconverted into percentages; now to be called MSF_n (modified site find - MSF). This can best be shown by a hypothetical worked example:

Let us say that in a series of 5 issues:

Percentage of Site Finds:		Silver content:	
SF_1 =	20%	R_1 =	2.00 g
SF_2 =	32%	R_2 =	1.85 g
SF_3 =	22%	R_3 =	1.80 g
SF_4 =	17%	R_4 =	1.70 g
SF_5 =	9%	R_5 =	1.65 g
Total	100 %		

If preferential recovery is proportional to a coins silver content, then Loss will be inversely proportional to this factor. Therefore, in order to get back to the original pattern of 'loss' we need to multiply SF_n by R_n and recalculate the group as percentages:

$SF_1 \times R_1$	=	20 x 2.00	=	40.00	Therefore: MSF_1 =	21.91 %
$SF_2 \times R_2$	=	32 x 1.85	=	59.20	Therefore: MSF_2 =	32.43 %
$SF_3 \times R_3$	=	22 x 1.80	=	39.60	Therefore: MSF_3 =	21.70 %
$SF_4 \times R_4$	=	17 x 1.70	=	28.90	Therefore: MSF_4 =	15.83 %
$SF_5 \times R_5$	=	9 x 1.65	=	14.85	Therefore: MSF_5 =	8.13 %
		(Total	=	182.5)	(Total	100.00%)

As can be seen, MSF_1 (21.91%) is slightly higher than SF_1 (20 %), this is because originally more Series 1 coins would have been lost; but because the coin had a higher silver content, losses of it were searched for more carefully and more recovered. The reverse picture is shown by MSF_5 and SF_5, having a lower silver content.

We now have two sets of variables: both are percentage breakdowns of the different coin series:

SF_n represents directly the site find lists, and ignores any 'preferential recovery factors'.

MSF_n represents a modified site find list, and accounts for preferential recovery on the basis that coins are searched for in proportion to their intrinsic value.

The main variables accounting for site losses were thought to be:

1. Loss is proportional to number of coins in circulation
2. Loss is proportional to the duration of coins in circulation
3. Loss may be affected by the preferential recovery of higher value coins

The belief or not in variable three determines whether the SF_n values are used in the further study, or the MSF_n values. From here on it will be assumed the unmodified values are being used; though MSF_n values should be used in place of SF_n values should variable three be believed.

Since loss is proportional to both the number of coins in circulation, and their duration in circulation, we can express this in the form of an equation:

SF_n = constant x {(the number of C_n coins in circulation) x (the duration of C_n coins in circulation)}

The product of these two variables represents the availability of the coinage measured in coin-years. This is the variable we are after to represent the areas on our second tier graph. So, using a new constant 'Z':

$Z \times SF_n$ = 'Area of C_n'

As yet we do not know the value of our constant 'Z'. Nonetheless we can insert these new values into our Equation 3 to form:

EQUATION 3a:

$Z \times SF_1 =$	$2.5 \times K_{40} \times C_1T_{40}$	$+ 5 \times K_{45} \times C_1T_{45}$	$+ 5 \times K_{50} \times C_1T_{50}$	$+...2.5 \times K_{280} \times C_1T_{280}$
$Z \times SF_2 =$	$2.5 \times K_{40} \times C_2T_{40}$	$+ 5 \times K_{45} \times C_2T_{45}$	$+ 5 \times K_{50} \times C_2T_{50}$	$+...2.5 \times K_{280} \times C_2T_{280}$
$Z \times SF_3 =$	$2.5 \times K_{40} \times C_3T_{40}$	$+ 5 \times K_{45} \times C_3T_{45}$	$+ 5 \times K_{50} \times C_3T_{50}$	$+...2.5 \times K_{280} \times C_3T_{280}$
$Z \times SF_4 =$	$2.5 \times K_{40} \times C_4T_{40}$	$+ 5 \times K_{45} \times C_4T_{45}$	$+ 5 \times K_{50} \times C_4T_{50}$	$+...2.5 \times K_{280} \times C_4T_{280}$
$Z \times SF_5 =$	$2.5 \times K_{40} \times C_5T_{40}$	$+ 5 \times K_{45} \times C_5T_{45}$	$+ 5 \times K_{50} \times C_5T_{50}$	$+...2.5 \times K_{280} \times C_5T_{280}$
$Z \times SF_6 =$	$2.5 \times K_{40} \times C_6T_{40}$	$+ 5 \times K_{45} \times C_6T_{45}$	$+ 5 \times K_{50} \times C_6T_{50}$	$+...2.5 \times K_{280} \times C_6T_{280}$
etc...	etc...			
$Z \times SF_n =$	$5 \times K_{40} \times C_nT_{40}$	$+ 5 \times K_{45} \times C_nT_{45}$	$+ 5 \times K_{50} \times C_nT_{50}$	$+...2.5 \times K_{280} \times C_nT_{280}$
Total area =	$2.5 \times K_{40} \times 100$	$+ 5 \times K_{45} \times 100$	$+ 5 \times K_{50} \times 100$	$+...2.5 \times K_{280} \times 100$

Total area = $250 (K_{40} + K_{280})$ $+ 500 \sum K_t$ (where t = 45 to 275)

This equation can be simplified, Let $Q_t = (5 \times K_t)/Z$

$SF_1 =$	$0.5 \times Q_{40} \times C_1T_{40}$	$+ Q_{45} \times C_1T_{45}$	$+ Q_{50} \times C_1T_{50}$	$+...Q_t \times C_1T_t$	$+...0.5 \times Q_{280} \times C_1T_{280}$
$SF_2 =$	$0.5 \times Q_{40} \times C_2T_{40}$	$+ Q_{45} \times C_2T_{45}$	$+ Q_{50} \times C_2T_{50}$	$+...Q_t \times C_2T_t$	$+...0.5 \times Q_{280} \times C_2T_{280}$
$SF_3 =$	$0.5 \times Q_{40} \times C_3T_{40}$	$+ Q_{45} \times C_3T_{45}$	$+ Q_{50} \times C_3T_{50}$	$+...Q_t \times C_3T_t$	$+...0.5 \times Q_{280} \times C_3T_{280}$
$SF_4 =$	$0.5 \times Q_{40} \times C_4T_{40}$	$+ Q_{45} \times C_4T_{45}$	$+ Q_{50} \times C_4T_{50}$	$+...Q_t \times C_4T_t$	$+...0.5 \times Q_{280} \times C_4T_{280}$
$SF_5 =$	$0.5 \times Q_{40} \times C_5T_{40}$	$+ Q_{45} \times C_5T_{45}$	$+ Q_{50} \times C_5T_{50}$	$+...Q_t \times C_5T_t$	$+...0.5 \times Q_{280} \times C_5T_{280}$
$SF_6 =$	$0.5 \times Q_{40} \times C_6T_{40}$	$+ Q_{45} \times C_6T_{45}$	$+ Q_{50} \times C_6T_{50}$	$+...Q_t \times C_6T_t$	$+...0.5 \times Q_{280} \times C_6T_{280}$
etc...	etc...				
$SF_n =$	$0.5 \times Q_{40} \times C_nT_{40}$	$+ Q_{45} \times C_nT_{45}$	$+ Q_{50} \times C_nT_{50}$	$+...Q_t \times C_nT_t$	$+...0.5 \times Q_{280} \times C_nT_{280}$
Total =	$0.5 \times K_{40} \times 100$	$+ Q_{45} \times 100$	$+ Q_{50} \times 100$	$+...Q_t \times 100$	$+...0.5 \times Q_{280} \times 100$

Total area = $50 (Q_{40} + Q_{280})$ $+ 100 \sum Q_t$ (where t = 45 to 275)

We know all our SF_n values, and our C_nT_t values, so we are left with a large number of simultaneous equations to solve. After which we have a full series of results for Q_t.

At the beginning we defined K_t as our money supply index. This index was anchored by saying that at AD50 it was unity (i.e. $K_{50} = 1$). After solving the above equations, we will have a value for Q_{50}. Since we defined Q_t as being $(5 \times K_t)/Z$, we can calculate Z:

$$Z = (5 \times K_{50})/Q_{50}$$

Once Z has been found we can calculate all our values of K_t, the *denarius* supply curve, and will hence have achieved one of our primary tasks.

This is the theory. In practise, of course, one can do no such thing. The problem is the penultimate stage, solving the simultaneous equations. In order to do this you need more equations than unknowns. The number of equations is defined by the number of *denarius* groups, which is 17. However if our curve, K_t, is broken down into five year divisions from AD 40-280 this gives 49 unknowns. This means that an exact curve cannot be generated this way. However an approximation can still be arrived at.

The basic principle involved in coming to a solution is that the ratio of the Areas of C_n should be equal to the ratio of values of SF_n, as stated in the equation $Z \times SF_n$ = 'Area of C_n'. The ratios of SF_n are fixed, determined by the number of *denarius* site finds. The ratios of 'Areas of C_n' however will vary depending upon the shape of the *denarius* supply curve K_t, which it is our aim to find out. In theory the shape of curve K_t is correct when the ratios of both variables are identical.

A procedure can therefore be developed whereby a series of curves are given to represent K_t. The closest fitting curve is then calculated by comparing the similarity between the SF_n values and the 'Area of C_n' values using the chi-squared test. The curve with the lowest value will be the one with the best fit.

This curve can then be taken and slightly randomly modified to produce five new offspring. In their turn each of these can be tested to see if any of them are a closer fit than the original curve. The best can be taken and again be randomly modified to produce five more slightly different curves. With each new generation the value of the chi-squared statistic will come down; and the lower the chi-squared statistic the better approximation we have to the real *denarius* supply curve (as defined by the model).

Effectively this is a mathematical equivalent of natural selection. Here the fitness to survive being determined by the value of chi-squared. Those with the lowest values proceed to form the next generation of curves.

In the following section (3.5) this model is run and tested.

3.5 Testing the model

3.51 *Denarius* site finds
3.52 Preferential recovery adjustment
3.53 Calculating the money-supply curve
3.54 Interpreting the results: Preliminary remarks
3.55 Interpreting the results: Hoard size
3.56 Interpreting the results: Imitating *denarii*
3.57 Interpreting the results: Sudden rises in the supply curve
3.58 Testing the model: the Antonine Wall
3.59 Conclusions

In order to use the model for the analysis of denarii in Britain we need the following information. First a representative sample of denarii deposited on British sites needs to be established (3.51). Secondly metrological and metallurgical details are required to establish a preferential recovery factor (3.52). Thirdly a routine for generating the model has to be established (3.53). And finally the results have to be compared with extant knowledge and tested to see if they bear any relation to reality (3.54 onwards).

3.51 *Denarius* site finds

The model developed in section 3.4 combines three sets of data to provide an idea of the changing volume of coinage in circulation. First the changing composition of the circulation pool, which can arguably be obtained by establishing the normal population of coin hoards over time (cf. Appendix 2.42). Secondly the changing intrinsic value of the coins themselves (should the choice to account for differential retrieval factors be exercised). For *denarii* , their silver content could be taken as an approximate guide (cf. Appendix 4.31). The third set of data required is a quantification of site finds.

The number of *denarii* deposited on the different site categories are provided in Appendix 3.51. Here genuine and fake *denarii* have been separated, with the number of copies being indicated in parenthesis... The proportion of genuine *denarii* found on different types of sites has also been graphically displayed in fig. 35.01.

The aim is to create a 'representative sample of the number of *denarii* lost on sites in Britain'. This is not as simple as it first seems. If any one type of site (eg. Roman towns) has a particular preponderance of, say, early silver, then problems of balance arise. How many of these kind of site are there in Britain compared with those of other types ? If Roman towns are over represented in our database then biases would creep into our overall picture. In an ideal world it would be nice to put together a series of coin lists from different types of sites in proportion to the number of such types of site in Britain. But in reality we are a long way off being able to say that in Britain there ten villas and twenty 'rural sites' for every Roman town. Regional variation would make a nonsense of such an attempt in any case. A second problem is that different coin lists have been accumulated in a wide variety of fashions. Few represent all the coins found on a site: excavations have usually only been on sample areas of sites and

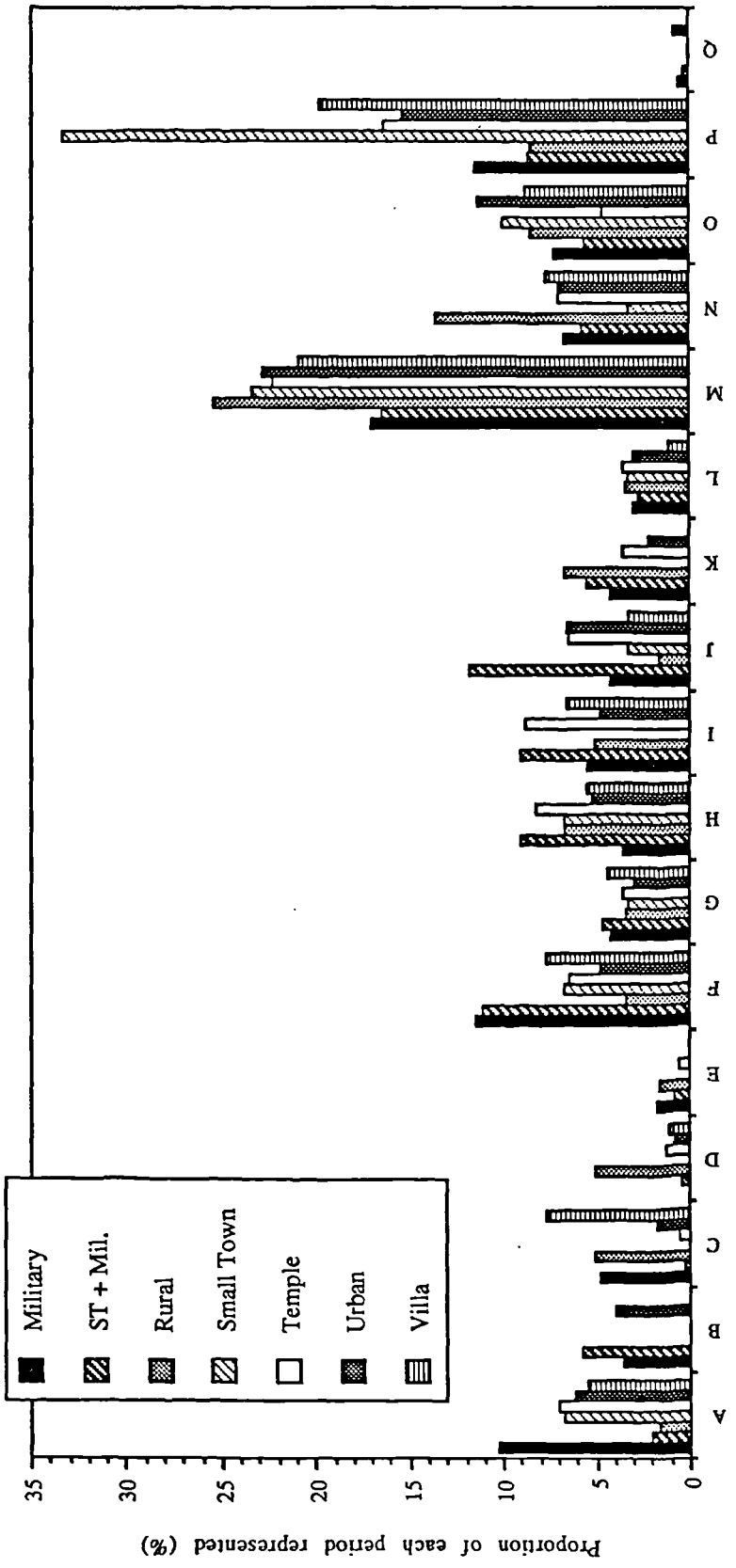


Fig. 35.01:
The proportion of *denarii* from different types of site in each period represented (%)

only recently has the use of metal detectors meant that anything approaching 'total recovery' has been reached.

In default of an ideal world not having come to pass, and since there is a broad similarity in the different proportions of *denarii* found on different types of sites in Britain (fig. 35.01), the decision has been made to take the simple option of lumping together all of the data together. for the time being. Though as the site corpus gradually increases in size different procedures may eventually become appropriate.

Table 3.51: *Denarii* from different types of site

		Forts	Small towns with forts	Rural	Small Towns	Temples	Public towns	Villas	Total Coins
A	Republican	17	17	1	2	12	14	5	68
B	Mark Antony	6	48	0	0	0	9	0	63
C	Julio-Claudian 1	8	2	3	0	1	4	7	25
D	Julio-Claudian 2	0	3	3	0	2	2	1	11
E	Civil War	3	7	1	0	1	0	0	12
F	Flavian 1	19	91	2	2	11	11	7	143
G	Flavian 2	7	38	2	1	6	7	4	65
H	Trajanic	6	75	4	2	14	12	5	118
I	Hadrianic	9	74	3	0	15	11	6	118
J	Antonine 1	7	97	1	1	11	15	3	135
K	Antonine 2	7	45	4	0	6	5	0	67
L	Antonine 3	5	23	2	1	6	7	1	45
M	Severan 1a	28	136	15	7	38	52	19	295
N	Severan 1b	11	48	8	1	12	16	7	103
O	Severan 2a	12	46	5	3	8	26	8	108
P	Severan 2b	19	71	5	10	28	35	18	186
Q	Severan 2c	1	2	0	0	0	2	0	5
	Total	165	823	59	30	171	228	91	1567

An amalgamation of all such *denarii* can be used as the input data for the model. Imitation *denarii* have been excluded for two reasons: first their fake status may have lead to them being deliberately discarded, which would cause biases in our data; secondly it will be interesting to see if the period(s) of copying coincide with shortages of genuine *denarii*; shortages which can only be detected by establishing the supply of genuine *denarii* alone in the first instance. However, it must be admitted that in some coin reports it is quite possible that some fake *denarii* have not been recognized. This point is returned to later in the section.

3.52 Preferential recovery adjustment

Two *denarius* supply curves are to be generated: one with and one without a factor to account for the possibility of the preferential recovery of higher value coin. The way this can be done has already been outlined in section 3.47. The proportion of site finds is adjusted by use of a variable based upon the intrinsic value of each coin. In the case of the *denarius* the most objective source for this is the weight of silver in each coin as established by Walker (1976, 1977, & 1978). The calculations are shown in Table 3.52. The original data are shown in column 2, and the adjusted values in column 5. If

preferential recovery was a factor in coin deposition, then we would expect more of the earlier *denarii* to have been recovered than the later ones due to the decline in the intrinsic value of the coin as the debasement took place. Hence the adjusted values for *denarius* deposition show enhanced values for early *denarii* whilst depressing the proportion of later coin represented.

Table 3.52: Correcting for preferential recovery
1. The number of *denarii* found as site finds (raw data).
2. The number of *denarii* found as site finds (%), this is SFn.
3. The weight of silver in each individual *denarius* (gms), this is Rn, see Appendix 4.51.
4. Column 1 x Column 3; using the weight of silver to act as a variable accounting for preferential recovery.
5. The adjusted proportion of *denarii* which may have been originally lost on sites (%), this is MSFn.
6. The difference between MSFn and SFn. Note the earlier higher silver *denarii* are now better represented, and the lower silver third century *denarii* are less well represented.

Group	Period	1.	2.	3.	4.	5.	6.
GROUP A	Republican	68	**4.3%**	3.52	239.36	**6.5%**	2.1
GROUP B	Mark Antony	63	**4.0%**	3.15	198.45	**5.4%**	1.4
GROUP C	Julio Claudian 1	25	**1.6%**	3.56	89.00	**2.4%**	0.8
GROUP D	Julio Claudian 2	11	**0.7%**	3.21	35.31	**1.0%**	0.3
GROUP E	Civil War	12	**0.8%**	3.00	36.00	**1.0%**	0.2
GROUP F	Flavian 1	143	**9.1%**	2.89	413.27	**11.2%**	2.1
GROUP G	Flavian 2	65	**4.1%**	3.02	196.30	**5.3%**	1.2
GROUP H	Trajanic	118	**7.5%**	2.91	343.38	**9.3%**	1.8
GROUP I	Hadrianic	118	**7.5%**	2.85	336.30	**9.1%**	1.6
GROUP J	Antonine 1	135	**8.6%**	2.74	369.90	**10.0%**	1.4
GROUP K	Antonine 2	67	**4.3%**	2.58	172.86	**4.7%**	0.4
GROUP L	Antonine 3	45	**2.9%**	2.29	103.05	**2.8%**	-0.1
GROUP M	Severan 1a	295	**18.8%**	1.90	560.50	**15.2%**	-3.6
GROUP N	Severan 1b	103	**6.6%**	1.67	172.01	**4.7%**	-1.9
GROUP O	Severan 2a	108	**6.9%**	1.51	163.08	**4.4%**	-2.5
GROUP P	Severan 2b	186	**11.9%**	1.37	254.82	**6.9%**	-5.0
GROUP Q	Severan 2c	5	**0.3%**	1.52	7.60	**0.2%**	-0.1
Total		1567	**100.0%**		3691.19	**100.0%**	0.0

3.53 Calculating the money-supply curve

Section 3.53 has provided us with values for SF_n and MSF_n. In this section the *denarius*- supply curves are calculated in accordance with the procedure outlined in section 3.46. For there to be a 99.5 % level of significance in terms of the similarity between the ratios of the 'areas on the graphs' and the 'ratios of the SF_n and MSF_n values', the chi-squared statistic must be less than 4.60. In fact the generation of the curves has been allowed to continue until the values came below 1.0, however, with each further generation reductions in the chi-squared value were getting increasingly small and so the process was halted. In the case of Method 1 (no recovery factor) this was at a value of 0.996, whilst in the case of Method 2 (with recovery factor) this was 0.944. The calculation is shown in Table 3.53. The curves are shown in figs. 35.02 and 35.03. The data for the shape of each curve are given in Appendix 3.52.

Table 3.53: The closeness of fit of each curve (note: values only shown to two or three decimal places)

	Method 1 (no recovery factor)				Method 2 (with recovery factor)			
	% Area	% Site finds	Σ(f-fe)^2 fe	A-SFn	% Area	% Site finds	Σ(f-fe)^2/fe	A-MSFn
A+B	8.05	8.35	0.011	-0.31	11.76	11.86	0.001	-0.10
C	1.54	1.59	0.001	-0.05	2.33	2.41	0.002	-0.08
D	1.01	0.70	0.094	0.31	1.05	0.95	0.009	0.20
E	0.57	0.76	0.067	-0.20	0.73	0.97	0.082	-0.24
F	9.64	9.12	0.028	0.52	11.68	11.19	0.020	0.49
G	4.14	4.14	0.000	0.00	4.85	5.31	0.043	-0.46
H	7.30	7.53	0.006	-0.22	9.44	9.30	0.002	0.14
I	7.85	7.53	0.013	0.32	9.79	9.11	0.048	0.68
J	8.89	8.61	0.008	0.28	10.50	10.02	0.021	0.48
K	3.22	4.27	0.338	-1.05	3.53	4.68	0.376	-1.15
L	3.38	2.87	0.076	0.51	3.11	2.79	0.033	0.32
M	18.20	18.82	0.021	-0.62	14.11	15.18	0.080	-1.07
N	6.50	6.57	0.000	-0.07	5.15	4.66	0.048	0.49
O	8.26	6.89	0.228	1.38	5.25	4.41	0.132	0.84
P	10.97	11.86	0.073	-0.90	6.41	6.90	0.037	-0.49
Q	0.42	0.31	0.025	0.10	0.24	0.20	0.006	0.04
	100.00	100.00	**0.996**		100.00	100.00	**0.944**	
The data for the relative shape of each curve is given in Appendix 3.52. For the curves see figs. 35.02 & 03								

Degrees of freedom =	15	Chi squared statistic:			
Chi squared for METHOD 1 =	0.996	Quantile:	99.5%	95%	5%	0.5%
Chi squared for METHOD 2 =	0.944	Value:	24.99	32.80	7.26	4.60

The first thing to note is the high degree of similarity between the two curves. The main points of dissimilarity are in the relative size of the peaks in the 50s and 230s. This is largely to be expected. The major differences between SF_n and MSF_n (see Table 3.52) were in the proportion of Republican, Flavian and Severan *denarii* on sites. The curve including the recovery factor enhances the earlier values at the expense of the Severan peak.

The first thing to emphasise is that only the broad trends from the graph should be examined (i.e. those appearing in both graphs). These are:

1. The early peak in supply in the 40-50s.
2. The shortage of *denarii* up until the late first century, where upon they increase again.
3. A cessation in the growth in the 120s
4. A sharp increase in the numbers in circulation in the 170s.
5. A dramatic rise in the number in circulation in the 220-30s.
6. An equally dramatic decline in the numbers in circulation in the 240s, with no significant numbers continuing in circulation beyond the 250s.

Now this graph should be tested against other data at our disposal to see if it is consonant or not.

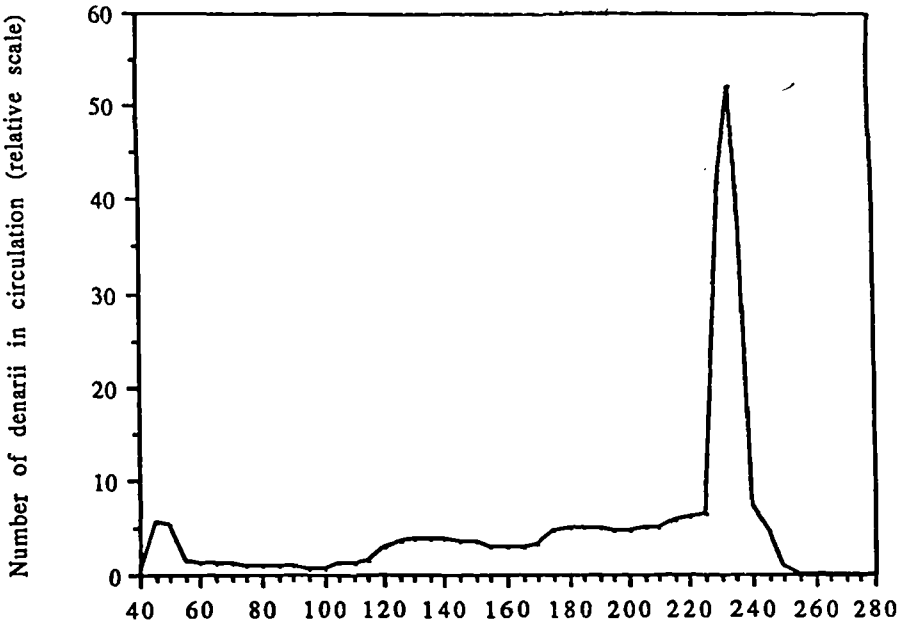


Fig. 35.02: *Denarius* supply curve: method 1 (no preferential recovery)

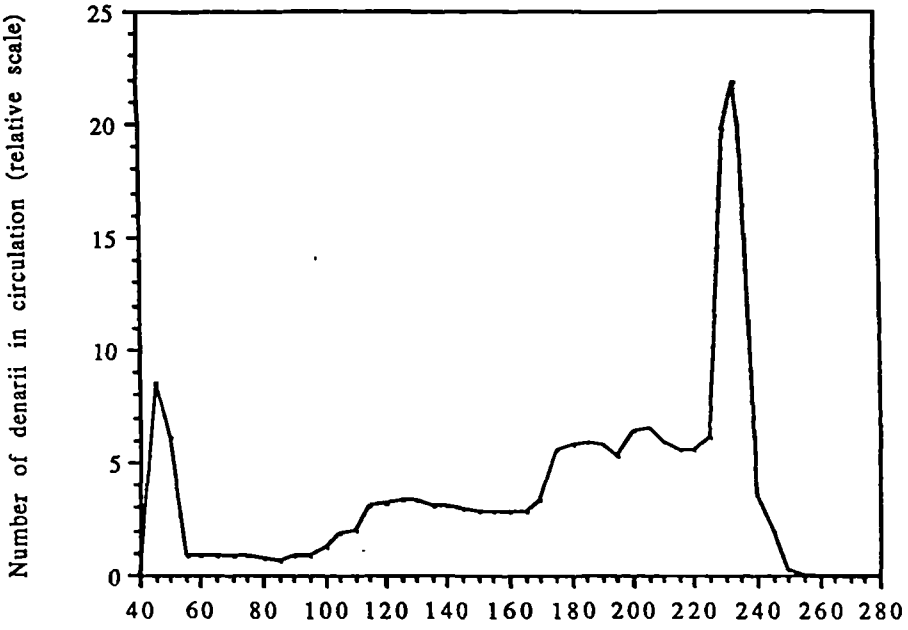


Fig. 35.03: *Denarius* supply curve: method 2 (preferential recovery)

3.54 Testing the model: Preliminary remarks

I expected a gradual increase in the number of *denarii* in circulation in Britain; reasonably gradual up until the Severan period when I expected it to rise rapidly, then decline as the *antoninianus* took over. The rationale behind this feeling was that as the *denarius* became baser, presumably there were more of them in circulation. This pattern is found, but with two important differences. First the Claudian peak, and secondly the step-wise growth in the volume of *denarii* in circulation - if the model is true that is. The task here is to test these curves against independent evidence to see if these trends can be borne out in reality.

The Claudian peak could be explained as a function of the huge degree of military activity in Britain in the early period, however, if that were the only explanation then one would have expected it to have been sustained for a little bit longer. Nor can the large number of allegedly Boudican hoards (contested in section 4.1) be used to explain away the peak. First the peak is too early, ending around the time of the Boudican revolt, and secondly the curve does not represent the number of hoards or even the size of them. It represents the total number of coins thought to be in circulation. A sudden peak in the number of hoards recovered in modern times will have no effect upon the shape of this curve. However, the end of the peak might possibly reflect the calling in of loans to the native elite:

> "Claudius had given sums of money to the leading Britons, and according to Catus Decianus, the procurator of the island, this money had to be returned together with the rest. The confiscation of this money was the pretext for the war. In addition, Seneca, with a view to a good rate of interest, had lent the reluctant islanders 40,000,000 HS and had then called it all in at once, and not very gently. So rebellion broke out."
>
> (Dio 62, 2, 1)

If the loans took the form of cash, then this would certainly fit the date. Another reason for an early peak would be the replacement of the native Iron Age coins with Roman *denarii*. Though we do not know this took place, the Roman state must have had some interest in the metal reserve tied up in these Iron Age coins.

However, none of this is really a test of the data, it is more in the nature of an *interpretation* trying to explain away the pattern. First I want to examine some other phenomenon which are reasonably independent of historical interpretation, before moving back to put the graph into its historical context.

3.55 Testing the model: Hoard size

The radical changes in the number of *denarii* in circulation over the first and second century must have affected how much coin was available for people to hoard. If there were 100 people in a group with money-boxes, and the amount of money in circulation suddenly halved, either half the people hoarding money would have to stop it, or else the median size of coin hoards would have to come down by half. This seems to be a reasonable working hypothesis. Hoard size was examined back in section 2.6, and the median hoard sizes were calculated in 20 year blocks (see fig. 26.04).

The pattern reflected there was of a high median figure to start with in the 40-50s, followed by a cut to about quarter of the value in the 60-70s. The position is partly re-established in the early second century. A further substantial rise can be found between the 160-170s and 180-190s. These coincide with the *denarius* supply curves. This evidence provides support for the early decline in the number of *denarii* in circulation, its gradual rise again, and possibly of a step up in numbers around 180. It should be stressed that the model is based upon the structure of hoards, site finds and the silver content of *denarii* . At no point does information pertaining to the size or number of coin hoards enter into the creation of the curve, therefore this is totally independent corroboration.

3.56 Testing the model: Imitating denarii

It is a numismatic truism that copying takes place when coinage is going into short supply and the type of coin copied is the last issue present in any quantity. Such was the case with the barbarous radiates of the late third century and the *Fel Temp* copies of the fourth century. When copying did not take place it was conspicuous by its absence, for example at the end of Roman Britain when new supplies of coin from the empire finally ended. Is there any evidence that *denarii* were copied at the two dates when our graph suggests it was rapidly disappearing from circulation? The second period is the easiest to deal with. Large numbers of Severan copies, more often than not plated, are found. It will be shown later (Chapter 4.7 - The *denarius* to *antoninianus* transition) that the types copied match precisely those in circulation in the late 230s. Archaeological evidence is also cited which shows that this period of copying continued for a bit longer after that. However, the details will not be pre-empted here. Suffice it to say that there is substantial evidence for the copying of *denarii* in the late 230-240s.

The plated *denarii* of the early third century make up the vast majority of irregular *denarii* in Britain. Very few earlier finds have been made. Two of the three Claudian *denarii* in the site find database (Appendix 3.51) are copies, and a Tiberian copy is

known from Swanton Morley in Norfolk (Kenyon, MS 1). Another Tiberian copy is known from the Llanfaethlu hoard, Anglesey (C151n). It is unlikely that these were copied during the early third century, since virtually no *denarii* of this date were still in circulation then. However, the most curious find is one dating to the late Claudian period in London, the hoard from St. Swithin's Lane. This was a find of several hundred plated *denarii* from Mark Antony to Claudius. It has always been difficult to explain:

> "Haverfield suggested that in these coins we should recognize the ancient equivalent of the modern paper currencies, designed for the convenience of the invading legions of Claudius. But this theory has many objections, not least being the doubt whether, at this stage of imperial history, an emperor would dare pay his troops in base currency."
>
> (Sutherland 1937, 9)

However, if we view the forgeries in the context of a late Claudian decline in the number of *denarii* in circulation it makes more sense. Since no coins of Nero are represented we can give it a T.P.Q. of 41-54, our analysis of the structure of the hoard (Appendix 2.53) suggested it would be later rather than earlier, suggesting 54 onwards on the basis of comparison with our bench-mark, though for this date the bench-mark relies upon few examples. The decline takes place on both graphs some where between 50 and 55. It is quite possible that the hoard dates to the period of *denarius* withdrawal or very shortly thereafter.

If there was much copying at this date, and St. Swithin's Lane is not an isolated example, then the absence of Neronian copies (Sutherland 1937, 10) suggests it was very short lived, i.e. it didn't continue into his reign; or conversely that there were not enough of his *denarii* around at that stage to copy.

From the St Swithin's hoard and the site find copies we have evidence which is not inconsistent with the idea of a rapidly declining number of *denarii* in Britain in the late years of Claudius' reign (or the very early years of Nero).

3.57 Interpreting the results: Sudden rises in the supply curve

At several points the curves suddenly rise up. Apart from the initial invasion, these are at the following dates: c. AD 120, 175 and 230. Did anything in particular happen during these dates in Britain?

AD 120 is very close to the visit of the Emperor Hadrian to the country in 121 or 122 and the arrival of the Legio VI from Germany (probably c. 122 from Lower Germany, though it is difficult to prove it arrived in York earlier than 130). Whist there was much military activity with the construction of Hadrian's Wall, I think that almost any date

from the Claudian conquest to the late second century could identify military activity as a reason for extra money coming into the country. However, the presence of the Emperor himself is a much more convincing explanation. Many activities have been related to Hadrian's visit: the draining of the Fens, the construction of the *Tholos* at Bath (Cunliffe 1986) and many other developments in towns throughout the province (cf. Salway 1984, 185-5). Whether these constructions were due to direct Imperial patronage or local collective effort - they coincide with the first significant rise in the number of *denarii* around since the initial Claudian peak (which incidentally followed an earlier imperial visit).

AD 175 again saw a significant rise in the number of coins present. However, there were no imperial visits then. There were various phases of garrison rebuilding in the north during Marcus Aurelius' reign, the Wroxeter forum was burnt down and 5,500 cavalry from the Iazyges came to Britain (Dio, 71, 16, 2); but apart from that no obvious causes for such a rise can be detected.

Clodius Albinus was the next Emperor to be found in Britain, however, since he was proclaimed here as opposed to visiting the country it is most unlikely that he would have brought any additional resources with him. No increase is found in the record upon his accession (192-196 in Britain, defeated in Gaul 197).

The next imperial visit came in 208 with Septimius Severus, who unfortunately died here in 211. No obvious sign of his presence is recorded in the quantity of *denarii* suggested in the province by this model. This is despite his increase in army pay from Domitian's 300 *denarii* to 400. Caracalla raised it again shortly thereafter to 600, but again this does not appear to be reflected in the curve - but then one wonders how much of the pay the army ever actually saw in the form of hard cash. Much appears to have been stopped for food, equipment, burial clubs and savings schemes (cf. section 4.52). The model also fails to register the 'great treasure' Herodian tells us Septimius Severus brought to Britain.

AD 230 is the next date where a large increase took place. Nothing obviously took place at this date.

3.58 Testing the models: The Antonine Wall

> "Will we ever understand the strategy of the curious backwards and forwards movements between Hadrian's Wall and the Antonine Wall in the years AD 122-164 ?"
>
> (Whittaker, 1989, 64)

In an ideal world the Antonine wall would provide us with an excellent possibility of testing our curve. If the Wall was occupied from date X to date Y then we could predict

the number of *denarii* we might expect to find there. However, the dates of the Antonine Wall are a rather contentious matter. Breeze (1989) tried to summarize the state of present knowledge, but even so the picture is remarkably confused.

The move forward from Hadrian's Wall under the governor Lollius Urbicus came in either 139 or 140-144 (depending upon the consular dates on the damaged part of an inscribed milestone from Ingliston - Breeze 1989, 46). In 142/3 coins announced a victory in Britain, and the *Scriptores Historia Augustae* tells us that having driven off the barbarians another wall of turf was built. Thereafter it was abandoned for a short while before being reoccupied again. The break came in the mid-150s (Macdonald), 158-184 (Hadrian's Wall chronology), or the mid 160s (Hartley) depending upon which author you accept. Hartley's date based upon a reassessment of the samian ware on both the Antonine Wall and Hadrian's Wall has the greatest currency at the moment. The final abandonment of the Wall is an equally movable feast. Coins (*aes* as well as *denarii*) of Marcus Aurelius and Commodus are very rare from the wall. In fact only one of Commodus is known (Robertson 1971, 133), making it most unlikely that the second occupation lasted much beyond the start of Commodus' reign in 177 or when he became Caesar in 175.

What we can do with the *denarii* from the Antonine wall is try to fit a curve to them as we did with our site find list for the country as a whole. If it gives us two peaks, one in the 140s and a second later one ending in the 170s this might provide some additional validation for the model - if not for the overall *denarius* supply curve itself.

Instead of making up curves with five year time slices, one year time slices can be produced by interpolation. However, this is not to suggest an increased level of accuracy which has not altered in any way. The original *denarii* in the database are still only dated to an Emperor's reign - so we should not expect too great a resolution from this analysis. The results of three curves are given (along with their chi-squared statistic) in fig. 35.04. These represent various generations *en route* to the final curve which is shown alone in fig. 35.05. The results show an initial peak in the late 120s and early 130s, followed by a lower level secondary occupation in the late 160s to early 170s. The fact that the model has been able to suggest that the coins from the wall come from two distinct phases is encouraging. The first phase, however, has been dated approximately a decade too early. The date for the secondary occupation of the wall is quite plausible. Indeed its termination around 177 fits in well with the paucity of finds of Commodus and Crispina from sites.

Broadly the model has managed to demonstrate that the Antonine Wall did have two phases of occupation/coin deposition - simply from analysing its *denarius* site find list.

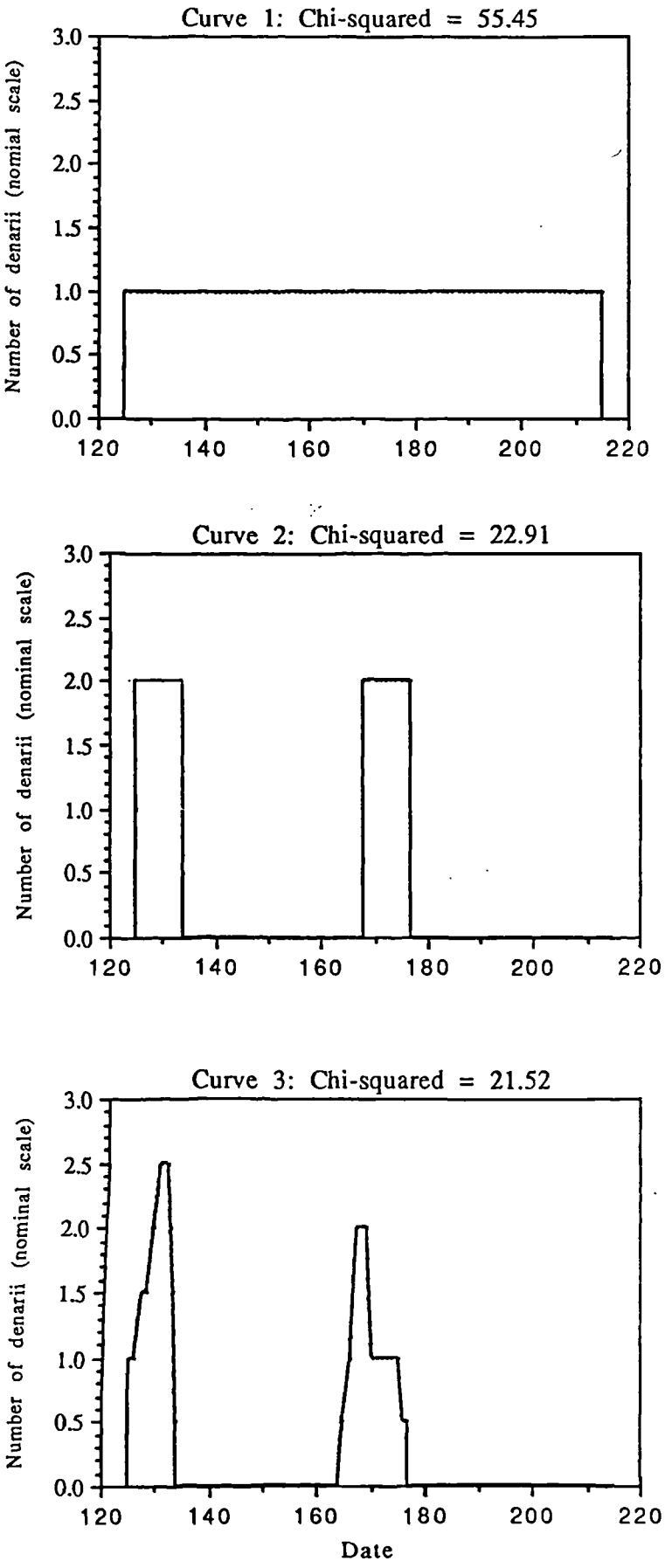


Fig. 35.04: Antonine Wall: *denarius* supply curve (3 generations)

Its dating of the phases of occupation is crude (but then so is the dating of the *denarii* to merely Emperor's reigns), but suggests that the technique does have some kind of validity.

Table 3.54: Antonine Wall *denarii* and the model predictions.

Group	Period	SITE FINDS Number	SITE FINDS Percent	CURVE 1	CURVE 2	CURVE 3
GROUP A	Republican	0				
GROUP B	Mark Antony	7				
GROUP C	Julio Claudian 1	0				
GROUP D	Julio Claudian 2	1 = 8	12.9%	3.6	8.8	9.1
GROUP E	Civil War	3	4.8%	1.2	1.7	1.8
GROUP F	Flavian 1	5	8.1%	16.6	18.7	19.2
GROUP G	Flavian 2	7	11.3%	7.0	8.8	8.9
GROUP H	Trajanic	20	32.3%	18.7	22.5	23.2
GROUP I	Hadrianic	9	14.5%	21.8	23.9	24.2
GROUP J	Antonine 1	8	12.9%	15.9	11.6	10.4
GROUP K	Antonine 2	2	3.2%	4.4	4.0	3.0
GROUP L	Antonine 3	0	0.0%	2.7	0.0	0.0
No later coins present.		-	-	-	-	-
Total		62	100.0	100.0	100.0	100.0
Degrees of freedom = 8						
Chi squared value:		-	-	55.45	22.91	21.52
Note: no 'recovery factor' has been used in these calculations.						

Detail of Curve 1:
Uniform coverage from AD 125-215

Detail of Curve 2:
Uniform coverage from AD 125-134 with a break followed by AD 168-177

Details of Curve 3:
As with curve 2, there were two phases:
The shape of the curve is as follows:

AD125	1.0	AD165	0.5
AD126	1.0	AD166	1.0
AD127	1.5	AD167	2.0
AD128	1.5	AD168	2.0
AD129	2.0	AD169	2.0
AD130	2.5	AD170	1.0
AD131	2.5	AD171	1.0
AD132	2.0	AD172	1.0
AD133	1.5	AD173	1.0
AD134	0.5	AD174	1.0
		AD175	1.0
		AD176	0.5
		AD177	0.5

3.59 Conclusion

Whilst the shape of the *denarius* supply curve was not expected, on reflection it does stand up to some measure of scrutiny. The size of coin hoards provides some independent corroboration as to the general shape. The analysis of the coins from the Antonine Wall provides some validity to the method; and independent historical information has been able to suggest causes for some (though by no means all) of the changes in the shape of the curve.

Section 4: Thematic Studies and Synthesis

4.1 Iron Age to Roman transition

After an introduction to Iron Age coinage, the specific case of the Iceni is examined. On the basis of this further regional trends are sought determining how much LPRIA monetary history influenced the uptake of Roman coinage. Following this the early stages of the Roman system are examined, concentrating particularly upon the production of Claudian copies. It is concluded that many of the trends seen in LPRIA Britain persist under the guise of the new Roman system.

4.2 The circulation of bronze and silver

The relationship between the bronze and silver circulation systems is discussed. First Walker's Bath coin report is examined to evaluate his estimates of the number of bronze coins in circulation in Britain (4.21). Secondly an attempt is made to derive *aes* supply figures as done previously for *denarii*.. This is achieved with *sestertii*. (4.22). A second method for reconstructing Bronze supply figures is then described based on wastage rates. The results are not dissimilar to those from the previous model (4.23). The results are then assessed in the light of the *denarius* data and other information about the circulation of both silver and bronze coin (4.24-25).

4.3. The debasement of the *denarius*

Prevailing views of the concept of debasement are discussed (4.31). A study then relates the amount of silver circulating in the currency pool to the issuing standard at the mint (4.32-33). Variability in the quality of newly issued *denarii* is discussed in relation to bullion supplies and quality control (4.34), finally a primary link between the rate of wear of the *denarius* in circulation and its debasement is made (4.35).

4.4 The *denarius* to *antoninianus* transition

In c. 215 the '*antoninianus*' was introduced. By 244 the *denarius* had ceased to be issued as a regular part of the currency. This section examines some of the associated events. First the evidence of *denarius* imitations is assessed (4.41), then the pattern of hoards and site finds is examined to see what light they throw upon the subject (4.42).

4.5 The quantity theory of money and cyclical trends in the economy

The quantity theory of money is introduced, relating the variables of money supply, velocity of circulation, prices and the quantity of goods and services being transacted within the monetary economy (Y) (4.51). Three of these variables are then established (4.52-54) leaving only Y unknown, this is then established (4.55). The variations in Y are then related to archaeological evidence (4.56) and to broader changes in the economy of the Empire (4.57-8).

4.1 Iron Age to Roman transition

4.11 Introduction
4.12 Icenian hoard evidence
4.13 Coinage in the other civitates
4.14 Early Roman Silver
4.15 Early Roman Bronze: Claudian copies
4.16 Conclusions

This section examines the transition from the Iron Age to Roman monetary system. After an introduction to Iron Age coinage, the specific case of the Iceni is examined. On the basis of this further regional trends are sought determining how much LPRIA monetary history influenced the uptake of Roman coinage. Following this the early stages of the Roman system are examined, concentrating particularly upon the production of Claudian copies. It is concluded that many of the trends seen in LPRIA Britain persist under the guise of the new Roman system.

4.11 Introduction

The arrival of Roman coin in 43 was not Britain's first experience of coinage. Indigenous systems had developed to different degrees over the previous century or more. Development speeded up in the post-Caesarean period when not only was inscribed coin minted, but some areas also started producing bronze coinage. Before examining the transition from the native to Roman currency system itself two questions must be addressed. First, as far as we can tell, how was Iron Age coinage used? Secondly, what stage had it reached in the different areas upon the conquest?

> "...the primary role of coinage was probably in the vertical relationships between issuers and their subordinates in its territory of origin, its use in horizontal relationships between individuals and groups was essentially a characteristic acquired through circulation, rather than the reason for its issue."
>
> (Haselgrove 1987, 212)

Haselgrove distinguishes between the reason for issuing coin and its subsequent function. Such a differentiation is also common to analyses of Roman coinage: Crawford linked the issue of Republican *denarii* explicitly to the demands of the military (Crawford 1974), what happened thereafter to the coin was not the concern of the state. Extremely old worn Republican issues were to circulate quite happily amongst later issues for over a century or more (though see section 4.3). Where differences in the interpretation of Iron Age and Roman systems most obviously occur is that with Iron Age coinage it is commonly accepted that different types of coin had different roles within society; whereas Roman coinage is rarely perceived as anything other than a fully integrated denominational system. For Iron Age coins functional specificity is emphasised. Gold, silver, potin and bronze all had at various times different depositional patterns. One good expression of this type of interpretation is

Haselgrove's description of the coinage of South East Britain in the late pre-conquest period:

> "In being restricted to the core territories of (by then) comparatively centralised polities..., the South-Eastern silver and bronze and Southern silver have very much the character of Dalton's (1977) *early cash*, contrasting with the continued export of gold to the outlying areas throughout Period III. ... If these gold distributions are indicative of political dependence ... it may well be that the same is true of the earlier potin distributions, i.e. that potin was initially a form of *primitive valuable*..., and was accumulated and transacted in non-commercial ways, such as alliance formation or tribute payments between different areas linked in some form of wider grouping, and the discharge of social obligations within them."
> (Haselgrove 1987, 159-60; my italics)

Here the role of gold and early potin is distinguished from silver and bronze. The picture given is decidedly dynamic and the use of coin could change rapidly. In the late pre-conquest period bronze coin was slightly more common on nucleated settlements. However, after the conquest the same coin starts appearing on sites where it had failed to register before, namely production sites such as the saltings and kiln sites along the north Kent coast; sites where previously only gold and potin were found (Haselgrove 1987, 157). The role of potin itself appears to have changed, from an early similarity to the use of gold, to a distribution more akin to that of bronze in the later period occasionally liked to the concept of incipient market development (cf. Allen 1971, Kent 1978). Interpretations can (and do) vary.

It is not the aim here to list the different functions of each type of coin at each date. That would not be possible. The important thing to emphasise is that with Late Pre-Roman Iron Age (hereafter LPRIA) coinage the idea that different types of coin fulfilled different social needs is the established viewpoint, though the details may differ.

The next stage is to assess the different levels of development of the LPRIA currencies in each region. The starting point for this is Haselgrove's analysis of Iron Age coin (1987). Here the issues have been divided up into regional groups (fig. 41.01). The peripheral groups can broadly be linked to the Iron Age territories of the Iceni (East Anglian series), Corieltauvi (North Eastern Series), Dobunni (Western series) and Durotriges (South Western series). The core circulation areas are divided into the Southern, South Eastern and Eastern series. Throughout I have tried to avoid using tribal names in association with the core provinces in particular. It is difficult to tell precisely how relevant the later Roman creation and boundaries of the civitates are to the LPRIA social and political geography (relevant: Millett 1990, not quite so relevant: Haselgrove 1984).

Some of these regions had a full range of gold, silver and bronze coins in circulation. The words gold, silver and bronze are used here very loosely, since metallurgical analysis has made us aware that the alloy composition of each series was in a tremendous state of flux, though apparently under strict control nonetheless (cf. Van Arsdell 1989, 501). Other regions had only gold and silver in circulation. The rest had no coinage at all. The information is summarised in fig. 41.01. An idea of the types of coin being produced in the final three periods of Iron Age coin production is given in Table 4.11.

Table 4.11: The denominational structure of each LPRIA system in periods 7-9.
The data are derived from Haselgrove (1987). The numbers represent the number of Mack entries in each series. This gives a broad idea of the number of types and their spread across the denominations. However, it should be noted that there are several biases in this picture. First some series are divided into more types than others owing to finer divisions rather than to there actually being more variation in the series. Secondly, no indication is given of the number of dies per type, and this may have varied greatly. Thirdly, the number of coins struck per die may have varied. Excluded from this table are the potin coins and the thin silver series.

	GOLD		SILVER				COPPER ALLOY		
	AV	AV 1/4	AR	AR 1/2	AR 1/4	AE/AR	AE2	AE	AE 1/2
E7	10	7	13				1	20	5
E8	9	5	21				1	31	1
SE7	8	7	8					11	1
SE8	2	4	6		1			4	1
SW7			1		1				
SW8						1		1	
SW9								1	
S7	5	7	3		3				
S8	4	8	6		7				
S9	1		4		4				
EA7	4	1	9	1					
EA8	1		5	1					
EA9			11	3					
NE7	5		4	5	1				
NE8	5		4	3					
NE9	3		4	4					
W7			5						
W8	3	1	2						
W9	5	1	4						

The principle distinction to be drawn is between the precious metal peripheral systems (EA, NE, W, S and possibly SW) and the bronze using core (E and SE). In the final stages of the LPRIA this division also correlates with another, the difference between open and closed currency areas. Coinage of the Iceni is infrequently found outside Icenian territory, likewise extraneous coins are uncommonly found inside Icenian territory. This part of East Anglia can therefore be seen as a closed circulation area in the LPRIA. In order for there to have been any transactions between outside interests and the Iceni, coin first had to be changed. Closed systems provide easier means of control over inter regional exchange. A similar pattern applies, more or less, to the other peripheral areas, though perhaps less so for the southern series. In the core however such discrete circulation areas are harder to find. Varieties of coin were

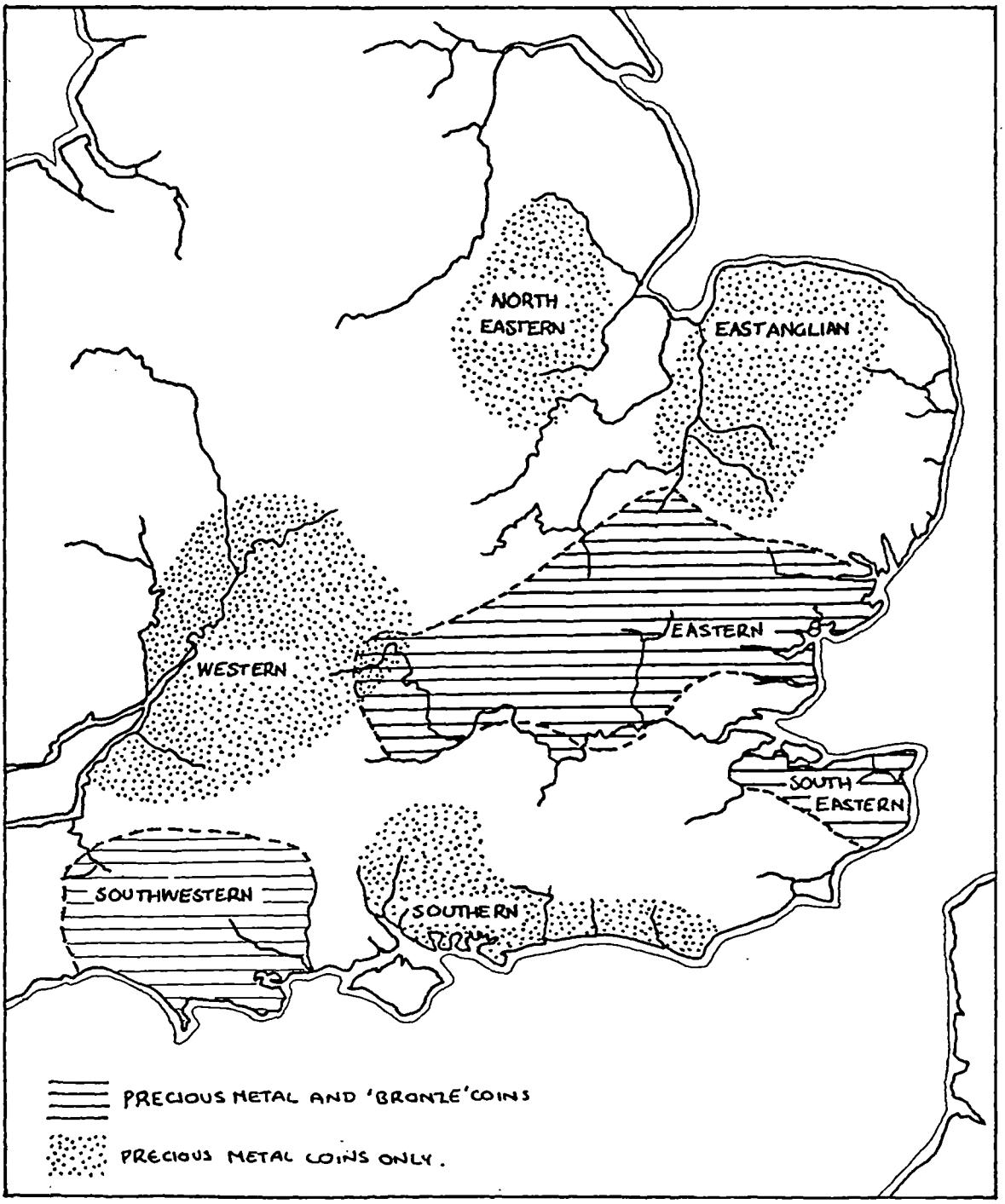


Fig. 41.01 LPRIA Coin Zones and denominational systems.

acceptable at different dates in different places (cf Cunliffe 1981). The fluidity of coin exchange between areas in the core therefore suggests less regulated control over inter-regional exchange than a closed system would suggest.

In the forthcoming analysis we must take into account the following ideas and questions. First, different denominations in the LPRIA are perceived as having different social functions, if this is the case was the multi-denominational Roman coinage system used in a similar way, at least initially ? Secondly the different levels of denominational development in the regions may have a similar effect upon the uptake and use of different Roman denominations. Would an area unused to using bronze coin accept it as readily as one which had been producing it indigenously before the conquest? Thirdly, can we detect any differences in the response of the LPRIA open and closed currency areas to Roman coin in the early period?

4.12 Icenian hoard evidence

The Iceni of East Anglia provide one area where this transition can be looked at in detail. Hoards containing both Icenian and Roman coins are known from here, what can they tell us?

More than a dozen late Icenian silver hoards have been discovered. The temptation to link them to the historical events of the invasion or the revolts of 47 and 60/1 has been irresistible (Eg. Rainbird Clarke 1956; Allen 1970; Van Arsdell 1987), though it has been the last which has found the greatest favour. However, only two of the hoards necessarily warrant such late a date as the Boudican revolt: the Scole and Joist Fen hoards. The Scole hoard (Burnett 1986) contained a *denarius* of Nero (BMC 24) dating to AD 60/1; similarly the Joist Fen hoard contained one of c.AD 55-60 (Briscoe 1963). Otherwise those which do contain Roman coins end with earlier issues whose terminal dates range from the Republic to the beginning of Nero's reign (Table 4.12). Of course this does not necessarily preclude them all from being Boudican deposits (the Roman coins only provide *termini post quem* after all), but the dating has implications regarding the chronology of the final Icenian issues, particularly the question as to whether any were minted after the Claudian conquest. Van Arsdell has suggested an extremely late chronology, dating one large issue to the Boudican revolt itself [this issue being Van Arsdell's Icenian O, Mack's 413 & 413d, Allen's IIIb-c or Haselgrove's 73.2 & 83.1 depending which classification one wishes to use] (Van Arsdell 1987). This argument rests upon the heavy weight of the coins compared with his theoretical issue weight for them, implying that the examples in the hoards were almost unworn. This is a theoretical conclusion which is directly contradicted by

Allen's observations of the coinage, where he describes the IIIb coins as being 'noticeably more worn' than other Face-Horse coins (Allen 1970, 28).

Table 4.12: The latest Roman coins in each hoard

Weston Longville	Republican	Roach Smith (1853) & Carradice (1989)
Chatteris	Tiberius ?	Burnett (1986)
Lakenheath	Caligula, AD 37/41	Briscoe et al (1958)
Santon Downham	Claudius, c. AD 43/54	Allen (1970). These were copied asses
Eriswell	Nero, AD 54/55	Kent & Burnett (1984)
Joist Fen	Nero, AD 55/60	Briscoe (1963)
Scole	Nero, AD 60/61	Burnett (1986)

If we start from a different premise, that the hoards represent a series of deposits at different dates, the conclusions resulting are very different to Van Arsdell's. Since all the late hoards contain the 'Icenian O' coins which he ascribes to Boudica, if any one hoard is demonstrably earlier, his late chronology becomes untenable. Similarly since all the hoards contain virtually the same range of coin, none of these issues could have been minted before the date of the earliest hoard (with the exclusion of the SUBRIPRASTO issue which is only found in one, to which we will return later). Therefore before we go any further it would be wise to see if there is any evidence for the hoards representing a chronological series, rather than a group all deposited at once. So let us free ourselves for a moment from the historical framework of the Icenian revolts and examine the coin hoards in their own right.

The chronological ordering of the coins comes from three sources: first stylistic affiliations, secondly the relative state of wear of the coins in hoards and thirdly the 'number of coins per obverse die' figures for each issue in the late hoards (the longer a coin series has been in circulation, the fewer examples of each die one expects to find). There is a large measure of agreement about the relative chronology of the series between those who have examined it, the principle works being Allen's original study (Allen 1970) and Haselgrove's review and periodization of the coins of the South East (Haselgrove 1987). The important thing to note is that neither drew upon differences in the structure of the late hoards to form their chronologies. This discounts the possibility of there being any circularity in the analysis that follows.

In order to examine the chronological trends in the patterning of hoards, the starting point would be a seriation; ordering them in terms of those hoards with the highest proportion of old coins to those with the highest proportion of new issues. This has been done in fig. 41.02 (hoards not referred to so far: Wimblington, March, Honingham, see Allen 1970). In sequence the hoards show a straightforward progression. The hoards to the left contain a higher proportions of coin of periods 6 (EA62) and 7 (EA71.1, 72.1-3, 73.1-2), whilst only the Joist Fen hoard on the far right that contains the latest type in phase 9 (EA94). The classification used is Haselgrove's with Allen's

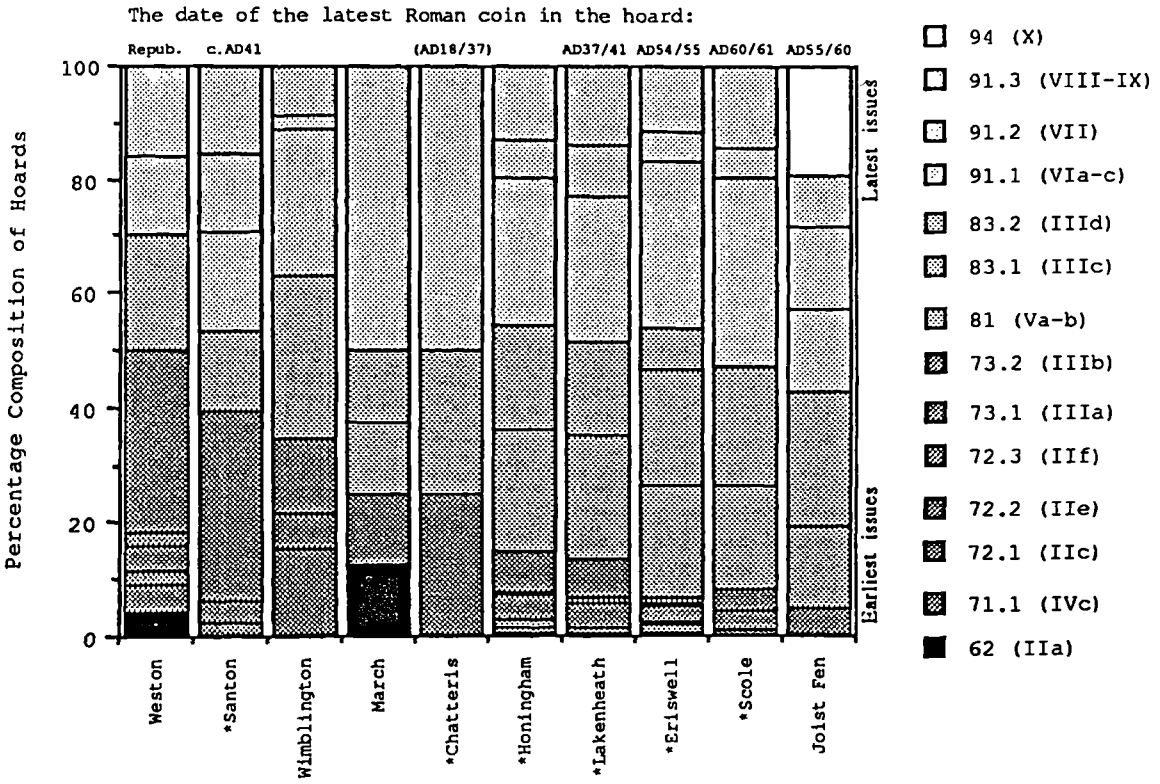


Fig. 41.02 The Icenian coin hoards.

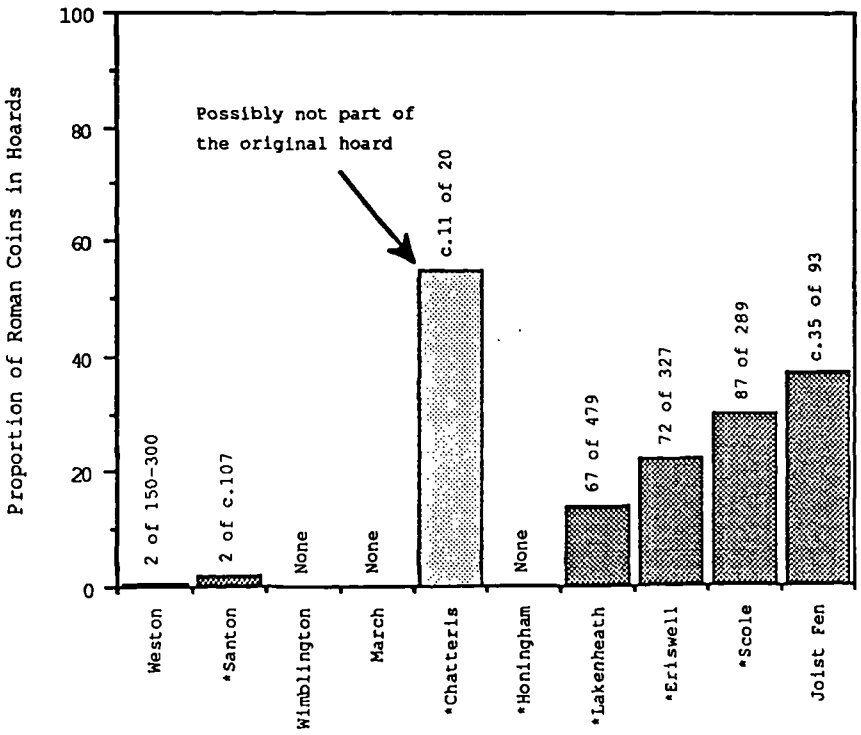


Fig. 41.03 The proportion of Roman coins in Icenian coin hoards.

given in brackets. Of course the quality of the data used must not be overlooked. Those hoards with an asterisk by them were represented by a high quality of data, whilst those without are known from only a proportion of the original hoard, or else the original description of the coins only allows for an approximate identification to be made. Now we have the hoards in a structural sequence, can we establish whether this pattern is due to a chronological change.

Our control comes from the presence of Roman coins. Do these coins with their varying terminal dates relate to the sequence proposed in fig. 41.02 ? If anything they confirm it. The hoards with the highest proportion of the latest Icenian issues (Scole and Joist Fen) contained the latest Roman coins. As one moves left along the chart the dates get earlier, until all are Claudian or pre-conquest (Note: the coin of AD 18/37 in the Chatteris hoard may be intrusive, this is discussed later).

Both the internal changing structure of the hoards and the terminal dates of the Roman coins contained within them tend to suggest that we are dealing with a chronological sequence of hoards, rather than a series deposited at one time. As stated above, this casts doubt upon the dating of any of the coin issues to late in the period of the client kingdom, or indeed to any time after 43 if the structurally earliest hoard (Weston) is as early as this; though by the nature of the evidence it is impossible to be certain. The exception to this is the SVBRIPRASTO issue (Haselgrove EA94, Allen X) which only appears in the latest hoard. This type of coin is only known from this single hoard and this one site. Therefore, it is quite than possible that this isolated issue *may* date to the final years of the client kingdom.

If we accept that these hoards do represent a chronological series then can this reveal anything to us about the nature of the transition here from the one monetary system to the other? Both types of coin were hoarded and mixed together, therefore it is difficult to conceive of them serving totally different social and economic functions. Was this mixing of systems a feature right from the first arrival of Roman coin into the area, or did the two forms of coin remain separate for a while, and only gradually merge? One way to examine the question would be to look at the proportion of Roman to Icenian coins in the hoards throughout the sequence (fig. 41.03). Though a trace of Roman coins can be found right from the first hoard, it is only in the later hoards that their proportion becomes at all significant. Only one exception to the trend is found: Chatteris. However, in this particular case the Roman coins may not in fact have been part of the Iron Age hoard at all. 14 Roman (from the Republic to Domitian) and 9 Icenian coins were found, as Burnett writes:

> "[the] 23 coins seem to represent one or more hoards, but it is not clear exactly how these hoards should be defined. One might have expected that the Icenian and Roman silver from the Republic to Tiberius represented a hoard (cf. the Scole hoard), but the finder gave evidence that the Celtic coins were not found with the Roman. Nor is it entirely satisfactory to think of an imperial silver hoard ranging from the Republic to Domitian, since all the Tiberian denarii were in quite good condition, while the coin of Nero was well worn and that of Vitellius worn. One can only point to two nuclei, one of Icenian silver, and one of Roman silver (Republic to Tiberius), and leave as uncertain how many or which other coins may have belonged to them."
> (Burnett 1986)

In conclusion I believe the hoards represent a series of deposits concealed at a series of dates from the conquest or sometime thereafter to the Boudican revolt or shortly thereafter. If one wishes they can be seen as dating to the historical events of 43, 47 and 60/1 though this does not particularly matter. Throughout this period the hoarding of Roman coins alongside Icenian coins became more and more common. The attraction of Roman *denarii* over the local series may have lain in their heavier weight (the Roman *denarii* were about three times heavier) and their better quality of silver. The gradual displacement of Icenian coins by Roman ones can be seen as happening by default, rather than any act of deliberate policy. Whereas in the LPRIA Icenian coins rarely passed outside into other circulation areas, the mobility and growing acceptability of Roman silver in East Anglia immediately points to a difference in the nature of the relationship between Rome and the Iceni rather than, say, between the Iceni and its earlier neighbours to the south, whose coin it had not accepted. From a closed currency system in the LPRIA, the Iceni had over a generation opened up to accept this new form of coin which finally surpassed it.

If the hoard sequence does start as early as 43, as I believe it does, this means that the Iceni do not appear to have minted any coins except perhaps the SVBRIPRASTO issue during their period as a client kingdom. This need not mean that they did not have the right to (cf. Braund 1984, 123-8); though it appears that with this one possible exception, if they did have that right, they did not act on it. Apart from the evidence above for an early chronology, such an interpretation is backed up by Kent and Burnett's observation of the coins in the Eriswell hoard (Kent & Burnett 1984): "The condition of the latest Icenian coins in the hoard is worse that that of the latest Roman [*denarii*], and suggests that the minting of Icenian Silver ceased well before 60, perhaps even in 43."

In this light perhaps this final issue can be reconsidered. The coin itself is probably based on a Neronian prototype rather than following the earlier Icenian styles (Allen 1976; Mossop 1979; though R. Kenyon has suggested an alternative Tiberian prototype, pers. com.). The legend itself has been taken to read SVB RI PRASTO / Under King

Prasutagus, which is exceptional. Neither is it a full weight Icenian coin, but rather a fraction, weighing c. 0.7 g against the unit weight of about 1.2 g (Haselgrove 198-, 263; though it has been noted in Van Arsdell (1989, 212) that most of the recorded examples are chipped, and therefore a heavier original weight is probably warranted). The coin stands quite apart from the main Icenian series. Since as yet they have only been found at Joist Fen, they do not appear to have had much currency. Perhaps it can best be seen not as a main stream issue, but as a 'one-off' ceremonial issue. It might even relate to the accession of Prasutagus, if as some people suggest he only came to the throne after the first revolt in AD 47, though this as with many things is by no means certain.

4.13 Coinage in the other Civitates

The nature of the transition in the territory of the client kingdom of the Iceni need not have been repeated elsewhere. Each LPRIA grouping could have responded in its own way depending upon its level of development before the conquest and the nature of its relationship with the conquering forces. A not dissimilar system to that of the Icenian coinage comes from Haselgrove's Southern coin series. Both comprised gold and silver fractions, though the Southern circulation area was not perhaps as closed to other Iron Age series as East Anglia appeared to be. It is interesting to note that the second client kingdom, that of Cogidubnus, probably covered much of the circulation area of this Southern Series. However, it must be admitted that opinions vary as to precisely where Cogidubnus's kingdom was. Chichester, Winchester, Silchester and Bath may all have been within it according to various authors (cf. Millett 1990, 68; Cunliffe 1988; 160, Salway 1984, Map III). Some have even suggested that it was far more extensive, comprising much of the South East including areas north of the Thames (Haselgrove 1984). Indeed the term client kingdom itself covers a wide variety of situations (Braund 1984) and we might be better advised to talk of the Iceni and Cogidubnus's territory as *foederati* - 'self governing' allies within the boundaries of the settled civilian provinces of the empire.

In our analysis of Icenian coinage, we saw that there was an interaction between both Roman and LPRIA currency systems, and the Roman one gradually took over. So can the kingdom of Cogidubnus be similarly found by plotting the location of mixed hoards?

> "At least twenty hoards and temple deposits contain both Iron Age and Roman coins. These mixed finds cluster in the known client kingdoms in Central southern England and East Anglia and have a complimentary distribution to the hoards with only Roman coins (up to Nero) which are concentrated in south-east England (Kent 1973)."
>
> (Haselgrove 1987, 204)

Rather than simply examining Roman and mixed hoards, our Icenian analysis should make us aware that many LPRIA hoards may in fact have been deposited in the Roman period. For example, the Honingham hoard contained no Roman coins in it, yet was structurally later than several other Icenian hoards which did contained some.

A corpus of LPRIA hoards has been compiled from Haselgrove (1987) and Van Arsdell (1989) (Appendix 4.11). The coins in each hoard have been converted from Mack and Van Arsdell's classifications to Haselgrove's periodization. In each case the latest coin period represented has been assessed. Whilst no Roman coins appear in hoards terminating with issues of period 7, some concluding in period 8 do contain Roman coin. Therefore *it is quite possible* that any of the hoards concluding in periods 8 and 9 are in fact post conquest deposits. The three types of hoard are therefore:

1. LPRIA coin hoards terminating in Periods 8 & 9
2. Roman coin hoards terminating before c. 75
3. Mixed coin hoards

These have been plotted in fig. 41.04. Icenian territory shows up very clearly as an open mixed circulation area, accepting both the pre-existing local LPRIA and Roman coinage. Indeed sites such as Woodcock Hall have produced extraneous British coins as well in post-conquest contexts, though here specifically with a military context. The other mixed hoards outside East Anglia are more dispersed. Apart from the hoard from Tunstall (an Eastern series hoard of two gold coins and an *aureus* of Claudius), all the hoards are potentially within the kingdom of Cogidubnus; but only on a maximum view of his territory. Otherwise no purely Roman hoards are recorded in the database before the Flavian period. The situation is therefore similar to that of the Iceni. The LPRIA coins probably continued in use for a while, with Roman coins only occasionally being hoarded alongside them, but never totally on their own. This interpretation is supported by the analysis of site finds by Haselgrove:

> "The most striking aspect of post-conquest deposition is, however, the separation between Roman civilian and British usage, and between the conquered territory and the client kingdom established in central southern England. ... Thus we may point to the contrast between the colonia and the extra-mural suburbs at Colchester, or between Insula XIV and the ribbon developments at St. Albans. London had no local bronze coinage, but the number of probable post-Conquest losses within the other two public towns north of the Thames is significantly smaller than at those within the client kingdom, Chichester, Silchester and possibly Winchester. ... But interestingly, despite British usage continuing in the client kingdom, it never apparently penetrated the class of newly emergent smaller nucleated settlements, eg. Neatham or Wickham Bushes. Coin use was Roman from the start - in marked contrast to similar sites north of the Thames.
>
> By inference then, British coin usage in the client kingdom continued largely as previously until Romanisation rendered it irrelevant."
>
> (Haselgrove 1987, 208)



Open circles - Iron Age coins only
Solid circles - Iron Age and Roman coins
Hatched circles - Roman coins only

Fig. 41.04 The location of LPRIA, Roman and Mixed hoards.

If we go outside the suspected areas of the client kingdoms, then mixed hoards disappear, and a parallel system appears to exist. There are LPRIA hoards, some of which may date to the post-conquest period and there are Roman coin hoards, but the two do not mix. Such was the situation identified from site finds by Reece (1979) in the territory of the Dobunni (Western series), where little overlap was found between the coin use at the contemporaneous sites of Cirencester and Bagendon. Cirencester produced mainly Roman coin, while Bagendon produced LPRIA coin. These territories may perhaps be characterised as running parallel rather than simply open systems in this period.

One final cluster of mixed hoards exist, off the map in fig. 41.04. These are a couple of Corieltauvian and Roman mixed coin hoards from Yorkshire (Lightcliffe and Honley). Haselgrove has suggested that these may indicate the post conquest use of British coin in the payment of auxiliaries raised in the province. This could similarly be used to explain the non-local coin in the fort at Saham Toney. However, the data for this is too small to be anything but merely suggestive (Haselgrove 1984, 41).

This regional division outlined above should not be over-emphasised. It would only require a couple more hoards in the right place to produce a totally different interpretation of fig 41.04. What would be useful would be a second method unreliant on hoards to see how post-conquest coin use related to the pre-conquest situation.

The Augustan monetary system offered a full range of denominations in gold, silver, brass and copper. Admittedly the supply of the *aes* coinage was problematic in the Claudian and early Neronian period, however copying certainly ensured there were small denominations around. The people of the Eastern and South Eastern currency areas may have adapted to this quite rapidly. In the LPRIA they also had a full range of denominations. However, in the peripheral circulation areas precious metal coinage dominated. Is this pattern reflected in the pattern of Roman loss?

In order to investigate this, the site lists were divided up into three zones depending upon their LPRIA currency systems:

Zone 1:	Full denominational LPRIA systems
Zone 2:	Precious metal currency systems (the South Western series has been included here)
Zone 3:	No LPRIA coinage

Table 4.13: The proportion of 'silver' coins in site assemblages, divided by LPRIA coin using zones. NOTE: This data excludes all military sites, and small towns with military associations.

	Zone 1 AV-AR-AE		Zone 2 AV-AR		Zone 3 None		Percentage silver		
	AE	AR	AE	AR	AE	AR	Zone 1	Zone 2	Zone 3
A Republican	1	17	0	6	0	11	94.44	100.00	100.00
B Mark Antony	0	0	0	1	0	8	-	100.00	100.00
C Julio-Claudian 1	27	3	11	8	16	4	10.00	42.11	20.00
D Julio-Claudian 2	148	3	61	4	138	2	1.99	6.15	1.43
E Civil War	1	1	0	1	0	0	50.00	100.00	-
F Flavian 1	80	8	41	16	60	9	9.09	28.07	13.04
G Flavian 2	57	7	36	6	27	7	10.94	14.29	20.59
H Trajanic	65	13	30	13	43	12	16.67	30.23	21.82
I Hadrianic	90	17	54	8	44	12	15.89	12.90	21.43
J Antonine 1	139	11	109	9	74	12	7.33	7.63	13.95

Zone 2 has the highest proportion of Roman silver finds from the Republican issues to the Flavian period. This shows the LPRIA preference here for precious metal coin continuing through into the use of Roman coin in the early period. The proportion remains higher than Zone 1 through until the Hadrianic period after which time no systematic difference remains. Again this feature was noted by Haselgrove:

> "The absence of post-conquest bronze coinages in the silver-using areas is to be viewed against the previous failure to adopt bronze and compares to Gaul. There, the polities striking extensive bronze coinages after the Conquest are apparently mainly those already producing base metal issues before 50BC - although difficulties in attribution and chronology preclude certainty."
>
> (Haselgrove 1987, 205)

There is a preference of LPRIA bronze using areas for Roman 'bronze', and LPRIA silver using areas for Roman silver. While a civitas by civitas study would be ideal, the database does not yet have sufficient in depth coverage to do this. The inference from this is that the functioning of Roman coin on non-military sites is related to the pre-existing LPRIA pattern of coin use.

4.14 Early Roman Silver

The *denarius* supply model outlined in section 3.5, indicated that there might have been a peak in the number of *denarii* in circulation in Britain in the immediate post-conquest period, however, the model also suggested that this had disappeared by 60, if not by 55. Two particular pieces of evidence were used to support the model. First the copying of Tiberian and Claudian *denarii* , a phenomenon which frequently relates to periods of shortage of coin (section 3.56). Secondly it was shown that while hoards were generally large in the first decade of conquest, when the total number suggested in circulation fell, hoards became smaller. Similarly when the model predicted a rise in the early second century, this too is reflected by a growth in hoard size (section 3.55).

The model can either be accepted or rejected, however, first a number of points need to be made to put the peak into context. First the replacement of British silver in circulation by Roman silver. Secondly the money on loan to the Iron Age elite in the immediate post-conquest period and other contributory factors which lead to the Boudican revolt.

Whatever the role of Iron Age coinage in post-conquest Britain, it is unlikely that all of it ended up in either post-conquest hoards or votive deposits. Much of it must surely have been exchanged for Roman *denarii* . The process by which this was done we do not know and probably cannot know. However, the alternative that the silver in circulation in Britain all went to ground is not particularly likely. Given this, a sharp rise in the number of *denarii* in circulation in Britain is entirely to be expected. This rise would be on top of the quantity of money being carried by the army of conquest itself. The old Iron Age coin would presumably have eventually found its way into the imperial melting pot.

This factor accounts for an initial rise, though one that would level out once much of the Iron Age coinage in circulation had been replaced. However, Iron Age coin is not uncommonly found in Flavian contexts, does this mean that the peak is too early? Of the mixed hoards with known *termini post quem* (Appendix 4.10), eight of the 13 close with Claudian or earlier coins, two end in Nero's reign (both from the Icenian territory) while only three have post Neronian closures. This suggests that less British coin was around from the Neronian period onwards. If the rise in the number of *denarii* in circulation was due to their replacement of Iron Age silver, this evidence would suggest the rise would not be sustained much into or beyond Nero's reign, as indeed the model indicates. However, none of this explains the dramatic fall in the number of *denarii* in circulation suggested.

~~in the later period. Whatever, this only explains an initial rise and cannot account for the dramatic fall immediately afterwards~~. ?

A second possible cause for the Claudian peak is the early but short term presence of money on loan to the elite. The most notable example being Seneca who we are told by Dio (LXII, ii, 1) had 10,000,000 HS on loan in Britain and recalled it all shortly before the Boudican revolt. This may be added to by payments from Claudius to prominent Britons which were also demanded back by the procurator, Decianus Catus. Dio places much of the blame for the revolt upon his shoulders. Quite how these loans should manifest themselves in the archaeological record it is unclear. Would the loans have actually appeared as physical coin in the province? If the coin had been used to pay for Gaulish stone-masons to construct romanized buildings (cf. Blagg 1984, then much of

this money may have only been transiently visible in Britain. However, much of this construction work post-dates this early period. Since few complicated financial instruments existed in the Roman world beyond maritime legislation, I believe that the early loans would have been in the form of coin. Their recalling in the immediate pre-Boudican period (together with healthy interest payments) had a dramatic effect if the *denarius* supply curve is anything to go by. Whilst Tacitus' account of the causes of the revolt must generally be preferred because of his source and proximity in time, it is unlikely that Dio's rather different emphasis on the repayment of the loans is completely without foundation.

I believe that the early *denarius* peak suggested by the *denarius* -supply model is consistent with the other evidence we have.

The shape of the supply curve, however, flatly contradicts some established beliefs. Sutherland states that "Nero's reform of the coinage has as its immediate results the multiplication of silver current in Britain and the tendency of the older and heavier coins to disappear..." (Sutherland 1937, 14). That the number of *denarii* of Nero outnumber those of Claudius in Britain is not contested, but Sutherland's conclusion still does not necessarily follow. The quantity of Republican *denarii* in Britain outnumbers both Claudian and Neronian issues, but that does not mean to say there must have been more *denarii* in circulation in Republican Britain than in Claudian or Neronian Britain. Such an argument would be based upon the static view of monetary circulation (cf. fig. 31.01). There is no reason why all Neronian *denarii* should have entered Britain during his reign. Many may have arrived in subsequent periods, possibly from the mint, possibly from inter-provincial exchange.

4.15 Early Roman Bronze: Claudian copies

Claudian copies form the core of a forthcoming analysis by Robert Kenyon. This section has no intention of attempting to pre-empt this. Rather, it sets out to draw a specific link between the manufacture of Claudian copies, their chronology and their relationship to other metallurgical changes taking place in Britain at the time of their issue.

The copying of Claudian *aes* coinage is a phenomenon not of Britain alone, but of the Rhineland, Gaul and Spain. The first copies to arrive in Britain were probably minted on the continent arriving with the legions in 43. Shortly thereafter British production probably began. The supply problem was only sorted out by the re-opening of the mint at Lugdunum by Nero in 64. In the Rhineland, Gaul and Spain this copying is not particularly remarkable. The local manufacture of coin to fulfil a shortage of low value coinage happened time and again in the Roman west. However, in Britain the original

coins are in a decided minority, and the use of Roman bronze coin was hardly an established practise. Why therefore were these coins copied rather that the pre-existing LPRIA bronze? The usual answer is to see the earliest minting as a function of the army's needs, followed only later by more wide spread production:

> "It seems possible that, originally, copies were made semi-officially to supplement existing supplies of cash for the legions, being fairly accurate in weight and style (grade 1). On being absorbed into the currency system of the province, these would themselves be liable to imitation, perhaps at the larger tribal centres... but with a falling off in both skill and weight (grade II)."
>
> (Sutherland 1937, 13)

There is not universal agreement however. Boon particularly dislikes the idea of regional 'quasi-official' production by the military. First he pointed out that army pay was collected in coin from the procurator's office (eventually to be found situated in London) on the basis of an estimates of expenditure presented to it (Boon 1988, 117). On the basis of this there would be no mechanism or need for coin to be manufactured locally by the army. It was contrary to the system:

> "...the chief reason why the theory of army-manufacture of coin must be dismissed is that the fact that the army units drew their pay against an estimate of the amount, and under an obligation to account later, from the procurator's office. In any case, the 'quasi-official' explanation is absurd: if some copies were counterfeit and others made by authority, some tolerated and some rejected as false, the result would be chaotic. It is proper to regard them as one and all false..."
>
> (Boon, 1988, 123)

The justification for coin coming directly from the procurator comes from a very fragmentary wooden writing tablet found in an early well from the legionary fortress of Caerleon (Tomlin 1986). It appears to be a series of future troop movements, including a body of men going to present the estimate of expenditure to obtain the *stipendium* . However, in the first instance the document does not specify that headquarters meant the procurator's office. Secondly I would have imagined that much of the coin was collected in *denarii* rather than base metal (though this is perhaps more of a problem of my imagination), and thirdly the document comes from a context dating to 75-85 and presumably post dates the period of Claudian copying in any case, indeed the site at Caerleon was only founded in the Flavian period, so the document is unlikely to be residual.

Empirical observations can be made associating the loss of Claudian copies specifically with military sites. Woodcock Hall is a good example (Brown 1986). Here there was an LPRIA site overlooked by a Roman fort on the other side of a stream. Systematic meta-detecting revealed large numbers of Iron Age coin focused upon the LPRIA settlement. Official Roman coin was found on both sites, however Claudian copies

concentrated primarily in the fort. As Brown says: "the concentration of *aes* copies within the confined area south of the stream suggests some restraint whereby circulation of these coins was confined effectively to military personnel." (Brown 1986, 10). Other associations such as the large numbers from Usk and Hod Hill mean that a military function or need for the coin is very likely. Even if the coin gradually spread out to become used by the general population later on, a military link cannot be dismissed. But first before we make all kinds of conclusions, let us examine some other kinds of evidence.

In order to copy coinage one thing that is needed is metal. The position of brass in the discussion of Claudian copies has been rather neglected, however it can throw some interesting light upon the chronology of the copies themselves and other transformations in the metallurgy of other artifacts in circulation in Britain.

In many ways brass can be considered as a prestige metal in LPRIA Britain. Whereas gold and silver could be mined in Britain, brass had to be imported; the technological knowledge to make it in this country was not established (the only possible evidence comes from some signs of brass working at Baldock). Its circulation appears to have been restricted to the form of brooches (Bayley 1989). This restriction in itself suggests some kind of special value placed upon the metal. At the time of conquest, therefore, brass could be supplied in only three forms: LPRIA brooches, genuine Roman *sestertii* and *dupondii*, and other imported metalwork. It is within this context that we must analyse the production of Claudian copies.

Whilst *asses* were originally made from copper, *dupondii* and *sestertii* were made from brass, and this is indeed what they appear to have been copied in (Bayley 1987). Evidence may be summoned which suggests that brass was deliberately imported in the mid first century, probably to make the copies. This takes the form of three brass ingots. One from Sheepen, Colchester measuring 91 x 15 x 0.5 came from an AD 43-60/1 context. Paul Craddock's analysis demonstrated it to be a very high zinc brass (Musty 1975). The second comes from another early context with military associations, Kingsholme (Gloucester) (Justine Bayley pers com.). A third is known, this time outside a well dated context from Claydon Pyke. This however can be paralleled with similar bun-ingots known from a 1st century wreck off Corsica. The first two are good early sites, and the third, while not specifically of the early conquest period is still indicative of the long distance supply of brass, since the metal is too pure to have been produced by melting down any of the LPRIA artifacts which were in Britain (the brooches tended to contain some tin which is absent from the ingots). However, there is reason to believe that the deliberate importation of brass, if there was such, in the early period of copying did not last, nor was it sufficient.

A systematic bias towards the copying of *asses* rather than brass coin can be found. The first thing to point out is that the proportion of *asses* copied was higher than the proportion of official *asses* in general circulation (Table 4.10). Either this was because of a preference for smaller valued coinage or because brass was in relatively short supply. However, we can move beyond this to add a chronological dimension to the picture. Throughout the 40s, 50s and early 60s there was a shift in production away from minting both brass and copper coins to concentrating upon copper asses. This can be seen from the coins at both Usk and Colchester.

Table 4.14: The ratio of Claudian denominations copied compared with the proportion in circulation. Colchester data from Kenyon (1987)

		Pre Neronian Aes from the Site Find database		Colchester 1971-82
Denomination	Metal	Real (n=153)	Copies (n=484)	Copies (n=124)
Sestertius	Brass	12.4 %	1.4 %	0.8 %
Dupondius	Brass	17.0 %	9.9 %	23.4 %
Dupondius/As	Brass/Copper	3.9 %	1.4 %	0.0 %
As	Copper	65.4 %	87.2 %	75.8 %
Quadrans	Copper	1.3 %	0.0 %	0.0 %
TOTAL		100.0 %	100.0 %	100.0 %

Using the coins from Usk and the broad rule of thumb that the better copies were earlier, and the degenerate copies later in date; one can see a shift in production from *dupondii* to *asses* throughout the period (Table 4.10).

Table 4.15: Claudian Copies at Usk (after Boon 1988)

Denomination	Metal	Grades I & I-II	Grades II & II-III	Grades III & IV
Dupondii	Brass	33.3 %	10.0 %	8.7 %
Asses	Copper	66.7 %	90.0 %	91.3 %
Sample		n = 18	n = 30	n = 82

The picture from Colchester is similar (Kenyon 1987). The grading of the copies here was slightly different, replacing the earlier scheme of Grades I to IV with three grades A-C. Again one can examine the proportion of denominations copied in each grade (Fig. 41.05) and again it would appear that brass coins became increasingly out of favour as articles to forge. Does this imply increasing pressure upon the source metal? If this hypothesis is correct then chronological changes in the quality of the brass alloy used might be expected, with copies starting off with relatively good brass and concluding with more variable alloys. So let us now turn to re-work Bayley's analysis of the *dupondius* copies from Colchester.

In Bayley's analysis the copies were ordered by archaeologically phased contexts (1987). Looked at in this way no systematic pattern in the composition of the coins was found. This was due to the residuality mixing up the order in which the coins might actually have been minted. However, Kenyon in his preceding article provided a alternative way to order the coins. By examination of the weight and size of numerous

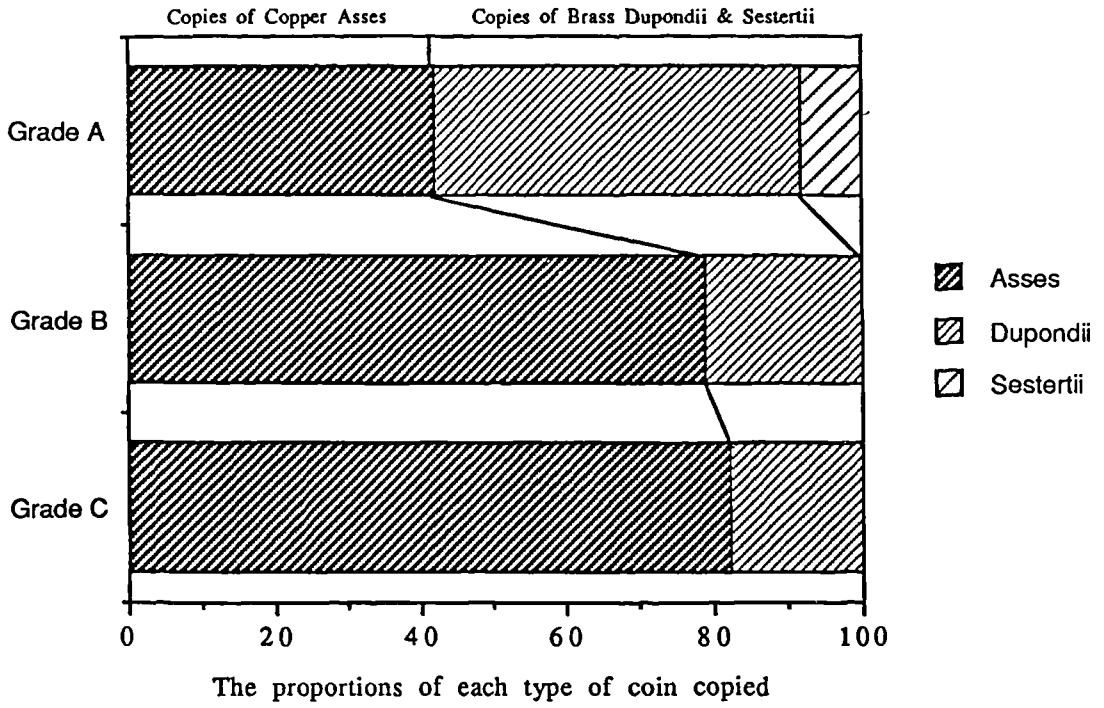


Fig. 41.05 Claudian copies from Colchester: grades & denominations.

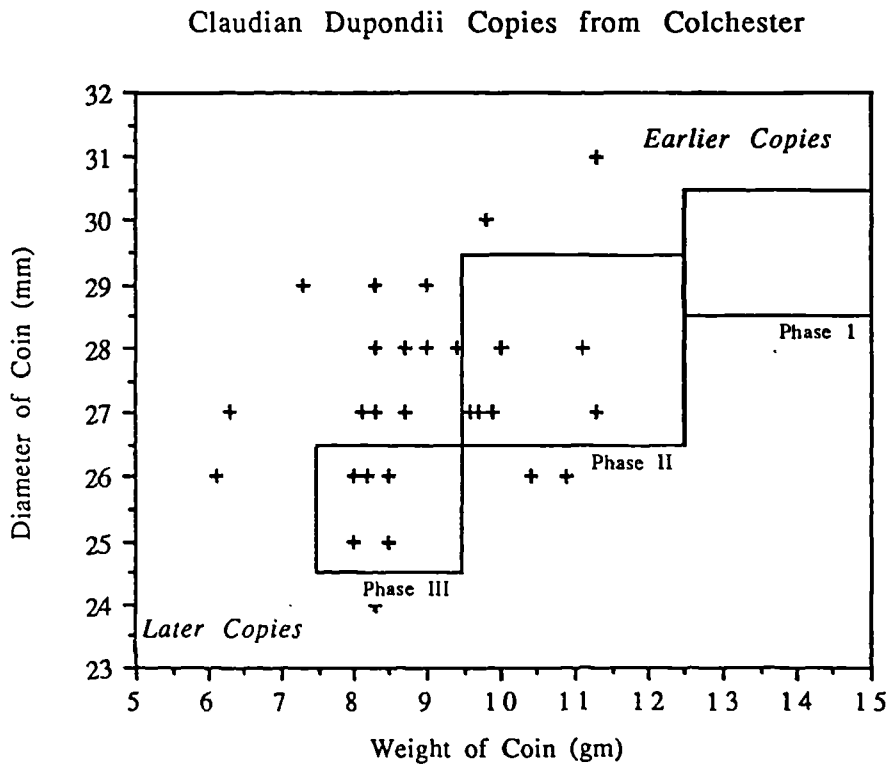


Fig. 41.06 Claudian copies from Colchester: weights and sizes.

copies from a wide variety of sites, Kenyon proposed three main phases of 'Claudian Copy' production, though the precise justification for this awaits publication.

Phase I Here the copies were very close in date to that of their originals. None of these were found in the group of coins from Colchester under examination, and therefore none were included in Bayley's analysis.

Phase II 44-c.49

Phase III c.49-60/1. (Kenyon 1987, 39).

The three standards he proposes are marked in fig. 41.06. Many of the Colchester coins were worn, and so were lighter than the original standard they would have been minted to. Nonetheless, we can approximately arrange these coins in order of date by working out their position along a transect from the top-right-hand corner of the graph (heaviest and biggest) to the lower-left corner (lightest and smallest) (Table 4.10).

Table 4.16: XRF Analysis of Claudian copies.
The data derived from Bayley (1987) and Kenyon (1987)

No.	Small Find Number	Diam. (mm)	Weight (gm)	Wear (1-9)	XRF Ratios Zinc	Lead	Tin	
1	BKC 189	31	11.3	3	70	-	-	Earlier Copies
2	1.81 2468	30	9.8	3	113	-	-	
3	1.81 2420	28	11.1	4	83	1	-	
4	1.81 2630	27	11.3	3	47	3	-	
5	BKC 3782	28	10.0	4	59	-	-	
6	BKC 2430	29	9.0	5	39	-	-	
7	1.81 2481	28	9.4	3	49	14	-	
8	LWC 914	26	10.9	5	82	-	-	
9	LWC 3551	27	9.9	1	88	3	-	
10	BKC 3750	28	9.0	3	25	22	-	
11	BKC 1469	29	8.3	5	32	8	-	
12	BKC 1546	27	9.7	5	35	-	-	
13	LWC 3361	26	10.4	5	143	14	-	
14	BKC 4594	27	9.6	4	95	18	-	
15	BKC 749	28	8.7	5	42	3	-	
16	BKC 911	28	8.3	4	67	-	-	
17	BKC 4708	27	8.7	4	62	2	-	
18	LWC 3629	29	7.3	4	44	10	-	
19	1.81 2474	27	8.3	4	59	3	-	
20	BKC 1832	27	8.1	7	50	-	-	
21	1.81 754	26	8.5	2	111	18	-	
22	BKC 4504	26	8.2	1	60	2	-	
23	BKC 1862	26	8.2	8	15	-	-	
24	BKC 3428	26	8.0	8	-	-	7	
25	BKC 3908	25	8.5	4	60	15	-	
26	1.81 2223	25	8.0	3	7	-	6	
27	1.81 2411	27	6.3	9	61	5	-	
28	BKC 5224	24	8.3	4	63	-	-	
29	BKC 4707	26	6.1	9	25	5	-	Later Copies

Note:
Zinc ratio is about 100 for a brass containing about 20% zinc.
Lead ratio is about 20 for alloys with around 10% lead.
Tin ratio is about 6-7 for alloys with 5-7% tin. Also very low levels of tin cannot be detected using this technique, owing to a secondary copper peak.

It is occasionally suggested that the reason why copies tend to be lighter than their original prototypes is that they are made from melting down the genuine coin and

reminting them at a lighter weight; herein lies the profit. So could British copies have been made from melting down genuine *dupondii* and *sestertii* ? In this case the model does not work. First it would not explain why the earliest copies were the same size and weight as orthodox issues, there would have been little profit here. Secondly, the extreme variability in the composition of the copies does not suggest that their sole metal source was the genuine article. Two trends can be seen in the results. The first is that in the earliest coins there is very little lead in the alloy, suggesting a fairly pure source for the minting of these coins. The second point is that the only coins to register the presence of tin are very late copies; however the fact that this method cannot detect levels below 1-2% must be remembered. I think these are real trends, but further quantitative analyses including more of the earlier better copies would be required to confirm it (cf fig 41.06).

How do these compositions compare with the brass ingots mentioned above? The ingots contained no sign of tin at all, and only the Claydon Pyke example contained a trace of lead. Otherwise they were generally of a much higher zinc content than these coins (around 20-27%). If these ingots were being imported for the production of brass copies, they were certainly being diluted by extraneous supplies, particularly in the later period.

The other artifacts in Britain which contained brass, as mentioned, were LPRIA brooches. These underwent a radical transformation in their alloy composition at just this date. Whilst nearly all brooches were made from brass in the LPRIA, upon the conquest this picture rapidly changed with a shift to leaded bronze (fig. 41.07). This can in no way be seen as a technological advance. Leaded bronze made far worse springs, and forced a change in brooch design to the use of a hinge replacing the spring. Brass also had a far more golden appearance, which leaded bronze did not possess. It was possibly to counteract this loss that many post conquest brooches had a silvery finish added to them by tinning. If technologically the new leaded bronze was not as good, and visually it was not as impressive, why did the change take place? Perhaps the leaded bronze was cheaper enabling more brooches to be produced? If so this did not result in any larger numbers of brooches being produced in the early Roman period (Creighton 1990, 188). The simplest explanation is that brass was for some reason in short supply and alternative alloys had to be found.

We have established that whilst brass coins were copied, the numbers copied declined with time. Two reasons could account for this:

1. A desire for low value *asses* in preference to *sestertii* and *dupondii* .
2. A shortage of brass to manufacture such coins.

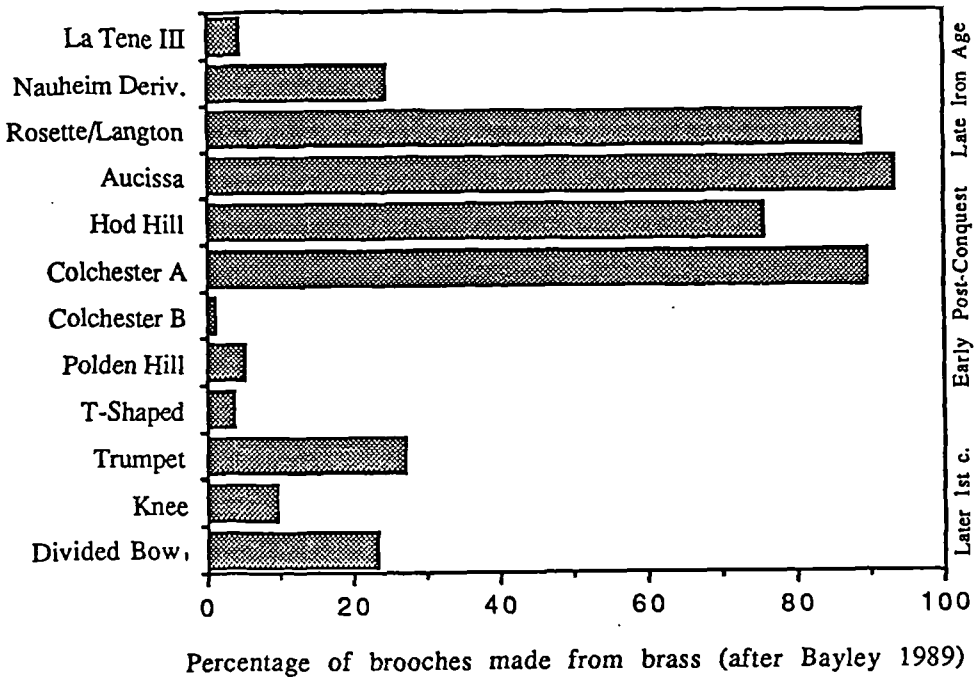


Fig. 41.07 The proportion of LPRIA and Roman brooches made from brass.

The change in the metallurgy of brooches strongly suggests that there was a shortage of brass in this period. Indeed it might be possible to go further and suggest that brooches were being melted down to be converted into coin, though to argue this on the basis of the analyses done so far would be premature. The conversion of brooches into coin may at first seem rather tenuous. However, if we look a bit further into how brooches and coinage functioned within Late Iron Age society the differences soon start to blur. Brass, like gold and silver can, because of its scarcity, effectively be treated as a precious metal.

In their range of depositional contexts, late Iron Age brooches have parallels with Iron Age coinage. Both coins and brooches are frequently found at Celtic and Romano-Celtic shrines, Hayling Island and Harlow being examples. Indeed at Harlow almost a hundred brooches were found. The Celtic coins occurred in two major concentrations within the temple precinct, with a thin scatter lying elsewhere. The brooches however had a different distribution, just under half came from within the central building itself, while as with the coinage there was a broad scatter in the precinct (France & Gobel 1985). A second example comes from Woodcock Hall (Brown 1986). Two particular concentrations of Iron Age coin were found by the brook (1986, 9, fig 4). The early forms of bow-brooches concentrated in precisely the same area (1986, 13, Fig 6). This suggests either a couple of widely scattered hoards (in which brooches and Iron Age coins were hoarded together) or two votive deposits. In either case, the depositional relationship (and therefore functional relationship?) between the coin and brooch is established. A final example comes from South Ferriby (South Humberside). Here, at the turn of the century when much of the site was being eroded into the Humber, a large quantity of metalwork (Iron Age coins, Roman coins, brooches and some other copper alloy artefacts) were discovered, largely in the vicinity of a natural spring called Cadwell (St. Chad's Well) (Sheppard 1907a). Not only this, but a hoard of c.25 Iron Age coins was discovered around 1904, containing with it three Romano-British brooches; two Colchester types and a trumpet brooch (Sheppard 1907a, 1907b; Allen 1963). These have frequently been dismissed because of their uncomfortably late date; however there is no *prima facie* reason to do this.

One frequent feature which can be taken to emphasis the votive nature of brooch deposition is the deliberate cutting of the brooches, similar to the twisting of swords and other equipment upon deposition. Brown noted this with the brooches from Woodcock Hall. They were frequently cut in two. The possibility that this was a preliminary stage to placing them in a crucible prior to melting them down was considered, but rejected. The reason was that whilst some of the larger brooches were severed, many of the smaller brooches were likewise cut, even though complete they were still much smaller

than some of the larger halves. I have also noted the same phenomenon on four sites in South Humberside including South Ferriby.

This discourse has simply been to establish that in the religious and hoarding sphere of Late Iron Age and Early Roman life, brooches and coins *could* fulfil similar functions. The circulation of coinage could be used to reinforce social status while brooches could be used to display social status.

So we come back to the effect of the conquest. If the Late Iron Age coinage was all eventually called in, whether by taxation, tribute, booty or any other mechanism, it was replaced in circulation by *denarii* . In this kind of context, I see nothing particularly strange about other prestige-goods being converted into the brass coinage. Of course it may be totally coincidental that brooches ceased to be made of brass at more or less the same date that the copying of *dupondii* required brass, but it seems unlikely. What we appear to have is a narrowing down of the variety and types of primitive currencies in circulation in Late Iron Age Britain to a unified monetary system. Mobile wealth is being converted into something more useful to the elite in integrating itself with the rest of the Empire.

If we wished to suggest a model for the supply of brass in this period to make the copies, then I would suggest the following:

Phase 1: Claudian *dupondii* copies are initially made from good brass. This was probably officially supplied. The slight evidence for this supply could come in the shape of three brass ingots: however such imported brass, as all three probably were, was not enough. Though the earliest brass copies started out un-leaded and still had a good proportion of zinc, this situation did not last.

Phase 2: Official supply of imported brass may have ceased or simply not gone far enough, so other resources within Britain may have been looked for. The presence of lead certainly suggests that the brass was being further alloyed with the addition of other metals, to make the brass go just that little bit further. Right at the end of the sequence we start to see tin showing in the alloy, which until now this has failed to register. Bayley's analysis of the brass brooches (1989) clearly shows that most of the common late Iron Age types contained some tin in their alloys so this might indicate a conversion of one to the other.

Whatever, this idea suggests that a co-ordinated analysis of different types of metal work in LPRIA and post-conquest Britain might enable us to make some more secure statements about the inter-relationship between local copying and the metal reservoir in

Britain. Similarly such an approach might be appropriate to other periods of copying as well in the Roman period.

4.16 Conclusion

The dominant view of the Iron Age to Roman monetary transition in Britain has been that of Reece followed by Haselgrove:

> "The monetary impact of the invasion has recently been assessed from the Roman side by Reece (1979), whose conclusion, and one with which I would certainly concur, is that generally the indigenous coinage was rapidly replaced by the imperial coinage, largely because confronted with Roman usage it was essentially irrelevant, and not because it was officially suppressed."
>
> (Haselgrove 1984, 41)

The effect of Reece's paper has perhaps polarized the difference between the systems more than is warranted. Various types of continuity did exist between the Iron Age and Roman monetary use.

1. Roman and British coins were hoarded together is some regions, though admittedly not everywhere. In the case of the Iceni we see a gradual transition from hoards dominated by British issues to totally mixed hoards.

2. Areas with silver rich LPRIA coinage systems show a preference for Roman silver coin, and areas with LPRIA 'bronze' currencies show a preference for Roman 'bronze' coinage up until the late Flavian period.

3. Brass in LPRIA Britain was restricted to brooches, items which could variously be used for status display or votive offering. In the early Roman period the use of brass was restricted to military fittings and the local manufacture of Claudian *dupondius* and *sestertius* copies. The contemporary change in the metallurgy of brooches from brass to a leaded bronze suggests a continuity in the status of the metal from the one period to the other.

Reece's point was primarily based on the difference between the site assemblages from Bagendon and Cirencester. This is an observation which I would certainly not wish to question. However, given the points above it is difficult to argue that the use and function of Roman coin in post-conquest Britain was something totally different to the functioning of the LPRIA issues. If the function of each currency was totally distinct then we would not have expected the pattern of deposition of coin in LPRIA contexts to have had a determinate role in the early Roman situation. But it appears that it occasionally did. It is commonly believed that LPRIA usage was dominated by military, political and social use rather than commercial exchange. Different types of

coin had different purposes. The mistake is to assume that the Roman currency system, which appeared to be an integrated whole orientated towards commercial exchange, in fact operated that way. If the social structure of the LPRIA survived the conquest relatively intact, then the continuance of earlier patterns of circulation and exchange, even if using a new medium, should not be unexpected.

4.2 The circulation of bronze and silver

4.21 Walker's Bath coin report
4.22 The supply of *sestertii* : method I
4.23 The supply of *sestertii* : method II
4.24 The hoarding of bronze in Britain
4.25 Multi-metallic systems

In this section the relationship between the bronze and silver circulation systems is discussed. First a thorough examination is made of Walker's Bath coin report to evaluate his estimates of the number of bronze coins in circulation in Britain (Section 4.21). Secondly an attempt is made to derive aes supply figures as done previously for denarii. This is achieved with sestertii, but alas not for asses and dupondii because of the quality of the data. Walker's results are looked at to see if they support the model, which broadly they do (Section 4.22). A second method for reconstructing Bronze supply figures is then described based on wastage rates. The results are found not to be dissimilar to those from the previous model (Section 4.23). The results of both of these studies are then assessed in the light of the denarius data and other information about the circulation of both silver and bronze coin (Section 4.24). Following this literary sources are used in addition to reassess the role of bronze in the circulation system (Section 4.25).

4.21 Walker's Bath coin report

The starting point of any discussion about the supply about *aes* coinage to Britain in AD 43-260 must be David Walker's report on the coins from the sacred spring at Bath (Walker 1988). The assemblage comprised 12,595 Roman coins together with some Iron Age and Post-Roman issues. Its importance lies in the analysis of the first to third century *aes* coins. Walker divided up the material into three main phases (table 4.21). During the first phase Britain was supplied sporadically, only receiving coin when the mint at Lugdunum was in operation. Some coin came over from Rome, but with the exception of Domitian's issues of AD 86-87, never in any quantity. From the reign of Nerva a regular supply arrived, however, from AD 197 this ceased and thereafter little new *aes* was seen in Britain. During the period of regular supply Walker managed to identify a series of extra-ordinary issues which appear to have been directed specifically towards Britain. From a die link analysis of those issues which circulated in Britain alone, he calculated estimates for the total quantity of *aes* in circulation in Britain in the Hadrianic and Antonine periods.

Since this work is liable to become the set word on the subject for a long time to come, it is worth conducting a detailed criticism of the analysis and an assessment of the reliability of the results. First the biases in the nature of the Bath deposit will be assessed. Secondly the effect of this on his division of supply into three periods will be examined. Thirdly the attribution of a 'British association' to the FORT RED issue will be questioned. Fourthly the establishment of Walker's *aes* supply figures for the Hadrianic and early Antonine periods will be assessed.

The biases in the Bath coin deposit

What are the biases in the Bath assemblage? Since the deposition of each coin was a conscious action one might suspect that denominational selection took place. Walker contrasted his list with the coins from Richborough and found that there were significantly fewer silver coins discarded as votive offerings at Bath. One silver coin to 24.86 *aes* at Bath compared to 1:5.77 at Richborough. So one bias in the deposit was clear. A similar analysis was conducted to detect differences in the deposition of *sestertii* and other smaller bronze coins. In this case no marked patterns emerged (Walker 1988, 284).

A second method analysing the differential deposition of denominations arose from the die link study. The series of *dupondii* and *asses* of Antoninus Pius which circulated principally in Britain were analysed. Estimates were created for the volume of each issue in circulation in Britain: 409,000 *dupondii* and 1,756,000 *asses* . Since the numbers of each actually represented at Bath were known (69 *dupondii* and 219 *asses*) it could be stated that the *dupondii* at Bath represented about 0.016% of the entire issue, while the *asses* represented 0.012%. This suggests that if anything there was a slight predilection for the deposition of *dupondii* rather than *asses* in the Antonine period (Walker 1988,303). However, the figures for the *aes* of Marcus Caesar showed the opposite pattern. The issues were estimated to be 360,000 *dupondii* and 280,000 *asses* , represented at Bath by 19 *dupondii* and 54 *asses* . This makes the proportion of the issue of *dupondii* deposited at Bath 0.0052%, and *asses* 0.019%. The sample size of the Marcus Caesar *dupondii* is admittedly low, but in general there appears to be no consistent pattern of selection.

In conclusion whilst a significant bias can be shown towards the deposition of bronze at Bath in preference to silver, no such differentiation can be seen within the *aes* denominations.

A second cause of bias in the sample is the assumption that the coins which were deposited were similar in proportion to those recovered. That is to say that there are no chronological biases, however, Walker admits there are problems with this:

> "...some coins would have been lost every time the sluice to the east of the spring was opened, while when the sluice ceased to be used the coins which were thrown in presumably remained undisturbed. This can only mean that our figures have a bias against the earlier periods in favour of the later periods, but how great this bias is, and how many of the earlier coins have been lost this way we have no way of knowing. All we can do is assume that the coins recovered reflect the proportions of the coins originally lost..."
>
> (Walker 1988, 283)

One way of testing to see how biased the Bath assemblage is would be to compare it against the *aes* from the site-find database. Both lists have been divided into *sestertii* and AE2, and then into the chronological divisions outlined in table 2.21. The differing proportions of coin are displayed in fig. 42.01. Both graphs show that Bath under-represents the quantity of early *aes* discarded on sites. With *séstertii* the cross-over point between under- and over-representation comes in the late Hadrianic/early Antonine period (Groups I/J). With the *asses* and *dupondii* the cross is earlier in the mid Flavian period, this is a factor of the dominant presence of Claudian copies (D) in the site-find database and their relative absence in the Bath deposit. This under-representation of the earlier issues must be recalled when we discuss Walker's division of the supply of Bronze into three periods. For the moment however these are the three principle biases affecting the Bath coin list:

1. There was a bias in favour of *aes* coins being deposited at Bath, in comparison with site list assemblages.

2. No significant biases can be found between the deposition of the different *aes* denominations.

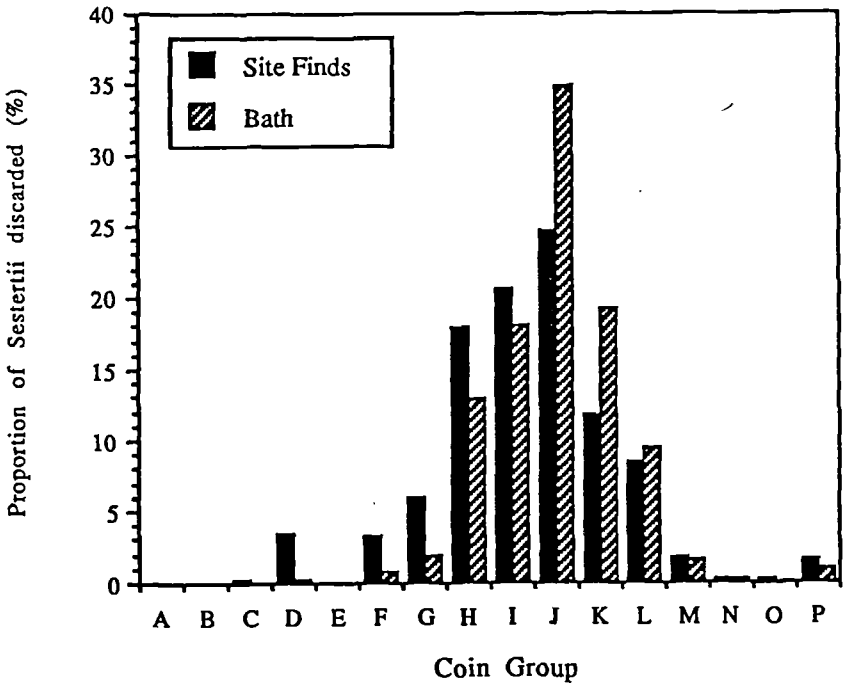
3. It can be demonstrated that the Bath list under-represents Julio-Claudian and early Flavian coinage. This may either be a function of the date the temple was established, or a pattern caused by the opening of the sluice washing out the spring.

The division of supply into three periods

Table 4.21: Supply of *aes* to Britain (After Walker 1988)

1. AD 43-96: Period of sporadic supply.		
The main injections of aes were as follows:		
	AD 64-7	Nero (Lugdunum)
	AD 71-73	Vespasian (Lugdunum)
	AD 77-78	Vespasian (Lugdunum),
	AD 86-87	Domitian (Rome)
2. AD 96-c.197: Period of regular supply.		
Issues particularly associated with Britain were:		
	AD 119	Hadrian - Britannia asses
	AD 122	Hadrian - FORT RED asses & the 'casting mint' issues
	AD 128	Hadrian - Salus and Sabina asses
	AD 153-55	Antoninus Pius - Britannia asses & other issues
		Clay (1989, 214) would add further issues to this list including sestertii of Antoninus Pius.
3. AD c.197-260: Period of minimal supply.		
	AD 198-222	Very minimal supply
	AD 222-260	minimal supply

It is possible to plot all of the Bath coins by issue date, divided up into the different denominations. This has been done in fig 42.02. The construction of these graphs is



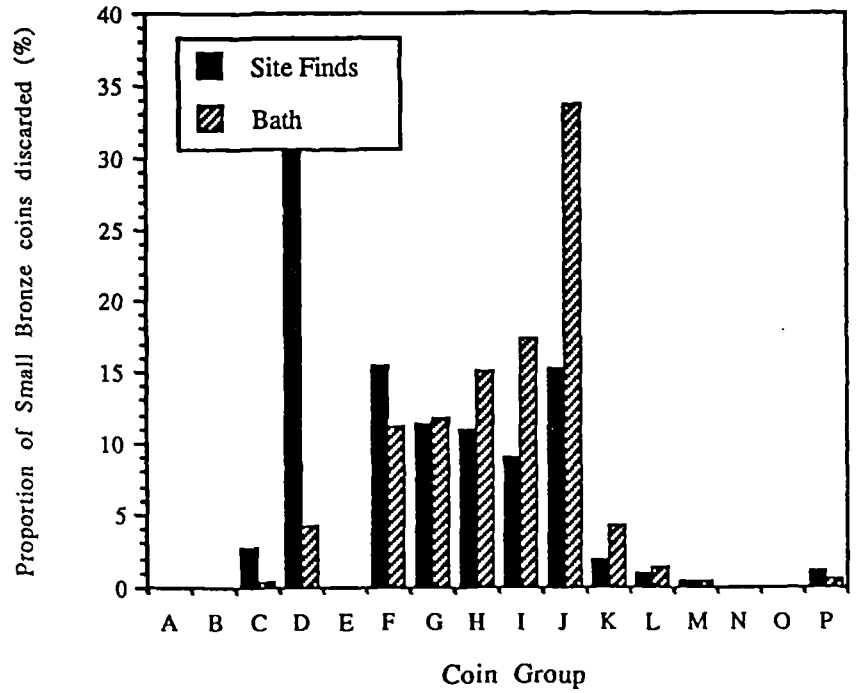


Fig 42.01 Biases in the assemblage from Bath: a) *sestertii* , b) *dupondii* and *asses*

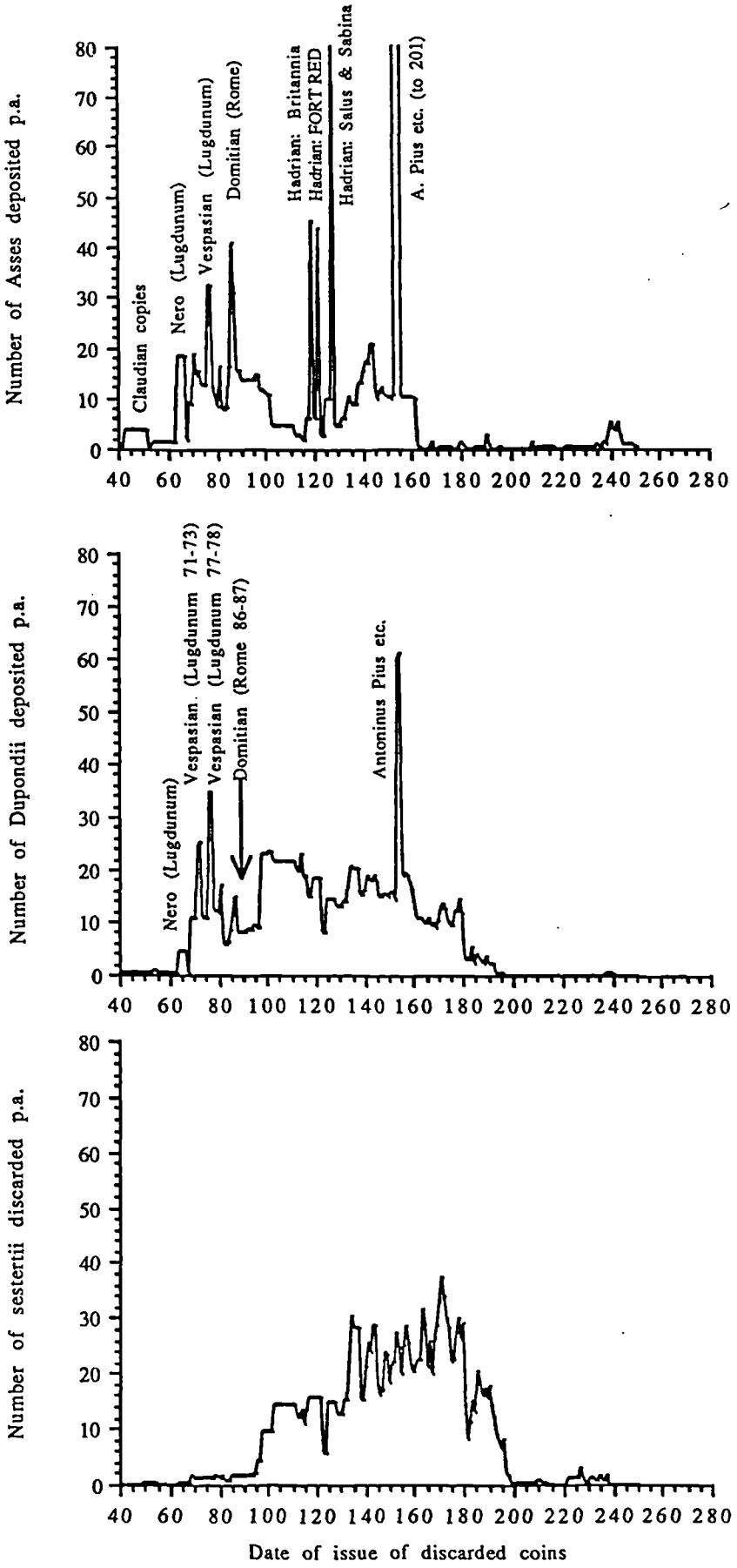


Fig 42.02 Bronze coins from Bath: deposition by denomination

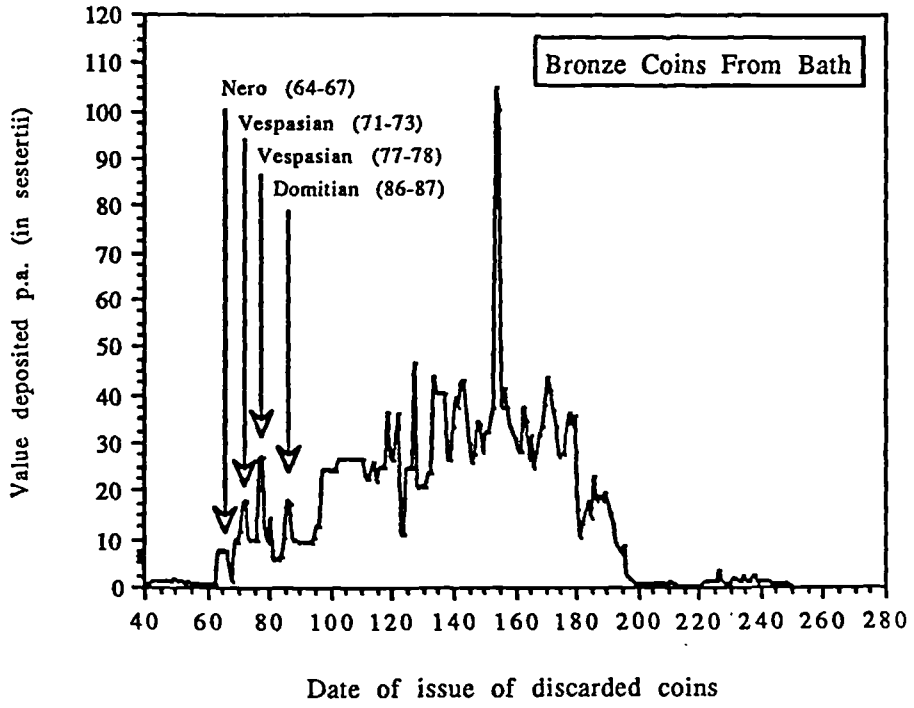


Fig 42.03 Bronze coins from Bath: value deposited pa.

straightforward. A *sestertius* of Antoninus Pius of AD 139 is plotted as one *sestertius* in that year; whereas one of AD 151-152 is plotted as half a *sestertius* of 151 and half of 152, and so on including all the coins except those simply ascribed to 'Illegible coins of the first-third centuries'. A composite graph calculating the value of the *aes* together (in *sestertii*) is given in fig. 42.03. The graphs show clearly the early dominance of the *as*, countered by the late predominance of *sestertii* . It is however instructive to note the almost total absence of Claudio-Neronian *sestertii* , whist these make up about 4% of the site-find database. This is part of the bias caused by the sluicing out of earlier finds mentioned above.

One factor blurs Walker's periodization of the supply in these illustrations. In the period of sporadic supply (AD43-96), the dating of some less well preserved issues to simply the emperor's reigns smooth out some of the peaks in the curve defined by many of the fully identified coins. Otherwise Walker's division corresponds quite well with the graphs. One point worth noting, however, is the gradual decline in supply during the later Antonine period, from c.170-197, before Walker's period of minimal supply.

In conclusion Walker's three period division is broadly correct, however:

- The Bath list may understate the early input of *aes* due to the under-representation of early coins in the Bath deposit.
- The period of 'regular supply' does not simply cease, but a progressive decline takes place the early Antonine period onwards.

The FORT RED issues and their circulation in Britain and the Continent

Next we examine the issues with British associations. Table 4.22 repeats some of Walker's data for these issues, alongside the corresponding data from the site-find database. With the coins of Hadrian, Sabina and Antoninus Pius there is a good correlation between the two. However, in the case of the small bronze of Faustina I (RIC 1162), Faustina II (RIC1395) and Marcus Caesar (RIC 1322), the comparisons are not as close. In the case of Faustina I, the proportion of RIC1162 issues at Bath, in the database and in Walker's own SE Corpus (the Croydon hoard and other sites), were all still much larger than the 1.5% representation on the Continent, so the British association is still maintained. Similarly with the other two. However, the association of one issue with Britain may be questioned: the FORT RED asses of Hadrian. Walker (1988,190-1) shows that this issue comprised 14 out of 24 of the *asses* at Bath, whilst only 5 of 64 from the continent (58% against 7.7%). However, this is only the case if all the Britannia coins are excluded from the count. If they are included then the proportion at Bath is 7.2%, in the site-find database 8.2% and on the continent 7.8%.

That is to say the proportion of FORT RED coins in Britain is not noticeably different from that on the continent, and its claim to be a coin principally directed towards Britain must be rejected.

Table 4.22: Issues with particularly British distributions.
Bath, SE Britain and Continental data from Walker 1988, Database information from the thesis.

		Bath		Database		SE Britain		Continental	
		No.	%	No.	%	No.	%	No.	%
HADRIAN									
Asses	RIC 577 (Britannia)	39	*20.0*	8	*16.3*			1	*1.5*
	RIC 617 (Fort Red)	14	*7.2*	4	*8.2*			5	*7.7*
	RIC 975	52	*26.7*	5	*10.2*				
	All identified asses	195	*100.0*	49	*100.0*			65	*100.0*
SABINA									
Asses	RIC 1023/1024	23	*100.0*	2	*66.7*			7	*29.2*
	All identified asses	23	*100.0*	3	*100.0*			24	*100.0*
ANTONINUS PIUS									
Asses	RIC 934	213	*71.2*	39	*65.0*	30	*65.2*	0	*0.0*
	RIC 937	5	*1.7*	0	*0.0*				
	All identified asses	299	*100.0*	60	*100.0*	46	*100.0*	295	*100.0*
Dupondii	RIC 930	3		4					
	RIC 932	3	*23.4*	6	*34.5*	25	*75.8*	1	*0.6*
	RIC 933	11		9					
	RIC 937 (dupondii)	5		0					
	All identified dupondii	94	*100.0*	55	*100.0*	33	*100.0*	170	*100.0*
FAUSTINA I (AP)									
AE2	RIC 1162	74	*56.5*	2	*10.0*	14	*63.3*	3	*1.5*
	All identified AE2	131	*100.0*	20	*100.0*	22	*100.0*	199	*100.0*
FAUSTINA II (AP)									
AE2	RIC 1395	33	*53.2*	6	*35.2*	8	*30.8*	2	*2.9*
	All identified AE2	62	*100.0*	17	*100.0*	26	*100.0*	68	*100.0*
MARCUS AURELIUS (AP)									
AE2	RIC 1317	12	*11.6*	1	*5.6*				
	RIC 1322	61	*59.2*	3	*16.7*	14	*77.7*	0	*0.0*
	All identified AE2	103	*100.0*	18	*100.0*	18	*100.0*	93	*100.0*

Note: Clay's (1988,223) correction to Walker's table (1988, 294 col 1) is wrong. Walker's figures are correct.

The Hadrianic and Antonine supply figures

With the identification of several issues which specifically circulated in Britain, Walker opened up the possibility of reconstructing *aes* supply figures for the province. The argument goes as follows: die link analysis can estimate the original number of coins of each issue minted. If a province specific issue represents a known proportion of site finds, and if its issue size can be established, then the two values can be used to calculate the total issue of that period. Walker did this for the Hadrianic and Antonine periods based on die link analyses of the issues referred to above.

In the following Walker's calculations are shown together with a recalculation on the basis of the site find database instead of the Bath coin list. The aim is to show the possible variation in Walker's results by using a different assemblage to scale up the die-link analysis figures.

Hadrianic period calculations:

Die study figures calculated using the value of 20,000 coins per obverse die:

Issue	Date	No. at Bath	Issue size	No. of coins represented by 1 coin at Bath
Hadrian's Britannia Asses	AD 128	39	352,000	9,025
Hadrian's Salus Asses	AD 128	52	823,400	15,834
Combined	AD 128	91	1,102,200	12,112

	at Bath	in Database
Fully identified Asses of Hadrian & Sabina:	221	53
Number of Britannia & Salus types	91	13
Proportion of Britannia & Salus types	41.18%	24.52%
If X % of the issues represent 1,102,200 coins in circulation in Britain, then all of Hadrian's issues amount to:	2,676,000 asses	4,495,000 asses

As can be seen the variation between the Bath list and the Site Find database is substantial. In order to gauge the credibility of these a third assemblage can be examined: that from Coventina's Well. This list contained about 54 to 117 identified *asses* . The range is due to the presence of 63 coins which may either have been *asses* or *dupondii* . Since 22 of them were Britannia and Salus types this means that the proportion represented by them was somewhere between 18.8% and 40.7%. Presumably the actual value is somewhere between the two. This is similar to the range given by the Bath and Database figures of 41.1% and 24.5%. So Walker's figure can be taken to represent a minimum figure for the number of Hadrianic *asses* sent to Britain (working on the assumption of 20,000 coins per obverse die).

Antonine period calculations:

Issue	Date	No. at Bath	Issue size	No. of coins represented by 1 coin at Bath
Antoninus Pius Dupondii	AD 153-155	69	409,000	5,927
Marcus Caesar Dupondii	AD 153-155	19	360,000	18,947
Antoninus Pius Asses	AD 153-155	219	1,756,000	8,018
Marcus Caesar Asses	AD 153-155	54	280,000	5,185
Faustina I AE2	AD 153-155	73	828,200	11,345
Faustina II (A.P.) AE2	AD 153-155	33	350,600	10,624
Combined	AD 153-155	467	3,563,600	7,630

ISSUES OF ANTONINUS PIUS	at Bath		in Database	
	Dupondii	Asses	Dupondii	Asses
Ratio of Dupondii to Asses (all British circulation coins)	97	370	19	39
If these represent 3,563,600 coins, then there are: (Y)	740,191	2,823,408	1,167,386	2,396,214
Total number of fully identified coins	214	514	68	103
Proportion of fully identified coins: (X)	45.32%	71.98%	27.94%	37.86%
If X % of the issues represent Y coins in circulation in Britain, then the total number in circulation = 100Y/X	1,632,998	3,922,247	4,178,013	6,328,462

Again the Site Find database assemblage suggests a higher figure than the Bath coin list, possibly of the order of doubling Walker's figures. It must be noted that the site find database represents a much smaller sample that the Bath list, however, it is not as obviously composed of deliberate votive offerings as the Bath deposit. It may be that some of the coins with 'British associations' were preferentially deposited at Bath. Such questions cannot be answered without the compilation of an even larger database of site finds.

The two sets of calculations above have estimated the number of Hadrianic *asses* , and Antonine *dupondii* and *asses* in circulation in Britain. Walker then extended these values to estimate the number of other denominations of each period:

NUMBER OF COINS IN CIRCULATION IN BRITAIN		Dupondii	Asses	Sestertii	TOTAL
Hadrian	Calculated figures (see above):		2,676,000		
	Proportion of denominations at Bath:	316	319	368	
	Estimated original population:	2,650,833		3,087,047	
	Valuation in sestertii:	1,325,416	669,000	3,087,047	c.5,080,000 HS
Antoninus Pius & family	Calculated figures (see above):	1,632,998	3,922,247		
	Total number of all dup. or sest. at Bath:	462		499	
	Estimated population of sestertii:			1,763,779	
	Values in sestertii:	816,494	980,561	1,763,779	c.3,560,000 HS

Note: The number of *sestertii* is estimated by using the ratio of *dupondii* at Bath to their proposed number in circulation. Therefore (1,632,998 x 499)/462=1,763,779

The figures achieved by Walker may have to be scaled upwards, however, the broad result that the Hadrianic input of *aes* coinage was larger than the early Antonine input should be accepted; especially considering Antoninus Pius' reign was slightly longer.

Walker went on to look at the proportion of Hadrianic and early Antonine coins in hoards to estimate the total coin population in Britain, however, since the bronze hoards are of various denominations and the estimated issue sizes already subject to huge margins of variation this will not be pursued, except to say that his ranges of the order of magnitude may similarly have to be increased from 10-15 million HS to 10-30 million HS in the late first century.

4.22 The supply of *sestertii* : method I

The question of the supply level of *aes* to Britain will now be tackled in a different manner, by using the same model established in section 3.2. The results will then be compared with Walker's analysis and other data (Section 4.23).

With *aes* in Britain we have three principle denominations, *asses* , *dupondii* and *sestertii* . In order to create a model for the supply of each of these to Britain it is necessary first to construct a cumulative composition curve showing the changing composition of hoards from the mid first century through to the late third.

The details of the composition of *aes* hoards are given in appendix 2.24. Unfortunately only the brass *sestertius* provided enough sample hoards to give a systematic picture. Figs. 43.04-06 show the construction of this curve with two example cumulative composition curves and the over-all picture. The data for fig. 42.06 is provided in Appendix 4.21. This picture has then been combined with the *sestertius* data from the site find database in the same way as the *denarius* bench-mark and site find data were

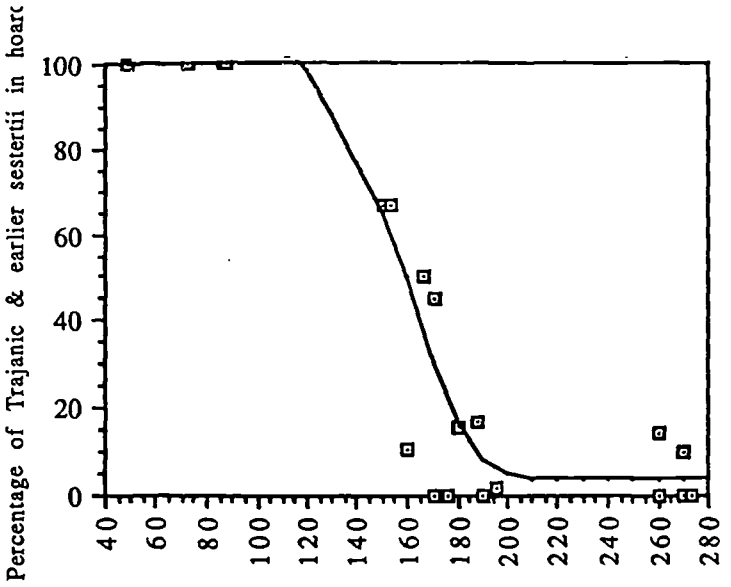


Fig 42.04 The proportion of *sestertii* up until Trajan in British bronze hoards

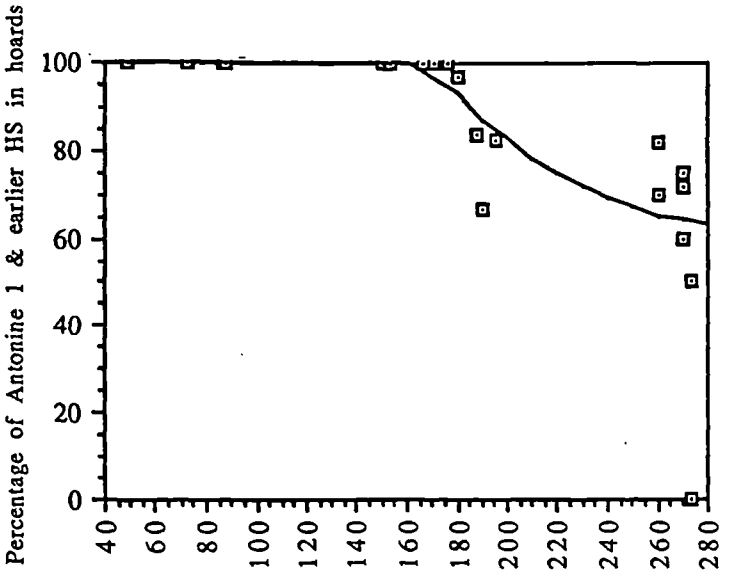


Fig 42.05 The proportion of *sestertii* up until Antonine 1 in British bronze hoards

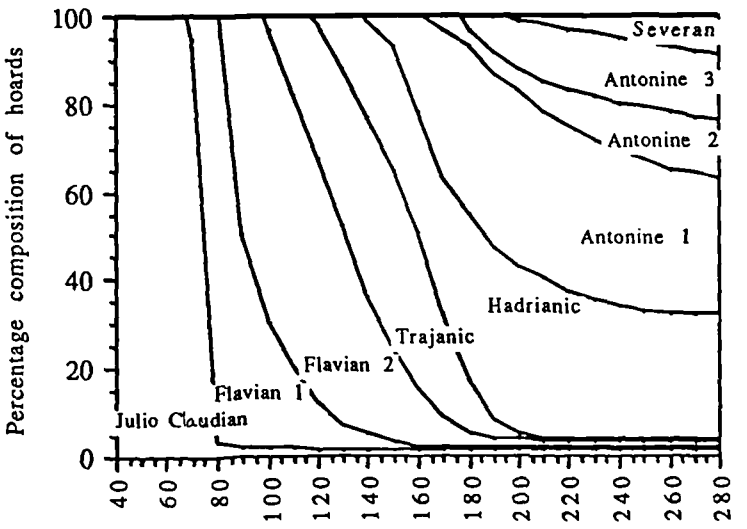


Fig 42.06 The make-up of the *sestertius* supply pool

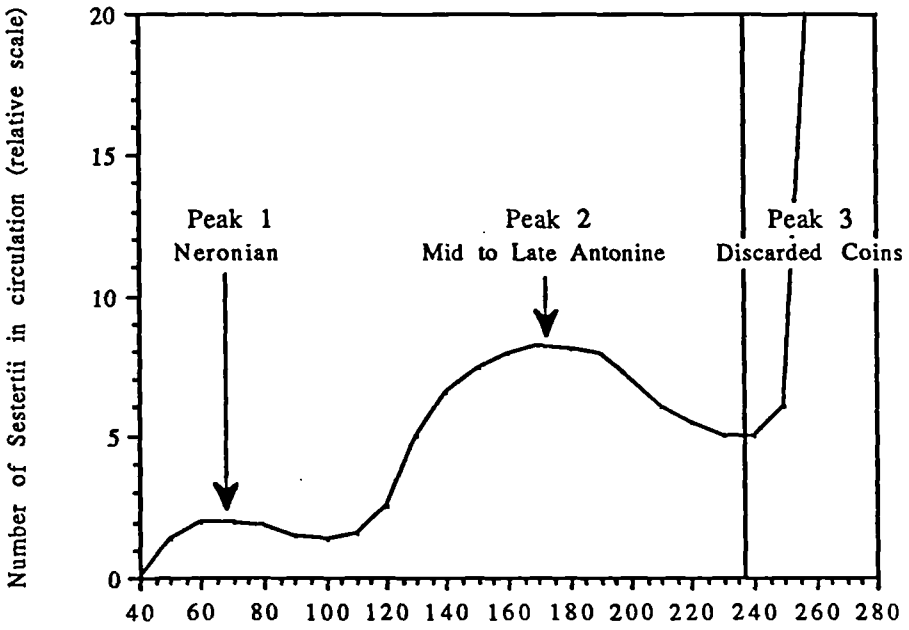


Fig 42.07 *Sestertius* supply curve I

combined (Section 3.3). However, since the number of *sestertius* hoards was relatively small, instead of calculating a curve at five year intervals, 10 year intervals have been used. The result is provided in fig. 42.07, the data for the shape and the site find database input values are provided in appendix 4.22.

The model is much coarser than the previous one for the *denarii* due to the lesser quality of the hoard data. The principle features are as follows:

1. A peak in the Neronian/Early Flavian period

2. A second peak reaching its zenith c. AD 170.

3. A third peak in the late third century, much higher than all the others.

The first peak tallies with the suggestion that the Bath report had under-represented the number of Julio-Claudian and early Flavian coins.

The second peak is the result of a continued increase in the number of *sestertii* around from the start of the second century until Marcus Aurelius. This is when we have at our disposal Walker' estimates for the number of new issues arriving in the province. He suggested that 3,087,047 HS arrived under Hadrian (= c.147,000 HS p.a.) whilst 1,763,779 HS arrived under Antoninus Pius (= c. 76,000 HS p.a.). This suggests that during the reign of Hadrian (117-138) the rate of increase in the *sestertius* circulation pool should be about double that in the Early Antonine Period (138-161). This is indeed the case. Walker's die link study therefore provides some corroboration for this part of the curve.

The third peak is rather a different matter. This takes place after *sestertii* ceased to be sent to the province, and yet the model demands some reason for the increased deposition of old *sestertii* in the late third century. The answer probably lies in the context of the collapse of the *denarius* monetary system in the third quarter of the third century. Along with the collapse of a monetary system comes the possibility of the deliberate discard of now worthless coin. This is how this peak should be seen, rather than a reflection of the total number of *sestertii* in circulation. A second context for their discard may have been the monetary reforms of Postumus (259-268) who issued very large numbers of new sestertii in Gaul, though few were ever to reach Britain (Bastien 1967). Perhaps some enactment of his may have demonetised these earlier *sestertii* resulting in their deposition on sites.

4.23 The supply of *sestertii* : method II

When dealing with bronze coin rather than silver or gold, another means lays at our disposal to try and reconstruct supply figures, or at least a relative idea as to how supply levels fluctuated. When gold and silver coins went out of circulation we may assume some were lost whilst the majority would have been melted down, either by the issuing authority recycling coin or else by individuals. With *sestertii* , however, what would be the consequences of assuming that all these coins were lost from circulation and none were recycled or deliberately discarded? The assumption is flawed since many *sestertii* were probably deposited in the third century when the monetary system fell apart, or else recoined as Barbarous Radiates. However, as an exercise it is worth pursuing.

If all *sestertii* were 'lost' from circulation, then the total number of site finds should accurately reflect the number of coins originally in circulation. We can use this idea to model the number of *sestertii* of an emperor (eg. Hadrian) in circulation at any one time. There were 234 HS of Hadrian recorded in the database. We can make two working assumptions: first that most of these would have come into circulation during his lifetime, and secondly that their issue was spread out evenly throughout his reign. These assumptions are almost certainly not true, however, the kind of broad changes being investigated here are of a slightly larger magnitude than the length of a single emperor's reign, so these need not worry us too much. Fig. 42.08 (Curve A) shows the number of these coins steadily increasing as they are issued from the mint, from zero at the start of his reign to 234 by his death. Thereafter the number declines as they start to get lost. Here an arbitrary wastage figure has been set at 2% of the coin stock p.a.. Of course this is not strictly accurate, coins would have started to be lost immediately after the first issue, not after the end of the final release. So curve B shows this factor taken into account as well. So we can model the number of *sestertii* of a given emperor in circulation given an assumed wastage rate. The wastage rate may be modified, and the same example is repeated in Fig 42.09 at rates of 2% and 4% p.a..

By doing this for all the *sestertius* issues found in Britain we can add them all up and come to a hypothetical *sestertius* supply curve, or rather a series of them depending upon which wastage rate seems most likely or acceptable (figs 42.10 & 42.11; Appendix 4.23).

The most notable features in these curves are the repeat as before of the mid second century peak, and at wastage rates of 8% and above the appearance of a second peak very shortly after the Roman conquest of the south-east. This compares favourably with the peaks suggested by the first method used in section 4.22.

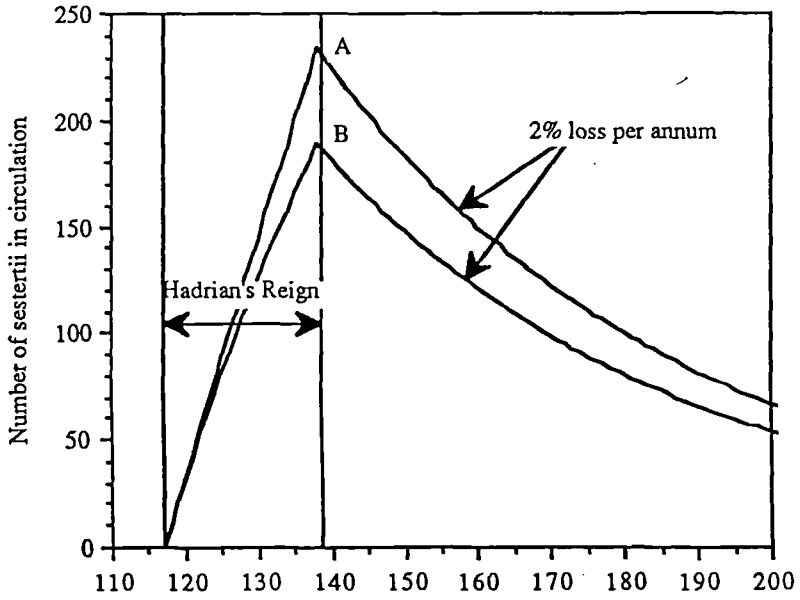


Fig 42.08 A Model of Hadrianic *sestertii* wastage rates

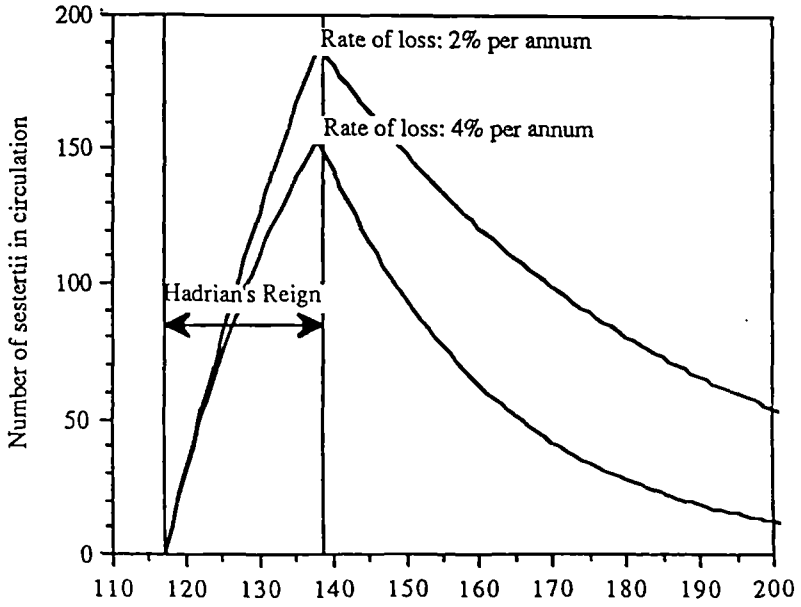


Fig 42.09 A Model of Hadrianic *sestertii* wastage rates (2% & 4% p.a.)

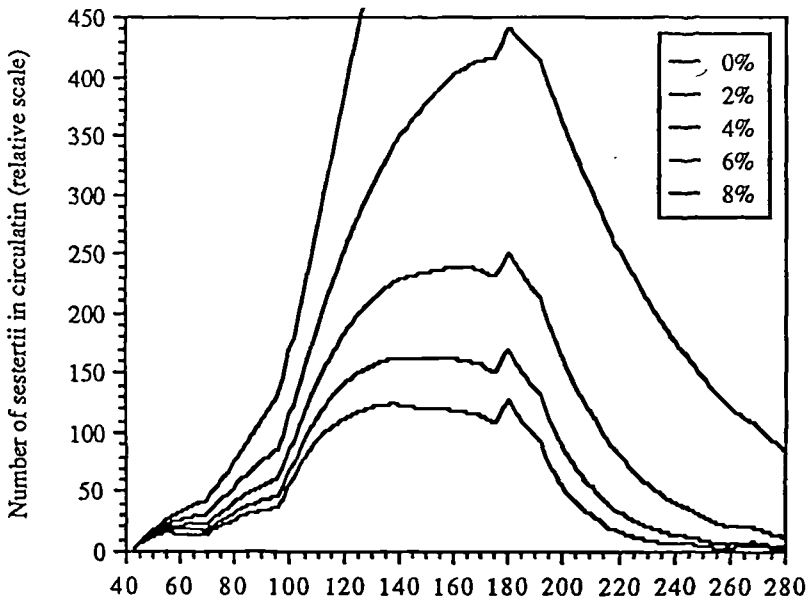


Fig 42.10 *Sestertius* supply curve II: Wastage rates 0-8% p.a.

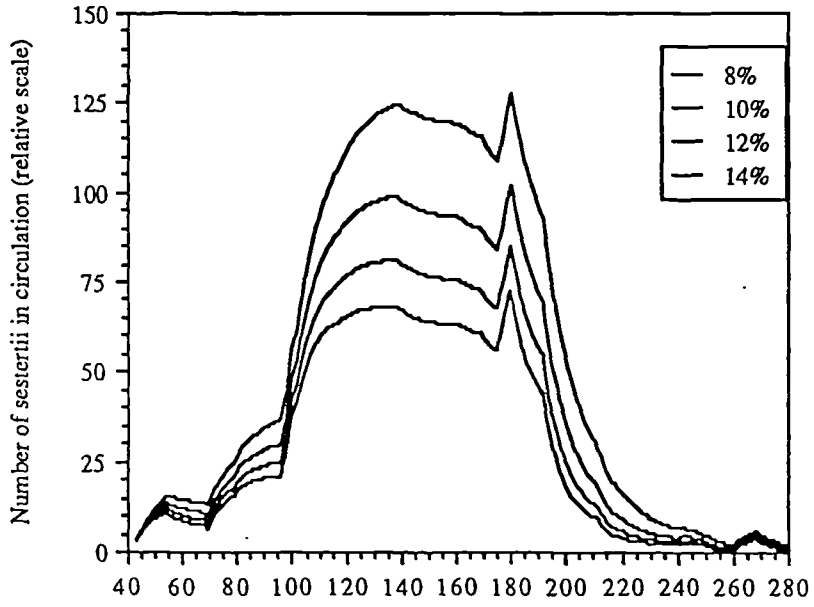


Fig 42.11 *Sestertius* supply curve II: wastage rates 8-14% p.a.

4.24 The hoarding of bronze in Britain

The first *sestertius* supply curves could be corroborated during the first half of the second century by David Walker's results. The final peak was also explicable in terms of the decline of the *denarius* monetary system and the deliberate discard of the coin. However, no supporting evidence has yet been advanced for the early peak apart from its reappearance using a slightly different method to reconstruct supply figures. However, support can be found by a different kind of analysis of coin hoards.

By a cursory look at comparative material, Britain appears to have far fewer bronze and mixed hoards than can be found in France and elsewhere in the empire. Whilst this might be a function of the degree of development of the LPRIA societies at the time of the Roman conquest (cf Section 4.1), it might also be due to a problem of supply to the province. In order to investigate this matter all the hoards in the corpus were divided into three categories: those containing only precious metal coins, those containing only *aes* coins, and those containing a mixture (in whatever proportions). These were divided up into ten year blocks depending upon their latest coin (Appendix 4.24). The resulting pattern is shown in fig. 42.12. On the left are shown the total number of hoards, whilst on the right the same data is shown as a proportion of all hoards in that ten year block.

The important features of the pattern are that during the main lifetime of *aes* in Britain, *aes* only and mixed hoards were most frequent in the AD 40-80s and the 140-190s. There are troughs around the turn of the first second century and in the early third century. This pattern matches directly the proposed *sestertius* supply curve.

It is concluded that the occurrence of *aes* and mixed currency hoards goes some way to substantiating the *sestertius* supply curve generated in section 4.22. *Aes* and mixed currency hoards were most commonly assembled when *aes* formed a larger part of the circulation pool from which to draw it.

4.25 Multi-metallic systems

The discussion of mixed hoards leads us onto the question of multi-metallic coinage systems. In the LPRIA the earliest coinages were in precious metals, followed by potin and bronze. Each has been argued to have a specific function, partly revealed in the differences in the distribution pattern of each. Gold may have been used for intertribal exchanges, with limited other functions, whilst potin may or may not have been 'special purpose money' for circulation within the tribal area in different forms of transactions

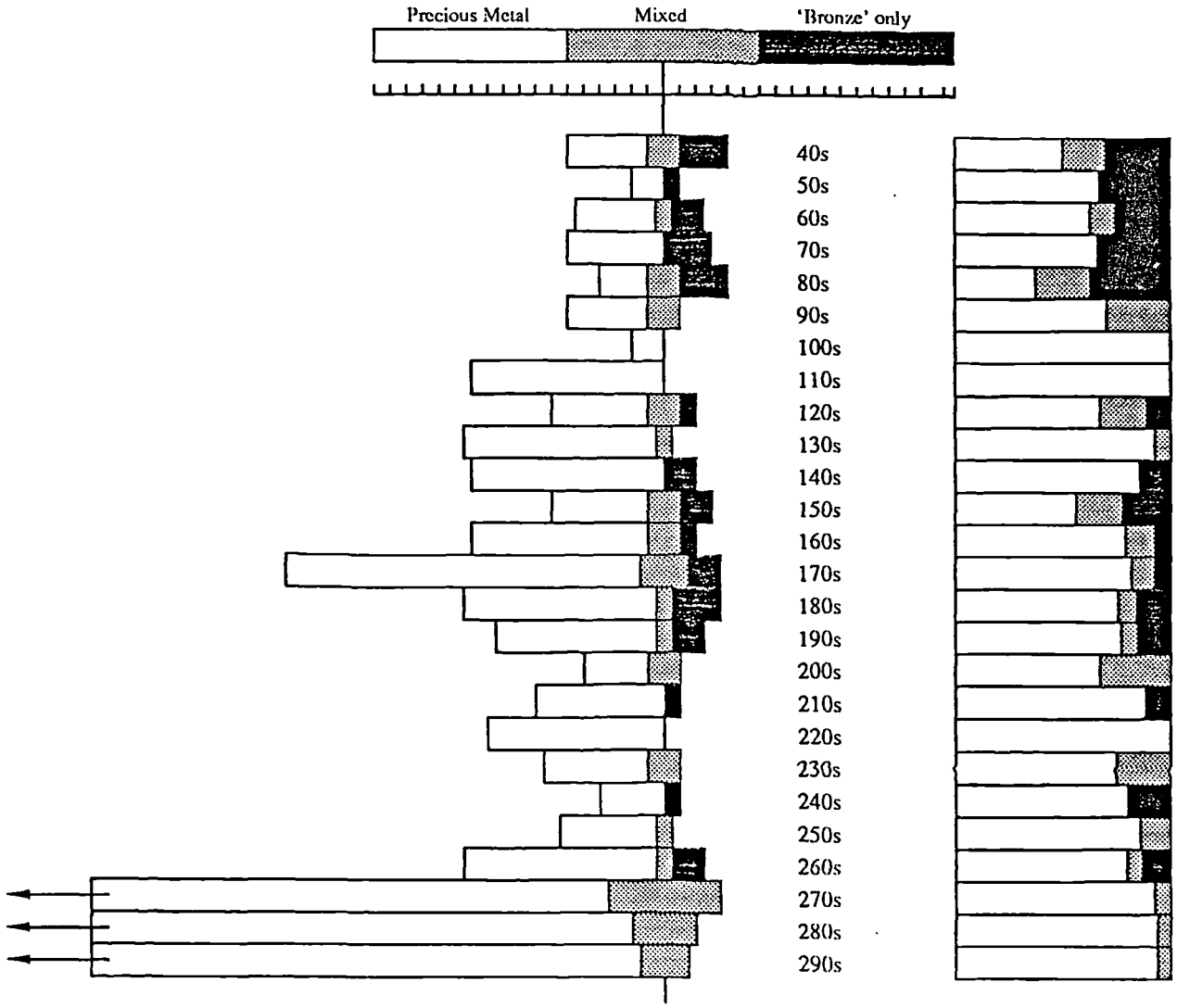


Fig 42.12 The hoarding of bronze and silver

(Haselgrove 1979, 207). The precise nature of these different functions may be difficult to reconstruct, but that there were such divisions has been generally agreed.

In contrast the Roman monetary system in the late Republic and Early Empire has usually been discussed in terms of a unified system, illustrated in the Augustan reforms, despite the origins and subsequent development of Roman coinage. In origin the use of silver and bronze was quite different. Silver developed from the usage of the cities of Magna Graecia, possibly largely to pay mercenaries and transactions with other cities; whereas Roman Bronze currency developed from the totally different origins of *Aes Grave* and *Aes Signatum.* Only in the third century BC did these elements start to come together with the establishment of theoretical numerical relationships between the two (Burnett 1987). Similarly 4th century AD coinage is typified by a division between bronze/billon coinage and precious metal coin. Precious metal was the coin of state payments and taxation, whilst bronze coinage was the coin of the market. Nonetheless despite a functional difference the two had at various points fixed relationships to each other.

The origins and subsequent history of Roman coinage show how one might still have dual systems running within what might superficially appear to be a unified currency system. So how unified was the Augustan system ? We know that in the Hadrianic period *denarii* and bronze issues were certainly not circulating in a rigid system of 16 *asses* to the *denarius* . In Pergamum a judgement is recorded in an inscription which tells us *denarii* were bought and sold by money-changers for 17 and 18 *asses* respectively, and that transactions on the fish stall had to take place in bronze coin or else a surcharge would be demanded (Burnett 1987, 102). If the values had been just above and below the notional value of 16 *asses* then this would tell us nothing more than the money-changers were charging a commission on the exchanges. However, they are not. Unless the local relationship between *asses* and *denarii* is of the order of 17.5:1 then the money-changers would be making a loss on one transaction or other, and this would be most out of character. Even if this inscription refers only to the autonomous bronze coinage of Pergamum it shows flexibility within what on the surface would appear to be fixed denominational relationships.

If market transactions had to take place in *aes* , then this effectively acted like a sales tax. All transfers between the precious metal (the medium of the storage of wealth) and bronze coin (the medium of the market place) would have taken place with the assistance of a money-changer, profits being accrued on each transaction.

> "A commission was made on these exchanges, as it is by banks today. The profit made in this way, however, did not just benefit private corporations, since the moneychangers operated under official control and

> either purchased the right to their position or passed on their profits to the licensor (normally the city in which they operated). A commission was also charged on their other main activity, changing coins from one metal into those of another, and the profit made on such transactions was a constant source of aggravation."
>
> (Burnett 1987, 102)

If this did happen everywhere it might help explain two phenomena. First, if bronze was the coinage of the market place, whilst stored wealth was usually kept in silver and gold, it explains why in the first to third century there is relatively less bronze coin found on rural sites in Britain. Precious metal coinage would only be converted into bronze coin when transactions at the market were called for. Similarly profits from trading in the town may have been converted back to the medium of storage, *denarii* , before returning to the countryside.

Secondly, if this dual system provided a revenue for the local administration, then the decline of the use of bronze due to the debasement of the *denarius* and *antoninianus* may have resulted in a decline in income of the *civitates* . A uni-metallic system would derive no such income for the towns of the provinces. This may have been an additional factor in the Empire as to why the investment in and maintenance of public buildings declined from the late second century onwards, and why the state increasingly needed to send in *curatores* to sort out city finances (Garnsey & Saller 1987, 34). If Blagg's (1990) interpretation of the building inscriptions from the NW provinces is correct then munificence in Britain relied far more upon the civitas as a corporate institution than on individuals competing for civic office. So if civic income fell due to the decline of money-changing then so may have its capacity to maintain public buildings; but of course this is entirely wild speculation.

4.3 The debasement of the *denarius*

4.31 The classical view
4.32 The reality of the circulation pool
4.33 Testing the model
4.34 Bullion supplies and quality control
4.35 Debasement and the velocity of circulation

Prevailing views of the concept of debasement are discussed (4.31). A study then relates the amount of silver circulating in the currency pool to the issuing standard at the mint (4.32-33). Variability in the quality of newly issued denarii is discussed in relation to bullion supplies and quality control (4.34), and finally a primary link between the rate of wear of the denarius in circulation and its debasement is made (4.35).

4.31 The classical view

Not only was the structure of the circulation pool ever changing, but so was the composition of the *denarius* itself. The fact that the *denarius* was debased has arisen many times in the preceding discussion, but here I wish to question exactly what debasement was and what it meant to imperial finance; the simple answer - a nice healthy profit - is surprisingly not the one concluded. In the Republic and early Augustan period the *denarius* was made of good silver, over 96% fine. This high value had remained remarkably constant for a long time. The analyses of Republican coins from the mid second century BC to P. Clodius (42 BC) all have a correspondingly high value. Only with Mark Antony did standards slip significantly (Crawford 1974). The first substantial debasement came with Nero's reforms, followed progressively more frequently by further adjustments until the coin contained less than 50% silver and was supplemented by, and eventually replaced by the *antoninianus* .

The broadest work quantifying this process are Walker's metallurgical analyses (1976, 1977, 1978). A summary of his results is provided in Appendix 4.31. The two principle variables he established were the silver content from XRF analysis (which suffer from some unsystematic errors, though the broad picture can be accepted) and a guide to the weight of the coins. Walker interpreted the evidence as a step-wise series of carefully controlled reductions (raw data: fig 43.01; Walker's interpretation: fig. 43.11). However, we must remember that this is only one of the possible interpretations of the data. Certainly the weight of silver in the coins fell, but an examination of the single standard deviation error bars suggests that the real picture might have been a bit more blurred than Walker's interpretation suggests. These error bars only represent variation due to the alloy content, if the variation due to the weight of the newly minted coins were also taken into account as well the error bars would be even wider. Even so, the more prominent reforms such as the debasement by Nero, and Domitian and

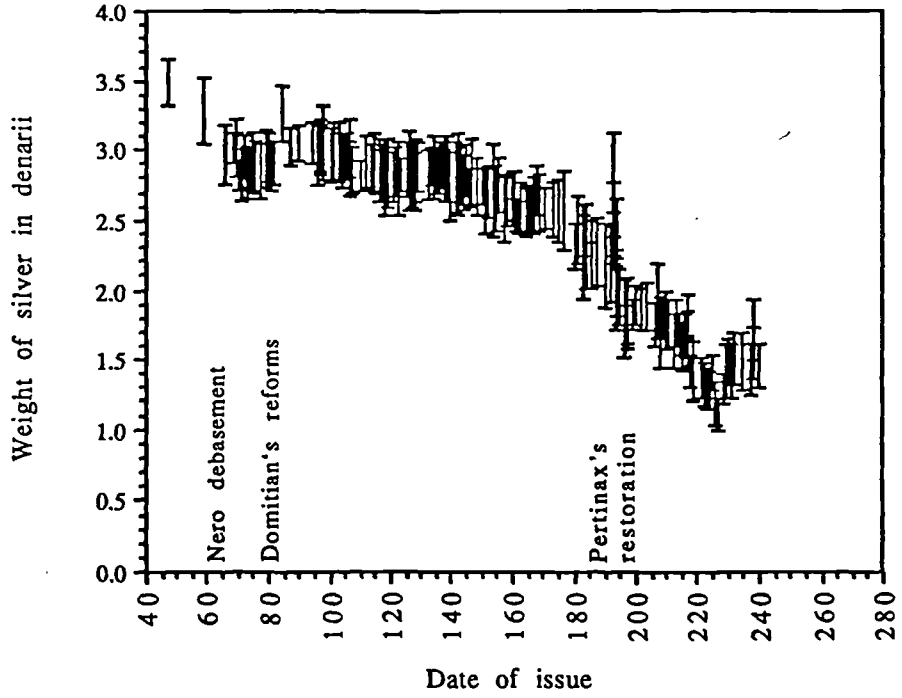


Fig. 43.01 The metrology of *denarii*: silver content

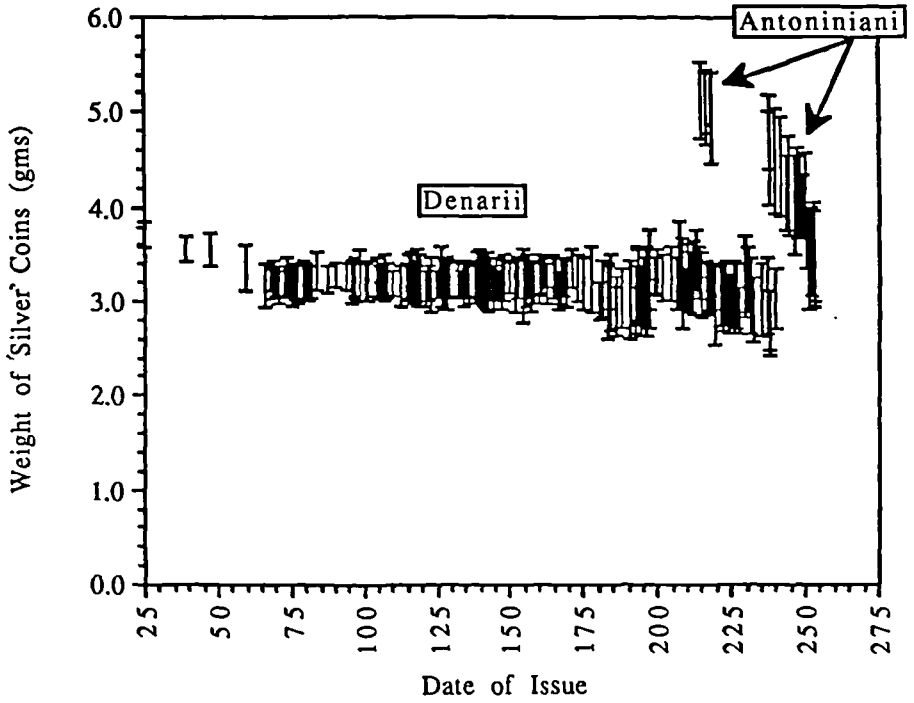


Fig. 43.02 The metrology of *denarii*: weight

Pertinax's short lived improvements, show themselves clearly. The weights (as far as the original minting weightscan be assessed) on the other hand, appear to be maintained quite well, though a slight decline in the late second to early third century can be noted (fig 43.02), however, again this change is well within the one standard deviation margin of error.

Walker (1978) interpreted the pattern in the light of the perceived fiscal policies of each emperor, described in terms of *avaritia, liberalitas* and *parsimonia* ; greed, generosity and frugality. Where as more money could always be raised by taxation or the confiscation of property, this was unlikely to make an emperor friends:

> "The anxiety which every emperor felt to be able to spend money freely without having to increase taxation (therefore not only displaying *avaritia* but also, on a more realistic level, risking unpopularity with the groups taxed) made debasement of the coinage a particularly attractive way of increasing imperial spending power, while avoiding criticism. ...debasement took place almost invariably with this end in view..."
> (Walker 1978, 109)

The assumption has always been that debasement made a short term profit for the mint: "Quite simply, old *denarii* collected in taxes could be melted down to make a larger number of new, less pure, coins, which would go further for paying the army and civil service." (Greene 1986, 61). This belief however requires testing; debasement need not have made a profit at all.

4.32 The reality of the circulation pool

At this point I want to turn away from the historical interpretation of the data and examine some of the basic ideas underpining our concept of debasement. To do this a simple model of the circulation and reminting of coin is put forward. Then slowly other variables are taken into consideration leading to complications in the picture. This model examines the implications of the recycling of coin, the degree to which this actually took pace will be discussed at the end.

Reminting silver: the ideal cycle (fig. 43.03)

In the simplest of all worlds *denarii* would be issued at a set weight, containing a certain quantity of silver. If the old Emperor died the new one might wish to see new *denarii* issued with his face on them, instead of that of his predecessor. 100 *denarii* are called in to be reminted and 100 new ones produced, at the original weight, with the same amount of silver in them. Here reminting is simply a symbolic and political expediency, spreading the image of the new emperor to all his people. Otherwise reminting has no function. No profit is gained. In fact it costs the emperor money for

all the labour involved. This of course is not a real situation, but it serves to introduce one to the more developed models put forward below.

Reminting silver: the classical model (fig. 43.04)

Now let us turn to look at the classical view of debasement. The idea is that by adulterating the alloy with a supplement of base metal it would be possible to make the silver at one's disposal go further, thereby producing more coins but of a lower standard. If 100 coins of one silver content were called in and 110 produced, this would make a short term profit of 10 *denarii* per 100 recycled so long as the public accepted the coin. Such dilution of an alloy by recycling has been demonstrated in other coins such as *sestertii* (cf. Étienne, Rachet et al, La Trésor de Garonne, 1984).

Reminting silver: the effect of coin wear

Unfortunately this model lacks a fundamental variable which needs to be added into the equation: coin wear. The coins which came back into the mint were much lighter than when they had left many years before. This we established in section 2.3. This means that if 100 worn coins come in from circulation, then unless any further metal is added to the melting pot it would be impossible to create 100 new coins of the same weight. So unless the alloy is tinkered with the mint will slowly produce fewer and fewer coins and therefore make a loss. This is demonstrated in fig. 43.05. This cycle can be used to explain why Republican coinage was rarely minted during the later Republic:

> "Why would the Roman mint systematically take in partly worn old coins, of almost pure silver, and remint heavier newer coins of the same purity ? By doing this, the mint would shoulder all the cost of wear and of reminting. The answer depends partly on the fiduciary element in the currency, on how far the coins were valued above their silver content, and on the availability of silver bullion"
>
> (Hopkins 1980, 107 note 19)

Reminting silver: composite model, debasement by default (fig. 43.06)

The alternative to adding bullion is to make up the weight lost due to wear, is to make up the deficiency with base metal. The philosophy behind this would be that maintaining the weight of the coin retained its credibility more than lowering its weight while maintaining the alloy standard. It is easy to tell if a coin is under-weight, it is not so easy to tell if a coin has 87% silver or 86% silver. Here the coin could be recycled without making a loss, but a consequence would be a decline in the silver standard.

The main point of this exploration is to show that because silver was lost in the circulation pool due to coin wear, if they were called in and reminted then debasement would be an inevitable result, unless the mint were to make a loss. These considerations also suggest the rate of debasement might be directly related to the degree of wear

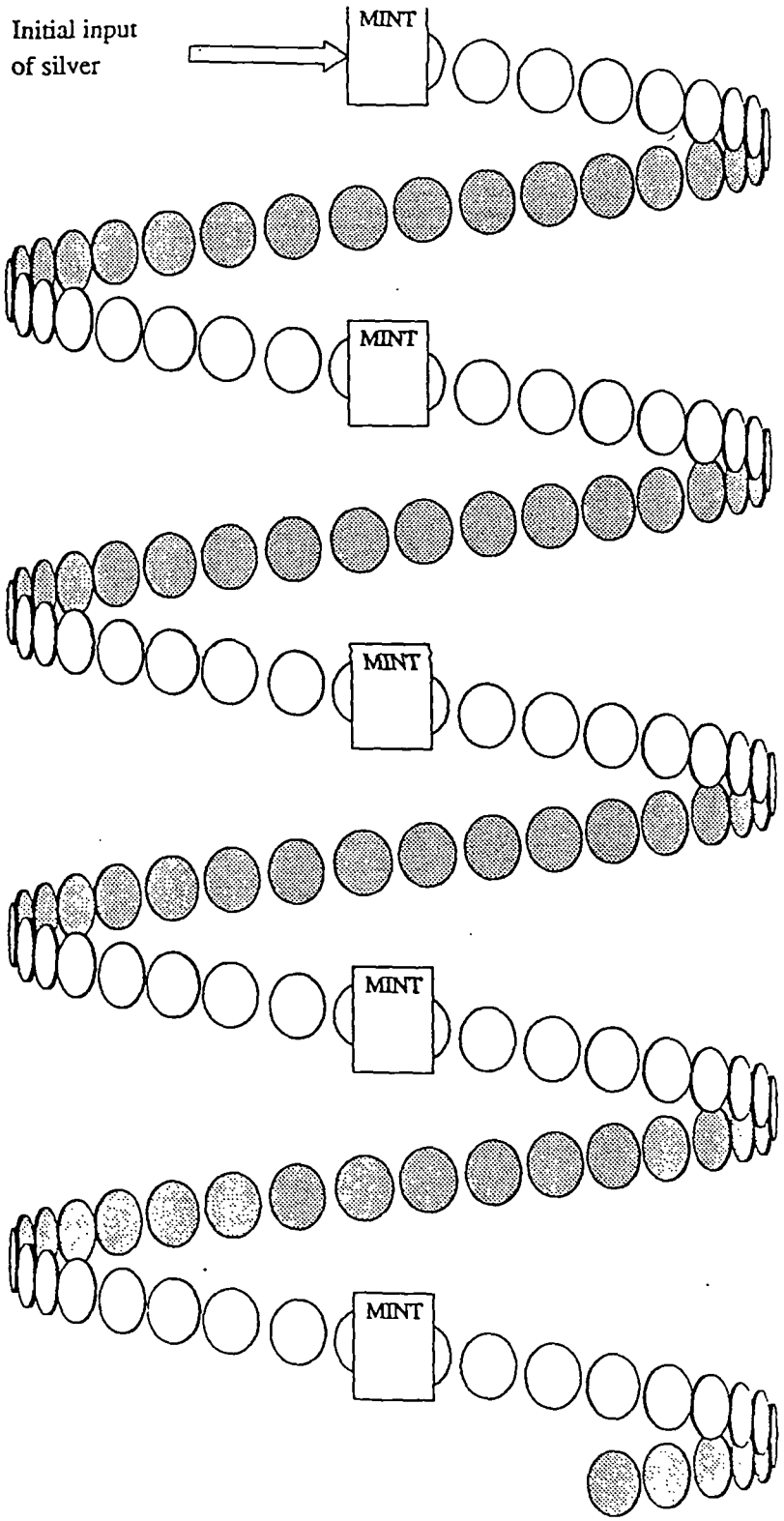


Fig. 43.03 Reminting silver: theoretical model

The original silver standard and weight are manitained. Coins withdrawn from circulation are totally unworn. There is no loss of silver in the minting process.

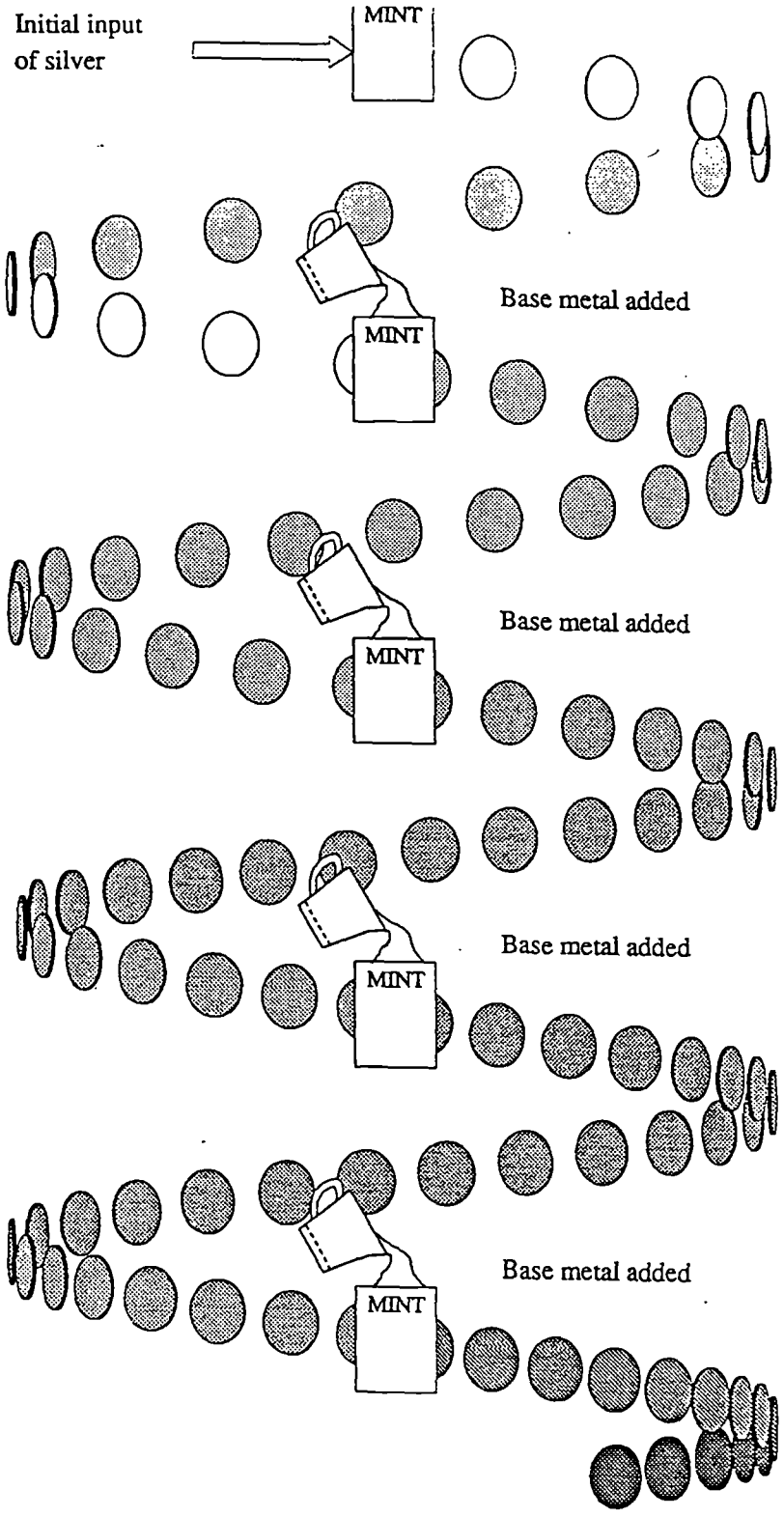


Fig. 43.04 Reminting silver: classical model

The coins called into the mint are melted down and base metal is added so that additional coins can be produced while still maintaining the full weight standard. This means the mint makes a profit.

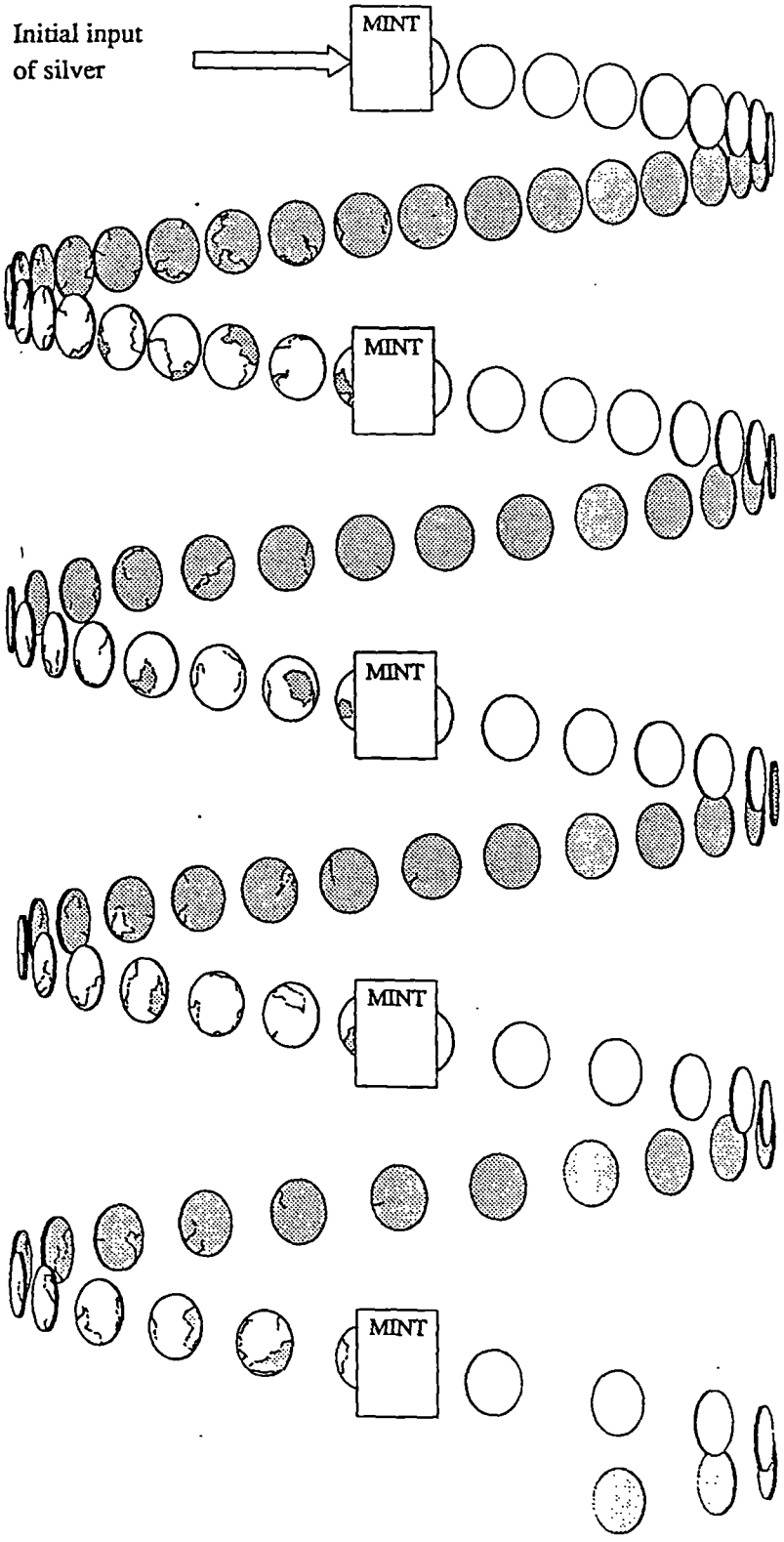


Fig. 43.05 Reminting silver: the effect of coin wear

The original silver standard and weight are maintained. However, because the old coin comes in under weight, fewer coins can be minted than are received. Therefore the mint makes a loss.

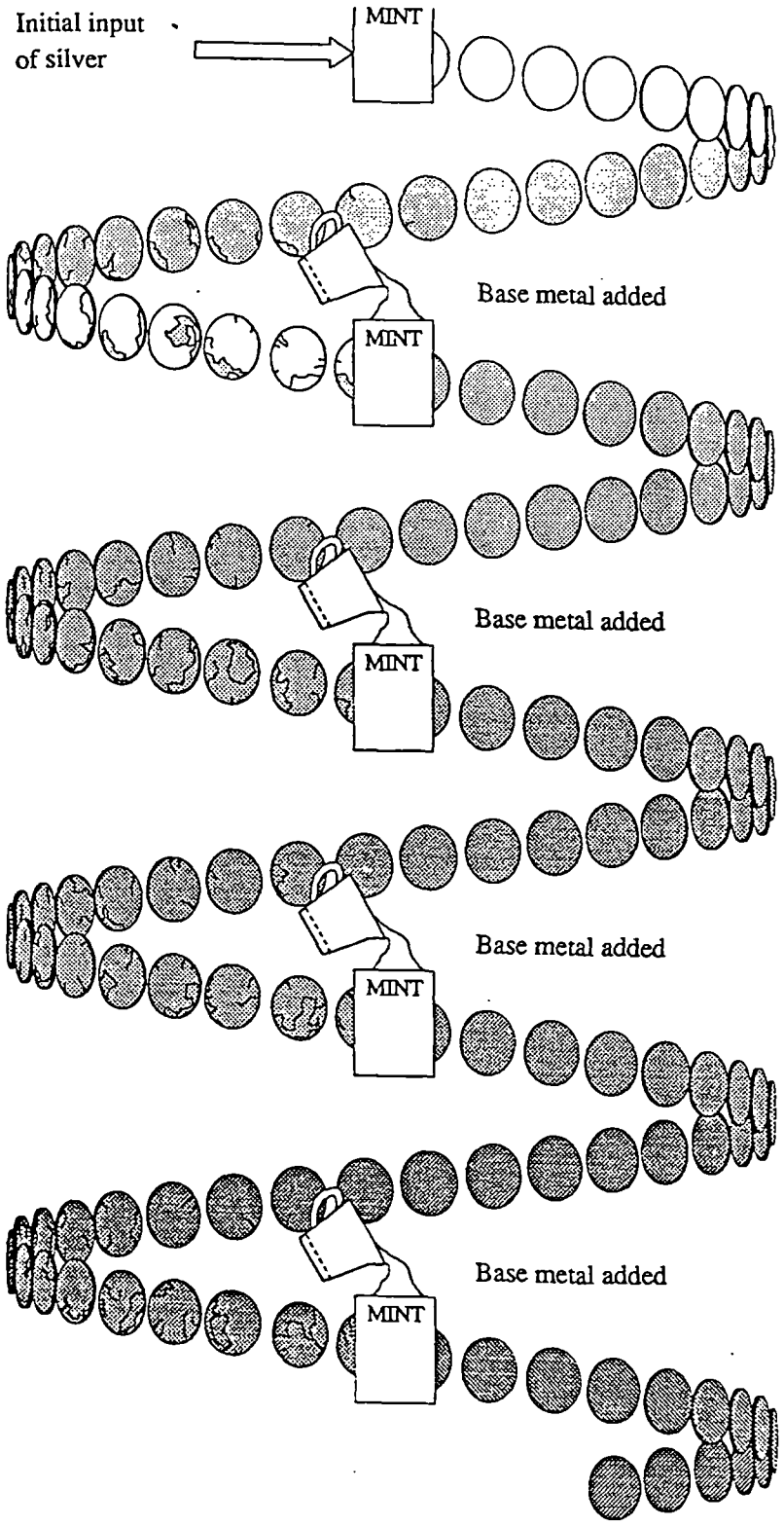


Fig. 43.06 Reminting silver: composite model - debasement by default

For every ten coins into the mint, ten are produced at the original weight standard. However, because of their worn state an additional metal supplement must be added to maintain the weight standard. This has the net effect of debasing the coinage.

taking place on *denarii* , all other things being equal. The reason why debasement only started in the very late republic is that until then coin was probably not recalled and reminted. This model *need not* mean the silver content of the newly issued *denarii* was not very carefully monitored and debasement took place in a controlled step-wise fashion; but it *does* run counter to the idea that debasement need have made a large profit for the exchequer.

4.33 Testing the model

How can this idea be tested? The theory predicts the following: if debasement was only the result of coin wear and not profit making, then the silver content of any new *denarii* from the mint at any date should be on average the same as that recovered by melting down a random sample of coins from the circulation pool in their various states of wear. What we need to do is establish values for these two variables. If similar then it would suggest that the hypothesis has some mileage in it.

We know the minting standards from David Walker's work (Appendix 4.31) so we have one of our curves. It is also possible to reconstruct the effect of melting down what is in the circulation pool. To start with we have quantified by our bench-mark the make-up of the mixed circulation pool (Appendix 2.42). We also know the percentage silver in each of those issues and their initial minting weight (Appendix 4.31). We have also calculated the rate of wear on these issues (Appendix 2.32). All this information combined together can tell us exactly how much silver would be recovered by melting down what was in circulation in Britain at any particular date.

The full calculations are given in Appendix 4.32. First the minting weights of each coin series are taken, these are then reduced by the rate of wear set for that particular date. This tells us the weight of any particular coin series at any particular date (Table 2). Then these values are multiplied by the percentage silver content of their respective issues and divided by 100. This tells us the weight of silver in a coin of any particular series at any particular date (Table 3). Finally these values are then added up in proportion to the number of coins of each series in circulation at any specified date (Table 4), to give us a value for the average silver content of a coin in circulation then. This is shown in fig. 43.07.

As can be seen the issuing standard of the day is more or less equal to the melt down content of worn *denarii* already in circulation. The correlation is fairly good. The most systematic deviation is from 150 onward where the mint appears to be producing relatively slightly more debased coins. So one could suggest that from this date debasement *may* have made a profit. However, compare the illustration with the error

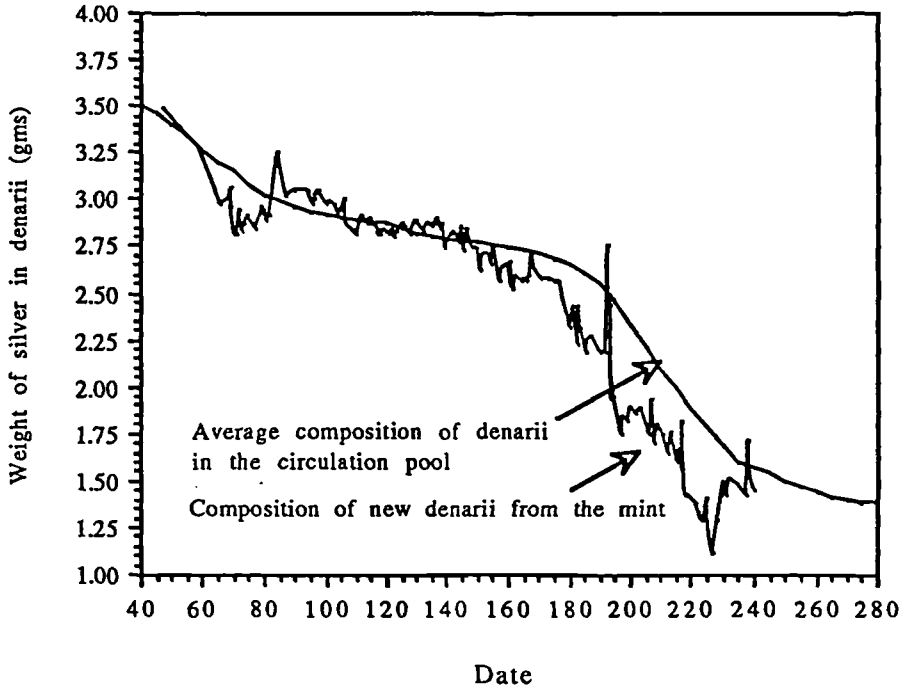


Fig. 43.07 The silver content of *denarii* from the mint and that of the circulation pool

bars in fig. 43.01 and the deviation appears to be much less significant than the variation in the composition in the *denarii* themselves.

4.34 Bullion Supplies and quality control

The alternative source of silver to recycled *denarii* is bullion. Even if bullion did make up a substantial volume of the silver supply for the new coin issued, it is unlikely that any issuing authority would have minted coins at a substantially higher silver content than their worn circulating counterparts. Had they done so it would have disappeared from circulation fairly rapidly. Such a problem was experienced by Domitian's early issues, where he 'improved' the minting standard briefly (Carradice 1983). Indeed Carradice specifically suggests that bullion was used for these higher silver standard coins:

> "...the increased standard of [Domitian's] silver cannot simply be explained as the result of a re-coining of earlier (Eg. Augustan) *denarii* of high fineness, because the consistency of fineness revealed by all pieces clearly denotes a coining of refined bullion."
>
> (Carradice 1983, 160)

The idea implicit in this statement is that we can tell the difference between periods of bullion dominating the mint supply and re-cycled coin being used by looking at the variation in the alloy of each issue. First one would need to establish how the consistency of the alloy varied, then this pattern would need to be cross checked against periods when bullion was known to be in large supply at Rome.

The figures for the variation in alloy composition again come from Walker's work (Appendix 4.31). The data are plotted in fig. 43.08. The consistency of Domitian's *denarii* can be seen to be substantially greater than in either the preceding or following period, and only matched by the issues of the Julio-Claudians. Otherwise the consistency of the alloy appears to deteriorate throughout the second and early third century, with perhaps signs of a marginal improvement during the 170-80s. Following Carradice's idea this might suggest that up until the Civil War there was a reasonable bullion supply, and as in the Republican period, most coin was adding to the circulation pool rather than recycling it. However, does this pattern relate to what we know of the dating of silver mines in the Empire?

The mines from around Carthago Nova in Spain were exploited by the Romans from the Republican period into the Empire (with a brief interruption during the civil wars), though work seems to have ended at the end of the second century (Keay 1988, 63). A similar pattern is suggested for the mines of the Sierra Morena. The mines of Río Tinto gained especial importance from the Flavian period, but production appears to have been disrupted late in the second century.

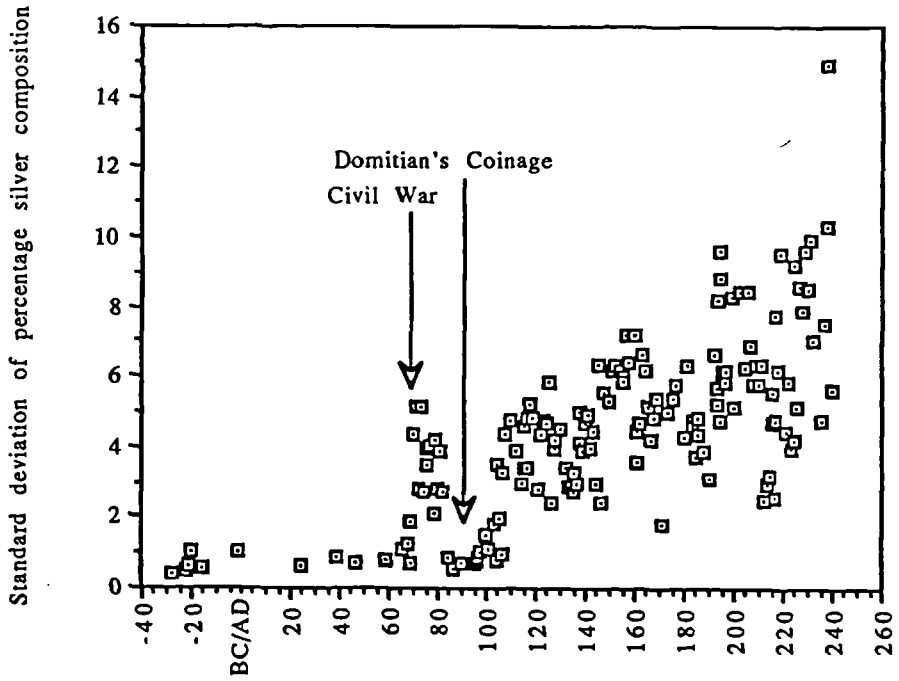


Fig. 43.08 The variability in *denarius* alloy composition over time

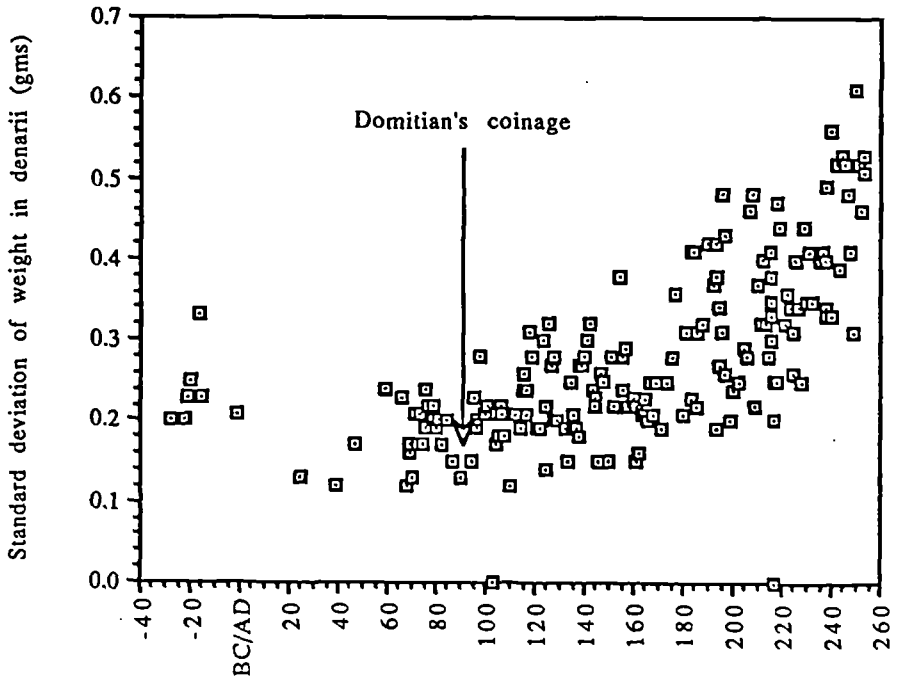


Fig. 43.09 The variability in *denarius* weight standard over time

In Upper Moesia, the lead-silver mines are thought to have been opened up by Trajan, and extended in the late Hadrianic to Antonine period. The Aeliana and Aureliana mines are probably Hadrianic, the latter name possibly relating to the young Caesar Marcus Aurelius in the last year of Hadrian's reign or possibly later. Certainly it was Marcus Aurelius who had the mines opened on Mount Kosmaj near the frontier; these were thought to be particularly profitable. This evidence suggests an early Antonine expansion of bullion going to Rome. But to judge by the associated settlements, the period of greatest prosperity around the mines came a little later under the Severi (Mócsy 1974, 133-4, 216). In Dalmatia the principle lead-silver mining area was Domavia in the Drina Valley which was certainly active in the late second century, though Wilkes (1969) provides little dating evidence.

It is difficult to draw from this any quantified conclusions about silver mining in the Roman world, however it would appear unlikely that there was a decline in the Trajanic to Antonine period. However, this is the time at which the consistency of *denarii* starts to deteriorate again. It seems that a simple equation of bullion supply against coin recycling is impossible to establish from this kind of analysis. Perhaps too complicated a picture is being forced on the data. The real answer may be that throughout the second and third century the mint simply took less care over the production of *denarii* . Whilst the source of the metal might lead to variations in the silver content of a coin, good workmanship should still result in a consistent weight. However, we find that not only does variability in the alloy content rise through the second century but so does the variability in the weight of the new coins (fig. 43.09). A gradual decline in quality control seems more likely from this evidence. In weight control as in alloy content, Domitian's coinage stands out as the exception to the rule. Here the *denarius* was being carefully monitored to a degree that no other emperor after the Julio Claudians matched. The wide variation in the weights and silver standard of the issues from the mint as the second century progressed suggest that the debasement of the *denarius* was not a precisely controlled process as Walker's interpretation would tend to suggest. The process appears to have been more like a gradual slide downwards with the occasional measured reform rather than Walker's interpretation of a precise stepped decline.

4.35 Debasement and the Velocity of Circulation

The section above has demonstrated that the circulation and wear of silver coins demands that if coin is recycled then debasement will follow if the weight standard is to be maintained. This is both theoretically demonstrated and practically demonstrated by showing the close correlation between the melt down value of the British circulation pool and the current issuing standard. It is stressed, however, that it is not known at the

moment how representative the state of wear on British *denarii* is, nor how similar the composition of the circulation pool here is to that in other provinces. However, these two questions can be addressed.

Coin wear on British coins may be similar to that on continental issues. *Denarii* were extremely mobile, so much so that it would be prudent to ask whether the weight of *denarii* in Britain is actually telling us anything about Britain per se, or is it possible that the wear on them is a far more general indicator of what is happening in the empire as a whole. Did the wear being measured actually take place in Britain, or did it take place in the whole of the Empire, with the coin simply terminating its European tour by being fossilized in a hoard in Britain ? There is no intrinsic evidence that will tell us this. Duncan Jones' analysis of the Londonthorpe, La Magura and Viuz-Faverges *denarii* hoards of Britain, Rumania and France suggested similar rates of wear in each country (Duncan Jones 1989), so this can be taken to suggest that the order of wear on the British *denarii* was similar to those in other provinces.

The second area for concern is whether the structure of British coin hoards is comparable to those from other areas of the Empire. In order to answer this a sample of 122 continental *denarius* hoards were gathered:

Italy	9
Spain	1
France & Belgium	33
Germany & Austria	24
Danube & Balkans	38
Albania & Yougoslavia	3
Syria & Palestine	2
Egypt	2
Morocco	1
W. Empire (unlocated)	9

Most of these were reported in the form of tables, and the chronological divisions did not always match those used for the British study. However, upon making the data as compatible as possible a structure analysis was run on them. The results are given in Appendix 4.33 and fig. 43.10. During two periods the scatter of points appears to be different. From about AD 70-90 the continental hoards (from a wide range of provinces) appear to be more archaic than those in Britain. This means that during this period Britain had more new currency arriving in it than many other regions of the Empire. This would fit in sensibly with the Flavian conquest of the North of Britain, whilst there was little going on elsewhere in the empire: a couple of seasons taking the Black Forest back under control, a minor war with the Parthians and later the start of trouble with Dacia. Under Trajan the picture reverses itself, five hoards show modern structures in comparison to Britain, suggesting Britain is was not getting as much new

coin as elsewhere. However, two of these come from Bulgaria shortly after the end of the Dacian Wars, so new coin could be expected here. In the Italian hoard we would also expect to find fresh coin. However, the other *two come from Egypt and Morocco.* We can only conclude in the negative that the circulation medium in Britain need not have been radically different from that in Gaul or Germany, we simply have no evidence. It was different to areas of current military activity, and the heart of the empire, and it was also different to North Africa. These differences must not be over stated, they all lie within the range of variation in the British hoards (see. Fig. 25.10-11), and in general the plotted hoards lie close to the line. Since all the continental hoards lie within the variation of the British data it can be assumed that the British 'normal hoard' structure is not a bad surrogate for an Empire-wide picture, pending further research.

The model also relies on the assumption that coins were not selectively called in. However, we know this was probably the case when the Republican coins disappeared, possibly under Trajan (Sperber 1974, 135-6). However, despite these problems, coin wear can be shown to be a major contributory factor to the debasement of the *denarius*, and I believe it to be the principle factor.

Debasement cannot now simply be interpreted as the act of Emperors short of money making the mint produce more, or at least not in the case of the *denarius.* Even without recycling and reminting, coin wear reduced the average silver content of the *denarii* in circulation. This requires the creation of alternative economic interpretations for what was happening. Previously debasement and inflation were linked, now debasement can also be linked to the velocity of circulation of *denarii* .

If this wear/debasement model is correct, we would expect the greatest sign of debasement to be taking place when money circulated most rapidly. Conversely, we would expect stability in the silver content of *denarii* when coin was not being worn, when it was moving around slowly. Examining Walker's simplified picture of the process (Figs 43.11) there are two principle periods of debasement. The first was under Nero and the civil war that followed, thereafter there was a period of virtual stability (apart from Domitian's brief attention to the coin). The second phase starts with the debasement of Antoninus Pius in AD 148 which began a new decline which this time proved to be terminal. These two periods, the mid first century and the mid second century onwards, were also the times when coin wear on *denarii* in Britain and elsewhere was at its height. The lull in the debasement of the *denarius* also correlates with the period of minimal wear (section 2.3). Debasement therefore seems to be a symptom of the degree of circulation of coinage.

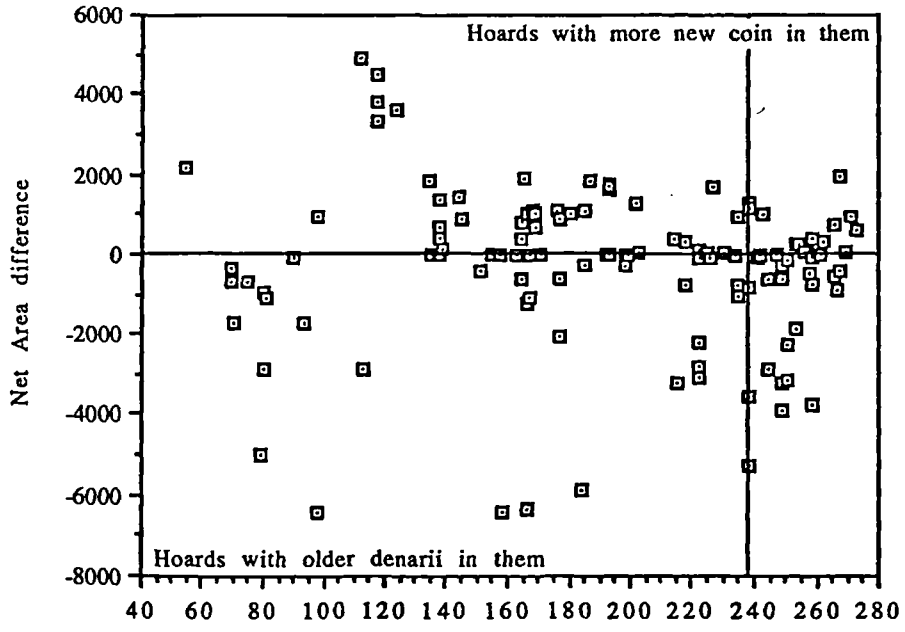


Fig. 43.10 The structure of continental *denarius* hoards against the British benchmark.

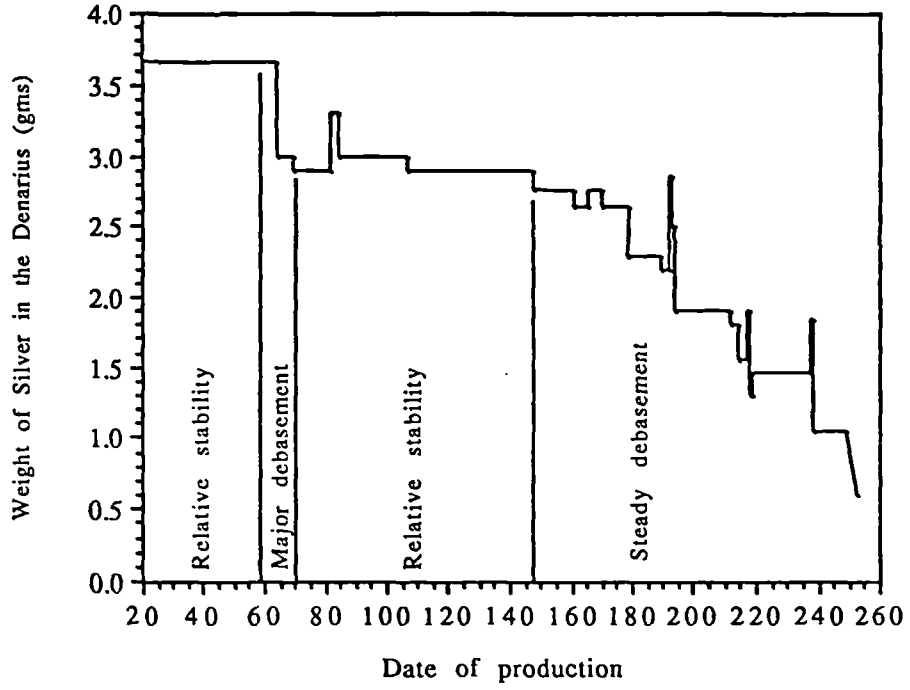


Fig. 43.11 Walker's simplified chronology of the debasement of *denarii*

The profit motive at the mint in Rome was not the prime causal factor behind the decline and fall of the Roman *denarius* . The later second century emperors may have made a slight profit (the curves in fig. 43.07 do diverge marginally here), but at the same time we must also note the severe decline in quality control at the mint. In general the silver content of the *denarii* of the day followed closely the path of the average melt down value of the coins in circulation. The faster the *denarii* circulated the more they got worn and the faster the silver content of the *denarius* fell. The coin was too successful for its own good.

4.4 The *denarius* to *antoninianus* transition

4.41 The imitation of *denarii*
4.42 The hoard and site find evidence
4.43 Conclusions

In 215 Caracalla introduced a new silver coin which we know as the 'antoninianus'. Whilst it did not immediately replace the denarius (indeed it was not produced between 222 and 238) by 244 the denarius had ceased to be issued as a regular part of the currency. This section examines some of the associated events. First the evidence of denarius imitations is assessed (4.41), then the pattern of hoards and site finds is examined to see what light they throw upon the subject (4.42).

4.41 The imitation of *denarii*

In the late second century and early third a large number of base *denarii* arrived in Britain minted by the Severans. A large influx of coins would have had one of two effects, either it would have lead to an increase in prices or else it would have resulted in a drop in the circulation rate of *denarii* (See section 4.51). However there is no evidence for a rapid rise in prices at this date in the Roman World in general (though it must be admitted there are hardly any prices for anything from Britain). The main price rises noted are those from AD 260 onwards, much later in date. The alternative was that there was for some reason price stability (social pressure ?) and that instead of the prices rising, the velocity of circulation of *denarii* fell substantially. In fact this is precisely what our study of hoard structure suggested. In 215 the '*antoninianus*' was introduced tarrifed at either one and a half or two *denarii*, the subject is a matter of some dispute: as will be shown it only arrived in Britain in substantial numbers rather late in the day, but the requirements for its production meant that *denarii* were called in to be melted down. Our money supply curve suggested that there was a fairly sudden decline in the number of *denarii* in circulation around 230-40, the same date as the re-introduction of the *antoninianus* after a brief period of its suspension from production (c.16 years). Such a chronological correlation is not unlikely but further evidence can be found to support it. First, if the number of *denarii* in circulation fell rapidly and they were not replaced by similar numbers of new *antoniniani* then a shortage of coin might result in copying. This is indeed found.

'Forged' *denarii* and other coins of the late second and early third century are not uncommon on British sites, nor are the moulds from which they were produced. One of the largest recent finds of moulds came in 1988 from Blomfield (London) where hundreds of fragments were found in the ditch of the Roman defences. Further moulds have been found in quantity elsewhere: Edington (Somerset); Lincoln, Ancaster and Bottesford (Lincolnshire); Lingwell Gate (near Wakefield, Yorkshire); and Ryton and Wroxeter (Salop) (Sutherland 1937, 43); and many other sites have produced moulds,

though in smaller numbers. The context in which they need to be viewed is the end of the *denarius* as the principle silver coin in Britain. The '*antoninianus*' which replaced it was first introduced in 214 by Caracalla, although production was discontinued under Elagabalus. Balbinus and Pupienus revived the issue in 238, and from Gordian III production of the *denarius* became very uncommon. This point marked the end of production of *denarii* to all intents and purposes, though occasional small issues were produced. Sutherland pointed out that many of these smaller sites had casts of Severan coins, but not later types: "Consequentially it is reasonable to fix the active and general beginning of mould-made *denarii* within the reigns of Severus and Caracalla." (1937, 46). This he saw continuing in some areas as late as Alexander. He concluded:

> "...it is best to conclude of the British moulds that they represent an attempt, certainly illicit, though perhaps not made without semi-official connivance, to bolster up the strength of the *denarius* in face of competition by the antoninianus. When the latter denomination was supreme, the series of moulds peters out. This explanation frees us from the difficulty of explaining why casting was not busily practised from circa AD 240-60, when silver dropped to a record low-frequency point; although silver was so scarce, it was useless to continue the fight to preserve the *denarius* after the *denarius* had virtually suffered official abandonment."
>
> (Sutherland 1937, 47-8)

The most recent updated survey of these has been by George Boon (1988, 124-6). Most of the moulds and coins are Severan, though some earlier ones are found whilst others continue to Severus Alexander and Maximinus. Despite the Severan date for the majority of them (AD 193-211), Boon differs in his interpretation of their date from Sutherland, dating the majority of them later to the re-introduction of the *antoninianus* in 238. The cause being related to the denarius' premium silver content against the over-valued *antoninianus* . The Blomfield (London) find, copying *denarii* down to Maximinus (235-238) helped to confirm this, however later bronze coins were also copied in the hoard down to Gallus (251-253).

A further way of examining the problem would be to look at the assemblage of imitation *denarii* as a whole rather than as a chronological series of individual emperors. Then it would be possible to see at what date this mixed assemblage most closely corresponds to the general circulation pool which it was meant to imitate. The comparison is made in fig. 44.01 (based on a corpus of 90 site finds of such coins: Appendix 4.41; these are drawn from the site-find database outlined in section 3.2). The ratio of copied types compares most favourably with the composition of the circulation pool between AD 230 and 240. This seems to confirm Boon's argument for a later date of manufacture and removes any necessity of envisaging any of the copies being made as early as the reign of Septimius Severus, despite his coins being the most

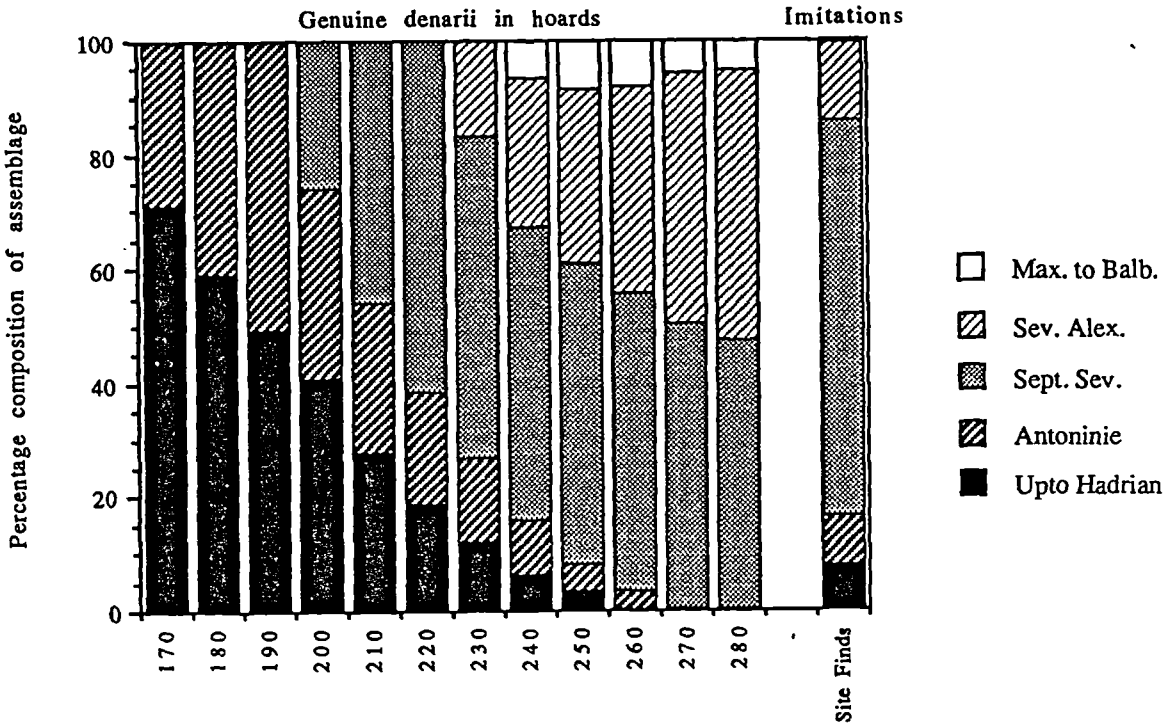


Fig. 4.4.01 Silver plated *denarius* copies and the circulation pool

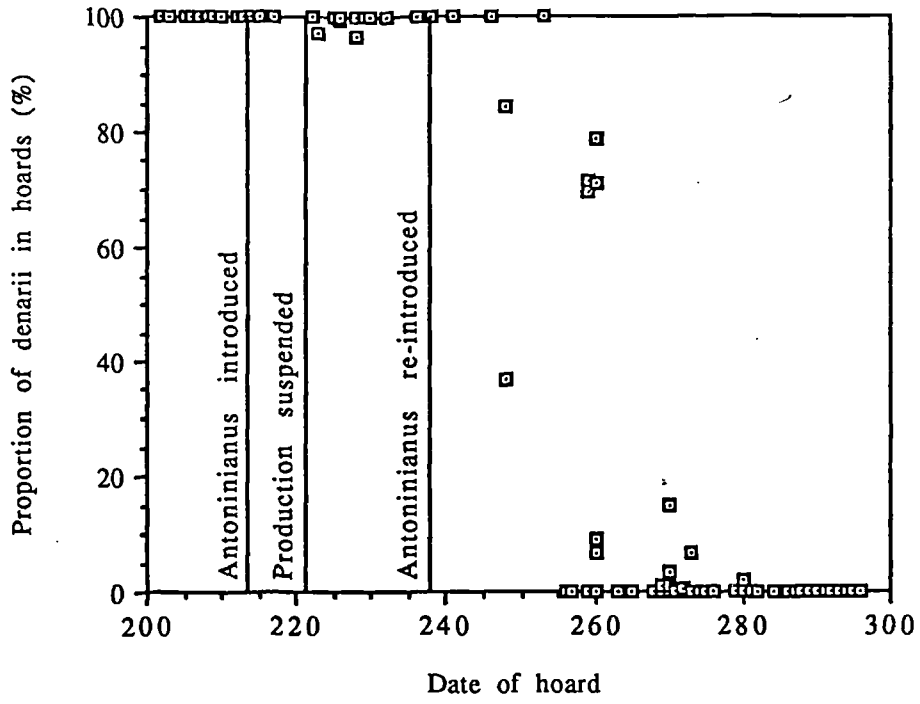


Fig. 44.02 The proportion of *denarii* to '*antoniniani*' in hoards

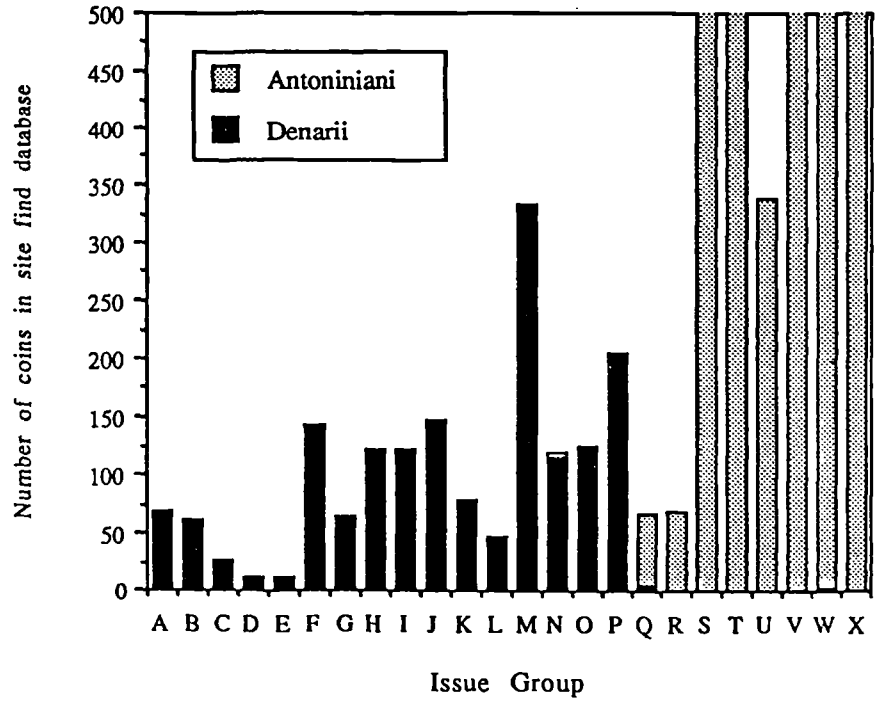


Fig. 44.03 The number of *denarii* and '*antoniniani*' as site finds

frequently copied. The worn condition of many of the coins used to make the moulds also supports this view.

If all these copies were made around AD 238 and thereafter, it is interesting that the *denarii* copied are a match for all those coins in circulation at that date, rather than being biased towards the imitation of the earlier silver rich *denarii*. If earlier *denarii* had circulated at a preferential rate, then surely they would have been preferentially copied. But this appears not to have been the case (cf. Section 4.8).

4.42 The hoard and site find evidence

A second method to look at the transition between the *denarius* and '*antoninianus*' is to examine their joint hoarding pattern. Fig. 44.02 shows the proportion of *denarii* in 'silver' hoards. As will be seen, whilst the *antoninianus* nominally takes over from the *denarius* in 238, the practical reality in British hoards would date this switch about 15 years later, in the late 250s.

There are very few hoards that can be dated to the 240s or early 250s. Those which do can still contain a very high proportion of old *denarii*. It might be the case that some of the earlier *denarius* hoards ending with coins of the 230s were in fact deposited later, but owing to the absence of any *antoniniani* in them we cannot tell this. In general the lack of '*antoniniani*' in hoards for a couple of decades either suggests that people suddenly stopped hoarding, which is unlikely, or else it simply reflects that there were relatively few of the new coins around.

A glance at the number of site find *denarii* and '*antoniniani*' (Fig. 44.03) shows that in both periods Q (Balbinus to Hostilian) and R (Trebonianus Gallus to Valerian) some *antoniniani* reached the province. However first the level is lower than the supply of *denarii* in the late 2nd century and early third, also in the late second and early third century the arrival of *denarii* was topping up an existing circulation pool, where as here the first supply from Balbinus to Hostilian represents virtually the entire stock of the new coin in the country. This all suggests that until Gallienus there was a shortage of *antoniniani* in Britain.

4.43 Conclusion

Denarii were copied on a large scale. The coins copied generally reflect those in circulation upon the date of the reintroduction of the *antoninianus* and probably reflect the rapid disappearance of *denarii* in circulation. This shortage lasted for a significant period with the occasional copying continued as is evident from the Bloomfield find.

Stability only came with the arrival of *antoniniani* of Gallienus. But what effect did this dearth of coinage have upon the market? This is explored in the next section.

4.5 The quantity theory of money and cyclical trends in the economy

4.51 The quantity theory of money
4.52 (M) An index of the money supply
4.53 (P) An index of prices
4.54 (V) An index of the velocity of circulation
4.55 Calculation of Y, the number of transactions
4.56 Interpretation and and correlation with archaeological data
4.57 Economic growth and cyclical trends
4.58 And yet...
4.59 Conclusion

The quantity theory of money is introduced, relating the variables of money supply (M), velocity of circulation (V), prices (P) and the quantity of goods and services being transacted within the monetary economy (Y) (4.51). In the following sections three of these variables are established (4.52-54) leaving only Y unknown. The three variables are inserted into the equation to generate a picture of Y (4.55). The peaks and troughs in this curve are then related to archaeological evidence from Britain (4.56), and then the picture is related to broader changes in the economy of the Empire (4.57-8).

4.51 The quantity theory of money

The quantity theory of money is an old idea allegedly dating back to Confucius (Begg et al 1984, 611), but its first systematic formulation came in the first half of the 18th century with the economists David Hume, Richard Cantillon and Joseph Harris. Its best known formulation is that devised by the American Irving Fisher (1867-1947), indeed the equation is frequently known by his name:

$$MV = PY$$

Where M represents the money supply
P represents the price level
Y represents the quantity of goods and services being exchanged for money
V represents the velocity of circulation (the number of times money is circulated to service the exchanges yielding the nominal income, PY).

These expressions are identities; they are always true by definition.

Monetarist explanations of the economy explained inflation in terms of too much money chasing too few goods: i.e. if there was an increase in the quantity of money (M), and the number of goods (Y) in the economy did not change then prices (P) have to rise. Indeed Milton Friedmen (1968) asserted that 'inflation is always and everywhere a monetary phenomenon'. One of the problems here was that these statements failed to take into account the possibility of changes in the velocity of circulation of money. So that in the late 1980s this brand of monetarism got a very bad name. The trouble is that in present day economies V (the velocity of circulation) is very difficult to measure, so it is often assumed to remain constant:

> "One justification for assuming [that V remains unchanged] is the belief that methods of using money in exchange are stable. But it is important to recognise factors which may induce changes in the velocity of circulation. ... once an economy is monetised, transactors seek more convenient and less costly ways of conducting exchange. For example, the advantage was shown of token money over gold, and that of bank money over token money, at least for some transactions. Now, as transactors use new ways of transacting, so they change the velocity of circulation. Perhaps the most important recent example of changes in the payment mechanism is the use of credit cards. The general acceptability of payments by credit card reduces the number of times money is circulated to service that sequence of exchanges which yields nominal income. The assumption of stability is acceptable if few such institutional changes take place over the period under consideration."
>
> (Creedy et al., 1984, 352)

There have been discussions of Fisher's equation in relation to the ancient world before now, but usually only two variables have been examined: prices and quantity.

> "Can Fisher's equation be applied to the ancient Roman world? Of course there are immediately all sorts of problems, mostly stemming from the lack of information ... about the quantity of goods in circulation within the Roman Empire, and more importantly, whether it varied significantly from period to period. Little is known about alterations in the velocity of the exchange of money. Thus I shall assume rashly, but in common with most discussions of the subject, that v(elocity) and q(uantity of goods) remained broadly constant, and concentrate on the remaining elements, m(oney) and p(rices)."
>
> (Burnett 1987, 105-6)

But solutions to these problems do exist. Modern economists may find difficulty measuring the velocity of circulation of money, but for Roman Britain two methods have *already* been used (sections 2.3 and 2.5). *Denarius* and *sestertius* supply figures have also been established (sections 3.5 and 4.2) which brings us some way towards two of the elements in Fisher's equation. If we could establish an index figure for the changes of price levels in Britain - or at least for the Empire as a whole then it might be possible to generate a curve reflecting the number of goods in the cash economy in Roman Britain. Such a curve could then be tested against the archaeological evidence. But first we need to establish the three variables for the equation: M, P and V.

4.52 (M) An index of the money supply

In sections 3.5 and 4.2 an attempt was made to estimate the changing pattern of the number of *denarii* and *sestertii* in circulation in Britain. However, the changes noted were only relative since the vertical axes had no definite scale. *Denarii* and *sestertii* were however only two of the forms of money in Roman Britain, so before using either or a combination of them in Fisher's equation it would be prudent to examine precisely what the term 'money-supply' means in this context.

Money supply has a variety of definitions. In its most basic form it is the amount of cash circulating in the economy, however the existence of even the most basic financial instruments and devices can complicate this. This has led to a proliferation of definitions of money supply to cope with the modern world. In the present day 'money' exists in a variety of forms from its most liquid form, cash, to more inaccessible deposits in interest-bearing accounts. These different types of money are added together to create a hierarchy of definitions from M1 (cash and current accounts only) to M3 (which includes public and private sector deposit accounts as well as deposits held in currencies other than sterling). These additional sources of money added into the equations are sometimes called 'near money' because though investment deposits in banks and foreign currency are not in themselves means of payment, they can readily be converted into such.

If we turn to Roman Britain the most basic definition of money would be the cash in circulation and in hoards (the equivalent of directly accessible current accounts). However, to what extent were there other forms of money around? We know that a form of letters of credit existed in the world of Mediterranean shipping, and Cicero used similar letters of credit from his banker Atticus to help finance his governorship in Cilicia. So it is quite probable that similar financial instruments were used in cross channel trade with Britain; but how would that have effected the money-supply for the province as a whole?

Banking institutions are also important to guard against. If any form of banking can be demonstrated where money is held and letters of credit pass in lieu of cash, then this opens up the possibility of the banker making loans from the bank's reserves thus increasing the stock of *money* in the economy without any increase in the quantity of *hard cash* in the system. This is how:

If a banker simply looks after other people's money with it being occasionally deposited and withdrawn, this would have no effect on the money-supply. However, things might develop so that letters of credit came into existence. These are documents which could pass instead of cash transferring the ownership of deposits in the bank, without cash actually having to be drawn out and redeposited again (eg. cheques). This on its own would have no direct effect on the money supply since the letters of credit equal the cash deposits frozen in the bank; so the money supply would still be equal to the total amount of cash in circulation and in the bank. However, if the banker lent out some of the cash reserves this *would* lead to an increase in the money supply. This is because the quantity of money in circulation has increased because of the money out on loan, but people's perceived deposits in the bank have not decreased, despite the fact that the

cash is not in fact there (Iucundus at Pompeii is an example of this in operation in the Ancient world - Andreau 1974). So if in Roman Britain there were both letters of credit and bankers lending people other peoples money then this would confuse the simple equation of the coin supply figures with the money supply figures.

The most extensive banking system at the time was probably that of the Roman Army. Whilst legionaries may have had a nominal income of 225 *denarii* after Caesar much of this was withheld in payment for clothes and other expenses and the rest held on account. One of the most revealing documents of this kind of practise comes from the details of the account of Iulius Proculus from Damascus c. AD 81 (*Pap. Lat.* I). The account records the three annual payments, here of 248 *drachmas* each (62 *denarii*). From this various deductions are made and the balance goes into his savings account:

Received	1st payment 248 dr	2nd payment 248 dr	3rd payment 248 dr
- bedding ?	10	10	10
- rations	80	80	80
- boots	12	12	12
- annual feast	20	-	-
- burial club	-	4	-
- clothes	60	-	146
EXPENSES	182	106	248
Remainder deposited to his account	66	142	0
Balance carried forward	136	202	344
New Balance	202	344	344

It is important to note a number of things, especially the fact that these figures do not show any withdrawals of cash from the account. Part of the reason may be that the 248 *drachmas* or 62 *denarii* did not represent the legionary's entire pay. A third of 225 *denarii* should have been 75 *denarii* , so the shortfall of three payments of 13 *denarii* may have been handed over in cash and known as the *acceptum.* (Watson (1969, 221) and Webster (1985, 267)). But this is hardly an interactive current account, and may be more of a way of the state indefinitely deferring a proportion of its recurrent annual expenditure.

So some kind of banking system existed within the army, but we have not demonstrated this in Britain yet, nor shown the existence of 'letters of credit' or for banks making loans. However, evidence for two of these comes from one of the Vindolanda writing tablets. This is the letter from Octavius to Candidus, probably dating to the early second century (Bowman et al.1990). The letter will be discussed further in the conclusion so it will be repeated here in full:

> "Octavius to his brother Candidus, greetings. The 100 pounds of sinew from Marinus - I will settle up. From the time when you wrote me about this matter, he has not even mentioned it to me. I have several times written to

> you that I have brought about 5,000 modii of ears of grain, on account of which I need cash. Unless you send me some cash, at least 500 *denarii* , the result will be that I shall lose what I have laid out as a deposit, c. 300 *denarii*, and I shall be embarrassed. So, I ask you send some cash as soon as possible. The hides which you write are at Cataractonium - write that they be given to me and the waggon about which you write. And write to me what is with that waggon. I would have already collected them except that I did not care to injure the animals while the roads are bad. See with Tertius about the 8 1/2 *denarii* which he received from Fatalis. He has not credited them to my account. Know that I have completed the 170 hides and I have 111 (?) modii of threshed bracis. Make sure that you send me some cash so that I may have ears of grain on the threshing floor. Moreover, I have already finished threshing all that I have. A messmate of our friend Frontius has been here. He was wanting me to allocate (?) him hides and that being so, was ready to give cash. I told him that I would give him the hides by the Kalends of March. He decided that he would come on the Ides of January. He did not turn up, nor take any trouble to obtain them since he had hides. If he had given the cash, I would have given him them. I hear that Frontinius Julius has for sale at a high price the leather ware (?) which he brought here for 5 *denarii* apiece. Greet Spectatus and ... and Firmus. I have received letters from Gleuco. Farewell."
>
> (Bowman et al.1990)

Octavius's activities must have been related to army supply, especially considering the quantities of material he is discussing. 5,000 *modii* of wheat would have fed from 67 to 167 people for a year. 67 people using Davies' (1971, 123) consumption figure of 3 lb of grain a day, or 167 people based on the subsistence level of the grain dole in Rome of 30 *modii* per annum (Garnsey 1983, 118). If we are looking for evidence for 'letters of credit', or rather transfers of money taking place without cash having to physically move distances, then the sentence "See with Tertius about the 8 1/2 *denarii* which he received from Fatalis. He has not credited them to my account" suggests that this was certainly possible. However, this is, more probably than not, a transaction within the closed community of the army. All the transactions with other people appear to be in cash. Octavius asks for cash to pay for the rest of the grain, again in relation to an order for hides and threshed bracis, and the transaction with the elusive friend of Frontius would have been acceptable had it been in cash. No mention in these cases is made of accounts, despite the large scale of expenditure. So despite the presence of some form of credit system with the military community this letter provides no evidence for its extension to military suppliers such as for the grain. Whilst one document represents very little to go on it seems safest to assume that whilst the Roman Army in Britain did run some form of banking system with transfers between individuals being possible, this was probably a limited closed system within the confines of the army.

The next question is did the army treasury make loans to people? A Hadrianic ostracon from Egypt suggests that they could give advances to soldiers of army pay (Lewis & Reinhold 1955), however this does not count as a loan which would increase the money supply. In effect the army was lending the man his own money since he would have

partaken in the compulsory savings scheme. In summary the banking system within the Roman Army in Britain is unlikely to have made much impact on the money-supply of Roman Britain in terms of extensive loans or army pay advances.

The other evidence for loans in Britain we have is of those from Seneca and others to leading Britons which were called in shortly before the Boudican revolt. If Seneca was lending his own money then this would not add to the money-supply figures for the Empire, since it needs to be someone else's money being lent while they are still able to use it via letters of credit. If the loans arrived in the province in the form of hard currency then they will have been included in the *denarius* and *sestertius* supply calculations.

Evidence for other forms of banking do not come from Britain, but appear in Roman law codes. It appears that interest bearing deposit banking did develop (*depositum*) probably by the Antonine period (Garnsey & Saller 1987, 55; Digest 16.3.28,24,26.11). However, again, even though the banker probably lent out the money to pay interest, money supply figures would only be enhanced by the account holder being able to utilise the money at the same time in the form of letters of credit from the bank, and the evidence for this is still minimal.

It seems safe to suggest that the money supply figures for Roman Britain would probably equate well with the supply of coinage. However, we only have supply curves for two of the denominations: *sestertii* and *denarii* (figs. 42.07 & 35.02). Since the *denarius* was the principal medium for the storage of wealth in the country, to judge from hoards, then it is probable that its curve is going to represent the bulk of the money tied up in coinage in Britain in terms of value. The trends in both curves are not dissimilar. The *denarius* curve has a Claudian peak, which as stated should probably have lasted slightly longer, whilst the *sestertius* curve also had an early peak through from Nero into the early Flavian period. Both curves hit a low point in the late first century, and both subsequently rose up until the Antonine period whence they diverge as the shipment of bronze to Britain effectively ends and the number of *sestertii* in Britain slowly declines.

For the purposes of this exercise the *denarius* supply curve will be taken as a surrogate for the sum value of all the denominations in Britain. Since other denominations are excluded, only the broadest trends from the results from Fisher's equation can be taken as potential reliable.

4.53 (P) An Index of Prices

The next variable we need is an index of inflation for Britain. Unfortunately there is very little data available to do this for the Empire, let alone an individual province. In looking at the empire as a whole one must guard against the possibility of regional price differentials. In Egypt and Sicily wheat may have been much cheaper than in less fertile areas. Nonetheless it has been thought worthwhile to attempt to reconstruct an index of inflation for the Empire as a whole, to see if such a thing is possible, or else to see if regional variations make such a task futile, which in itself would be informative.

The most commonly stated price is that of wheat. Four principle collections of wheat prices have been gathered (Appendix 4.51):

VARIOUS AREAS	J.P. Callu, La Politique Monétaire des Empereurs Romains de 238 à 311, Paris, 1969, pp 395-396.
PALESTINE	D. Sperber, Roman Palestine 200-400, Money and Prices. Ramat Gan, 1974, p 124 & 247. After West & Johnson, Currency, p 81 and Johnson in JJP, 4, 1950, p 156.
LOWER EGYPT: Official	R. Duncan-Jones (1990), Structure & Scale in the Roman Economy.
LOWER EGYPT: Private	R. Duncan-Jones (1990), Structure & Scale in the Roman Economy.

All these prices cannot just be used together. For example the Egyptian official price for wheat was lower than the market price, but nonetheless both experienced fluctuations. Similarly because Palestine may not have been quite so fertile other factors may have played on prices there. Each price series needs to be converted to a standard. Each series of values has been plotted separately, and the interpolated price of wheat at about AD 150 had been given the indexed value 100. All other prices have been altered correspondingly. As an example the official price of wheat in Lower Egypt around AD 150 was c. 8 *drachmas* per *artaba* . So 8 *dr.* is given the value of 100 units. Hence in AD 246 when the price was 24 *drachmas* the index would be 300 units. This means that all the four price series can be plotted on the same scale without regional variation entering the data set (with the exception of Callu's figures).

All the converted wheat prices are shown in fig. 45.01. The most notable feature is the massive price inflation after 260. Fig. 45.02 shows the earlier section in more detail. Generally prices can be seen to rise from the earliest period to the early third century, however it is questionable whether prices necessarily rose consistently during this period. From the late first century to the mid second century one could possibly see a fall in the price of wheat. This can be seen in the scatter of prices and the fitted polynomial, though it must be emphasised that the quality of the data is not sufficient to state categorically that prices actually fell in this period, but it should make us aware of this possibility. Since three of the sources are prices from the Eastern Mediterranean, how relevant to the Empire as a whole is this? The answer lies in looking at the values

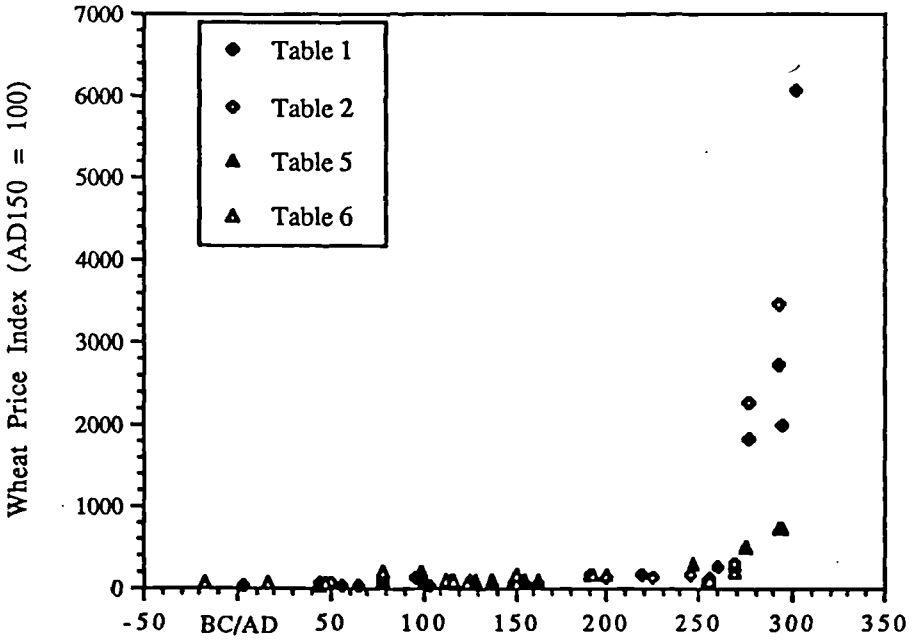


Fig. 45.01 Wheat Prices: 50 BC to AD 300

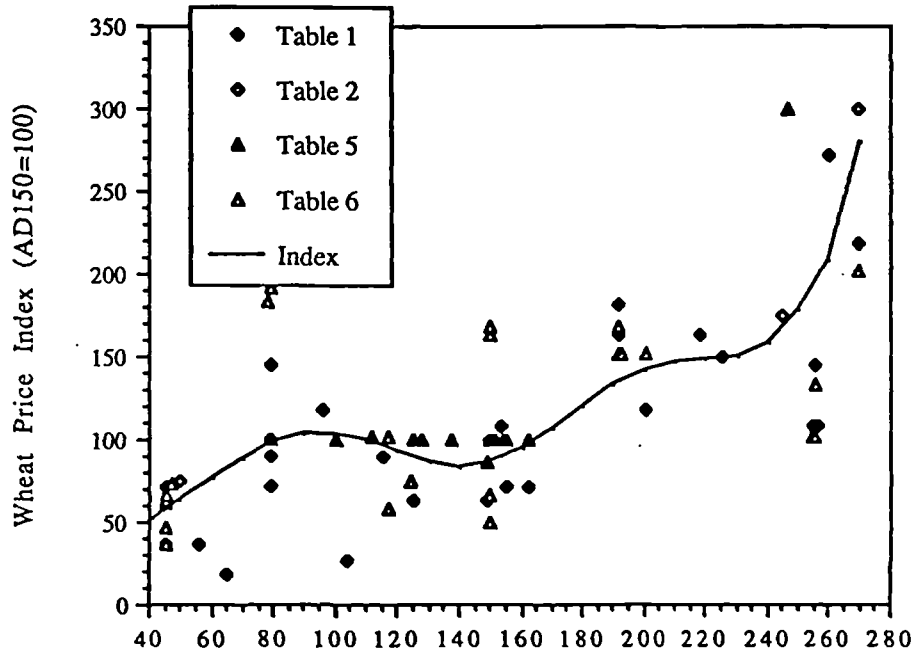


Fig. 45.02 Wheat Prices: AD 40 to 280

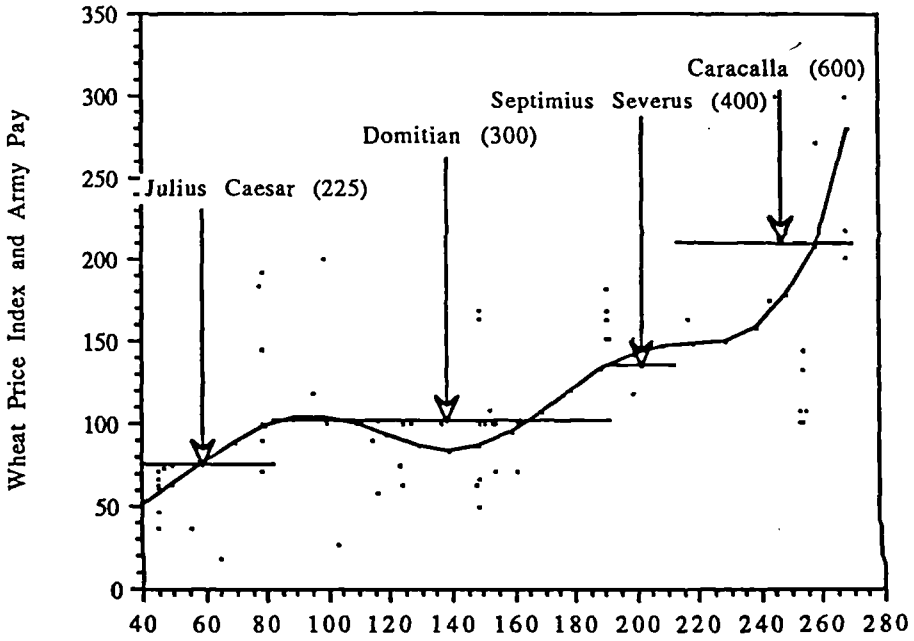


Fig. 45.03 Wheat Price Index and Army Pay

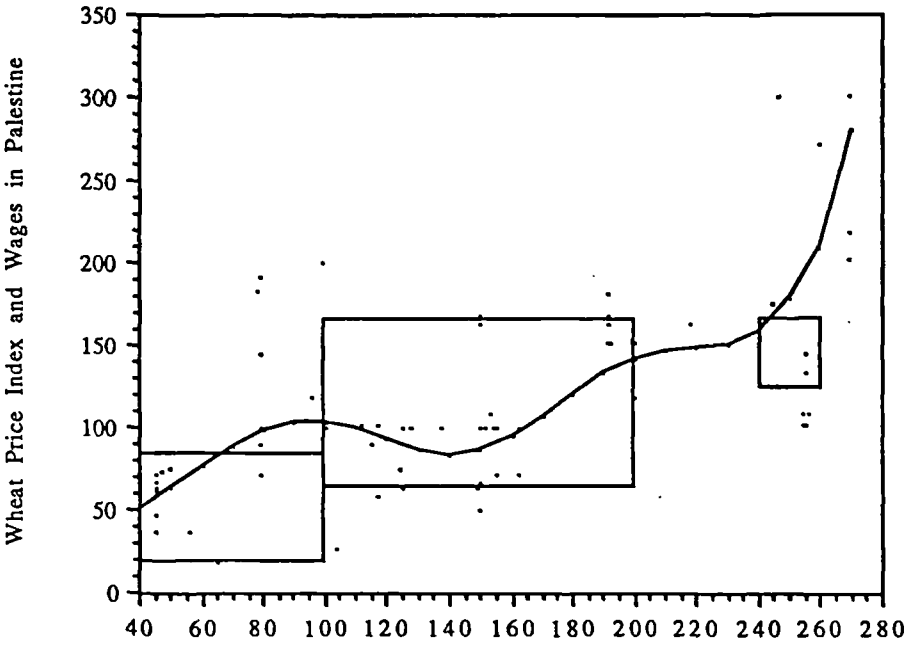


Fig. 45.04 Wheat Price Index and Wages in Palestine

from Callu's corpus hence its inclusion despite the geographical variation in its sources (Table 1). These prices lie on either side of the index and do not have a markedly different distribution to the others. So this index can be taken as a crude, but for our purposes useful, indicator as to changes in the price of wheat.

We do have one wheat price from Britain. This can be derived from the letter from Octavius found at Vindolanda (above). In it he states he has already put down a deposit of about 300 *denarii* on 5,000 *modii* of wheat, and that he needs at least another 500 *denarii* soon to pay for it otherwise he will loose the deal. This gives us a minimum price for wheat of 2.56 HS per *modius*, during the early second century. Comparable prices were as follows:

Antioch	2 1/4 HS per *modius*	Late 1st c. AD	(Duncan Jones 1990, 150)
Africa	2 1/2 HS per *modius*	Late 2nd c. AD	(Duncan Jones 1990, 150)
Italy	4 HS per *modius*	Early 2nd c. AD	(Duncan Jones 1990, 150)
Egypt	2 1/2 HS per *modius*	AD 98-192	(Duncan Jones 1982, 365)
Britain	c 2 1/2 HS per *modius*	Early 2nd c. AD	(Octavius' letter)

This suggests that the wheat price in Britain was not radically different from those in the Empire as a whole (the only deviant city in the Empire was Rome itself with a price almost double that elsewhere). However, this is only on the basis of one value from Britain, and wheat is only one commodity, wage inflation and commodity inflation may have taken place at different rates. It is possible to test the index against two salary scales. The first is the pay levels of the Roman legionaries, the second are wages in Palestine (Appendix 4.81). Both have been indexed using the same method and have been plotted on top of the background of the wheat price index (figs. 45.03 & 45.04). In both cases there seems to be a general correlation between the wheat price index and nominal labour costs ('nominal' since as has been pointed out Roman legionaries probably never got their entire pay entitlement at the time).

In conclusion the general agreement between the wheat price series and the labour cost values suggests that the wheat price index is a useful device that can with due caution be taken to represent the level of prices in the Empire as a whole.

4.54 (V) An index of the velocity of circulation

Two methods were used for calculating the velocity of circulation of *denarii* . One was based on coin wear and the other analysing the variation in *denarius* hoard structures (2 versions). Both methods showed a reasonable degree of correlation. However, the use of hoard structure results are more appropriate for this analysis. The problems with the coin wear results are as follows: first the method was based on coins from a sample of 15 hoards rather than the 145 from the hoard structure analysis. Secondly the

chronological span of the hoards with published coin weights did not last as long as that for the structure analysis. Thirdly the variation in the rate of wear curve was restricted to showing a simple curve by the nature of the polynomials fitted.

The two methods were based on the calculation of the 'net area difference' and the 'best fit date' of each hoard. The first compared a hoard against the structure of contemporary hoards and measured the difference. The second scanned the period from AD 40 to 280 until it came to the date where the sample hoard was most similar to the average hoard. The difference between this date and the hoard's TPQ was then calculated. These two techniques gave very similar results (cf. figs 25.12 & 25.15):

Conquest to AD 80:	A growth in the variability of hoards (velocity of circulation falls)
AD 80 to AD 120:	A sustained high variability in hoards (velocity of circulation low)
AD 120 to AD 200	A decline in the variability of hoards (velocity of circulation rises)
AD 200 to AD 220:	A growth in the variability of hoards (velocity of circulation falls)
AD 220 onwards:	A decline in the variability of hoards (evening out as production ceases)

The resolution of the data can be marginally refined by combining the two data sets. Both readings can be plotted against each other, providing a straight line and thereby an equation by which the results of one method can be converted into the other (fig. 45.05). Once converted to the same scale (Appendix 2.55) they can be plotted as before (figs. 45.06-45.08). It is this combined curve that will be taken as an index of the velocity of circulation of *denarii* in Britain. Since the *denarius* represented the major portion of the cash supply to the province, its circulation will be taken as a surrogate for the circulation of all the other denominations as well.

One problem remains. Whilst the changing diversity of hoards may be equated with the rate of circulation of coinage the two variables are inversely related: when the velocity of circulation is high, the diversity in hoards is small, so this variable needs to be turned on its head. Since this is only an approximate calculation looking only for the broadest changes we could suggest that there is a direct inverse relationship between the variation in hoards (H) and the velocity of circulation (V). Hence $V \alpha 1/H$. So if $Y = MV/P$, then $Y \alpha M/PH$.

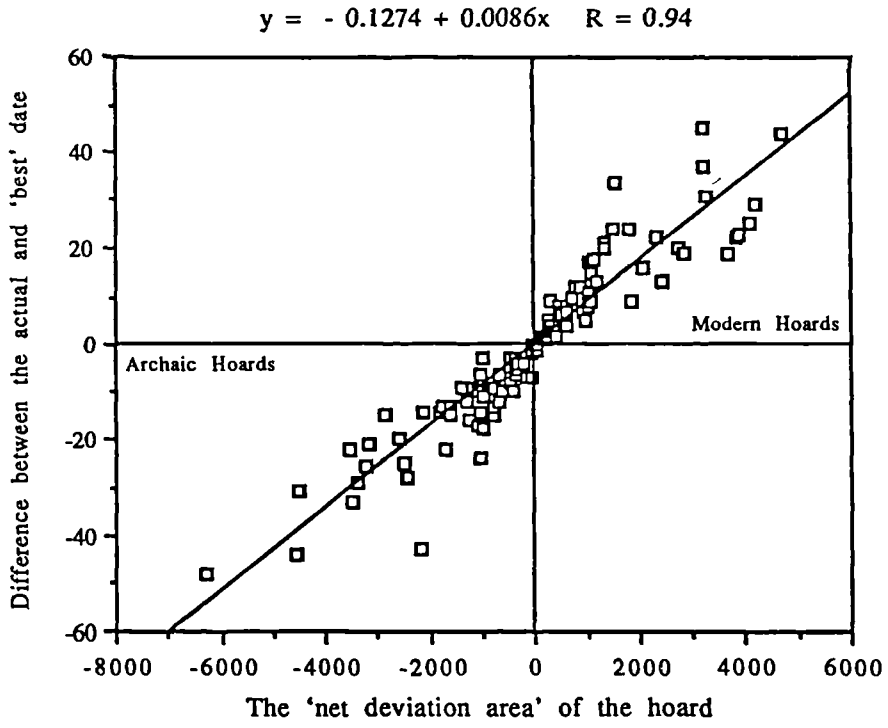


Fig. 45.05: The correlation of the two hoard structure analysis measurements

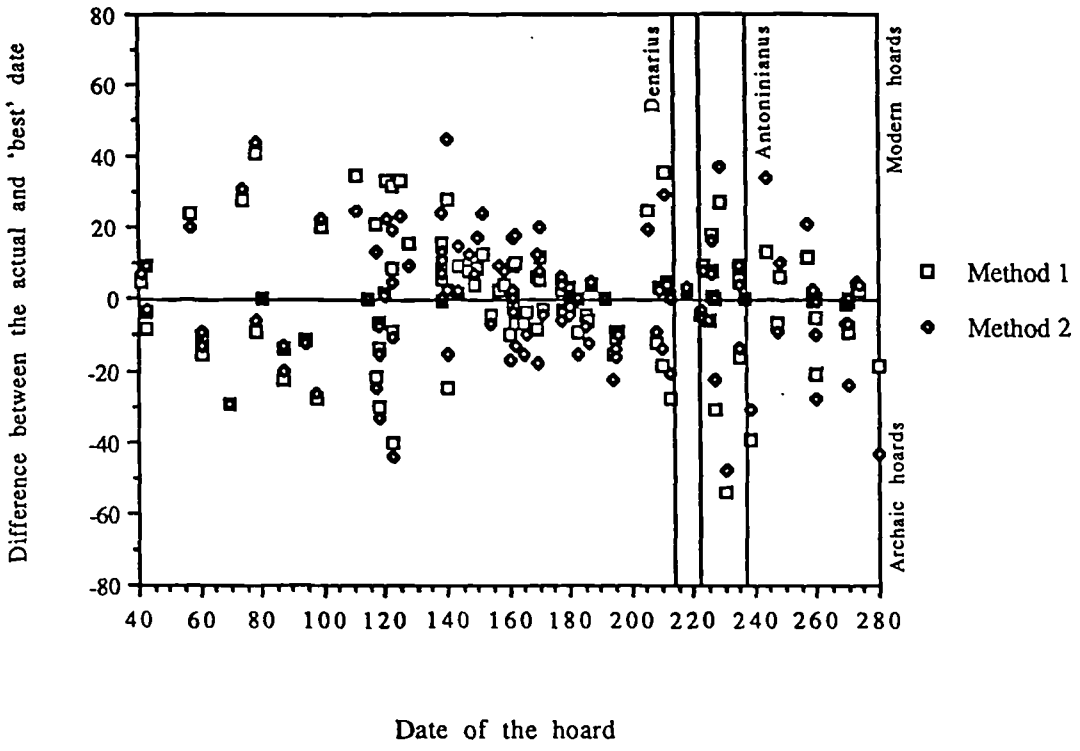


Fig. 45.06: The deviation (using both methods) of all the hoards against time

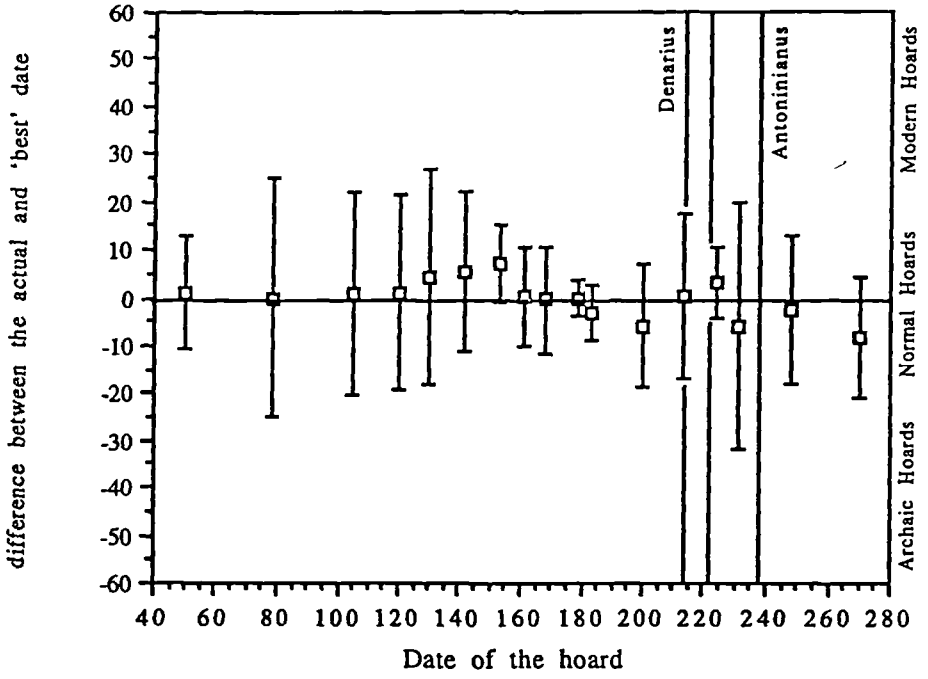


Fig. 45.07: The range of the deviation (using both methods) of hoards against time (1)

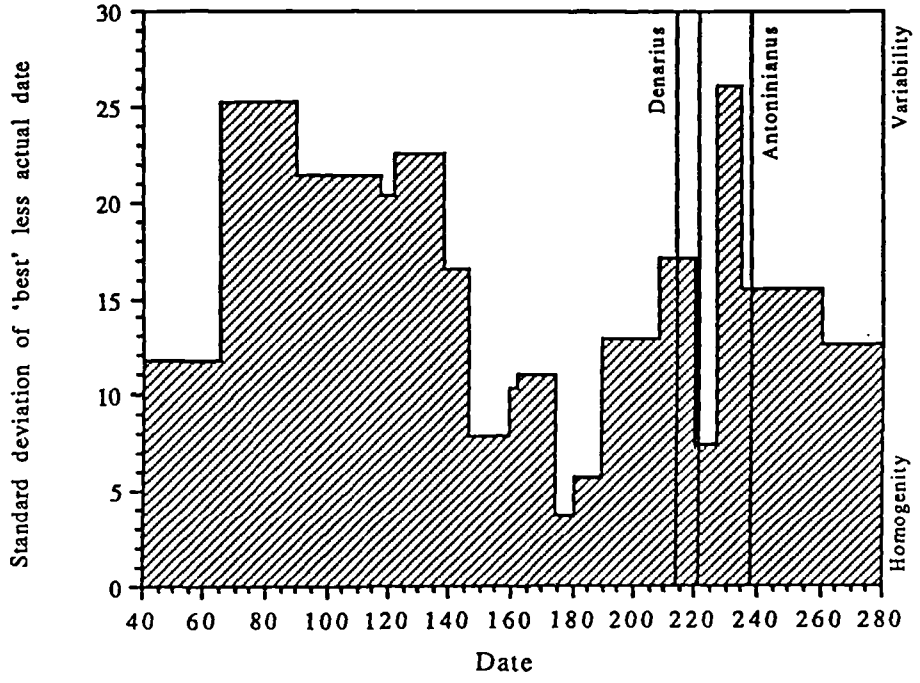


Fig. 45.08: The range of the deviation (using both methods) of hoards against time (2)

4.55 The calculation of Y, the number of transactions

We now have three variables representing the approximate shapes of (M) Money supply, (P) Prices and (V or $^1/_H$) Velocity of circulation. Once inserted into the equation it is a simple matter to establish the variable Y - the number of goods and services in the cash economy (Appendix 4.52). This is shown in fig. 45.09. As stated earlier, because of the nature of the variables inserted into the equation to generate this variable, only its grossest changes can be regarded as potentially meaningful. That being the case the graph may be described as follows:

Phase 1 A substantial number of transactions taking place immediately after the Claudian conquest

Phase 2 A period with very little activity during the later first century and into the very early second.

Phase 3 A period of sustained growth in the number of monetary transactions from the early second century to a peak in the 180s.

Phase 4 A decline in the number of transactions from the Antonine peak down to a low point in the mid third century when the number of *denarii* in circulation had dropped and significant numbers of *antoniniani* had not yet arrived to make up their numbers in circulation. One could hypothesis that had the data continued there might be a third peak in the late second century with the huge number of radiates in circulation, whatever speed at which they were circulating.

During the following interpretation of this graph various things must be borne in mind. First the early peak may be too short. This possibility has already been discussed for the *denarius* itself, but since the *denarius* supply figures here are meant to represent bronze coinage as well, the Neronian to Early Flavian peak in the *sestertius* curve should be considered. This would delay the trough's start from the Neronian period in fig 45.09 to c. AD 80 (cf. fig 42.07).

Secondly the graph is meant to represent any kind of transaction with coin, whilst this might be market trading, it could equally be bride-wealth or any other kind of social transaction. The equation would not distinguish between these.

Thirdly the number of goods and services traded within the cash economy might vary, not due to any changes in demand, but due to changes in the functions of money itself. One society might use coinage as bride-wealth, but this custom might disappear, leading

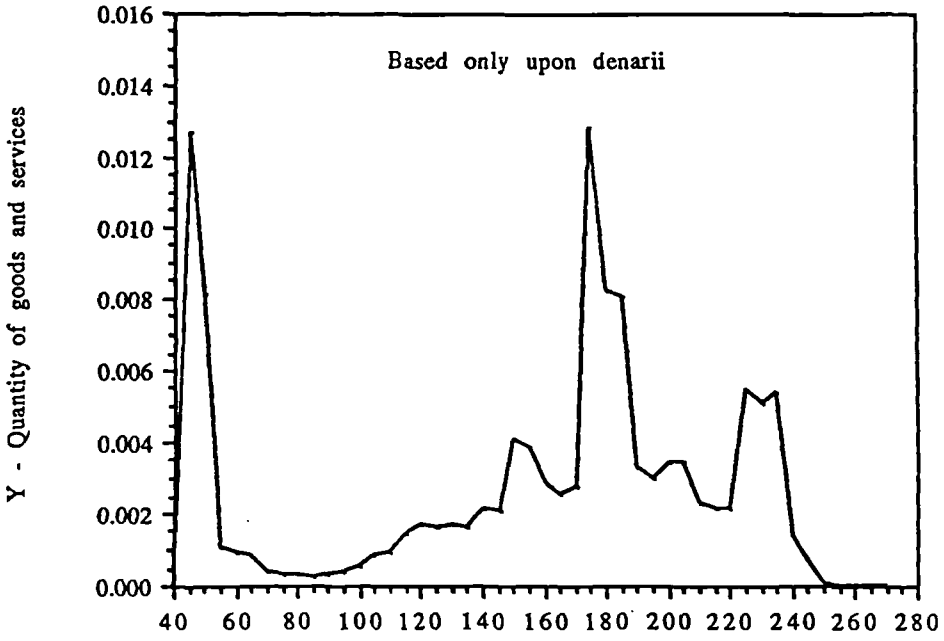


Fig. 45.09 (Y) A curve representing the changing number of goods and services with the Romano-British cash economy

to a decrease in the value of Y (which would potentially be inflationary). On the other hand new commodities, previously not within the monetary sphere, might be brought onto the market which would lead to an increase in Y (which could be anti-inflationary). Such changes are happening even today: in the last year of the USSR the economy was in a mess, lots of commodities were kept at artificially low prices for reasons of social policy. In the transition to a market economy one of the many proposed but aborted schemes meant that these artificially low prices would have to go, leading inevitably to price inflation. One way thought up of countering this was to increase the number of goods in circulation. Since there were no extra goods to be found something was needed which had not hitherto been considered a commodity. The suggestion was made that everyone should have to buy their own houses. This would increase Y and hence reduce pressure on the need for P(rices) to rise (Economist 31.3.1990, 71). The case is pertinent since Gregson (1982) has already suggested that the Roman period may see the conversion of land in Britain from a resource to a commodity. So changes in what money can buy would also effect the shape of the graph.

4.56 Interpretation and correlation with archaeological data

In discussing the archaeological evidence, especially pottery, it is the effect of imports and the military that will be looked at most. The military would have used coinage where making purchases outside the realm of taxation and requisition. Also whilst local ceramics may have been 'traded' through various social exchanges persisting from the LRPIA, imported vessels made closer to the heart of the empire would have been more likely to be traded for cash.

The Early Peak

Finding a peak in trading activity shortly after the Claudian conquest should not be at all unexpected. By AD 60/61 London had already developed into an important commercial centre flocking with traders (Tacitus *Annals* 14.33). This new foundation was not a centre based upon a pre-existing LPRIA central place constrained within a pre-existing social framework, and so the more extensive use of coin here for transactions in comparison to elsewhere would be likely. However, the goods were transacted many sites in the south rapidly received imported pottery and early brooches in the pre-Flavian period. This has been demonstrated in Sussex where samian arrived on many rural sites even earlier than the development of many of the towns:

> "...the arrival of samian ware in quantity fulfilled a demand stimulated by the shortage before the conquest. Its previous rarity had made it a prestige good, unavailable down the social hierarchy and so used to define position within society. The demand was sated by increased supplies after the conquest, so it reached more of the population for a short period before

> its very abundance removed from it any prestige of status value. Thus by the Flavian period it had passed the peak of its popularity on the rural sites of the south-east."
>
> (Millett 1990, 98)

This initial boom, as previously prestige goods flooded into the country, correlates well with the early peak in the model. Another site where the artifacts demonstrate extensive pre-Boudican trading is the Sheepen, Colchester. Here Sealey's (1985) analysis of the amphorae have shown there to be far more vessels from the pre Boudican deposits than either the LPRIA or later strata. However, it must be pointed out that later occupation on the site was minimal.

Interaction with the Roman Army in the South East and Midlands in this early period must also have promoted Roman monetary transactions through the spending of army pay and the contracting of army provisions. The letter above from Octavius in Vindolanda demonstrates that at a later date the Army certainly purchased some of their grain. This initial boom would not have lasted beyond the 70s when the Army moved further away and supplies would be sought nearer at hand. Whilst the database covers sites from the whole country it would still be fair to say it retained a south-eastern bias, so the army's passing presence in lowland Britain may have had an effect upon the curve.

Finally, of course, we have Claudius and Seneca's loans to Britain, which must have encouraged the use of Roman money up until their withdrawal around AD 60. Once again suggesting there should be an early peak in trading activity, perhaps receding after the Boudican revolt.

The Depression

It is not so easy identifying a depression in the archaeological record. One way is to look at the supply of pottery to the Roman Army. Swan (1984, 8) and Greene (1979, 99) state that the army's policy was to to obtain pottery locally as far as possible, to import small quantities of specialist wares where necessary, and to make its own pottery only as a last resort. If the graph represents the level of trading activity, then from the late first into the very early second century the Army may have had difficulty obtaining ceramics from the market place and may have had to resort to manufacture itself. In order to test this idea we have to demonstrate that both before and after this period the army was obtaining ceramics from the market, and only during this slump did it make pottery itself.

Swan (1984) sees evidence for this switch from the market to army manufacture in the late first century, and the change back in the 120s:

> "The pottery evidence suggests that in the Trajanic (97-117) period Roman official policy towards military supply changed radically .... A number of legionary and auxiliary depots was established for the manufacture of tiles and pottery, and these can be clearly distinguished on the Stanegate and elsewhere in the North. ... One effect of this was possibly to accelerate the decline of some of the earlier specialist industries such as the Kent mortarium manufacturers. ... Under Hadrian in c.AD 120, another drastic turn-about in military supply-policy is implied by the ceramic evidence. These depots were closed and the army of the North was left dependent on supplies from civilian sources further south, a policy seemingly adhered to thereafter. This must have contributed to the rapid expansion of the Dorset black-burnished ware industry and the Hartshill/Mancetter potteries, among others."
>
> (Swan 1984, 19)

Other evidence can be added to this. From the late first century into the second the Holt kilns supplied legion XX Valeria Victrix with tiles and pottery, while the IX Hispana apparently had kilns at York from the 70s to the end of the century (Breeze 1977,137).

However, it is not just the military supply and manufacture which demonstrates the possibility of a depression. Up until about AD 70, imported colour coated wares had been popular, but these are rare between then and the start of the large scale production in the Nene Valley in the 150s (Greene 1977, 125). Other imports suffered as well. Samian ware curves (Marsh 1981) also show this depression; from around AD 70 the level declined to reach a low point in the early second century, from which it began to rise again to a new peak in the 170s with the importations from Lezoux (Central Gaul).

Evidence exists from towns as well, most strikingly from Canterbury. Here, despite early activity, many of the areas of the town were covered by a grey loam during the last quarter of the first century through until AD 110-120. Whilst the theatre (and presumably associated temple precinct) was established around about AD 90, it cannot be said to have been sited within a thriving bustling commercial town. (Bennett 1991). A hint of this, though not so obvious, can be found at Verulamium. The shops of Insula XIV were not replaced after their destruction during Boudica's revolt until c.AD 75. When new buildings were built they were of a lesser quality and size; however c.105 they were rebuilt again though this time expanding to fill all the vacant space to the rear of the street (Frere 1983). The forum may have been built during the great depression, but this need imply nothing about the vitality of the monetary economy.

The Antonine Peak

It has already been noted that as the second century proceeds colour coated wares re-emerge in the 150s, Samian ware reaches a second peak in the 170s, and the army start receiving pottery from a series of expanding industries in the south from the Hadrianic period (117-138). This all seems to be in line with the gradual rise seen in the number

of transactions suggested from the low point in the late first century to a peak in the 180s. The fall thereafter continues until the mid third century. Some of the industries set up during this boom period can also be seen to die with it:

> "From c. 120 onwards, the regular shipping of black-burnished ware to the northern frontier along western sea-ways may well have stimulated the establishment or expansion of industries within easy access of such routes or along them, for example the Wilderspool, Cheshire, Muncaster, Cumberland, and Severn Valley potteries. Their distributions indicate a steady expansion in the number of potteries throughout the 2nd century, including more specialist factories than at any other time in Roman Britain. Many of these supplied relatively small quantities of their wares to the garrisons in Wales and the North. Most of them were relatively small and by the mid third century many had either ceased production or become of purely local significance."
>
> (Swan 1984, 19)

Evidence for this Antonine flourishing can be seen elsewhere, in villa construction for instance. Gregson (1982) has shown that it is at about AD 175 that the mean distance of villas from *civitas* capitals reaches its height (though the maximum number of villas was reached later). If villas relied upon the sale of their surplus through towns then the maximum distance of villas from towns must correlate with the healthiest period of interaction between the town and the villa. The Antonine boom would seem to be a reasonable context for this.

Beyond this date we have a decline into the mid third century, though quite possibly the sheer quantity of radiate *antoniniani* in circulation in the latter part may mean that there should be a peak here in the money-supply figures and thereby the Y-curve. However, this depends upon the degree to which a corresponding rise in prices counteracted this. Whilst prices rose from 250 to 270 (fig. 47.02), the graph shows that the major escalation in prices came just after 270 (fig. 47.01). Whilst this period is really beyond the scope of this thesis it might be that from 270 onwards we have a transfer from the use of coinage back to other forms of exchange. If people stopped using coin for transactions then Y would fall, hence all other things being equal the prices of the items still brought and sold for cash would go up. An inflationary cycle could have been entered into with even more people withdrawing from the monetary economy forcing prices up even further.

There appears to be some correlation between the archaeological evidence and the curve denoting the hypothetical number of monetary transactions taking place in exchange for goods and services. This certainly suggests that within the spheres of the military and imported pottery both were fully within a monetized economy. Without an analysis of the changing level of the production of coarse and local wares it is more difficult to say how far into the realms of other manufactured goods the use of money passed.

4.57 Economic growth and cyclical trends

One thing that is striking is that we do not seem to have a slow continuous 'monetization' as might have been expected. If anything the monetary economy could be seen as a series of booms and depressions, with peaks every 100 years or so, around the AD50s, 160s and the 260s. In this case the first short peak may entirely relate to the effect of the invasion. On the other hand it may be the second half of a boom which began earlier in the LPRIA. This kind of picture is contrary to the belief in sustained gradual economic growth in the late Republic and under the principate, a view epitomised by Keith Hopkins (1980) and in a slightly different version by Garnsey & Saller:

> "A general argument for economic growth under the Principate might run as follows: the accession of Augustus inaugurated an era of relatively stable government, the basic condition for economic recovery and expansion. The new regime was dedicated to the cause of civil peace and the pacification of Rome's enemies. The success of this policy furthered internal economic development, and insofar as it expanded the territory under Roman control, extended the economic horizons of the empire. ... Augustus lacked a clear and coherent policy of stimulating economic expansion, but he did create the conditions under which economic life could flourish. After his reign the pax Romana was by and large uninterrupted ... the empire suffered few major calamities until the middle of the third century."
>
> (Garnsey & Saller 1987, 51)

Instead of sustained growth we appear to have a series of booms and depressions in trading activity. Such cycles have long been discussed and almost taken for granted in more recent economic history, though that is not to say that the causes behind them have been understood (T. Hopkins & Wallerstein 1982). Various length cycles have been identified from the Kitchin cycle of 3-4 years, the Juglar cycle of 9-11 years and the Kondratieff cycle of 40-60 years, sometimes called 'long' cycles; then there are Cameron's 150-300 year cycles called 'logistics'. These cycles were originally identified as phenomena of features of the capitalist economy after the industrial revolution, but many historians have traced long cycles back in England into the 15th century, with 'logistics' going back into the 9th century, in each case with the cycle getting longer and longer. They only appear to stop there because the Economic Historian's data starts to become problematic at an earlier date.

In their discussion of cyclical rhythms within the context of world systems analysis, Immanuel Wallerstein and Terrence Hopkins (1982) pointed to a series of phenomenon which frequently occur during such cycles which potentially can be traced in Roman historical and archaeological sources:

1. During times of economic expansion there will be pressure towards ever greater specialization as the counterpart to ever greater interdependence within the economy. This would take the form of different areas of the Empire specialising in different goods and in the specialization of craft production. The reverse is the case during periods of contraction.

2. The effectiveness of the political machinery that guarantees the functioning of the social economy will vary. Since this has the power to restrain intra state social conflict and larger scale military conflict. Both constraints tend to be lessened during periods of stagnation.

These variables and suggestions regarding the supply and demand for goods manufactured in 'high wage cost' and 'low wage cost' areas of a system were deemed to vary in dual cycles labelled A1,B1 and A2,B2 ('A' being the expansion of the economy, 'B' being the subsequent contraction). During the first cycle one particular political power block would rise to dominate the 'world system', whilst during the second cycle it would decline eventually to be replaced by a new system. The predictions of the model are outlined below in Table 4.51.

Table 4.51:
Hopkins and Wallerstein's (1982, 112-120) predictions of phenomena during 'long period cycles'.

D(HW) = Demand for goods from High Wage areas
S(HW) = Supply of goods from High Wage areas
D(HW) = Demand for goods from Low Wage areas
S(HW) = Supply of goods from Low Wage areas

Cycle	Political Power	Social Structure	Specialisation	Trade & Production
A1 Rise	Ascending Hegemony Acute conflict between rivals to the succession		Increasing regional and craft specialization	D(HW) > S(HW) D(LW) > S(LW)
B1 Fall	Hegemonic victory 'New' power by-passes 'old' in decline	Social stress	Decreasing regional and craft specialization	D(HW) = S(HW) D(LW) = D(LW) Stagnation in LW areas earlier
A2 Rise	Hegemonic maturity True hegemony		Increasing regional and craft specialization	At the end of the rise: D(HW) < S(HW) D(LW) > S(LW)
B2 Fall	Declining hegemony Acute conflict of old power versus successors	Social stress	Decreasing regional and craft specialization	After this 'crash' Production in HW areas is particularly hit.

A superficial analysis suggests that the cycles indicated above for the first to third century Britain could be correlated with Hopkins and Wallerstein's suggestions. The first two cycles would be seen as the period of dominance of the Principate in the style of Augustus, the Flavians and the Antonines - the senator made king. This 'Hegemony' of the Early Empire was replaced after a crisis by the new order of the Late Empire, initially under the Tetrarchy, but then a new succession of Imperial Houses, but by this

time the nature and style of the office had radically changed, so had the structure of the Empire. The Late Empire would suggest a fourth boom in the mid to late fourth century. A money supply curve might indicate this with the re-emergence of large numbers of *siliquae* and the huge *aes* issues of the House of Valentinian (364-78). Table 4.52 is an attempt to draw together some of the historical and archaeological evidence to see if this kind of model fits the data. In it High Wage areas of production have been taken to be the extreme frontiers where there would have been more cash possibly leading to higher prices (cf. Birley 1981), eg. Germany and Northern Britain. Low Wage areas have been taken to be the areas described as 'tax exporting' regions by Keith Hopkins: Gaul and Spain:

Table 4.52: The Roman Empire and the Hopkins and Wallerstein model.

Cycle Phase	Political Power	Social stress	Specialization: Verulamium insula XIV	Production: the evidence of pottery.
A1 - Expansion ? - AD 55	Ascending Hegemony The establishment of the Principate and final expansion of the Empire		Phase 1 (49-60) Row of shops built early on, likened to military barracks	There is a high demand for both Gallo Belgic Wares (HW) and Southern Gaulish Samian (LW)
B1 - Stagnation AD 55-c.100	Hegemonic Victory		Phase 2a (c. 75-c. 105) After a gap building replaced by a lesser built construction	The demand for Southern Gaulish Samian Ware falls off (LW) as does the supply of Gallo Belgic Wares
A2 - Expansion AD 100-180	Hegemonic Maturity The establishment of Frontiers		Phase 2b-d (c. 105-150) Buildings expand to the rear to fill all the available space.	Demand for Central Gaulish (LW) Samian increases, but not Eastern Gaulish (HW) Samian, despite its closer proximity.
B2 - Stagnation AD 180-240	Declining Hegemony Problems with finances, problems with the succession		Insula XIV, having been destroyed by a fire, remains largely vacant	The production of central and eastern Gaulish samian both terminally decline into the 3rd century.
A1 - Expansion AD 240-280	Ascending Hegemony Acute conflict with the division of the empire and a high turn-over of emperors		The prize street frontage Wattling street is re-occupied by strip buildings in 275	Demand rises for products not from HW areas (Germany, N. Britain etc.) but from LW areas, especially southern Britain: eg. Oxfordshire, New Forest Wares.
B1 - Stagnation AD 280-340	Hegemonic Victory Establishment of the Tetrarchy and House of Constantine	Bacaudae in Eastern Gaul		
A2 - Expansion AD 340-370	Hegemonic Maturity	No references to bacaudae		Crambeck Ware (HW?) expanded after c.367, but the most important industries are those in the South (LW).
B2 - Stagnation AD 370-400+	Declining Hegemony Barbarian pressures and various usurpations	Bacaudae and stress on the frontiers.		Most of the major production centres enter into terminal declines

There is enough correlation to suggest that this form of analysis *may* prove useful in understanding structural changes in the Roman World, however more detailed archaeological investigations of other provinces (and the calculation of their money-

supply, velocity of circulation and Y curves) would be required which would be beyond the scope of this thesis. Incidentally the hegemony preceding the empire would be expected to have peaked around the mid second century BC, around about the time often described as the golden age of senatorial rule. In the opposite direction we have the 'victory' of a new hegemony from the late 5th to mid 6th century which matches with Clovis' (482-511) consolidation of the Frankish Kingdom, and its expansion into Burgundia, Thuringia and Provence under his sons. Thereafter the Frankish kingdom occasionally fell apart and was reconstituted, but the next great peak would be scheduled to arrive with the Carolingians around AD 800, the year Charlemagne was crowned Emperor in Rome.

4.58 And yet...

A headlong run into this form of analysis would be premature. The 'world system' view is based upon the existence of a reasonably integrated economic system. Though the level of political integration in the Roman world was certainly high, one may wonder about other aspects of the economy. The *denarius* was to all intents and purposes a universal currency in the central and Western Empire, but unless that currency and articles of trade were reasonably fluid how relevant is it to apply any of the 'world systems' terminology to the Ancient World?

Though some of the evidence above suggests that cycles did occur, they were certainly not empire-wide affairs. The floruit of the West seen in monumental buildings and levels of material culture appears as a mini dark-age in the archaeology of the East (cf. the evidence of the Boeotia Survey, Bintliff 1991). Though even within a confined area of the East these changes are not synchronous, the rises and fall of the Hellenistic floruit apparently being about 200 years earlier in SE Attica than in Boeotia. Even within the West the growth and decline of regional activities do not all appear synchronous, with Arretine Ware giving way to Southern Gaul, then Central and Eastern Gaul (though part of this might potentially be explicable in terms of the difference between high and low wage areas as the empire expanded and settled down).

In terms of other material culture the circulation of goods often appears to have marked regional tendencies. Duncan-Jones remarked upon this in his analysis of Roman Lamps in various provinces:

> "In so far as lamps were produced in the regions in which they have been found, the layout of finds still show regional limits in the way production was organised, which ultimately reflect limits in the long-distance trading pattern. The implicit boundaries, especially the sharp north-south differences within the western half of the empire, show limits in the trading pattern, and they do not support the view that, in trade terms, the empire formed a single integrated economy."
>
> Duncan-Jones (1990, 58)

Then there are the coins themselves. Walker (1988) remarked upon the provincial nature of bronze circulation. Certain types of *aes* rarely crossed certain boundaries like the Alps or the channel, this does not bode well for the concept of an integrated monetary economy. Kraay (1956) noted the even more restricted circulation of bronze coins with early imperial countermarks in the Rhineland. If this phenomenon were restricted to bronze it might not concern us too much, but Duncan-Jones has identified a similar pattern in the distribution of *denarii* across different provinces (1989b). The analysis is fairly restricted at the moment, but again it is suggestive of there being discrete regional economies within the framework of the empire as a whole.

4.59 Conclusion

This section has tried to bring together various elements of the analysis so far. Studying together the money-supply and velocity of circulation trends within the framework of the quantity theory of money the suggestion has been made that the economy in Roman Britain did not experience a continuous economic growth, rather after a rapid period of activity following the conquest of the south there was a depression lasting up and just into the beginning of the second century, a further recession began at the end of the Antonine period. This pattern has been shown to be not inconsistent with other forms of archaeological evidence.

Secondly we tried to see if these two peaks were part of a broader pattern within the context of broader economic trends in western Europe as a whole. Again a provisional investigation suggested that some of the predictions connected with cyclical trends in the economy can be traced in the evidence for western Europe (4.57). However, this part of the analysis is only suggestive as the chronologically and regionally restricted scope of this work is not sufficient to confirm such a picture on its own (4.58). Trends in one province should only very warily be taken to represent generalized pictures of what is happening elsewhere. Even if shown, the existence of cycles does not 'explain' what is happening. It just highlights systematic patterns which still need to be interpreted. Cycles should not be sought or studied for their own sake (eg. Going 1992).

'World systems analysis' (beyond the use of core-periphery phraseology) shows some potential for the investigation and interpretation of archaeological data, and numismatics has an important role to play here. Fisher's equation used with numismatic data has managed to produce at least an idea of the changing number of monetary transactions taking place within the Romano-British economy, and that pattern has been shown to be not inconsistent with other archaeological data. Were this work to be carried out in other provinces then a better idea of the workings of the empire as a whole could be achieved, and its level of integration assessed.

5.0 Concluding Remarks

In the introduction I set myself a series of questions to answer. Because Introductions are usually the last thing to be written to theses there is almost an inevitability that these have all been answered in one way or another. The first was 'How much money was there in circulation?'. A precise answer is impossible, but an idea as to changes in the quantity of money has been provided for both *denarii* (section 3.53) and *sestertii* (section 4.22) on the basis of a model of losses from the circulation pool. Other models based on wastage rates have been tried giving similar basic trends (section 4.23) and a reanalysis of Walker's Bath coin report has tagged some cautionary warnings onto his figures (section 4.21). So overall while no absolute quantification has come out of this, a 'feel' for the changing volume of silver and bronze in circulation has been achieved.

The second question was 'How evenly was this distributed?'. The answer depends upon a clarification of the question. In terms of the use of silver and bronze there was a slight tendency for areas to continue using similar metals to those used in that area in the LPRIA (section 4.13) for a generation at least. Thereafter in terms of the distribution of wealth, throughout the life of the *denarius* in Britain there appears to be a remarkable degree of stability in terms of the number of large to small hoards (2.63), perhaps suggesting a great deal of social stability. However, this might break down in the mid third century but that is really beyond the breadth of this work.

Thirdly, 'How rapidly did they circulate?'. Three methods were tried based on coin wear and the similarity of coin hoards (sections 2.36, 2.44 and 2.55). What all of them indicated was the variable rate of circulation which in previous analyses had always been assumed to be constant.

Fourthly, 'Where and how did coin enter circulation?'. We were able to show this in periods of slow circulation where the variability in hoard structures had a geographical pattern to it. Hoards containing greater proportions of new coin could usually be found where the army was located. But rarely at the Provincial capital - London (section 2.56).

Lastly, 'Was monetization progressive or variable?'. Here a minor digression is appropriate.

> "As in any self-sufficient pre-industrial economy, the bulk of the empire's labour force was primarily engaged in producing food, most of which the producers also consumed. This was the most important element of the Roman economy. We may add to this picture by assuming also that peasants individually grew most of their own food and did not exchange much produce with each other. In addition, it seems likely that handicraft workers, because of the low level of capital investment, each produced little

> more than the average peasant. We can now see that an extremely large proportion of all that was produced both in Italy and in the provinces was never traded; it stood outside the market, solid and inflexible, almost untouched by the forces of money. Analysis of the Roman economy has always to take that solid unmarketed core into account."
>
> (Hopkins 1978, 15-6)

The thesis has been almost entirely about money. Hopkins reminds us that it is all too easy to forget that the vast majority of food and work took place outside that monetary economy. That much exchange within the Roman Empire should not have used coin during certain periods should not surprise us. Strabo noted that in parts of post-Augustan Spain (the Lusitani and some of the northern tribes) barter in basic commodities such as goats milk, beer and butter was still practiced (as opposed to the more civilized cow's milk, wine and olive oil; Strabo, Geography, 3.3.7). But rather than being depressed at this the use of the quantity theory of money, if correct, could offer us a way of trying to examine the process of monetization. In section 4.5 an attempt was made to calculate 'Y', the number of monetary transactions taking place within Britain. It is just possible that all this curve reflects is the changing population level in the country: more people, more transactions; fewer people, fewer transactions. Yet such drastic changes in population level seem unlikely. The simplest explanation is that it reflects changes in the number of goods being transacted in the monetary economy and therefore the level of monetization of that society.

Perhaps the most important result is that monetization does not prove to be progressive all the way through until the sudden decline of Roman Britain, but rather cyclical. It starts off well, though its novelty wears off rapidly after the conquest leading to a depression lasting much of the late first and early second century. Hitherto the unyielding forces of 'progress' have all too often been taken for granted. The greater preponderance of later third and fourth century coin has been seen as facilitating the development of a market economy, and hence greater monetization:

> "...the bulk of exchange was ... embedded within social relations and was not solely for profit. The breakdown of this pattern, with an increase in buying and selling outside the sphere of social control in the later Roman period, has been argued to result from a reduction in the effective authority of the centralized élite, with the consequence that exchange was liberated (or became disembedded) from the social control so that the economy began to grow. This argument has been developed by Hodder ... and reinforced by Reece ... on the strength of the coin evidence. It has been shown that there was a massive increase in the number of coins *lost* from the third century onwards and these were of lower denominations than those of the early Roman period... . This evidence is consistent with a pattern of the increased *use* of coinage for exchange within a marketing system.
>
> (Millett 1990, 169; my italics)

Yet the coin evidence here may reflect no more than a difference between periods of instability in the financial systems where worthless coins were discarded and periods

when the monetary system was basically stable. 'Loss', the number of coins found on excavations, and 'use' are not the same thing. Also the presence of larger or smaller quantities of coin does not necessarily imply 'market conditions'. Large scale command economies can use vast quantities of money just as slightly freer 'market economies' (cf. the late Soviet Union vs. the West). Quantity of money and the existence of 'the market' are not necessarily linked. However, I hope this work has shown that by exploring the quantity theory of money we can at least develop ideas about the changing level of monetization, whatever that money was used for.

The Future

This thesis has been based upon the coins from one small part of the Roman world. There is no reason why the models should not be taken and applied to other provinces. Potentially we might be able to show how new coin circulated around the Empire as a whole. That would greatly enrich the arguments such as Hopkins (1980) about tax importing areas and exporting areas; as well as those who prefer to see more of the state interaction between provinces taking place by the procurement of taxation in kind (eg. Garnsey & Saller 1987). It is certainly into this wider area that this work should progress next. But that is just the numismatic side of things. The possibility of booms and slumps aired in 4.5 should also make field-archaeologists more aware of their interpretation of early Imperial levels. Until recently there was a reluctance in some quarters to see Roman towns in Britain as 'declining' from the third century onwards, though now recognized as a possibility and sought for, evidence appears to be turning up to support the idea. Similarly with the concept of a late first century to very early second century slump, given time and research similar patterns might be found at other towns than Canterbury and Verulamium, which are simply the two cases the author knows best.

Throughout this thesis an attempt has been made to develop numismatic models for drawing out patterning within the archaeological data. Those patterns still need to be interpreted. The interpretations which I have offered here may not be the correct ones, sometimes I myself have suggested alternatives, whilst I am sure readers will be able to come up with their own. However, agree or disagree with the interpretations, patterning has been shown within the data which needs to be explained. If this thesis has set anyone thinking about that then it has been worthwhile.

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Tome III	1984	Pays de la Loire
Tome IV	1985	Haute-Normandie
Tome Vi	1987	Rhône-Alpes
Tome Vii	1988	Rhône-Alpes

Appendix 2.11

Antonine *denarius* hoards

Data for the clustan analysis. The full details of each hoard can be found in appendices 2.21 and 2.22. Those with an asterisk by them represent the hoards with the better data.

Cat N°	N°	TPQ	Rep	Ant	Aug	Nero	CW	Vs	Dom	Nrv	Trj	Had	AP	MA	Com	Total	
C 246	1	117	32.4	10.2	4.0	0.0	2.0	22.4	14.2	4.0	10.2	0.0	0.0	0.0	0.0	49	*
C 139	2	118	20.9	5.2	0.0	0.0	5.2	57.8	0.0	0.0	5.2	5.2	0.0	0.0	0.0	19	*
C 262n	3	118	43.7	2.4	4.8	0.0	4.8	31.7	4.8	0.0	4.8	2.4	0.0	0.0	0.0	41	*
S 059	4	120	0.0	0.0	0.0	0.0	0.0	33.3	33.3	0.0	0.0	33.3	0.0	0.0	0.0	6	*
S 155	5	120	14.8	0.0	0.0	1.6	6.6	31.6	8.3	1.6	28.3	6.6	0.0	0.0	0.0	60	*
C 141	6	120	23.9	0.8	0.0	0.8	4.0	27.2	4.0	4.0	28.8	6.4	0.0	0.0	0.0	125	*
C 028n	7	121	0.0	0.0	0.0	0.0	0.0	33.3	0.0	11.1	33.3	22.2	0.0	0.0	0.0	28	*
S 015	8	122	36.5	20.0	3.3	3.3	0.0	16.6	3.3	0.0	10.0	6.6	0.0	0.0	0.0	30	*
S 016	9	122	24.9	3.5	0.0	3.5	10.7	25.0	3.5	3.5	21.4	3.5	0.0	0.0	0.0	28	*
C 084	10	127	0.0	0.0	0.0	0.0	3.8	15.3	11.5	0.0	30.7	38.4	0.0	0.0	0.0	26	*
C 228	11	127	73.2	13.3	6.6	0.0	6.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15	*
S 056	12	127	0.0	0.0	0.0	0.0	14.2	28.5	14.2	0.0	28.5	14.2	0.0	0.0	0.0	7	*
C 261	13	136	0.0	0.0	0.0	0.0	0.0	0.0	8.3	0.0	58.3	33.3	0.0	0.0	0.0	12	*
S 114	14	136	0.0	0.0	0.0	0.0	2.1	10.8	7.2	8.6	47.1	23.9	0.0	0.0	0.0	138	*
C 236	15	137	0.0	3.3	0.0	1.6	2.8	21.3	17.9	2.8	26.9	23.0	0.0	0.0	0.0	178	
S 037	16	138	0.0	0.0	0.0	1.6	6.4	12.9	19.3	4.8	30.6	22.5	1.6	0.0	0.0	62	
C 258	17	140	0.0	0.0	0.0	0.0	11.1	22.2	11.1	0.0	33.3	22.2	0.0	0.0	0.0	9	*
C 127n	18	142	16.5	0.0	8.3	0.0	4.1	25.0	12.5	4.1	8.3	16.6	4.1	0.0	0.0	24	
S 127	19	143	0.0	2.9	0.0	0.0	5.8	17.6	0.0	2.9	29.4	32.3	8.8	0.0	0.0	34	*
S 098	20	147	0.0	0.0	0.0	0.0	0.0	6.3	10.6	4.2	34.0	42.5	2.1	0.0	0.0	47	
C 154	21	149	0.0	3.0	0.0	0.0	3.0	9.0	3.0	3.0	33.3	33.3	12.1	0.0	0.0	33	*
C 052	22	150	0.0	0.0	0.0	0.0	0.0	7.5	2.5	0.0	47.5	30.0	12.5	0.0	0.0	40	
C 053	23	150	0.0	2.2	0.0	4.5	4.5	20.4	6.8	6.8	31.8	9.0	13.6	0.0	0.0	44	*
S 180	24	152	0.0	0.0	0.0	0.0	0.0	0.0	14.2	0.0	35.7	14.2	35.7	0.0	0.0	14	
S 060	25	153	0.0	0.0	0.0	0.0	0.0	16.6	0.0	0.0	33.3	41.6	8.3	0.0	0.0	12	*
C 158	26	154	0.0	1.6	0.0	0.9	2.3	17.6	10.9	3.8	29.0	25.7	7.8	0.0	0.0	420	*
C 187n	27	159	0.0	0.0	0.0	0.0	0.0	10.5	5.2	0.0	21.0	26.3	36.8	0.0	0.0	19	
C 212	28	159	0.0	0.0	0.0	0.0	0.0	9.7	4.8	3.6	28.0	41.4	12.1	0.0	0.0	82	*
S 135	29	160	0.0	1.6	0.0	1.6	1.6	34.6	8.4	1.2	20.3	16.7	13.3	0.0	0.0	471	
C 005	30	162	0.0	3.7	0.0	2.0	2.7	24.3	2.0	1.3	20.9	19.9	20.9	2.0	0.0	296	*
C 248	31	162	0.0	0.0	0.0	0.0	0.0	6.2	12.5	0.0	12.5	37.5	25.0	6.2	0.0	16	*
C 215	32	165	0.0	11.1	0.0	0.0	0.0	22.2	0.0	0.0	22.2	0.0	33.3	11.1	0.0	9	*
C 198	33	166	0.0	0.0	0.0	0.0	0.0	25.0	0.0	0.0	12.5	12.5	7.5	12.5	0.0	8	*
C 085	34	166	0.0	0.0	0.0	0.0	3.8	23.0	11.5	0.0	19.2	19.2	11.5	11.5	0.0	26	
S 086	35	169	0.0	0.0	0.0	0.0	0.0	22.2	11.1	0.0	44.4	0.0	11.1	11.1	0.0	9	
C 039n	36	170	0.0	0.0	5.0	0.0	5.0	20.0	0.0	5.0	10.0	20.0	20.0	15.0	0.0	20	*
C 184q	37	170	0.0	0.0	0.0	0.0	0.0	5.2	0.0	2.6	31.5	26.3	21.0	13.1	0.0	38	
C 193q	38	170	0.0	1.5	0.0	3.0	1.5	7.6	7.6	12.3	23.0	24.6	13.8	4.6	0.0	65	
C 136	39	170	0.0	0.0	0.0	0.0	0.0	12.8	5.1	3.8	14.1	26.9	26.9	10.2	0.0	78	*
C 257	40	170	0.0	0.0	0.0	0.0	0.0	11.1	0.0	0.0	22.2	22.2	22.2	22.2	0.0	9	*
C 028	41	171	0.0	0.0	0.0	0.0	0.0	19.6	3.2	0.0	31.1	26.2	9.8	9.8	0.0	61	*
C 001	42	176	0.0	1.3	0.0	0.0	0.0	13.3	2.6	2.6	14.6	20.0	33.3	12.0	0.0	75	*
C 048n	43	177	0.0	2.7	0.0	0.0	0.0	13.2	3.8	1.6	17.6	25.4	29.2	6.0	0.0	181	
C 206	44	177	0.0	0.0	0.0	0.0	0.0	7.1	3.5	0.0	21.4	32.1	25.0	10.7	0.0	28	*
C 011n	45	178	2.6	0.0	0.0	0.0	0.0	13.5	5.4	2.7	8.1	21.6	35.1	10.8	0.0	37	
C 097	46	178	0.0	0.0	0.0	0.2	0.8	11.6	7.0	1.9	26.0	27.4	14.9	9.7	0.0	368	
C 227n	47	180	0.0	0.0	0.0	6.6	0.0	13.3	6.6	0.0	20.0	13.3	26.6	13.3	0.0	15	
S 097	48	181	0.0	0.0	0.0	1.1	2.3	8.9	2.3	0.5	16.1	24.5	26.9	16.1	0.5	167	
C 022	49	183	0.0	3.0	0.0	1.0	1.7	15.1	4.8	3.4	15.4	20.6	24.0	10.6	0.0	291	*
S 046	50	185	0.0	0.0	0.0	2.5	4.1	12.5	4.1	1.6	18.3	19.1	20.8	10.0	6.6	120	*
C 010	51	186	0.0	0.4	0.0	0.6	1.8	8.7	2.7	3.9	21.9	16.3	31.4	10.3	1.3	433	*
C 033	52	186	0.0	0.0	0.0	0.0	0.0	8.0	4.0	4.0	20.0	8.0	28.0	24.0	4.0	25	*
C 162n	53	186	0.0	0.6	0.0	0.6	1.2	14.1	3.2	3.8	18.0	16.7	26.4	14.1	0.6	155	
C 162	54	187	2.4	0.0	0.0	0.0	0.0	15.7	5.2	0.0	15.7	18.4	23.6	13.1	5.2	38	*
S 022	55	186	0.0	0.0	0.0	1.1	1.6	6.6	3.8	1.6	14.4	12.2	29.4	24.4	4.4	180	*

The hoards were:

1. Verulamium
2. Lancaster, Bridge Lane
3. Wheathampstead
4. Corbridge 1965
5. Thorngrafton
6. Lathom, Ormskirk
7. Brecon, Y Gaer
8. Birdoswald
9. Birdoswald
10. Dewsbury
11. Southants.
12. Corbridge 1911c
13. Weston, Green Farm
14. Mallerstang
15. Swaby
16. East of Carlisle
17. Westmeston
18. Hengistbury Head, site 33
19. Norton, Malton
20. Kirkintilloch
21. Llanynynech Hill
22. Chalfont St. Giles
23. Chatburn
24. York, Post Office
25. Corbridge 1969
26. Londonthorpe, Alma Wood
27. Nottingham
28. Pyrford, Bolton's Lane
29. Rudchester
30. Allerton Bywater
31. Waddington
32. Ribchester
33. Piercebridge
34. Dewsbury, Thornhill
35. Hampsthwaite
36. Caistor St. Edmund
37. Naseby
38. Parwich Hill
39. Knapwell
40. Westgate
41. Braughing
42. Aldworth
43. Castle Bromwich
44. Poughill
45. Beachamwell
46. Edwinstone
47. Slay Hills Saltings
48. Kirkby Thore
49. Blerchley
50. Southshields
51. Barway
52. Brixworth
53. Near Lydney
54. Lowestoft
55. Briglands

Appendix 2.21
Hoard Corpus

This corpus is divided into four parts:
1 Hoards from Northern Britain (Sekulla 1980)
2 Fourth century bronze hoards (Brickstock 1988)
3 Fourth century precious metal hoards (Archer 1979)
4 Additional hoards

Part 1: Coin hoards from Northern Britain
This is based on M. Sekulla (1980).
The format has been changed and the bibliography extended, corrected and updated where appropriate.

S1 Adderstone
Northumberland
NU 134 300
1856
Emperors & Denominations.

Asses:	9
Sestertii:	5
Dupondii:	1
Antoninianii:	13
Deposited:	(c 270 +)

a) J. Archibold, 'Roman Remains found at Adderstone', Archaeologia Aeliana, Volume 2, 1858, pp 14-16.
b) History of the Berwickshire Naturalists Club, 1850-1856, pp 262-263.
c) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 161.

S2 Alston
Cumbria (Cumberland)
NY 71 46
1848
Some Emperors listed.

AE3:	c 100
Deposited:	(c 317 +)

a) Anon., The correspondence of John Bell of Gateshead. In Proceedings of the Society of Antiquaries of Scotland, Series 3, Volume 8, 1917, pp 80-83.

S3 Backworth
Northumberland
NZ 30 72
1812
One coin fully identified.

Denarii:	280
Deposited:	(c 139 +)

a) J. Collingwood Bruce, The Roman Wall, 3rd edn., London, 1867, pp 426-427.
b) British Museum Accessions Register (Ms.)
c) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 156.

S4 Balgreggan
Wigtownshire
NX 090 506
1913
LRBC Nos.

AE:	119
Deposited:	(c 350-353 +)

a) G. Macdonald, 'Notes on Three Hoards of Coins recently discovered in Scotland', Proceedings of the Society of Antiquaries of Scotland, Volume 48, 1914, pp 395-398.
b) A.S. Robertson,'Roman Coins found in Scotland', Proceedings of the Society of Antiquaries of Scotland, Volume 103, 1971, p 130.
c) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p166.

S5 Bar Hill, Kirkintilloch
Dumbartonshire
NS 707 758
1902
RIC Nos.

Denarii:	2
Irregular Denarii:	11
Deposited:	(c 140-144 +)

a) G. Macdonald, 'A Recent find of Roman Coins in Scotland', Numismatic Chronicle, Series 4, Volume 5, 1905, pp10-11.
b) A.S. Robertson, 'The Coins', Bar Hill, A Roman Fort and its Finds, M. Scott and L. Keppie, Oxford, 1975, pp 169-170.

S6 Barton — Antoniniani: 203
Yorkshire — Deposited: (c 273 +)
NZ 213 069
1920
RIC Nos.
a) Ms. note in Darlington Museum
b) Northern Echo, 21 December 1921, p 5.
c) 'Roman Britain In 1921 and 1922', Journal of Roman Studies, Volume 11, 1923, p 202.
d) 'Notes', Journal of the British Archaeological Association, New Series, Volume 27, 1922, pp 231-232.

S7 Bean Castle — Gold: ?
Nairnshire — Deposited: ?
?
1460
Few details.
a) Scotorum Historiae, H. Boece fo.86, Paris, 1575

S8 Beaumont, Kirkandrews — Coins: c 1323
Cumberland — Deposited: (c 323 +)
NY 349 565
1819-1823
RIC Nos for a sample of 223.
a) R.S. Ferguson, 'The Beaumont Hoard, with some remarks on a pre-Roman road near Carlisle', Cumberland & Westmoreland Transactions, Volume 8, 1886, p 380.
b) Coin Hoards Volume 4, 1978, No. 164, p 40, also P. J. Casey, pp 50-55, Royal Numismatic Society, London.
c) Cumberland News, March 25th 1977.
d) W. Whellan, History and Topography of the Counties of Cumberland and Westmoreland, 1860, Pontefract.

S9 Benwell — Coins: 'several urns'
Northumberland — Deposited: ?
NZ 21 64
pre 1722
Few details.
a) W. Camden, Britannia, Gibsons Edn. Volume 2, London, 1722, pp1087ff.

S10 Berwick upon Tweed — Denarii (?): ?
Northumberland — Deposited: ?
NU 00 53
1766
Few details.
a) M.A. Richardson, Local Historians Table Book, Volume 2, Historical Division, London 1843, p156.

S11 Bewcastle — Denarii: c 30
Cumberland — Deposited: (c 118 +)
NY 540 810
c.1795
Few details.
a) J.Maughan, 'The Maiden Way', Archaeological Journal, Volume 11, 1854, p 230.

S12 Bewcastle — Coins: ?
Cumberland — Deposited: ?
NY 566 745
pre 1922
Few details.
a) W.G.Collingwood, 'The Roman Fort at Bewcastle', Cumberland & Westmoreland Transactions, Series 2, Volume 22, 1922, p 176.

S13 Bewcastle — Antoniniani: 5
Cumberland — Radiate Copies: 8
NY 566 745 — Deposited: (c 273 +)
1937
RIC Nos.
a) C.H.V. Sutherland, 'Report on the Coins from the Sacellum at Bewcastle', Cumberland & Westmoreland Transactions, Series 2, Volume 38, 1938, pp 232-234.

S14 Binnington Carr — Denarii: 12
Yorkshire — Deposited: (c 77-78 +)
SE 98 79
1874
CRR & RIC Nos.
a) H.S. Harland, 'Proceedings...', Proceedings of the Society of Antiquaries of London, Series 2, Volume 13, 1891, p 29-31.

S15 Birdoswald — Denarii: 30
Cumberland — Deposited: (c 119-122 +)
NY 615 663
1930
CRR & RIC Nos.
a) I.A. Richmond, 'Excavations on Hadrians Wall in the Birdoswald - Pike Hill Sector, 1930', Cumberland & Westmoreland Transactions, Series 2, Volume 31, 1931, pp130-131.
b) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p155.

S16 Birdoswald — Denarii: 28
Cumberland — Deposited: (c 119-122 +)
NY 615 663
1949
CRR & RIC Nos.
a) I.A. Richmond, 'A Roman wrist purse from Birdoswald', Cumberland & Westmoreland Transactions, Series 2, Volume 50, 1950, p 69.
b) I.A. Richmond, 'The Birdoswald Hoard and its composition', Cumberland & Westmoreland Transactions, Series 2, Volume 54, 1954, pp 56-60.
c) G.R. Watson, 'The Birdoswald hoard: the pay and the purse', Cumberland & Westmoreland Transactions, Series 2, Volume 54, 1954, pp 61-65.

S17 Bolton Castle, Wensleydale — Antoniniani: c 1100
North Yorkshire — Deposited: (c 270 +)
SE 03 91 ?
1832
RIC Nos. of a sample of 32.
a) Gentleman's Magazine, 1832, I, p 256.
b) E.J.W. Hildyard and P.V. Wade, 'A Third Century Roman Hoard from Yorkshire', Numismatic Chronicle, Series 6, Volume 12, 1942, pp 130-131.
c) A. Raistrick,'Roman Remains...in West Yorkshire', Yorkshire Archaeological Journal, Volume 31, 1934, pp 220-221.
d) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p160.

S18 Bowness on Solway — Bronze: c 15
Cumberland — Deposited: (c 141 +)
NY 223 626
16th/17th Century
Few details, RIC No. of one coin obtained.
a) F. Haverfield, Cotton Ivlivs f.4, Cumberland & Westmoreland Transactions, Series 2, Volume 11, 1911, p 352.
b) T.W.Potter,'Excavations at Bowness on Solway', Cumberland & Westmoreland Transactions, Series 2, Volume 75, 1975, pp 47 & 53.

S19 Braco, Shotts — Denarii: 'Several hundred'
Lanarkshire — Deposited: (c 180 +)
NS 828 665
1842
Few details,Emperors for 26, RIC CRR for 13.
a) R.Stuart, Caledonia Romana, Edinburgh, 1852 (2nd Ed.), p 260n.
b) 'Proceedings of the Society', Proceedings of the Society of Antiquaries of Scotland, Volume 1, 1854, p 72.
c) G.MacDonald,'Roman Coins found in Scotland', Proceedings of the Society of Antiquaries of Scotland, Volume 58, 1924, p 329.
d) A.S.Robertson, 'Roman Coins found in Scotland', Proceedings of the Society of Antiquaries of Scotland, Volume 94, 1950, pp150-151.

S20 Hawkhurst, Brampton
Cumberland
NY 512 612
1826
Some Emperors listed.
? Denarius: 1
? Antoniniani: c 5000
Deposited: (c 276 +)
a) J.Hodgson, A History of Northumberland, Volume 3 Part 2, Newcastle, 1840, p 233 and n..
b) H.McLaughlan, A Memoir written during the survey of the Roman Wall through the Counties of Northumberland and Cumberland, London, 1858, pp 63-64.

S21 Braystones
Cumberland
NY 007 059
Late 19th century
Few details, only one Emperor named.
No. of Coins: ?
Deposited: (c 172 +)
a) M.C.Fair,'Roman Finds on the Cumberland Coast', Cumberland & Westmoreland Transactions, Series 2, Volume 48, 1948, pp 218-219.

S22 Briglands, Rumbling Bridge
Kinrosshire
NT 017 998
1938-1957
RIC Nos.
Denarii: 180
Deposited: (c 187 +)
a) A.S. Robertson, 'A Hoard of Roman Silver Coins from Briglands, Rumbling Bridge, Kinrosshire', Proceedings of the Society of Antiquaries of Scotland, Volume 90, 1957, pp 241-246.
b) A.S.Robertson, 'The Circulation of coins in Northern Britain', Scripta Nummaria Romana, Eds. R.A.G. Carson & C. Kraay, London, 1978, p 199.

S23 Broonholm
Dumfriesshire
NY 37 81
1782
Listed by Emperor.
Aurei: 7?
Deposited: (c 73 +)
a) Old Statistical Account of Scotland, Volume 13, Edinburgh, 1794, p 597.
b) New Statistical Account of Scotland, Volume 4, Edinburgh, 1845, p 404.
c) G. Macdonald, 'Roman coins found in Scotland', Proceedings of the Society of Antquaries of Scotland, Volume 52, pp 203-276, reference on p 241.
d) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p155.

S24 Brough under Stainmore
Cumberland
NY 793 143
c.1790
Few details, one Emperor named.
Denarii: 'An urn full'
Deposited: (c 73 +)
a) W. Porson & W. White, A History, Directory and Gazeteer of Cumberland and Westmoreland, 1829, London, p 534.

S25 Brough under Stainmore
Cumberland
NY 793 143
c.1825
Few details.
Gold: 'few'
Silver: 'many'
Bronze: 'thousands'
Deposited: ?
a) W. Porson & W. White, A History, Directory and Gazeteer of Cumberland and Westmoreland, 1829, London, p 534n.
b) W. Whellan, History and Topography of the Counties of Cumberland and Westmoreland, 1860, Pontefract, p 728.

S26 Brough under Stainmore
Cumberland
NY 793 143
c.1845
Few details.
Silver: ?
Deposited: ?
a) W.Whellan, History and Topography of the Counties of Cumberland and Westmoreland, 1860, Pontefract, p 735.

S27 Brougham Castle — Antoniniani & copies: c 500
Westmoreland — Deposited: (c 273 +)
NY 539 290
1910
RIC Nos. for a sample of 51 (8 genuine, 43 copies).
a) A.J. Heelis ,'A Find of Roman Coins near Bougham Castle',Cumberland & Westmoreland Transactions, Series 2, Volume 11, 1911, pp 209-211.
b) D.C.A. Shotter, 'A Roman Coin Hoard from Brougham', Cumberland & Westmoreland Transactions, Series 2, Volume 78, 1978, pp 204-206.

S28 Ninekirks, Brougham — Radiate Copies: 23
Cumberland — Deposited: (c 276 +)
NY 527 284
c.1914
RIC Nos.
a) P.J. Casey,'The Ninekirks(Brougham) Hoard; a reconsideration', Cumberland & Westmoreland Transactions, Series 2, Volume 78, 1978, pp 23-28.
b) C.M.L. Bouch, 'A Dark Age Coin Hoard from Ninekirks, Brougham', Cumberland & Westmoreland Transactions, Series 2, Volume 55, 1955, pp 108-111.
c) Coin Hoards Volume 5, 1979, No. 164, p 56, Royal Numismatic Society, London.

S29 Capheaton — Denarii (?): ?
Northumberland — Deposited: ?
NZ 03 80
1745
Few details, associated with some 'Severan' silver work.
a) J. Wallis, The Natural History and Antiquities of Northumberland, Volume 2, 1769, London, pp 535-537.

S30 Carlisle — Coins: ?
Cumberland — Deposited: ?
NY 39 55
pre 1539
Few details.
a) Leyland's Itinerary, Herne's Edition, Volume 7, 1744-5, London, p54.

S31 Carlisle — Denarii: c 100
Cumberland — Deposited: (c 143-144 +)
NY 382 564
1860
Sample of 62 listed by Emperor, 2 with RIC Nos.
a) J. Collingwood Bruce, The Roman Wall, 3rd Edn., 1867, London, pp 427-428n.
b) L.E. Hope, 'Recent Additions to Carlisle Museum', Cumberland & Westmoreland Transactions, Series 2, Volume 7, 1907, p 277.
c) D.C.A. Shotter,'Roman Coin Hoards from Cumbria', Cumberland & Westmoreland Transactions, Series 2, Volume 79, 1979, pp 8-9.

S32 Carlisle — Asses: 8
Cumberland — Deposited: (c 86 +)
NY 403 566
1965+
RIC Nos.
a) A.S. Robertson,'Two Groups of Roman Asses from Northern Britain', Numismatic Chronicle, Series 7, Volume 8, 1968, pp 63-66.
b) D.C.A. Shotter, 'A Roman As from Carlisle', Cumberland & Westmoreland Transactions, Series 2, Volume 77, 1977, p 178.

S33 Carlisle, Fisher Street — Denarii: 'a large quantity'
Cumberland — Deposited: (c 172 +)
NY 399 560
1782
Some Emperors listed.
a) S. Jefferson, The History and Antiqutities of Carlisle etc, 1838, Carlisle, p 324.

S34 Carlisle, Gallows Hill
Cumberland
NY 39 55
October 1829
One Empress named (Faustina).
Denarii: 'several hundred'
Deposited: (c 138 +)
a) R.Ferguson, 'On the Roman Cemetaries at Luguvallium', Cumberland & Westmoreland Transactions, Series 2, Volume 12, 1893, pp 367-368.

S35 Carlisle, New Markets
Cumberland
NY 39 55
1887
Few details.
Silver: 200-300
Deposited: ?
a) R.Ferguson,'On a massive timber platform of early date uncovered at Carlisle', Cumberland & Westmoreland Transactions, Series 2, Volume 12, 1893, p 360.

S36 Carlisle, St Cuthberts Church
Cumberland
NY 39 55
pre1774
Few details.
Coins: 'a great quantity'
Deposited: ?
a) W. Stukley, Iter Boreale, 1774, London, p 55.

S37 Carlisle, East of the city
Cumberland
Not located
pre 1763
Emperors listed for a sample of 63.
Aurei: 1+
Denarii: 62+
Deposited: (c 138 +)
a) 'Proceedings', Archaeologia, Volume 8, 1787, p 428.

S38 Carrawburgh
Northumberland
NY 859 713
July 1872
Some details.
Antoninianii: 3
Radiate Copies 78
Blank 1
Deposited: (c 270 +)
a) J.G.Milne, 'Romano-British Notes', Numismatic Chronicle, Series 5, Volume 13, 1933, pp 82-84.
b) G.Askew, 'Notes on Two Hoards of Roman Coins from Crrawburgh', Numismatic Chronicle, Series 5, Volume 17, 1937, pp 144-145.

S39 Carrawburgh
Northumberland
NY 859 713
1875
RIC Nos.
Denarii: 66
Deposited: (c 210-212 +)
a) 'A Small Hoard of Coins from Carrawburgh', Proceedings of the Society of Antiquaries of Scotland, Series 2, Volume 10, 1902, pp 161-164.
b) 'Curators Announcements; Additions to the Museum', Proceedings of the Society of Antiquaries of Scotland, Series 2, Volume 4, 1930, pp 240-241.
c) G. Askew, 'Notes on Two Hoards of Roman Coins from Crrawburgh', Numismatic Chronicle, Series 5, Volume 17, 1937, pp 144-145.

S40 Carrawburgh, Coventinas Well
Northumberland
NY 859 713
1876
Some Emperors listed.
Coins: c 16000
Votive deposits
a) Dr Bruce, 'Observations' & C. Roach Smith, 'A Numerical View of Coins', Archaeologia Aeliana, New Series, Volume 8, 1880, pp 40-49.

S41 Castledykes — Bronze: c 100
Lanarkshire — Deposited: (c 140 +)
NS 94 28
1781
Some Emperors listed.
a) Letter from William Fullerton to A Stephenson, 20 October 1781, 'The Circulation of Roman Coins in Northern Britain', A.S.Robertson, in Scripta Nummaria Romana, Eds R.A.Carson & C.Kraay, London, 1978, p 199.
b) W.Smellie, Account of...the Society of Antiquaries of Scotland, Edinburgh, 1782, p 42.
c) G.MacDonald, 'Roman Coins Found in Scotland', Proceedings of the Society of Antiquaries of Scotland, Volume 52, 1918, pp 272-273.

S42 Catterick — Bronze: 'a pot full'
Yorkshire — Deposited: 'Lower Empire'
SE 22 99
1732
Few details.
a) John Horsley, Britannia Romana, London, 1732, p 400.
b) T.D.Whitaker, An History of Richmondshire, 1823, Volume 2, London, p 22.

S43 Chesterholme — Bronze: c 300
Northumberland — Deposited: (c 350 +)
NY 771 664
1833
Some Emperors listed.
a) J.Hodgson, History of Northumberland, 1843, Volume 3, Part 2, London, p 196.
b) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p166.
c) =B17

S44 Chesterholme — Bronze: 7
Northumberland — Deposited: (c 348 +)
NY 771 663
1937
Two coin types recorded.
a) Ms. Chesterholme site find collection.

S45 Chesterholme — Antoninianii: 111
Northumberland — Deposited: (c 270 +)
NY 769 663
1976
RIC Nos.
a) Coin Hoards Volume 3, P.J.Casey, 'Coin Hoard from Vindolanda', 1977, No.175, p 61, Royal Numismatic Society, London.
b) Unpublished Catalogue, P.J.Casey.

S46 Chesterholme ? — Bronze 18
Northumberland — Deposited: (c 346-348 +)
Not located
1930s?
LRBC Nos.
a) Unpublished Catalogue, M.F.Sekulla.

S47 Chester Le Street — Silver: 6
Durham — Bronze: 10
NZ 275 517 — Deposited: (c 273 +)
1920
Listed by Emperor.
a) 'Exhibitions', Proceedings of the Society of Antiquaries of Scotland, Series 3, Volume 9, 1921, pp 273-274.
[Note: Possibly not a 'hoard']

S48 Chesters — Denarii (?): 'several'
Northumberland — Deposited: (c 193 +)
NY 912 702
c.1810
One Emperor mentioned (Sept.Sev.).
a) J.Hodgson, History of Northumberland, Volume 3, Part 2, 1843, London, p 180.
b) R.C.Bosanquet, 'Excavations on the line of the Roman Wall in Northumberland; The Roman Camp at Housteads', Archaeologia Aeliana, Series 3, Volume 25, 1904, p 221.
c) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p158.

S49 Church Brough — Coins: ?
Cumberland — Deposited: (c 69 +)
NY 79 13
1761
Some Emperors listed.
a) Annual Register 1761, London, 1762, 1st End., p178.

S50 Corbridge, 1907 — Bronze c 650
Northumberland — Deposited: (c 346 +)
NY 983 648
1907
LRBC Nos. of sample of 259.
a) R.H.Forster,'Corstopitum: Report on the Excavations', Archaeologia Aeliana, Series 3, Volume 4, 1908, pp 282-283.
b) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p165.

S51 Corbridge, 1908a — Bronze: c 50
Northumberland — Deposited: (c 330 +)
NY 983 648
1908
Few details, some types mentioned.
a) H.H.E.Craster,'The Coins', in W.H.Knowles & R.H.Forster, 'Corstopitum: Report on the Excavations in 1908', Archaeologia Aeliana, Series 3, Volume 5, 1909, p 361.
b) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p166.

S52 Corbridge, 1908b — Bronze: c 400
Northumberland — Deposited: (c 330 +)
NY 983 648
1908
Few details, some types mentioned.
a) H.H.E. Craster, 'The Coins', in W.H.Knowles & R.H.Forster, 'Corstopitum: Report on the Excavations in 1908', Archaeologia Aeliana, Series 3, Volume 5, 1909, p 361.
b) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p165.

S53 Corbridge, 1908c — Solidi: 48
Northumberland — Deposited: (c 383-384 +)
NY 983 648
1908
RIC Nos.
a) H.H.E. Craster, 'The Coins', in W.H. Knowles & R.H. Forster, 'Corstopitum: Report on the Excavations in 1908', Archaeologia Aeliana, Series 3, Volume 5, 1909, pp 351-361.

S54 Corbridge, 1911a — Bronze: 17
Northumberland — Deposited: (c 367-375 +)
NY 983 648
1911
LRBC Nos.
a) H.H.E. Craster,'The Coins', in W.H. Knowles & R.H. Forster, 'Corstopitum: Report on the Excavations in 1911', Archaeologia Aeliana, Series 3, Volume 8, 1912, pp 234-235.
b) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p160.

S55 Corbridge, 1911b
Northumberland
NY 983 648
1911
RIC Nos.
Aureii: 160
Semis: 1
As: 1
Deposited: (c 158-159 +)
a) W.H.Knowles & R.H.Forster, 'Corstopitum: Report on the Excavations in 1911', Archaeologia Aeliana, Series 3, Volume 8, 1912, pp 153-154, 201, 210-231.
b) H.H.E. Craster, 'Second and fourth century hoards found at Corbridge, 1908-1911', Numismatic Chronicle, Series 4, Volume 12, 1912, pp 265-308.

S56 Corbridge, 1911c
Northumberland
NY 983 648
1911
RIC Nos.
Aurei: 1
Denarii: 7
Deposited: (c 125-128 +)
a) W.H. Knowles & R.H. Forster,' Corstopitum: Report on the Excavations in 1911', Archaeologia Aeliana, Series 3, Volume 8, 1912, pp 233-234.
b) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p155.

S57 Corbridge, 1912
Northumberland
NY 983 648
1912
RIC Nos.
Follies: 8
Deposited: (c 310-313 +)
a) W.H. Knowles & R.H. Forster, 'Corstopitum: Report on the Excavations in 1914' Archaeologia Aeliana, Series 3, Volume 12, 1915, pp 248-249.
b) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p164.

S58 Corbridge, 1914
Northumberland
NY 983 648
1914
CRR &RIC Nos.
Denarii: 32
Bronze: 12
Deposited: (c 98-99 +)
a) W.H. Knowles & R.H. Forster, 'Corstopitum: Report on the Excavations in 1914', Archaeologia Aeliana, Series 3, Volume 12, 1915, pp 250-254.
b) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p155.

S59 Corbridge, 1965
Northumberland
NY 983 648
1965
RIC Nos.
Denarii: 6
Deposited: (c 119-122 +)
a) Unpublished Catalogue, M.F.Sekulla.
b) Ms. note on exterior of envelope containing coins.

S60 Corbridge, 1969
Northumberland
NY 98 64
1969
RIC Nos.
Denarii: 12
Deposited: (c 145-161 +)
a) Unpublished Catalogue, P.J.Casey.

S61 Corsock
Kirkudbrightshire
NX 79 74
c.1918
Some Emperors listed.
Bronze c20
Deposited: (c 348-350 +)
a) A.S. Robertson,'Roman Coins Found in Scotland', Proceedings of the Society of Antiquaries of Scotland, Volume 94, 1961, p 151.

S62 Covesca — Bronze: 229
Morayshire — Deposited: (c 353 +)
NJ 175 707
1929-1930
RIC/LRBC Nos. for a sample of 171.
a) S. Benton,'The Excavation of the Sculptors Cave, Covesea, Morayshire', Proceedings of the Society of Antiquaries of Scotland, Volume 65, 1931, pp 209-216.
b) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p166.
c) =B27

S63 Cowie Moss — Denarii: ?
Kincardineshire — Deposited: (c 193 +)
NO 89 91
1843
Some Emperors listed.
a) Gentleman's Magazine, Volume I, 1884, pp 525-526.
b) A.S. Robertson, 'The Circulation of Coins in Northern Britain', in R.A.G. Carson & C. Kraay Eds., Scripta Nummaria Romana, London, 1978, pp 204-205.
c) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p158.

S64 Cowlam — Antoniniani: 4
Yorkshire — 4th c. bronze: 10252
SE 967 653 — Deposited: (c 351-353 +)
1858
Emperors given.
a) M.Kitson Clark, A Gazetteer of Roman Remains in East Yorkshire, Leeds, 1935, p 76.
b) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p166.
c) =B28

S65 Darlington, River Tees — Silver: ?
Durham — Deposited: (c 287-293 +)
NZ 25 14
Some Emperors listed.
a) W.H.D.Longstaffe, The History and Antiquities of the Parish of Darlington, Darlington, 1854, p 187.
[Note: This may not be a hoard, it is unusual to get Trajanic to Carausian coins in the same group.]

S66 Darlington — Bronze: 'a vast quantity'
Durham — Deposited: Constantinie II
NZ 259 157
c.1850 - present
Some Emperors listed.
a) W.H.D.Longstaffe, The History and Antiquities of the Parish of Darlington, Darlington, 1854, p 187 and n. .

S67 Deskford — Denarii: 27 +
Banffshire — Deposited: (c 138 +)
NJ 50 60
pre 1726
Emperors given for a sample of 27.
a) A.Gordon, Itinerarium Septentrionale, p 186, London, 1726.

S68 Docker, Keer River — Antoniniani: 123
Lancashire — Deposited: (c 273 +)
SD 5620 7525
1975-1979
RIC Nos. for a sample of 34
a) D.C.A. Shotter & A.J. White, 'Two Hoards of Roman Coins from the Lancaster Area', Cumberland & Westmoreland Transactions, Series 2, Volume 77,1979, pp 175-178.
b) D.C.A. Shotter, 'Roman Coin Hoards from Cumbria', Cumberland & Westmorland Transactions, Series 2, Volume 79, 1979, p 10.
c) D. Shotter and A White, Coutrebis, Volume 3, Part 1, 1975, pp 43-44.
d) Coin Hoards Volume 2, 1976, No.279, p 72, Royal Numismatic Society, London.
e) Coin Hoards Volume 7, 1985, No.286, p 165, also D.C.A. Shotter p 181-182, Royal Numismatic Society, London.

S69 Drummond Castle — Denarii: 'a bushel'
Perthshire — Deposited: (c 172 +)
NN 84 18
pre 1672
Some Emperors listed.
a) Letter from Lord Drummond to P. Drummond, 15 January 1672, In Historical Manuscript Commission Report X, p 130, London, 1885.
b) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p157.
c) G. MacDonald, 'Roman coins found in Scotland', Procedings of the Society of Antiquries of Scotland, Volume 52, 1918, p 263.

S70 Edinburgh — Denarii: 'a good many'
Midlothian — Deposited: (c 160 +)
NT 25 73
pre 1741
One Empress mentioned (Faustina II).
a) Letter from Sir John Clerk, to Rodger Gale, 5 May 1741, In The Family Memoirs of the Revd. W. Stukley etc., Surtees Society Volume 80, 1885, p 420.

S71 Falkirk — Denarii: c 1931
Stirlingshire — Deposited: (c 230 +)
NS 893 799
1933
CRR & RIC Nos.
a) G.MacDonald, 'A Hoard of Roman Denarii from Scotland', Numismatic Chronicle, Series 5, Volume 14, 1934, pp 1-30.
b) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p158.

S72 Fawsyde — Coins: ?
Kincardineshire — Deposited: (c 138 +)
NO 84 77
19th century
One Emperor mentioned (Antoninus).
a) J. Crabb Watt, Mearns of Old, Edinburgh, 1914, p 65.

S73 Filey — Coins: ?
Yrokshire — Deposited: (c 375 +)
TA 11 80
pre 1909
Some Emperors listed.
a) A.N. Cooper, 'Report of the Hon. Secretary for 1908-9', Transactions of the East Riding Archaeological Society, Volume 16,1909, p 71.

S74 Filey — Bronze: 22
Yorkshire — Deposited: (c 388 +)
TA 129 816
1923a
Emperors & types listed.
a) H.H.E. Craster, 'Appendix on Coin Finds', In M.R. Hull,'The Pottery from the Roman Signal Stations on the Yorks Coast', Archaeologial Journal, Volume 89, 1932, p 251.
b) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p167.
c) =B34

S75 Filey — Bronze: 103
Yrokshire — Deposited: (c 393 +)
TA 129 816
1923b
Emperors & types listed.
a) 'Roman Britain in 1923', Journal of Roman Studies, Volume 12, 1924, p 248.
b) H.H.E. Craster, 'Appendix on Coin Finds', In M.R. Hull, 'The Pottery from the Roman Signal Stations on the Yorks Coast', Archaeological Journal, Volume 89, 1932, p 251.
c) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p168.

S76 Fort Augustus — 'Mixed metal': c 300
Invernesshire — Deposited: (c 284 +)
NH 37 09
1767
One Emperor mentioned (Diocletian).
a) G.MacDonald, 'Roman Coins found in Scotland' [quoting: Scots Magazine, 1767, p 326], Proceedings of the Society of Antiquaries of Scotland, LII, 1918, p 274.
b) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p164.

S77 Fulwell — Antoniniani: 6+
Durham — Deposited: (c 268 +)
NZ 39 59
1891
RIC Nos.
a) 'Proceedings', Proceedings of the Society of Antiquaries of Scotland, Series 2, Volume 5,1893, p 76.

S78 Gateshead — Denarii: 'a great number'
Durham — Deposited: (c 118 +)
NZ 255 636
1790
One Emperor named (Hadrian).
a) M.A. Richardson, The Local Historians Table Book, Volume 2, Historical Division, Newcastle, 1829, p 332.

S79 Giggleswick, Craven Bank — Bronze: 'a large quantity'
Yorkshire — Deposited: (c 330 +)
SD 79 65
1783
Some types mentioned.
a) Gentlemans Magazine, 1784, p 259.
b) F. Villy, 'The Roman Road beyond Long Preston and the position of a Hoard of Coins', Bradford Antiquary, Volume 8, 1940, pp 317-318.

S80 Gillingwood Hall, near Richmond. — Denarii: 14
Yorkshire — Deposited: (c 79 +)
NZ 171 047
pre 1867
Few details (Republican & Vespasianic coins recorded).
a) 'Proceedings of the Society', Numismatic Chronicle, Series 2, Volume 7, 1867, p 5.

S81 Glaisdale Moor — Antoniniani: c 13 +
Yorkshire — Radiate Copies: c 10 +
NZ 736 009 — Deposited: (c 270 +)
c. 1912
Listed by Emperors and Reverse type for a sample of 23.
a) E.J.W. Hildyard & P.V. Hill, 'A Radiate Currency Hoard from Yorkshire', Numismatic Chronicle, Series 6, Volume 18, 1958, pp 183-185.

S82 Glamis — Denarii (?): 'great quantities'
Angus — Deposited: (c 68 +)
NO 38 48
pre 1707
One Emperor mentioned (Galba).
a) R. Sibbald, Historical Enquiries, Edinburgh, 1707, p 16.
b) A. Gordon, Itinerarium Septentrionale, London, 1726, p 186.

S83 Grasington — Bronze 18
Yorkshire — Deposited: (c 330-335 +)
SD 9706 7253
1877
LRBC Nos.
a) Pers com. from Craven Museum, Skipton, to M.Sekulla.
b) A. Raistrick, 'Roman Remains.....in W. Yorks', Yorkshire Archaeological Journal, Volume 31, 1934, p 216.

S84 Great Chesters
Northumberland
NY 703 668
1895
Some details (5 RIC Nos. & 9 Emperors given).
Denarii: c 20
Deposited: (c 125 +)
a) J.P.Gibson, 'On Excavations at Great Chesters (Aesica) in 1894, 1895 and 1897', Archaeologia Aeliana, New Series, Volume 24, 1903, pp 33, 62.
b) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p155.

S85 Great Chesters
Northumberland
NY 703 668
1897
RIC Nos.
Antoniniani: 38
Radiate Copies: 81
Deposited: (c 276 +)
a) J.P.Gibson, 'On Excavations at Great Chesters (Aesica) in 1894, 1895 and 1897', Archaeologia Aeliana, New Series, Volume 24, 1903, pp 50-51,63-64.

S86 Hampsthwaite
Yorkshire
SE 25 58
1845
RIC Nos.
Denarii: 9
Deposited: (c 169 +)
a) M. Kitson Clark (ed.), 'Roman Yorkshire, 1932.' Yorkshire Archaeological Journal, Volume 31, 1934, pp 196-198.
b) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p157.

S87 near Harrogate
Yorkshire
Not located
c. 1830
One Emperor named (Domitian), but it included later unspecified coins.
Denarii: 6+
Deposited: (c 81 +)
a) A.S. Robertson, Romano-British Coin Hoards, Unpub. MA Thesis, Univ. London, 1936, (Hd.824)

S88 Heddon
Northumberland
NZ 13 66
1752
Some Emperors mentioned.
Silver: ?
Bronze: c 3000
Deposited: (c 350 +)
a) Newcastle Journal, 4th November 1752.
b) The Local Historians Table Book, M.A. Richardson, Historical Division, Volume 2, London, 1843, p 46.
c) A.S. Robertson, 'Roman Coinage in North Britain', in Aufstieg und Niedergang des Romischen Welt, Volume 2, part 3, H.Temporini, 1975, p 412.
d) Letter from J. Walton to W. Stukeley 1754, in The Family memoirs of the Revd. W. Stukeley, Part 3, Surtees Society, 1885, Volume 80, p 131.
e) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p167.
f) =B48

S89 Heslington
Yorkshire
SE 6242 5079
1966
RIC & LRBC Nos.
Antoniniani: 1274
Radiate Copies: 1587
Deposited: (c 355 +)
a) R.A.G. Carson and J.P.C. Kent, 'A Hoard of Roman Fourth Century Bronze Coins from Hesslington, Yorks', Numismatic Chronicle, Series 7, Volume 11, 1971, pp 207-225.
b) 'Roman Britain in 1966', Journal of Roman Studies, 1967, p 179.
c) J.P.C. Kent, Roman Imperial Coinage, Volume 8, No.203.

S90 High Force
Durham
NY 88 28
RIC Nos.
Folles: 13
Deposited: (c 313-314 +)
a) 'Roman Britain in 1929', Journal of Roman Studies, Volume 19, 1929, p 186.
b) Bowes Museum Ms. Accession note.

S91 Houseteads — Bronze: 5
Northumberland — Deposited: (c 218 +)
NY 790 687
1931
Emperors.
a) W.P. Hedley, 'The Coins', in E.B. Birley & J. Charlton, 'Excavations at Houseteads in', Archaeologia Aeliana, Series 4, Volume 9, 1932, p 235.

S92 Houseteads — Denarii: 5
Northumberland — Deposited: (c 229 +)
NY 790 686
1933
Emperors and some RIC Nos.
a) E.B. Birley & J. Charlton, 'Third Report on the Excavations at Houseteads', Archaeologia Aeliana, Series 4, Volume 11, 1934, p 191.
b) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p158.

S93 Howstean Beck, Nidderdale — Denarii: c 40
Yorkshire — Deposited: (c 118 +)
SE 093 734
1868
Some Emperors listed.
a) Nidderdale, H. Speight, London, 1894, p 433.
b) A. Raistrick, 'Roman Remains ... in W.Yorks', Yorkshire Archaeological Journal, Volume 31, 1934, p 219.

S94 Husthwaite — Bronze: c 400
Yorkshire — Deposited: (c 379 +)
SE 51 75
1901
Some Emperors listed.
a) M. Kitson Clark, A Gazetteer of Roman Remains in East Yorkshire, Leeds, 1935, p 94; quoting from Haverfield Mss. in Oxford.
b) =B51

S95 Kendal Museum — Folles: 92
Unknown location — Deposited: (c 330-333 +)
Unknown location
pre 1893 ?
RIC Nos.
a) D.C.A. Shotter, 'A Hoard of Roman Coins in Kendal Museum', Cumberland & Westmoreland Transactions, Series 2, Volume 78, 1978, pp 29-35.
b) Coin Hoards Volume 6, 1981, No.173, p 36, Royal Numismatic Society, London.

S96 Kirkby Thore — Denarii: 13
Westmoreland — Bronze: 12 or 14
NY 635 253 — Deposited: *problem hoard*
1838
Emperors.
a) W.H. Smyth, 'On Some Roman Vestigia recently found at Kirkby Thore...', Archaeologia, Volume 31, 1846, pp 281-286.
b) D.C.A. Shotter, 'Roman Coins from Kirkby Thore', Cumberland & Westmoreland Transactions, Series 2, Volume 78, 1978, pp 19-22.
[Note: The last two coins in this hoard are problematic, they are bronze coins of Victorinus and Constantine I. Except for these the series ends nicely with Julia Domna. It is possible that they are intrusive.]

S97 Kirkby Thore (Newbiggin Hall) Denarii: 234
Westmoreland Deposited: (c 180-183 +)
NY 63 25
1861 or 1863
Emperors (& RIC Nos. for a sample of 67).
a) 'Find of Roman Coins at Crackenthorpe, 'Archaeologia Aeliana, Series 2, Volume 6, 1865, pp 196-197.
b) R. Blair, 'Roman Coins', Cumberland & Westmoreland Transactions, Series 2, Volume 3, 1903, pp 415.
c) H. Mattingly, 'Hoards of Roman Coins - Newbiggin', Numismatic Chronicle, Series 5, Volume 9, 1929, pp 314.
d) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 157.
d) D.C.A. Shotter, 'Roman Coins from Kirkby Thore', Cumberland & Westmoreland Transactions, Series 2, Volume 58, 1978, pp 17-19.
e) Coin Hoards Volume 5, 1979, No.129, Royal Numismatic Society, London.
f) Coin Hoards Volume 6, 1981, No.107, Royal Numismatic Society, London.

S98 Kirkintilloch Denarii: 47
Dumbartonshire Deposited: (c 147 +)
NS 655 739
1893
Emperors (some RIC Nos.)
a) A.B. Richardson, 'Notice of Recent Finds of Coins in Scotland', Proceedings of the Society of Antiquaries of Scotland, Volume 28, 1894, p 276.
b) G. MacDonald, 'Roman Coins found in Scotland', Proceedings of the Society of Antiquaries of Scotland, Volume 52, 1918, p 262.
c) G. MacDonald, 'Roman Coins found in Scotland', Proceedings of the Society of Antiquaries of Scotland, Volume 73, 1939, p 244.
d) A.S. Robertson, 'Roman Coins found in Scotland', Proceedings of the Society of Antiquaries of Scotland, Volume 94, 1961, p 151.

S99 Kirklington Antoniniani: ?
Yorkshire Deposited: (c 270 +)
SE 31 81
pre 1908
Some Emperors listed.
a) 'Proceedings of the Society, July 15 1908', British Numismatic Journal, Volume 5, 1909, p 438.

S100 Kirksteads, Kirkandrews Folles: 223
Cumberland Deposited: (c 323 +)
NY 349 565
1855 & 1977
RIC Nos.
a) W. Whellan, The History and typography of the Counties of Cumberland and Westmoreland, Pontefract, 1860, p 171.
b) Cumberland and Westmoreland Transactions, New Series, Volume 23, 1923, p 235.
c) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p164.
d) Coin Hoards Volume 5, 1978, pp 50-55, P.J. Casey, 'A Further Component of the Beaumont Hoard 1855'.

S101 Lanark Denarii: ?
Lanarkshire Deposited: (c 138 +)
NS 88 43
1847
Some Emperors listed.
a) R. Stuart, Caledonia Romana, Edinburgh, 1852 (2nd Ed), p 140n.
b) G. MacDonald, 'Roman coins found in Scotland', Procedings of the Society of Antiquries of Scotland, Volume 52, 1918, p 259.
c) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p156.

S102 Lancaster Coins: 'a great many'
Lancashire Deposited: (c 73 +)
SD 467 618
pre 1780
Some Emperors listed.
a) Mr.West, 'Antiquities discovered in Lancaster, 1776', Archaeologia, Volume 5, 1779, p 100.

S103 Lancaster
Lancashire
SD 474 619
1830
Some Emperors listed.
a) W.T. Watkin, Roman Lancashire, Liverpool, 1883, p 188.
b) D.C.A. Shotter, 'Roman Coin Hoards from Lancashire', Lancaster Archaeological Journal, Volume 1, 1977.

Coins: ?
Deposited: (c 140 +)

S104 Lancaster
Lancashire
SD 474 619
c. 1830
Some Emperors listed.
a) W.T. Watkin, Roman Lancashire, Liverpool, 1883, p 188.

Coins: c100
Deposited: (c 294 +)

S105 Lancaster, Albert Square
Lancashire
SD 47 61
pre 1931
Few details.
a) D.C.A. Shotter, 'Roman Coin Hoards from Lancashire', Lancashire Archaeological Journal, Volume 1, 1977, p 11.

Bronze: c 30
Deposited: ?

S106 Lancaster, Bridge Lane
Lancashire
SD 47 61
1856
CRR & RIC Nos. for a sample of 19.
a) W.T. Watkin, Roman Lancashire, Liverpool, 1883, p 188.
b) D.C.A. Shotter, 'Roman Coin Hoards from Lancashire', Lancashire Archaeological Journal, Volume 1, 1977, pp 16-17.

Denarii: c 100
Deposited: (c 118 +)

S107 Lancaster, Castle Hill
Lancashire
SD 4745 6200
1973
RIC Nos.
a) D.C.A. Shotter & A.J. White, 'Two Hoards of Roman Coins from the Lanaster Area', Cumberland & Westmoreland Transactions, Series 2, Volume 77, 1977, pp 173-175.

Antoniniani: 15
Radiate Copies 4
Deposited: (c 286 +)

S108 Lancaster, Marsh Lane
Lancashire
SD 472 621
1849
Few details.
a) W.T. Watkin, Roman Lancashire, Liverpool, 1883, p 185.

Coins: ?
Deposited: ?

S109 Lancaster'Quernmore?
Lancashire
Not located
pre 1908
Few details.
a) D.C.A. Shotter, 'Roman Coin Hoards from Lancashire', Lancashire Archaeological Journal, Volume 1, 1977, pp 45-46.

Coins: ?
Deposited: ?

S110 Leuchars
Fifeshire
NO 445 244
1808
Some Emperors listed.
a) New Statistical Account of Scotland, Volume 9, Edinburgh, 1845, p 223.
b) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 158.

Denarii: c 100
Deposited: (c 193 +)

S111 Leven — Gold: ? — Silver: ? — Deposited: ?
Fifeshire
NO 38 00
1519
Few details
a) H. Boece, Scotorum Historiae, fo.86, Paris, 1575.

S112 Linlithgow — Denarii: c 300 — Deposited: (c 140 +)
West Lothian
NT 02 78
1781
Emperors (for a sample of 13).
a) Old Statistical Account of Scotland, Volume 14, p 570, Edinburgh, 1795.
b) W. Smellie, Account of...the Society of Antiquaries of Scotland, pp 58-60, Edinburgh, 1782.
c) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 157.

S113 Lochar Moss — Denarii: c 16 — Deposited: 1st/2nd century
Dumfriesshir
NY 00 70
c. 1860
Only one coin identified (CRR 356/1).
a) 'The Address of the President', Transactions and Journal of the Procedings of the Dumfriesshire and Galloway Natural History and Antiquarian Society, Volume 2, 1863-1864, p 18.

S114 Mallerstang — Denarii: 138 — Deposited: (c 134-138 +)
Westmoreland
NY 797 012
1926
RIC Nos.
a) H. Mattingly & R.G. Collingwood, 'The Mallerstang Hoard', Cumberland & Westmoreland Transactions, Series 2, Volume 27, 1927, pp 205-217.
b) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 155.

S115 Malton — Denarii: 8 — Deposited: (c 201-206 +)
Yorkshire
SE 792 717
1927-28
RIC Nos.
a) P. Corder, Defences of the Roman Fort at Malton, Report 2 of the Roman Malton and District Series, Malton, c.1930, p 32.

S116 Maryport — Irregular Denarii: 17 — Deposited: (c 138 +)
Cumberland
NY 038 373
pre 1860
Emperors.
a) W. Whellan, History and Directory of Cumberland and Westmoreland, Pontefract, 1860, p 325.
b) P.J. Casey, 'The Coins', in M.G. Jarrett, Maryport; A Roman Fort and its Garrison, Kendal, 1976, p 47.
c) D.C.A. Shotter, 'Roman Coin Hoards from Cumbria', Cumberland & Westmoreland Transactions, Series 2, Volume 79, 1979, p 11.

S117 Hill of Megray — Denarii: 200 — Deposited: (c 202-210 +)
Kincardineshire
NO 878 879
1852
RIC Nos. for 20
a) G. MacDonald (quoting an account in Aberdeen Journal, 10th March 1852), 'Roman Coins found in Scotland', Proceedings of the Society of Antiquaries of Scotland, Volume 52, 1918, pp 268-269.
b) W. Scott, 'Report on Coins presented to the Society...', Proceedings of the Society of Antiquaries of Scotland, Volume 1, 1855, pp 226-228.
c) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 158.

S118 Millom Castle
Cumberland
SD 17 81
1759
Few details.

Silver:	'Two great urns full'
Deposited:	?

a) The Family Memoirs of the Revd. William Stukeley... Letters and Diaries Volume 2, Surtees Society, 1883, p 113.

S119 Mindrum, Camp Hill
Northumberland
NT 32 82
1826
Some Emperors listed.

Denarii:	c 600
Deposited:	(c 141 +)

a) M.A. Richardson, The Local Historians Table Book, London, 1843, Volume 3, Historical Division, pp 327-328.
b) M.H. Dodds(ed.), A History of Northumberland, Newcastle, 1935, Volume 14, pp 74-75.

S120 Minskip
Yorkshire
SE 394 637
1888
Few details.

Bronze:	?
Deposited:	?

a) A.S. Robertson, Roman Coin Hoards in Britain, No.842, Unpublished M.A. Thesis University of London, 1936.
b) O.S. Map, 1:25000, 1st Edition, Sheet SE 36.

S121 Nairn
Nairnshire
NH 87 56
pre 1780
Few details.

Silver:	?
Deposited:	?

a) R. Gough, British Topography, Volume 2, p 705, London, 1780.

S122 Nawton
Yorkshire
SE 65 84
pre 1935
Emperor.

Denarii:	33
Deposited:	(c 217-218 +)

a) M. Kitson Clarke, A Gazetter of Roman Remains in East Yorkshire, Leeds, 1935, pp 111-112.

S123 Newbiggin
Cumberland
NY 434 513
1762
Cohen Nos for 68.

Bronze:	c 700
Deposited:	?

a) Annual Register, 1762, 4th Edition, London, 1780, p 102.
b) Newspaper Cutting 1849 in Dept. of Archaeology Library, Durham.
c) H. Mattingly, 'Hoards of Roman coins: Newbiggin', Numismatic Chronicle, Series 5, Volume 19, 1929, pp 314-315.
d) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 157.

S124 Newcastle, Tyne Bridge
Northumberland
NZ 253 637
1771-1910
Emperors and metals.

Gold:	1
Silver:	35
Bronze:	24
Deposited:	*problematic hoard*

a) M.H. Dodds (ed.), History of Northumberland, Volume 13, Newcastle, 1930, p 513.
b) K.A. Steer, Roman Durham, Unpublished PhD Thesis, Durham University, p 294.
[Note: Probably not a hoard.]

S125 Newcastle (?)
Probably part of the Gateshead Hoard (S72)

S126 Northallerton
Yorkshire
SE 36 93
1788
Few details.
a) C.J.D. Ingledew, The History and Antiquities of Northallerton, London, 1858, p 123.

Coins: 'several hundred'
Deposited: ?

S127 Norton, Malton
Yorkshire
SE 78 71
17th January 1963
CRR/RIC Nos.
a) R.A.G. Carson, 'Norton(Malton) Roman Imperial Treasure Trove', Numismatic Chronicle, Series 7, Volume 3, 1963, p 67.
b) E. Pirie, 'Norton(Malton)Treasure Trove 1963', Yorkshire Archaeological Journal, Volume 42, 1967, pp 23-24.

Denarii: 39
Deposited: (c 143-144 +)

S128 Piercebridge
Durham
NZ 211 159
1974
RIC Nos.
a) 'Roman Britain in 1974', Britannia, Volume 6, 1975, p 235.
b) Coin Hoards Volume 2, 1976, No.266, p 70, The Royal Numismatic Society, London.
c) Coin Hoards Volume 3, P.J. Casey & R. Coult, 'The Piercebridge Hoard of Mid-Third century Antoniniani...', 1977, pp 72-76, The Royal Numismatic Society, London.

Antoniniani: 130
Deposited: (c 263 +)

S129 Piercebridge
Durham
NZ 210 155
1979
RIC Nos.
a) Unpublished Catalogue, P.J. Casey.

Denarii: 6
Deposited: (c 156-157 +)

S130 Piercebridge
Durham
NZ 211 158
Summer 1980
RIC & LRBC Nos.
a) Unpublished Catalogue, M.F. Sekulla.
b) R.J. Brickstock Catalogue in P. Scott, Piercebridge Report, forthcoming. This report is to be preferred.
c) =B70

Antoniniani: 2
Radiate copies: 2
Isis festival coin: 1
4th c. Bronze: 96
Irregular 4th c Bronze: 17
Siliquae 2
Deposited: (c 393-402 +)

S131 Pitcullo
Fifeshire
NO 41 19
1781
Some Emperors listed.
a) W. Smellie, Account of...the Society of Antiquaries of Scotland, Edinburgh 1782, p 41.
b) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 157.

Denarii 19 +
Deposited: (c 172 +)

S132 Portmoak
Kinrosshire
NO 10 20
1851
RIC Nos for a sample of 129.
a) 'Roman Antiquities, Fifeshire', Proceedings of the Society of Antiquaries of Scotland, Volume 1, 1855, pp 60-66.
b) G. MacDonald, 'Roman Coins Found in Scotland', Proceedings of the Society of Antiquaries of Scotland, Volume 73, 1939, p 245.
c) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 158.

Denarii: 600
Deposited: (c 196-197 +)

S133 Ravenglass — Bronze: 3
Cumberland — Deposited: (c 350-351 +)
SD 087 961
1976
LRBC Nos
a) T.W. Potter, The Romans in North West England, Carlisle, 1979, pp 41, 104.
b) =B72

S134 Richmond — Siliquae: c 600
Yorkshire — Deposited: (c 400 +)
NZ 171 006
1720 & 1955
RIC Nos. of a sample of 12.
a) R. Gale, Registrum Honoris de Richmond, London, 1722, pp 252-254.
b) 'Roman Britain in 1975', Britannia, Volume 7, 1976, p 314.

S135 Rudchester — Aurei: 15
Northumberland — Denarii: 471
NZ 113 647 — Deposited: (c 160 +)
1766
RIC Nos. for the Aureii, Emperors for the Denarii.
a) Annual Register, 1766, 4th Edition, London, 1785, p 70.
b) H.H.E. Craster, 'The Coins', in R.H. Forster & W.H. Knowles, 'Corstopitum; Report on the Excavations in 1911', Archaeologia Aeliana, Series 3, Volume 8, 1912, p 232.
c) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 157.

S136 Sauchie — Bronze: ?
Stirlingshire — Deposited: ?
NS 89 94
c.1846
Few details.
a) Archaeologia Scotica, Volume 5, 1890, Appendix 54.
b) G. MacDonald, 'Roman Coins found in Scotland', Proceedings of the Society of Antiquaries of Scotland, Volume 52, 1918, p 274.

S137 Scarborough — Bronze: 57
Yorkshire — Deposited: (c 395 +)
TA 052 892
1924
Emperors & Types.
a) H.H.E. Craster, 'Appendix on Coin Finds', in M.R. Hull, 'The Pottery from the Roman Signal Stations on the Yorkshire Coast', Archaeological Journal, Volume 89, 1932, pp 251-252.
b) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 168.
c) =B86

S138 Scratchmill Scar — Antoniniani: 51 +
Cumberland — Deposited: (c 270 +)
NY 51 37
pre 1899
Emperors known of a sample of 51.
a) F. Haverfield,'Voreda, the Roman Fort at Plumpton Wall', Cumberland & Westmoreland Transactions, Series 2, Volume 13, 1913, p 197.
b) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 161.

S139 Seamer — Antoniniani: 21
Yorkshire — Deposited: (c 273 +)
TA 031 833
1947
RIC Nos.
a) J.G. Rutter & G. Drake, Excavations at Crossgates, near Scarborough 1947-1956, Scarboroough and District Archaeological Research Report No.1, Scarborough 1958.

S140 Seaton, Seaham — Antoniniani: 'pot half filled'
Durham — Deposited: (c 270 +)
NZ 39 49
c. 1820
Some Emperors listed.
a) R. Surtees, The History and Antiquities of the County Palatine of Durham, London, 1823, Volume 3, p 402.
b) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 160.

S141 Sewingshields — Folles: 8
Northumberland — Deposited: (c 303 +)
NY 805 702
1978-1980
RIC Nos.
a) Personal Communication from M. Savage to M. Sekulla.

S142 Shap — Aurei: 19
Westmoreland — Denarii: c 580
NY 558 175 — Deposited: (c 98 +)
c. 1830
Some Emperors listed.
a) Gentleman's Magazine, Volume 1, 1833, p 5.
b) J. Hodgson, History of Northumberland, London, 1843, Volume 3 Part 2, p 255n.

S143 Silver Burn — Denarii (?): ?
Aberdeenshire — Deposited: ?
NO 80 98
pre 1726
Few details.
a) A. Gordon, Itinerarium Septenionale, p 186, London, 1726.
b) 'Proceedings of the Society', British Numismatic Journal, Volume 3, 1907.

S144 Skerne — Silver: 1
Yorkshire — Bronze: 16
TA 066 549 — Deposited: ?
1897
Few details.
a) M. Kitson Clark, A Gazetteer of Roman Remains in East Yorkshire, Leeds, 1935, p 128.

S145 Skerling, Greatlaws — Coins: ?
Peeblesshire — Deposited: (c 138 +)
NT 07 39
c.1825
Some Emperors listed.
a) New Statistical Account of Scotland, Volume 3, Edinburgh, 1845, p 101.

S146 South Shields 1 — Aurei: 12
Durham — Denarii: 120 +
NY 365 679 — Deposited: (c 192 or 185 +)
1878 ?
RIC Nos.
a) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 156.
b) P.J. Casey, 'The Coins', in J.N. Dore & J.P. Gillam, The Roman Fort at South Shields, Newcastle, 1979, p 90.
c) J.H. Corbitt, 'The Roman Gold and Silver Hoard', South Shields Archaeological and Historical Society Papers, Volume 1 No.3, 1955, p 5.
d) Coin Hoards Volume 6, 1981, No. 109, Royal Numismatic Society, London.
[Note: Casey suggests the terminal issue may have been a site find rather than part of the hoard, this would push back the dating of the hoard to 185.]

S147 South Shields 2 — Folles: 12
Durham — Deposited: (c 310 +)
NY 365 679
post 1876
RIC Nos.
a) P.J. Casey, 'The Coins', in J.N. Dore & J.P. Gillam, The Roman Fort at South Shields, Newcastle, 1979, p 91.
b) Coin Hoards Volume 6, 1981, No. 166, p 35, Royal Numismatic Society, London.

S148 South Shields 3 — Folles: 59
Durham — Deposited: (c 326 +)
NY 365 679
post 1876
RIC Nos.
a) P.J. Casey, 'The Coins', in J.N. Dore & J.P. Gillam, The Roman Fort at South Shields, Newcastle, 1979, p 91.
b) Coin Hoards Volume 6, 1981, No. 172, p 36, Royal Numismatic Society, London.

S149 South Shields 4 — Folles: 12
Durham — Deposited: (c 351-353 +)
NY 365 679
?
LRBC Nos.
a) P.J. Casey, 'The Coins', in J.N. Dore & J.P. Gillam, The Roman Fort at South Shields, Newcastle, 1979, p 91.

S150 South Shields 5 — Antoninianii: 13
Durham — Radiate Copies: 32
NY 365 679 — Deposited: (c 273 +)
1977
RIC Nos.
a) Unpublished Catalogue of Site Finds, P.J. Casey.
b) Coin Hoards Volume 4, 1978, No. 151, p 39, Royal Numismatic Society, London.

S151 Sowerby — Denarii: 'a considerable no.'
Yorkshire — Deposited: (c 118 +)
SE 43 81
1678
Some Emperors listed.
a) Britannia, W. Camden, Gough Edition, Volume 3, London, 1789, p 36.
b) Leland's Itinerary, T.Hearne, 3rd Edition, Volume1, London, 1768-1770, p 145.

S152 Stanwix — Bronze: 9
Cumberland — Deposited: (Hadrianic +)
NY 40 56
1930
Few details
a) R.G. Collingwood, 'Roman Objects from Stanwix', Cumberland & Westmoreland Transactions, Series 2, Volume 31, 1931, pp 79-80.

S153 Stranraer — Bronze: 50+
Wigtownshire — Deposited: (c 324 +)
NX 06 60
c. 1939-1945
Few details.
a) Letter to A.S. Robertson from BM, 1949, quoted in A.S. Robertson, 'Roman Coins found in Scotland', in Proceedings of the Society of Antiquaries of Scotland, 1950, p 151.

S154 Taymouth — Denarii: c 12-14
Perthshire — Deposited: (c 180 +)
NN 80 42
1755
Few details.
a) New Statistical Account of Scotland, Volume 10, Edinburgh, 1845, p 468.
b) T. Pennant, Tour in Scotland, London, 1776, Volume 3, p 5.

S155 Thorngrafton — Aurei: 3
Northumberland — Denarii: 60
NY 783 665 — Deposited: (c 119-122 +)
1837
CRR & RIC Nos.
a) J. Collingwood Bruce, The Roman Wall, London, 1867 (3rd Edition).
b) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 155.
c) J. Clayton, 'The Thorngrafton Find', Archaeologia Aeliana, Series 2, Volume 3, 1859, pp 269-267.
d) E.B. Birley, 'The Thorngrafton Hoard', Numismatic Chronicle, Series 7, Volume 3, 1963, pp 61-66.

S156 Thornton — Coins: 'hundreds'
Yorkshire — Deposited: (c 317 +)
NZ 47 13
1786
Few Details.
a) J. Cade, 'Some Observations on the Roman Station Cataractonium...', Archaeologia, Volume 9, 1789, pp 288-289.

S157 Walbottle, Throckley — Antoniniani 5024
Northumberland — Deposited: (c 272 +)
NZ 153 669
1879
Emperors (RIC Nos for a sample of 887)
a) J. Clayton, 'Discovery of a hoard of Roman Coins on the Wall of Hadrian, in Northumberland', Archaeologia Aeliana, Volume 8, 1880, pp 256-280.
b) W.P. Hedley, 'The Walbottle(Throckley) Hoard of Roman Coins', Archaeologia Aeliana, Series 4, Volume 8, 1931, pp 12-48.
c) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 161.

S158 Torfoot — Denarii: c 400
Lanarkshire — Deposited: (c 180 +)
NS 642 385
1803
Emperors.
a) Annual Register 1803, London, 1805, p 378.
b) J. Lindsay, View of the Coinage in Scotland, Cork, 1845, p 265.

S159 Traprain Law — Siliquae 4
East Lothian — Deposited: (c 400 +)
NT 581 746
1919
RIC Nos.
a) A.O. Curle, The Treasure of Traprain, Glasgow, 1923, pp 5, 91.

S160 Uddingston — Antoniniani: ?
Lanarkshire — Deposited: (c 270 +)
NS 69 60
1848
One Emperor named (Tetricus).
a) R. Stuart, Caledonia Romana, Edinburgh, 1852 (2nd Edn), p 240n.
b) G.MacDonald, 'Roman Coins Found in Scotland', Proceedings of the Society of Antiquaries of Scotland, Volume 52, 1918, p 273.
c) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 161.

S161 Ugthorpe — Denarii: 5+
Yorkshire — Deposited: (c 147 +)
NZ 791 116
1792
Some Emperors listed.
a) G. Young, History of Whitby, Whitby, 1817, Volume 2, p 765.
b) M. Kitson Clark, A Gazatteer of Roman Remains in East Yorkshire, Leeds, 1935, p 133.

S162 Upper Holker — Silver: 524
Lancashire — Deposited: (c 253 +)
SD 35 77
1806
Some Emperors listed (RIC Nos for a sample of 8).
a) Annual Register 1806, p 451, London 1808.
b) J. Stockdale, Annales Caermoelensis, Cartmel, 1872, pp 244-248.
c) W.T. Watkin, Roman Lancashire, Liverpool, 1883, p 234.
d) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 159.

S163 Upsall Castle — Antoniniani: 30 or 40
Yorkshire — Deposited: (c 286 +)
SE 45 86
1863
Some Emperors listed
a) 'Proceedings', Numismatic Chronicle, Series 2, Volume 3, 1863, p 216.
b) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 162.
c) N. Shiel, The Episode of Carausius and Allectus, British Archaeological Reports 40, 1977, p 49.

S164 Wallsend — Denarii: 14
Northumberland — Deposited: (c 188 +)
NZ 301 660
1895
CRR/RIC Nos.
a) W.S. Corder, 'Roman Wallsend', The Mid-Tyne Link, Volume 1 Part 3, 1905, p 141.
b) Rd. M.H. Dodds, Northumbria County History, Volume 13, Newcastle, 1930, p 488.
c) Catalogue of the coins (Ms.), P.J. Casey.
d) Coin Hoards Volume 2, 1976, No.22, p 64 (sic.), The Royal Numismatic Society, London.

S165 Washington — Folles: 59
Durham (Tyne and Wear) — Deposited: (c 333-335 +)
NZ 29 56
1939
RIC Nos.
a) J.H. Corbitt, 'Coin Hoards of the Roman Period from Northern England; Durham', Archaeologia Aeliana, Series 4, Volume 38, 1960, pp 122-123.
b) M. Savage, Archaeologie Aeliana, Volume 6, 1978, pp 166-169.
c) Coin Hoards Volume 6, 1981, No.174, p 36, Royal Numismatic Society, London.

S166 West Calder — Denarii: ?
Midlothian — Deposited: (c 161 +)
NT 04 56
1810
Some Emperors listed.
a) Scots Magazine, May 1810, *pp 323ff.*
b) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 157.

S167 Westgate, Weardale — Denarii: 15+
Durham — Deposited: (c 138 +)
NY 906 382
1870
Some Emperors listed.
a) W.M. Egglestone, 'The Romans in Weardale', Transactions of the Weardale Naturalists Field Club, Part 1 Volume 1, 1900, pp 64-72 and 97.
b) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 157.

S168 Whickham — Antoniniani: 10
Durham — Deposited: 3rd cent.
NZ 20 60
c. 1927
Few details.
a) K.A. Steer, The Archaeology of Roman Durham, PhD Thesis, Durham, 1938, p 310.

S169 Whitburn — Bronze: ? / Deposited: (c 310 +)
Durham
NZ 41 62
c. 1660
Some Emperors & types listed.
a) The Diary of Abrahm de la Pryme, Surtees Society, Volume 54, 1870, p 112.
b) W.Camden, Britannia, Gibson's Edition, London, 1695, p 784.

S170 Whorlton — Siliquae: 38 / Deposited: (c 400 +)
Yorkshire
NZ 49 02
1810
RIC Nos.
a) Gentlemans Magazine, 1811, II, p616.
b) Recent Coin Hoards from Roman Britain (Volume 1), 1979, A.M. Burnett, 'The Whorlton(Yorks) Hoard (1810)'.

S171 Wilton — Solidi: 1 / Siliquae?: 79 / Deposited: (c 393 +)
Yorkshire
NZ 583 196
1856
Some Emperors listed.
a) F. Elgee, The Romans in Cleveland, York, 1923, p 14.

S172 York — Bronze: 118 / Deposited: ?
Yorkshire
Not located
1823
Few details.
a) 'Register of Donations 1822-1842' Ms., p10, Yorkshire Museum.

S173 York — Silver: 224+ / Deposited: (c 246 +)
Yorkshire
Not located
1840
Some Emperors listed.
a) C. Wellbeloved, A Handbook to the Antiquities in the Grounds and Museum of the Yorkshire Philosophical Society,7th Edition, York, 1881, p 88.
b) Report of the Yorkshire Philosophical Society, Volume 1, 1913, p 8.

S174 York — Denarii: 11 / Deposited: (c 198 +)
Yorkshire
Not located
1844
Emperors.
a) 'Proceedings of the Committee', Archaeological Journal, Volume 2, 1846, p 397.
[Note: possibly part of S173.]

S175 York, All Saints Church — Bronze: 7 / Deposited: (c 351-353 +)
Yorkshire
-
1862
Emperors & some types.
a) 'General Catalogue of Antiquities 1823-1882', Ms., 4 March 1862, Yorkshire Museum.
b) =B112

S176 York, Blake Street — Denarii: 35 / Deposited: (c 74 +)
Yorkshire
SE 601 520
1975
CRR/RIC Nos.
a) 'Roman Britain in 1975', Britannia, Volume 7, 1976, p 315.
b) Unpublished Catalogue, P.J. Casey.
c) Coin Hoards Volume 2, 1976, No.215, p 63, The Royal Numismatics Society, London.

S177 York Clifton Fields — Folles: 96
Yorkshire — Deposited: (c 310-315 +)
SE 59 52
1692
Emperors & Types.
a) Letter from Noah Hodgson 21 April 1692 to Dr. Gale, in The Family Memoirs of the Revd. Wm. Stukley etc., Part 3 , Surtees Society, Volume 80, 1885, pp 286-290.
b) RCHM Inventory of York, Volume 1, HMSO, 1962, pp 73-74.

S178 York, Foss Islands — Denarii: c 200
Yorkshire — Deposited: ?
SE 609 518
1868
Few details.
a) C. Wellbeloved, A Handbook to the Antiquities in the Grounds and Museum of the Yorkshire Philosophical Society, 7th Edition, York, 1881, p 88n.

S179 York Mount School — Coins: 29
Yorkshire — Deposited: (c 317 +)
SE 592 512
1818
Some Emperors listed.
a) RCHM Inventory of York, Volume 1, HMSO, 1962, pp100-101, quoting: W. Hargrove, 'The New Guide for strangers and residents in the City of York', York, 1838, p 34.

S180 York, Post Office — Denarii: 30
Yorkshire — Deposited: (c 152 +)
SE 596 519
1930
RIC Nos for a sample of 30.
a) R.G. Collingwood & M.V. Taylor, 'Roman Britain in 1930', Journal of Roman Studies, Volume 21, 1931, p 221.
b) M. Kitson Clark, 'Roman Yorkshire, 1930', Yorkshire Archaeological Journal, Volume 30, 1931, p 256.
c) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 156.
d) M. Sekulla, 'A Roman coin hoard from York', Yorkshire Archaeological Journal, Volume 53, 1981, p 119.

S181 York, Railway Street — Denarii c 200
Yorkshire — Deposited: (c 172 +)
SE 59 51
1898
Some Emperors listed.
a) Report of the Yorkshire Philosophical Society, Volume 1, 1913, p 9.

Appendix 2.21 Part 2
4th Century bronze coin hoards in Britain: After Richard Brickstock (1988)

B1 Abergele ?Hoard
Clwyd
SH 94 77
-
Antoniniani: 27
4th c. Bronze: 29
Deposited: (c 380 +)

Emperors & some types.
a) B.H.St.J.O'Neil, 'The Abergele Hoard of Roman Bronze Coins', in Bulletin of Board of Celtic Studies, Nov. 1933, Volume 7, part1, pp 64-72.
b) G.C. Boon, 'A list of Roman Hoards in Wales', in Bulletin of Board of Celtic Studies, November 1967, Volume 22, pp 297-310.

B2 Appleford
Oxfordshire
SU 52 93
1954
Antoniniani: +
4th c. Bronze:: c 5752
Deposited: (c 348-350 +)

Divided into periods.
a) C.E.King, Revue Belge de Numismatique, 1977, Volume 23, pp 41-10.
b) Hoard No. 153 in J.P.C. Kent, Roman Imperial Coinage Volume 8, 1981.
c) Coin Hoards Volume 5, 1979, no.184, p 58, The Royal Numismatic Society, London.

B3 Arbury Road, Cambridge
Cambridegshire
TL 451 608
-
4th c. Bronze:: 17
Deposited: FTR Copies

Emperors & Types.
a) W.H.C. Frend, 'A Romano-British settlement at Arbury Road, Cambridge', in Proc. Cambs. Antiquarian Society, Volume 48, 1954, pp 10-43.

B4 Balgreggan
See S4

B5 Barton Court
Oxfordshire
SU 49 97
1975
4th c. Bronze: ?
Deposited: (c 379 +)

Few details.
a) Coin Hoards Volume2, 1976, no.318, The Royal Numismatic Society, London, p 76.
b) 'Roman Britain in 1974', Britannia, 1975, p 279.

B6 Bermondsey
London
TQ 33 79
May 1946
Bronze: 3
4th c. Bronze: 358
Deposited: (c 392 +)

Types given for 291 of them.
a) Harold Mattingly, 'The Bermondsey hoard' Numismatics Chronicle, Series 6, Volume 6, 1946, pp 167-169.
b) R. Reece,'Numerical Aspects of Roman coin hoards in Britain', in P.J. Casey and R. Reece (eds.), Coins and the Archaeologist, British Archaeological Reports 4, pp 78-94.
c) H. Mattingly, 'Bermondsey Hoard', Numismatic Chronicle, Series 6, Volume 7, 1947, p 91.

B7 Besthorpe
Nottinghamshire
SK 82 64
1964
Bronze: 1347
Deposited: (c 354 +)

Emperors & Types given.
a) Alan Cotterill, H. Mattingly and Malcolm Todd, 'A Hoard of Roman Coins from Besthorpe', in Transactions of the Thoroton Society of Notts., 1945, pp 40-49.
b) Hoard No.192 in J.P.C.Kent, Roman Imperial Coinage Volume 8, 1981.

B8 Brindle — Bronze: 21
Lancashire — Deposited: (c 383 +)
SD 59 24
1934
Emperors & some types given.
a) A.S. Robertson, 'The Hoards of Roman coins in the Harris Museum, Preston, Lancs.', Numismatics Chronicle, 1948, pp 205-18.

B9 Byard's Leap — Bronze: c 40
Lincolnshire — Deposited: (c 350-53 +)
TF 03 49
Winter 1940
Emperor & Types given for 27.
a) C.H.V. Sutherland, 'A Roman Hoard from Lincolshire', Numismatics Chronicle 1942, pp 107-108
b) Hoard No.180, in J.P.C. Kent, Roman Imperial Coinage Volume 8, 1981.

B10 Caerwent — Bronze(?): ?
Gwent — Deposited: (c 393+)
ST 46 90
-
Few details.
a) G.C.Boon, 'A list of Roman Hoards in Wales', Bulletin of Board of Celtic Studies, Volume 22, 1974-76, pp 297-310, no.108, p 310

B10b Caerwent — Bronze: 20
Gwent — Deposited: (c 348-50 +)
ST 46 90
-
LRBC Nos.
a) P.J. Casey, 'Caerwent (Venta Silurum): the excavation of the north-west corner tower and an analysis of the structural sequence of the defences', Archaeologia Cambrensis, Volume 132, 1983, pp 78-94.

B11 Canterbury Hoard 1 — Bronze: 19
Kent — Deposited: (c 351+)
TR 14 57
-
LRBC Nos.
a) The late B.H.St.J. O'Neil, C.M. Kraay, R. Reece, 'Coins', in P. Bennett, S.S. Frere & S. Stow, The Archaeology of Canterbury, Kent Arch Society, 1982, Volume 2, pp 141-143.

B12 Canterbury Hoard 2 — Antoniniani: 2
Kent — 4th c. Bronze: 17
TR 14 57 — Deposited: (c 388-402 +)
-
Some date ranges.
a) Excavations of S.S. Frere - details in R. Reece,'Numerical Aspects of Roman coin hoards in Britain', in P.J. Casey and R. Reece (eds.), Coins and the Archaeologist, British Archaeological Reports 4, pp 78-94 [Canterbury 4].

B13 Canterbury Hoard 3 — Antoniniani: c 5
Kent — 4th c. Bronze: c 79
TR 14 57 — Deposited: (c 388-402 +)
-
Some date ranges & types.
a) Excavations of S.S. Frere - details in R. Reece,'Numerical Aspects of Roman coin hoards in Britain', in P.J. Casey and R. Reece (eds.), Coins and the Archaeologist, British Archaeological Reports 4, pp 78-94 [Canterbury 5].

B14 Canterbury Hoard 4 — Bronze: 21
Kent — Deposited: (c 388-402 +)
TR 14 57
-
Some date ranges & types.
a) Excavations of S.S. Frere - details in R. Reece,'Numerical Aspects of Roman coin hoards in Britain', in P.J. Casey and R. Reece (eds.), Coins and the Archaeologist, British Archaeological Reports 4, pp 78-94 [Canterbury 6].

B15 Carrawburgh
See S40

B15a Castle Nick (Hadrian's Wall) — Bronze: 26
Northumberland — Deposited: (c 354 +)
-
1984
LRBC Nos.
a) Catalogue by R.J. Brickstock (unpublished).

B16 Chester — Bronze: 9
Cheshire — Deposited: (c 367 +)
SJ 40 66
23 April 1936
Emperors & some types.
a) Coin Hoards Volume 5, 1979, no.191, The Royal Numismatic Society, London, pp 59-60.
b) R. Newstead, 'Records of archaeological finds', Journal of Chester Archaeological Society, Volume 33, 1939, p 61.

B17 Chesterholme (Vindolanda)
See S43

B18 Cirencester Hoard 1 — Antoniniani: 1
Gloucestershire — Radiate Copies: 2
SP 02 01 — 4th c. Bronze: 921
- — Deposited: (c 393 +)
Emperors, types & some Cohen Nos.
a) J.W.E. Pearce, 'Roman Coins from Cirencester', Numismatic Chronicle, Series 5, Volume 9, 1929, pp 332-334.
b) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 168.

B19 Cirencester Hoard 2 — Bronze: 31
Gloucestershire — Deposited: (c 380 +)
SP 02 01
pre 1900
Some date ranges, emperors, types & LRBC Nos.
a) Coin Hoards Volume 6, 1981, No.189, The Royal Numismatic Society, London, p 38.

B20 Cirencester Hoard 3 — Bronze: 10
Gloucestershire — Deposited: (c 392 +)
SP 02 01
-
Emperors & Types.
a) A. Fox and B.H.St.J. O'Neil, 'A fourth century hoard and its container from Corinium', Antiquaries Journal 1949, pp 83-84.

B21 Cobham Park — Bronze: 1088
Kent — Deposited: (c 353 +)
TQ 67 68
-
Types & Mints for c. 839 of the coins.
a) C. Roach Smith, 'On a hoard of Roman coins discovered in Cobham Park', Numismatic Chronicle, Series 3, Volume 5, 1885, pp 108-117.
b) Details taken from P.J.C. Casey listing, unpublished.
c) Hoard No. 188 in J.P.C. Kent, Roman Imperial Coinage Volume 8, 1981.
d) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 166.

B22 Colchester Hoard 1 — Bronze: 39
Essex — Deposited: (FTR Copies)
TL 99 25
1870-1880
few details (all copies).
a) M.R. Hull, Roman Colchester, Society of Antiquaries Research Report no.20, 1958, p 277.
b) H. Mattingly, 'Three hoards of barbarous Roman coins', Numismatic Chronicle, Series 5, Volume 14, 1934, pp 255-268.

B23 Colchester Hoard 2 — Bronze: 49
Essex — Deposited: (c 393 +)
TL 99 25
1870-1880
Emperors given for 46 of them.
a) M.R. Hull, Roman Colchester, Society of Antiquaries Research Report no.20, 1958, p 277.
b) Report of the Museum and Muniment Committee (CMR) 1927, no.5291.26, p 23 (Curator M.R. Hull).

B24 Coleshill — Bronze: 2373
Warwickshire — Deposited: (c 353 +)
SP 19 89

Some date ranges and types given.
a) W.H.Seaby, 'A hoard of late Roman coins found at Coleshill, Warwickshire', Transactions of the Birmingham Archaeological Society, Volume 66, 1950, p 170.
b) Hoard No. 191 in J.P.C. Kent, Roman Imperial Coinage Volume 8, 1981; which uses a Ms. from the B.M. courtesy of R.F. Bland.
c) Note in Recent Coin Hoards in Roman Britain, Volume 1, 1979

B25 Corbridge
See S54
Note: 'S54', not 'S50' , misrefered to in Brickstock.

B26 Corsock
See S61

B27 Covesea
See S62

B28 Cowlam
See S64

B29 Croydon — Bronze: c 3600
London — Deposited: (c 351-354 +)
TQ 32 66
10th March 1903
Date ranges and mints given.
a) G.F. Hill, 'Roman coins from Croydon (Constantius II, Constans, Magnentius, Gallus)', Numismatic Chronicle, Series 4, Volume 5, 1905, pp 36-62.
b) Hoard No.189 in J.P.C. Kent, Roman Imperial Coinage Volume 8, 1981.
c) Listing by P.J. Casey, unpublished.
d) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 166.

B30 Dinorben Hoard 1 — Antoniniani: 1
Clwyd — 4th c. Bronze: 7
SH 97 75 — Deposited: (c 350-351 +)
1912-1922
LRBC Nos.
a) G.C. Boon, 'The Coins', In Willoughby Gardner and H.N. Savory, Dinorben Excavation Report , Volume1, 1964, pp 114-131.
b) G.C. Boon, 'A List of Roman Hoards in Wales', Bulletin of Board of Celtic Studies, Volume 22, November 1967, pp 297-310, (p 309).
[Note: The 9th coin (one of Gratian) has been treaded as intrusive, it was also a lot more worn.]

B30a Dinorben Hoard 2 — Bronze: 49
Clwyd — Deposited: (c 355 +)
SH 97 75
1982-1983
RIC Nos.
a) G.C. Boon, 'A scattered Majorina Hoard with a coin of the Domino group from Dinorben', Bulletin of the Board of Celtic Studies, Volume 32, pp 380-83.

B31 Dorchester on Thames Hoard 1
Oxfordshire
SU 57 94
-
Some date ranges.

Antoniniani:	1
4th c. Bronze:	30
Deposited:	(c 388-402 +)

a) Excavations of S.S. Frere - details in R. Reece,'Numerical Aspects of Roman coin hoards in Britain', in P.J. Casey and R. Reece, Coins and the Archaeologist, British Archaeological Reports 4, pp 78-94 [Dorchester A].

B32 Dorchester on Thames Hoard 2
Oxfordshire
SU 57 94
-
Some date ranges.

Antoniniani:	c 15
4th c. Bronze:	c 481
Deposited:	(c 388-402 +)

a) Excavations of S.S. Frere - details in R. Reece,'Numerical Aspects of Roman coin hoards in Britain', in P.J. Casey and R. Reece, Coins and the Archaeologist, British Archaeological Reports 4, pp 78-94 [Dorchester B].

B33 Filey Hoard 1
See S73

B34 Filey Hoard 2
See S74

B35 Filey Hoard 3
See S75

B36 Freckenham
Suffolk
TL 66 72
March 1948
Emperors, Types & Cohen Nos.

Bronze:	543
Deposited:	(c 353-354 +)

a) H. Mattingly, 'The Freckenham hoard of Roman coins', Numismatic Chronicle, Series 6, Volume 13, 1953, pp 69-73.
b) Hoard No. 193 in J.P.C. Kent, Roman Imperial Coinage, Volume 8, 1981.

B37 Frilford
Oxfordshire (Berkshire)
SU 43 96
1937-1938
Emperors, types & Cohen Nos.

Bronze:	49
Deposited:	(c 367-383 +)

a) J.S.P. Bradford and R.G. Goodchild ,'Frilford, Berks 1937/8', Oxoniensia, 1939, pp 1-71.

B38 Gadebridge Park ?Hoard
Hertfordshire
TL 05 08
1963-68
Date ranges & types.

Antoniniani:	3
Radiate Copies:	7
4th c. Bronze:	152
Deposited:	(c 350-353 +)

a) P. Cunrow, 'The Coins', In D.S. Neal, 'The Excavation of the Roman Villa in Gadebridge Park, Hemel Hempstead, 1963-1968', Society of Antiquaries Research Report no.31, 1974, pp 101-122.

B39 Gloucester Hoard 1
Gloucestershire
SO 83 18
1966-1967
Emperors, types & some LRBC.

Bronze:	101
Deposited:	(c 388 +)

a) M. Hassall and J. Rhodes, 'Excavations at the new Market Hall, Glos., 1966/7', in Bristol & Glos. Arch. Society Transactions, Volume 93, 1974, pp 15-100, Hoard 2 : pp 83-86.

B40 Gloucester Hoard 2
Gloucestershire
SO 83 18
1966-1967
Emperors, types & some LRBC.

Radiate Copies:	2
4th c. Bronze:	179
Deposited:	(c 393 +)

a) M. Hassall and J. Rhodes, 'Excavations at the new Market Hall, Glos., 1966/7', in Bristol & Glos. Arch. Society Transactions, Volume 93, 1974, pp 15-100, Hoard 3 : pp 83-86.

B41 Godmanchester ?Hoard
Cambridgeshire
TL 24 70
-
Few details.
a) H.J.M. Green, Godmanchester (Cambs.), p 363.

Bronze:	'a small group'
Deposited:	(c 355 +)

B42 Gravesend, Wattling Street
Kent
TQ 64 74 ?
c.1880s
Emperors & types.
a) R.J. Brickstock catalogue (unpublished).

Antoniniani:	2
4th c. Bronze:	58
Deposited:	(c 395 +)

B43 Great Casterton
Leicestershire
TF 00 09
1949-1951
Types known for 123.
a) B.W.Pearce, 'The Coins', P. Corder (ed.), The Roman Town and Villa at Great Casterton, Rutland, Univ. of Notts, 1951, pp 22-23 .

Bronze:	327
Deposited:	(c 350-353 +)

B44 Great Weldon
Northamptonshire
SP 92 89
1955
Some date ranges & types for 225 of them.
a) D.J. Smith, Great Weldon Villa Excavations, (1953-6).
b) P. Cunrow, 'The Coins', In D.S. Neal, 'The Excavation of the Roman Villa in Gadebridge Park, Hemel Hempstead, 1963-1968', Society of Antiquaries Research Report no.31, 1974, pp 101-122.

Bronze:	230
Deposited:	(c 348-350 +)

B45 Halifax
West Yorkshire
SE 09 25
21 May 1915
Some types mentioned, but no quantification.
a) A.M. Woodward, 'A hoard of Roman coins from Halifax', in Yorkshire Archaeological Journal 23, 1915, pp 444-451.
b) Hoard No.155 in J.P.C. Kent, Roman Imperial Coinage Volume 8, 1981.

Antoninianus:	1
4th c. Bronze:	1053
Deposited:	(c 348-350 +)

B46 Hamble
Hampshire
SU 4711 0735
1968
Some Date ranges, types, mints & LRBC.
a) Recent Coin Hoards in Roman Britain, Volume 1, 1979.
b) Coin Hoards Volume 5, 1979, no.185, The Royal Numismatic Society, London, p 59.
c) Hoard No.154 in J.P.C. Kent, Roman Imperial Coinage Volume 8, 1981.

Antoninianus:	1
4th c. Bronze:	2493
Deposited:	(c 349 +)

B47 Hanham
Gloucestershire
ST 64 72
Early 1951
Some date ranges, mints & Cohen Nos.
a) C.H.V. Sutherland, 'The Hanham (Glos.) hoard of Roman coins', Numismatic Chronicle, Series 6, Volume 14, 1954, pp 213-215.
b) Listing by P.J. Casey (unpublished)
c) Hoard No.165 in J.P.C. Kent, Roman Imperial Coinage Volume 8, 1981.

Antoniniani:	1 +
4th c. Bronze:	200 +
Deposited:	(c 351 +)

B48 Heddon
See S88

B49 Heslington
Yorkshire
SE 6242 5079
1 March 1966
LRBC & RIC Nos.

4th c. Bronze:	2860
Antoniniani:	2
Deposited:	(c 355 +)

a) R.A.G. Carson and J.P.C. Kent, 'A hoard of Roman fourth century bronze coins from Hesslington, Yorkshire, Numismatic Chronicle, Series #, Volume #, 1971, pp 207-225.
b) Hoard No. 203 in J.P.C. Kent, Roman Imperial Coinage Volume8, 1981.
c) G.C. Boon, 'A scattered Majorina Hoard with a coin of the Domino group from Dinorben', Bulletin of the Board of Celtic Studies, Volume 32, pp 380-85, Footnote 3.
d) Coin Hoards Volume 1, 1975, No. 221, The Royal Numismatic Society, London, p 55.

B50 Holybourne
Hampshire
SU 37 41
-
Few details.

Bronze:	117
Deposited:	(c 378 +)

a) Coin Hoards Volume 3, 1977, no.213, The Royal Numimatic Society, London, p 68.

B51 Husthwaite
See S94

B52 Ickham
Kent
TR 22 58
-
LRBC Nos.

Bronze:	29+
Deposited:	(c 364-378 +)

a) Coin Hoards Volume2, 1976, no.186, The Royal Numismatic Society, London, pp 53-55.

B53 Icklingham
Suffolk
TL 78 71
1902
Emperors, some types & Cohen Nos.

Antoniniani:	c 23
4th c. Bronze:	1041
Silver:	20
Deposited:	(c 393-395 +)

a) J.W.E. Pearce, 'Roman Coins from Icklingham', Numismatic Chronicle, Series 5, Volume 9, 1929, pp 319-327.

B54 Ifton
Gwent
ST 46 87
-
Few details.

Bronze:	?20+
Deposited:	(c 395-402 +)

a) G.C. Boon, 'A list of Roman Hoards in Wales', Bulletin of Board of Celtic Studies, Volume 22, Nov.1967, pp 297-310 (No. 107, p 310).

B55 Kenchester
Herefordshire
SO 44 42
13 December 1912
Date ranges & mints.

Antoniniani:	3
4th c. Bronze:	46
4th c. Bronze Copies:	1
Deposited:	(c 367-375 +)

a) G.H. Jack, 'The Romano-British town of Magna (Kenchester), Herefordshire', Report of the Research Committee of the Woolhope Club, Volume1 for 1912-13 excavations, 1916, pp 54-60.
b) Listing by P.J. Casey, unpublished.
c) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 168.

B56 Kiddington
Oxfordshire
SP 41 22
pre 1935
Emperors & some types.

Antoninianus:	1
Radiate Copies	9
4th c. Bronze:	1166
Deposited:	(c 395 +)

a) C.H.V. Sutherland, 'A late Roman hoard from Kiddington, Oxon', Oxoniensia Volume I, 1936, pp 70-79.
b) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 168.

B57 'Knott Mill' Hoard — Bronze: 1573
?Britain — Deposited: (c 364-378 +)
?
1852
Date ranges & some mints.
a) F.A. Bruton, 'The Roman Fort at Manchester 1909', pp 41-78 (hoard listed in two parts).
b) Hoard No. 222 in J.P.C. Kent, Roman Imperial Coinage Volume 8, London.
[Note: This looks more like an eastern hoard.]

B58 Laxton — Antoniniani: 3
Northamptonshire — 4th c. Bronze: 336
SP 94 96 — Deposited: (c 393 +)
January 1936
Emperors & Types.
a) A.S. Robertson, 'A hoard of Theodosian coins from Laxton, Northants', Numismatic Chronicle, Series 5, Volume 16, 1936, pp 156-63.
b) R. Reece, 'Numerical Aspects of Roman coin hoards in Britain', P.J. Casey and R. Reece (eds.), Coins and the Archaeologist, British Archaeological Reports 4, pp 78-94.

B59 Little Langford — Bronze: c 1000
Wiltshire — Siliquae: 296
SU 04 36 — Miliarensia: c3
pre 1906 — Deposited: (c 388-402 +)
No details of aes, full descriptions of silver coins
a) G.F. Hill, 'Roman silver coins from Grovely Wood, Wilts.' Numismatic Chronicle, Series 4, Volume 6, 1906, pp 330-347.
b) R. Reece, 'Numerical Aspects of Roman coin hoards in Britain', P.J. Casey and R. Reece (eds.), Coins and the Archaeologist, British Archaeological Reports 4, pp 78-94.
c) =A24

B60 Llwchwr (Loughor) — Antoniniani & 4th c.Bronze: 48 +
West Glamorgan — Deposited: (c 348-350 +)
SS 57 98
-
Few details.
a) G.C. Boon, 'A List of Roman Hoards in Wales', Bulletin of Board of Celtic Studies, Volume 22, November 1967, pp 297-310, no.97 (p 309).
b) G.C. Boon, 'First Supplement 1973', Bulletin of Board of Celtic Studies, Volume 26, May 1975, pp 237-40 (p 238).

B61 ? 'Long Wittenham' — Bronze: 24
? British, called Berkshire. — Deposited: (c 353 +)
?
-
RIC & Cohen Nos.
a) E.J.W. Hildyard and P.V. Hill, 'A late Constantinian Hoard', Numismatic Chronicle, Series 6, Volume 14, 1954, pp 211-213.
b) Hoard No. 163 in J.P.C. Kent, Roman Imperial Coinage Volume 8, 1981.

B62 Lydney Hoard 1 — Antoniniani: 2
Gloucestershire — 4th c. Bronze: 124
SO 61 02 — Deposited: (c 353-354 +) ?
1928
Cohen Nos.
a) J.W.E.Pearce, in R.E.M. and T.V. Wheeler, The Report on the Excavations at Lydney Park in 1928 9, Society of Antiquaries Research Report no.9, 1932, pp 112-115.
b) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 166.

B63 Lydney Hoard 2 — Bronze: 1646
Gloucestershire — Deposited: (c 353 +)
SO 61 02
1929
Types given.
a) J.W.E.Pearce, in R.E.M. and T.V. Wheeler, The Report on the Excavations of the Prehistoric, Roman and Post-Roman site in Lydney Park, Gloucestershire, Society of Antiquaries Research Report no.9, 1932; also T.V. Wheeler, 'Hoard II', pp 116-129; D.A. Casey, 'Method of manufacture', pp 129-131.

B64 Nettleton, Hoard 1
Wiltshire
ST 82 76
1957-1971
Emperors, types & RIC.

Antoninianus:	1
4th c. Bronze:	53
Deposited:	(c 353-354 +)

a) R. Reece, 'The Coins', in W.J. Wedlake, The Shrine of Apollo at Nettleton, Wiltshire, 1956-1971, Society of Antiquaries Research Report no.40, 1982.

B65 Nettleton, Hoard 2
Wiltshire
ST 82 76
1956-1971
Emperors & date ranges given.

Lucius Verus ?:	1
Antoniniani:	5
Radiate Copies:	2
4th c. Bronze:	718
4th c. Bronze copies:	9
Deposited:	(383 +)

a) R. Reece, 'The Coins', in The Shrine of Apollo at Nettleton, Wiltshire, 1956-1971, by W.J. Wedlake, Society of Antiquaries Research Report no.40, 1982, p 277.

B66 Nobottle
Northamptonshire
SP 67 63
1928
Date ranges, types & mints.

Bronze:	735
Deposited:	(c 388 +)

a) B.H.St. J. O'Neil, 'A hoard of Roman coins from Northamptonshire; its parallels and significance', Archaeological Journal, Volume 90, 1933, pp 282-305.
b) R. Reece, 'Numerical Aspects of Roman coin hoards in Britain', P.J. Casey and R. Reece (eds.), Coins and the Archaeologist, British Archaeological Reports 4, pp 78-94.
c) Listing by P.J. Casey, unpublished.
d) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 167.
e) B.H.St.J. O'Neil, 'The Nobottle Theodosian Hoard (corrigenda)', Numismatic Chronicle, Series 5, Volume 11, 1931, pp 321-322.
f) B.H.St.J. O'Neil, 'A Late Roman Hoard from Northamptonshire', Numismatic Chronicle, Series 5, Volume 9, 1930, pp 275-281.

B67 Oldcroft
Gloucester
SO 645 060
1971-1972
LRBC Nos..

Bronze:	3333
Deposited:	(c 354-359 +)

a) J.F. Rhodes, 'The Oldcroft (1971-2) Hoard of Bronze Coins and Silver Objects', Numismatic Chronicle, Series 7, Volume 14, 1974, pp 65-74.
b) Hoard No. 202 in J.P.C. Kent, Roman Imperial Coinage Volume 8, 1981.
c) Coin Hoards Volume 2, 1976, No. 306, The Royal Numismatic Society, London, p 75.

B68 Park Street
Hertfordshire
TL 14 03
1943-1945
Few details, mainly copies.

Bronze:	17
Deposited:	(c 348-358 +)

a) B.H.St.J. O'Neil, 'Coins', pp 59-62, in Helen E. O'Neil, 'The Roman Villa at Park Street near St.Albans, Herts., Report on the excavations of 1943-1945', Archaeological Journal 102, 1945, pp 21-110.

B69 Pembroke Castle
Dyfed
SM 98 01
-
2 Emperors mentioned.

Antoniniani:	? 1 +
4th c. Bronze:	? 5 +
Deposited:	(c 337-350 +)

a) G.C. Boon, 'A List of Roman Hoards in Wales', Bulletin of Board of Celtic Studies, Volume 22, November 1967, pp 297-310 (no.98, p 309).
b) Law, History of Pembrokshire, p 46.
c) N. Shiel, The Episode of Carausius and Allectus, British Archaeological Reports 40, 1977.

B70 Piercebridge
See S130

B71 Poundbury
Dorset
SU 56 95
-

Bronze:	74
Deposited:	(c 353-354 +)

Emperors & types given.
a) A.S. Robertson, 'Poundbury hoard of 4th Century copies and their prototypes', Numismatic Chronicle 1952, pp 87-95.
b) Hoard No. 195, in J.P.C. Kent, Roman Imperial Coinage Volume 8, 1981.

B72 Ravenglass
See S133

B73 Redenhall
Norfolk
TM 26 84
pre 1895

Bronze:	144
Deposited:	(c 394 +)

Emperors & types given.
a) P.V. Hill, 'The Redenhall (Norfolk) Hoard c. 1895', Numismatic Chronicle 1946, pp 157-59.
b) R. Reece,'Numerical Aspects of Roman coin hoards in Britain', in P.J. Casey and R. Reece (eds.), Coins and the Archaeologist, British Archaeological Reports 4, pp 78-94.

B74 Richborough Hoard 1
Kent
TR 32 60
1924

Antoniniani:	14
Radiate Copies:	15
4th c. Bronze:	115
Deposited:	(c 378 +)

Some details of 61 of them.
a) F.S. Salisbury and J.W.E. Pearce, 'The Coins', In J.P. Bushe-Fox, Report of the Excavation of the Roman Fort at Richborough, Kent, Volume2, Society of Antiquaries Resarch Report no.7, 1928, pp 106-226, (Hoard 1 pp 26-27; 118-119).

B75 Richborough Hoard 2
Kent
TR 32 60
-

Sestertius:	1
Antoniniani:	c 11
4th c. Bronze:	c 1188
Deposited:	(Theodosian)

Some Emperors & types given.
a) G.C.F. Hayter, analysis of th hoard in: W.P.D. Stebbing, 'The Coins', In J.P. Bushe-Fox, Report on the Excavation of the Roman Fort at Richborough, Kent, Volume 3, by Society of Antiquaries Resarch Report no.10, 1932, pp 187-235 (the hoard, pp 192-95).

B76 Richborough Hoard 3
Kent
TR 32 60
-

Antoninianus:	1
4th c. Bronze:	360
Deposited:	(c 393 +)

Emperors given.
a) W.P.D. Stebbing, 'The Coins', In J.P. Bushe-Fox, Report on the Excavation at the Roman Fort at Richborough, Kent, Volume 4, Society of Antiquaries Resarch Report no.16, 1949. pp 273-320 (Hoard No.1, p 278).

B77 Richborough Hoard 4
Kent
TR 32 60
-

Antoniniani:	4
4th c. Bronze:	87
Deposited:	(c 393 +)

Emperors given.
a) W.P.D. Stebbing, 'The Coins', In J.P. Bushe-Fox, Report on the Excavation at the Roman Fort at Richborough, Kent, Volume 4, Society of Antiquaries Resarch Report no.16, 1949. pp 273-320 (Hoard No.2, p 279).

B78 Richborough Hoard 5
Kent
TR 32 60
-

Antoninianus:	1
4th c. Bronze:	84
Deposited:	(c 393 +)

Emperors given.
a) W.P.D. Stebbing, 'The Coins', In J.P. Bushe-Fox, Report on the Excavation at the Roman Fort at Richborough, Kent, Volume 4, Society of Antiquaries Resarch Report no.16, 1949. pp 273-320 (Hoard No.3, p 279).

B79 Richborough Hoard 6
Kent
TR 32 60
-
Antoninianus: 1
Siliquae: 3
4th c. Bronze: 62
Deposited: (c 393 +)
Emperors given.
a) W.P.D. Stebbing, 'The Coins', In J.P. Bushe-Fox, Report on the Excavation at the Roman Fort at Richborough, Kent, Volume 4, Society of Antiquaries Resarch Report no.16, 1949. pp 273-320 (Hoard No.4, p 279).

B80 Richborough Hoard 7
Kent
TR 32 60
-
Antoniniani: 6
4th c. Bronze: 72
Deposited: (c 348-350 +)
Emperors given.
a) W.P.D. Stebbing, 'The Coins', In J.P. Bushe-Fox, Report on the Excavation at the Roman Fort at Richborough, Kent, Volume 4, Society of Antiquaries Resarch Report no.16, 1949. pp 273-320 (Hoard No.5, p 280).
[Note: The Theodosian coin found with the hoard is taken to be a stray.]

B81 Richborough Hoard 8
Kent
TR 32 60
-
Bronze: 96
Deposited: (c 394 +)
Emperors given.
a) R. Reece, 'The Roman Coins', in B.W. Cunliffe (ed.), Report on the Excavation at the Roman Fort at Richborough, Kent, Volume 5, Society of Antiquaries Resarch Report no.23, 1968, pp 118-216 (Hoard No.1, p 189).

B82 Richborough Hoard 9
Kent
TR 32 60
-
Bronze: 124
Deposited: (c 394 +)
Emperors given.
a) R. Reece, 'The Roman Coins', in B.W. Cunliffe (ed.), Report on the Excavation at the Roman Fort at Richborough, Kent, Volume 5, Society of Antiquaries Resarch Report no.23, 1968, pp 118-216 (Hoard No.2, p 190).

B83 Richborough Hoard 10
Kent
TR 32 60
1937
Bronze: 12
Deposited: (c 375 +)
Emperors given.
a) R. Reece, 'The Roman Coins', in B.W. Cunliffe (ed.), Report on the Excavation at the Roman Fort at Richborough, Kent, Volume 5, Society of Antiquaries Resarch Report no.23, 1968, pp 118-216 (Hoard No.3, p 190).

B84 Richborough Hoard 11
Kent
TR 32 60
1937
Antoninianii: 4
Radiate Copies 11
4th c. Bronze: 1206
Deposited: (c 353 +)
Emperors given.
a) R. Reece, 'The Roman Coins', in B.W. Cunliffe (ed.), Report on the Excavation at the Roman Fort at Richborough, Kent, Volume 5, Society of Antiquaries Resarch Report no.23, 1968, pp 118-216 (Hoard No.5, p 191).
b) H. Mattingley and W.P.D. Stebbing, 'Site Finds from Richborough, including a scattered diademed minimi', Numismatic Chronicle, 1939, pp 112-119.

B85 Richborough Hoard 12
Kent
TR 32 60
1937
Radiate Copies: c 860
Deposited: (c 273 +)
Some emperors given.
a) R. Reece, 'The Roman Coins', In B.W. Cunliffe, Report on the Excavation at the Roman Fort at Richborough, Kent, Volume 5, B.W. Cunliffe (ed.), Society of Antiquaries Resarch Report no.23, 1968, pp 118-216 (Hoard No.5, using Pearce's listing, p 191).
b) H. Mattingley and W.P.D. Stebbing, 'The Richborough hoard of radiates', in Numismatic Notes and Monographs, no.80, 1931.

B86 Scarborough
See S137

B87 Shakenoak Farm — Bronze: 15
Oxfordshire — Deposited: (c 353-358 +)
-
-
RIC & LRBC Nos.
a) 'The Coins', in A.A.C. Brodribb, A.R. Hand and D.R. Walker, Excavation at Shakenoak Farm, Oxon., Volume1, Oxford, 1968, pp 32-35.

B88 Shapwick 3 — Bronze: 1121
Somerset — Deposited: (c 383-388 +)
ST 41 38
Emperors & types given.
a) J.W.E. Pearce, 'Shapwick III: a large hoard of Valentinian Aes', Numismatic Chronicle, Series 5, Volume 19, 1939, pp 128-142.
b) Hoard No. 234, in J.P.C. Kent, Roman Imperial Coinage Volume 8, 1981.

B89 Silchester Hoard V — Antoninianus: 1
Hampshire — 4th c. Bronze: 17
SU 64 62 — Deposited: (c 337 or 348 +)
1891
Emperors & types.
a) G.C. Boon, 'Hoards of Roman coins found at Silchester', Numismatic Chronicle, Series 6, Volume 20, 1960, p 268.
b) Note by G.E. Fox in Archaeologia, Volume 53, 1891, p 269.
[Note: FTR coin taken as a stray.]

B90 Silchester Hoard VII — Antoninianus: 1
Hampshire — Radiate Copy: 1
SU 64 62 — 4th c. Bronze: 34
1891 — Deposited: (c 341-348 +)
Emperors & types.
a) G.C. Boon, 'Hoards of Roman coins found at Silchester', Numismatic Chronicle , Series 6, Volume 20,1960, p 251.
b) Note by G.E. Fox in Archaeologia, Volume 53, 1891, p 284.

B91 Skellow — Bronze: 19
South Yorkshire — Deposited: (c 351-353 +)
SE 53 10
Emperors & types.
a) N. Smedley, 'Roman coins from Skellow, Yorkshire', Numismatic Chronicle, Series 6, Volume 7, 1947, pp 83-84.
b) Hoard No. 185, in J.P.C. Kent, Roman Imperial Coinage Volume 8, 1981.

B92 Slaughter Farm, Bourton-on-the-Water — Bronze: 23
Gloucestershire — Deposited: (FTR copies)
SP 16 22
19th century.
a) B.H.St.J. O'Neil, 'A hoard of minimissimi from near Bourton on the Water, Glos., in the parish of Lower Slaughter', Bristol and Gloucestershire Archaeological Society, Transactions 56, pp 133-139.
b) B.H.St.J. O'Neil, 'A Hoard of Mimimissimi near Bourton on the Water (Glos)', Numismatic Chronicle, Series 5, Volume 15, 1935, pp 284ff.

B93 South Shields Hoard 1
Coin Hoards Vol ume 6, 1981, No. 178, p 36.

B94 South Shield Hoard 2 — Bronze: ?
Durham — Deposited: (c 388 +)
NZ 365 679
-
Emperor named.
a) Coin Hoards Volume 3, 1977, no. 214, The Royal Numismatic Society, London, p 68.

B95 Stretham — Bronze: 865
Cambridgeshire — Deposited: (c 392-402 +)
TL 52 73
-
Emperors & types given.
a) J.W.E. Pearce, 'A hoard of late Roman bronze coin from Stretham', Cambs. Antiquarian Society Proceedings, Volume 39, pp 85-92.
[the radiate copies have not been taken as belonging to the hoard]

B96 Uley — Bronze: 66
Gloucestershire — Deposited: (FTR Copies)
ST 79 99
1977
Fel Temp Copies.
a) Richard Reece, provisional list, unpublished.
[Note: Theodosian coin taken as a stray.]

B97 Usk, Hoard No. 4 — Bronze: 12
Gwent — Deposited: (c 350 +)
SO 37 00
1971
Some Emperors listed.
a) Coin Hoards Volume 1, 1975, no.220, The Royal Numismatic Society, London, p 55.
b) G.C. Boon, Hoard No.4 in 'First Supplement 1973 to A list of Roman Hoards in Wales', Bulletin of Board of Celtic Studies, Volume 26, May 1975, pp 237-240.

B98 Waldersea, Elm — Antoninianus: 1
Cambridgeshire — 4th c. Bronze: 13
TF 47 07 — Deposited: (c 393 +)
1785
Emperors & some types.
a) Coin Hoards Volume 4, 1978, no.176, The Royal Numismatic Society, London, pp 43, 49-50.
b) C. Phillips (ed.), The Fenland in Roman Times, London, 1970, p 320.
c) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 167.

B99 Weymouth — Antoniniani: 34
Dorset, — 4th c. Bronze: c 4416
SY 67 78 — Deposited: (c 388-402 +)
Summer 1928
Emperors & types.
a) F.S. Salisbury, 'A hoard of Roman coins from Jordan Hill, Weymouth', Dorset Archaeological Society Transactions, Volume 51, 1929, pp 158-182.
b) R. Reece,'Numerical Aspects of Roman coin hoards in Britain', in P.J. Casey and R. Reece (eds.), Coins and the Archaeologist, British Archaeological Reports 4, pp 78-94.
c) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 167.

B100 Wisbeach (North Brink) — Bronze: 9
Cambridgeshire — Deposited: (c 383 +)
TF 46 09
1874
RIC & LRBC Nos.
a) Coin Hoards Volume 4, 1978, no.174, pp 43, also D.C.A. Shotter, p 49, The Royal Numismatic Society, London.
b) C. Phillips (ed.), The Fenland in Roman Times, London, 1970, p 323.

B101 Wisbeach — Antoniniani: 4
Cambridgeshire — 4th c. Bronze: 12
TF 46 09 — Deposited: (c 393 +)
1852
Emperors given.
a) Coin Hoards Volume 4, 1978, no.175, pp 43, 49, The Royal Numismatic Society, London.
b) C. Phillips (ed.), The Fenland in Roman Times, London, 1970, p 324.

B102 Wiveliscombe
Somerset
ST 09 27
4 March 1946
Emperors & types.

Antoniniani:	8
Radiate Copies:	2
4th c. Bronze:	c 1140
Deposited:	(c 388 +)

a) P.V. Hill, 'The Wivelscombe (Somerset) Hoard', Numismatic Chronicle 1946, p 163-165.
b) R. Reece,'Numerical Aspects of Roman coin hoards in Britain', pp 78-94, in P.J. Casey and R. Reece (eds.), Coins and the Archaeologist, *British Archaeological Reports 4*, pp 78-94 .

B103 Woodbridge
Suffolk
TM 27 49
-
Emperors & types.

Antoniniani:	2
Radiate Copies:	3
4th c. Bronze:	525
Deposited:	(c 393 +)

a) J.M.E. Pearce, 'Late fourth century hoard of Aes from Woodbridge', in Numismatic Chronicle, Series #, Volume #, 1935, pp 49-53.
b) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 167.

B104 Woodeaton II
Shropshire
SP 53 11
19th century
Some details.

Bronze:	217
Deposited:	(c 350-353 +)

a) Ms. in Heberden Coin Room, Ashmolean Museum, Oxford, In Numismatic Chronicle, New Series, Volume 15, 1875, p 7.
b) Hoard No. 171 in J.P.C. Kent, Roman Imperial Coinage Volume 8, 1981.
c) Victoria County History, Oxfordshire, Volume 1.

B105 Worle Camp
Somerset
ST 32 62
1852
Emperors & types.

Antoninianus:	1
Radiate Copies:	2
4th c. Bronze:	238
Deposited:	(c 394 +)

a) P.V. Hill, 'The Worle Camp (Somerset) Hoard', Numismatic Chronicle, Series 6, Volume 6, 1946, pp 153-156.
b) R. Reece,'Numerical Aspects of Roman coin hoards in Britain', pp 78-94, in P.J. Casey and R. Reece (eds.), Coins and the Archaeologist, British Archaeological Reports 4, pp 78-94 .

B106 Wroxall
Isle of White
SZ 55 79
1863
Emperors given for 463 of them, though biased sample.

Bronze:	c 5000
Deposited:	(c 388-402 +)

a) B.H.St.J. O'Neil, 'The Wroxall Theodosian Hoard', Numismatic Chronicle, Series 5, Volume 13, 1933, pp 220-222.
b) R. Reece,'Numerical Aspects of Roman coin hoards in Britain', pp 78-94, in P.J. Casey and R. Reece (eds.), Coins and the Archaeologist, British Archaeological Reports 4, pp 78-94 .
c) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 167.

B107 Wroxeter Hoard 1
Shropshire
SJ 56 08
19th Century
Some date ranges given.

Bronze:	115
Deposited:	(c 348-350 +)

a) C.Roach Smith, 'Note on some Roman Coins discovered in a hypocaust at Wroxeter', Numismatic Chronicle, Series 1, Volume 20, 1859, pp 79-83.
b) Hoard No.244, in J.P.C. Kent, Roman Imperial Coinage Volume 8, 1981.
c) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 166.

B108 Wroxeter Hoard 2
Shropshire
SJ 56 08
pre 1862
Emperors listed.

Bronze:	132
Deposited:	(c 364-378 +)

a) Thoams Wright, Uriconium: a historical account of the Roman city, London, 1862, Hoard 1, p 68.

B109 Wroxeter Hoard 3
Shropshire
SJ 56 08
pre 1862
Emperors listed.
a) Thomas Wright, Uriconium: a historical account of the Roman city, London, 1862, p 68, Hoard 2.

Denarius:	1
Denarius Copy:	1
AE2:	1
Antoniniani:	18
4th c. Bronze:	17
Deposited:	(c 367-383 +)

B110 Wroxeter Hoard 4
Shropshire
SJ 56 08
-
Emperor & types listed.
a) Coin Hoards Volume 6, 1981, no. 188, The Royal Numismatic Society, London, p 38.

Bronze:	47
Deposited:	(c 364-378 +)

B111 Yardley
Warwickshire
SP 138 854
1935
Date ranges & LRBC.
a) D.R. Walker, Transactions of the Birmingham and Warwickshire Archaeological Society, Volume 84, 1967-1970.

Bronze:	62
Deposited:	(c 353-354 +)

B112 York, All Saints Church
See S175

Appendix 2.21 Part 3
Late Roman Gold and Silver coin hoards in Britain: Derived from Archer (1979)

A1 Allington, near Southampton
Hampshire
SU 47 17
1869
List of emperors and types.
a) R. Jennings, 'Find of coins near Southampton', Numismatic Chronicle, New Series, Volume 9, 1869, p 372.
b) Victoria County History, Hampshire, Volume I, p 343.

Solidi: 1
Siliquae: 53
Deposited: (c 400 +)
% clipped Siliquae: 19%

A2 Alcester
Warwickshire
SP 08 57
pre 1871
No Details.
a) S.Clarke, Geographical description of the World, 1871.

Solidi: 16
Siliquae: 800
Deposited: (c 312-337 +)

A3 Amesbury
Wiltshire
SU 15 41
1843
No Details.
a) Proceedings of the Society of Antiquaries, Volume 4, p 27.

Siliquae: ?
Bronze: ?
Deposited: (c 379-395 + ?)

A4 Barrow on Humber
Humberside (Lincolnshire)
TA 07 20
1979
Emperors and mints.
a) Coin Hoards in Roman Britain, Volume 2, Burnett & Whitwell, 1981, pp 113-121.
b) Coin Hoards in Roman Britain, Volume 5, Burnett & Whitwell, 1984, pp 113-115 [22 more].

Siliquae: 260
Solidi: 1
Deposited: (c 400 +)

A5 Bath/Bristol
Gloucestershire/Somerset
-
1839
Emperors and some mints.
a) Anon. 'Discovery of denarii', Numismatic Chronicle, Series 1, Volume 2, 1840, p 144.
b) Victoria County History, Somerset, Volume 1, p 355.
c) Coin Hoards Volume 4, 1985, no. 332, Royal Numismatic Society, London, p 172.
d) Coin Hoards from Roman Britain, Volume 2, 1981, A.M. Burnett, pp 109-111.

Siliquae: 250
Deposited: (c 395 +)

A6 Burtle
Somerset
ST 39 42
Early19th century.
No details.
a) 'Proceedings...', Proceedings of the Society of Antiquaries, Series 2, Volume 26, 1914, p 142.

Siliquae: 41
Bronze (?): 7
Deposited: Late 4th c.

A7 Cakeham
West Sussex (Sussex)
SZ 78 97
c.1935
List of Emperors.
a) Victoria County History, Sussex, Volume 3, p 52.

Solidi: 12
Deposited: (c 388 +)

A8 Camerton
Avon (Somerset)
ST 68 57
post 1841
Few details.
a) Victoria County History, Somerset, Volume 1, p 292

Siliquae: 26
Deposited: (c 393-410 +)

A9 Carlton St Peter
Norfolk
? TM 16 81
1807
Some Emperors named.
a) Victoria County History, Norfolk, Volume 1, p 314.

Solidi: 4
Siliquae: 10
Deposited: (c 393-410 +)

A10 Chaddleworth
Berkshire
SU 41 77
?
Some Emperors named.
a) Victoria County History, Berkshire, Volume 1, p 205.
b) C. Long, 'Antiquities and Works of Art Exhibited', Archaeological Journal, Volume 7, p 87

Siliquae: ?
Bronze: ?
Deposited: (c 367-383 +)

A11 Chobham
Surrey
SU 97 61
1772
Some Emperors named.
a) Victoria County History, Surrey, Volume 4, p 360.

Siliquae: ?
Bronze ?
Deposited: (c 393-410 +)

A12 Cleeve Prior
Hereford and Worcestershire (Worcestershire)
SP 08 49
1811
List of Emperors for a sample of 85.
a) B.H.St.J. O'Neil, 'The Cleeve Prior hoaedof 1811', Numismatic Chronicle, Series 5, Volume 16, 1936, pp 314-316.
b) Haverfield in Victoria County History, Worcestershire, Volume 1, p 217.

Siliquae: c 3000
Solidi: c 525
Deposited: (c 395 +)

A13 Coleraine
County Londonderry
-
April 1854
Emperors & mintmarks.
a) J. Scott-Porter, 'On Roman coins found near Coleraine', Numismatic Chronicle, Series 1, Volume 17, 1855, pp 101-115.

Siliquae: 1482
Miliarensis: 1
Deposited: (c 420 +)

A14 Colerne
Wiltshire
ST 81 71
1941
Emperors & mintmarks for a sample of 118.
a) J.W.E. Pearce and C. Oman, 'A find of Siliquae from Colerne, Wiltshire', Numismatic Chronicle, Series 6, Volume 2, 1942, pp 97-104.

Siliquae: 200
Deposited: (c 410 +)
% clipped Siliquae: 100%

A15 Corbridge
Northumberland
NY 983 648
25th April 1908
Emperors & mintmarks.
a) = S53

Solidi: 48
Deposited: (c 383-384 +)

A16 Cosgrove
Northamptonshire
SP 79 42
?
Some Emperors named.
a) Victoria County History Northamptonshire, Volume 1, p 216.

Siliquae: ?
Miliarensia: ?
Bronze: ?
Deposited: (c 383-388 +)

A17 Dorchester, Somerleigh Court Estate
Dorset
SY 68 90
1898
Emperors & mintmarks
a) H. Mattingly, 'A find of Siliquae at Dorchester, Dorset', Numismatic Chronicle, Series 5, Volume 2, 1922, pp 134-139.

Siliquae: 48
Bronze 1
Deposited: (c 400 +)

A18 East Harptree, near Bristol
Avon (Gloucestershire)
c. ST 56 55

Siliquae:	1474
Miliarensia	11
	Deposited:
(c 376 +)	

c 1888
Emperors, types & mintmarks.
a) J. Evans, 'On a hoard of Roman coins found at East Harptree, near Bristol', Numismatic Chronicle, Series 3, Volume 8, 1888, pp 22-46
b) Coin Hoards Volume 7, 1985, no. 325, Royal Numismatic Society, London, p 171.

A19 Edington
Somerset
ST 38 39
1838

Siliquae:	62
Deposited:	(c 400 +)
% clipped Siliquae:	47%

Emperors and types.
a) E.J.W. Hildyard, 'The Edimgton(Somerset) Hoard of siliquae', Numismatic Chronicle, Series 6, Volume 8, 1948, pp 82-85.

A20 Eye Solidi:
Suffolk
TM 14 73
1791

600	
Deposited:	(c 407-411 +)

Few Details.
a) Numismatic Chronicle, Series 3, Volume 11, 1891, p 10 [problematic reference].

A21 Great Stanmore, Bentley Priory
Greater London (Middlesex)
TQ 15 93
1781

Solidi:	40
Deposited:	(c 407-411 +)

Some Emperors named and a description of the metalwork.
a) Gough's edition of Camden Volume 2, p 30.
b) Archaeological Journal, 1933, p 300.
c) A. Evans, 'Notes on the coinage and silver currency in Roman Britain from Valentianian I to Constantine III' Numismatic Chronicle, Series 4, Volume 15, 1915, pp 433-519, Reference p 511.

A22 Fincham, near Swaffham
Norfolk
TF 68 06
1801

Siliquae:	6
Denarius	1 Antoninus Pius
Deposited:	(c 395 +)
% clipped Siliquae:	83%

Emperors mintmarks and types.
a) Rainbird Clarke, 'Theodosian Coin Hoard from Norfolk', Numismatic Chronicle, Series 5, Volume 15, 1935, pp 67-8.
b) Rainbird Clarke, 'A Theodosian Coin Hoard from Norfolk', Numismatic Chronicle, Series 5, Volume 16, 1936, pp 255-257, also p 320.

A23 ? Fleetwood/Preston
Lancashire
N.A.
1840

Siliquae:	388
Deposited:	(c 410 +)
% clipped Siliquae:	99%

RIC Nos.
a) A. Robertson, 'Roman Coins in the Harris Museum, Preston', Numismatic Chronicle, Series 6, Volume 8, 1948, pp 205-14.
b) C.E. King, 'Preston Hoard', Numismatic Chronicle, 1981, pp 40-64.
c) Coin Hoards Volume 7, 1985, no. 335, Royal Numismatic Society, London, p 174.

A24 Grovely Wood, Little Langford
Wiltshire
SU 05 34
1906

Siliquae:	296
Miliarensia	3
Bronze	c 1000
Deposited:	(c 393 +)

Emperors & mintmarks.
a) G.F. Hill, 'Roman silver coins from Grovely Woods, Wilts.', Numismatic Chronicle, Series 4, Volume 6, 1906, pp 329-347.

A25 Guisborough
Cleveland (Yorkshire)
NZ 60 15
1856
Few details.
a) F. Elgee, The Romans in Cleveland.

Siliquae: 79
Solidi: 1
Deposited: (c 393-410 +)

A26 Holway, Taunton
Somerset
ST 24 23
1821/1830
Emperors.
a) Victoria County History, Somerset, Volume 1, p 356.
b) Numismatic Chronicle, Series 1, Volume 5, 1845, pp 9-14 [problematic reference].

Siliquae: 275
Miliarensia: 33
Deposited: (c 395 +)

A27 Holyoaks, Stockerston
Leicestershire
SP 84 95
1799
Some Emperors named.
a) Victoria County History, Leicestershire, Volume 1, p 213.

Siliquae: 250
Deposited: (c 383-408 +)

A28 Honiton
Devon
ST 16 00
c.1923
Emperors & mintmarks.
a) H. Mattingly, 'Honiton', Numismatic Chronicle, Series 5, Volume 5, 1925, pp 296-297.

Siliquae: 16
Deposited: (c 390 +)

A29 Icklingham 1
Suffolk
TL 77 72
1877
Emperors & mintmarks.
a) G.F. Hill, 'Silver coins of the late fourth century from Icklingham, Suffolk', Numismatic Chronicle, Series 4, Volume 8, 1908, pp 215-221.
b) Victoria County History, Suffolk, Volume 1, p 309.

Siliquae: 318
Deposited (c 395-400 +)
% clipped Siliquae: +

A30 Icklingham 2
Suffolk
TL 77 72
1902
Emperors & mintmarks.
a) J.W.E. Pearce, 'Roman Coins from Icklingham', Numismatic Chronicle, Series 5, Volume 9, 1929, pp 319-327.
b) J.W.E. Pearce, 'Icklingham II Redivivus', Numismatic Chronicle, Series 5, Volume 18, 1938, pp 59-61.

Siliquae: 61
Bronze 897
Deposited: (c 400 +)
% clipped Siliquae: 38%

A31 Icklingham 3
Suffolk
TL 77 72
1880/1890
Emperors & mintmarks.
a) J.W.E. Pearce, 'A New Hoard of Silver from Icklingham', Numismatic Chronicle, Series 5, Volume 16, 1936, pp 257-261.

Siliquae: 230
Deposited: (c 410 +)

A32 Kempston
Bedfordshire
TL 03 48
27th August 1978
Ric Nos.
a) Recent Coin Hoards from Roman Britain, (Volume 1), R.A.G. Carson, p105.

Siliquae: 2
Miliarensia 11
Deposited: (c 400 +)

A33 Maiden Castle
Dorset
SY 6 88
?
Emperors & mintmarks.
a) R.E.M. Wheeler, Maiden Castle.

Solidi: 4
Deposited: (c 400 +)

A34 Manton Down, near Marlborough
Wiltshire
SU 15 71
c.1884
Emperors, types & mintmarks.
a) C. Soames, 'Find of Roman coins in Wilts.', Numismatic Chronicle, Series 3, Volume 4, 1884, pp 348-349

Siliquae: 26
Bronze 15
Deposited: (c 395 +)
% clipped Siliquae: +

A35 Mildenhall
Suffolk
TL 71 74
c.1942
Emperors & mintmarks.
a) J.W.E. Pearce, 'Siliquae from a find at Mildenhall, Suffolk', Numismatic Chronicle, Series 6, Volume 2, 1942, pp 105-106.

Siliquae: 13
Deposited: (c 395 +)

A36 ? Milverton
Somerset
ST 12 25
c.1847
Emperors.
a) Anon., 'Archaeological Intelligence', Archaeological Journal, Volume 4, 1847, p145
b) Victoria County History, Somerset, Volume 1, p 356.

Siliquae: 45
Deposited: (c 388 +)

A37 North Curry, near Taunton
Somerset
ST 32 25
1748
List of Emperors.
a) Gentleman's Magazine, 1748, 405

Siliquae: c 150
Miliarense: 1
Deposited: (c 393-410 +)

A38 North Mendip, near Bristol
Gloucestershire
ST ?
1867
Emperors & mintmarks.
a) A. Evans, 'Notes on the coinage and silver currency in Roman Britain from Valentinian I to Constantine III', Numismatic Chronicle, Series 4, Volume 15, 1915, pp 433-519.

Siliquae: 2015
Miliarensia: 30
Deposited: (c 395 +)

A39 Otterbourne I
Hampshire
SU 46 23
1978
Emperors & mintmarks.
a) Coin Hoards from Roman Britain, Volume 5, 1984, Burnett, p 119.

Siliquae: 356
Miliarensia: 7
Deposited: (c 395 +)

A40 Reading 1
Berkshire
SU 71 73
?
Some Emperors named.
a) Victoria County History, Berkshire, Volume 1, p 212.

Siliquae: c 50
Deposited: (c 383–408 +)

A41 Reading 2
Berkshire
SU 71 73
?
Some Emperors named.
a) Victoria County History Berkshire Volume 1, p 212.

Siliquae: c 120
Solidus 1
Deposited: (c 383–408 +)

A41a Richmond — Siliquae: (?) c 600
North Yorkshire (Yorkshire) — Deposited: (c 393-410 +)
NZ 17 01
1720
Some Emperors named (have details of 12).
a) R. Gale, Registrum Honoris de Richmond, London, 1722, London, pp 252-254.
b) 'Roman Britain in 1975', Britannia, Volume 7, 1976, p 314.
c) = S134

A42 St Pancras — Siliquae: 9
Greater London — Deposited (c 420 +)
? TQ 30 82 — % clipped Siliquae: +
1958
Emperors & mintmarks.
a) R.A.G. Carson, 'Roman coins acquired by the British Museum', Numismatic Chronicle, Series 6, Volume 19, 1959, pp 1-16 [these coins were found in the soil of a modern window box].

A43 Samson — Siliquae: 6
Isles of Scilly — Deposited: (c 393-410 +)
SV 87 12
c.1874
Some Emperors named.
a) Victoria County History Cornwall, Volume 5, p 40.

A44 Shanklin — Siliquae: 6
Isle of White — Bronze: 600
SZ 58 81 — Deposited: (c 393-410 +)
1833
Some Emperors named.
a) Victoria County History, Hampshire, Volume 1, p 349.
b) Numismatic Chronicle, Series 1, Volume 4, 1844 [problematic reference].

A45 Shapwick 1 — Siliquae: 120
Dorset — Deposited: (c 400 +)
ST 93 01
18th May1936
Emperors & mintmarks.
a) A.S. Robertson, 'A find from Shapwick, Somerset', Numismatic Chronicle, Series 5, Volume 16, 1936, pp 245-250.

A46 Shapwick 2 — Siliquae: 125
Dorset — Deposited: (c 390 +)
ST 93 01
1936
Emperors & mintmarks
a) J.W.E. Pearce, 'A Second find from Shapwick', Numismatic Chronicle, Series 5, Volume 18, 1938, pp 53-58.

A47 South Ferriby — Siliquae: 224
Humberside (Lincolnshire) — Miliarensia 4
SE 99 21 — Deposited: (c 400 +)
1906 — % clipped Siliquae: c 33%
Emperors & mintmarks.
a) B.H.St.J. O'Neil, 'The South Ferriby Theodosian Hoard', Numismatic Chronicle, Series 5, Volume 15, 1935, pp 254-274.

A48 Southsea — Siliquae: ? 653
Hampshire — Miliarensia: ? 85
SZ 663 986 — Argentius: ? 67
Spring 1897 — Denarii: ? 6
Emperors & mintmarks. — Deposited: (c 365 +)
a) H.A. Grueber, 'The Southsea find of Fourth Century Silver coins', Numismatic Chronicle, Series 5, Volume 18, 1936, pp 292-303.
b) P. Ker Gray, 'A further report on the Southsea find of fourth century silver coins', Numismatic Chronicle, Series 6, Volume 19, 1959, pp 89-91
NOTE: total given as 1167, only adds up to 806 in Archer 1979.

A49 Springhead, Gravesend
Kent
TQ 618 725
1964
Emperors & mintmarks.
Siliquae: 431
Solidi: 3
Miliarensia: 12
Deposited: (c 365 +)
a) R.A.G. Carson, 'Springhead, Gravesend (Kent), Roman Imperial treasure trove', Numismatic Chronicle, 1965, pp 177-182.

A50 Sproxton
Leicstershire
SK 85 24
11 May 1811
Emperors & mintmarks.
Siliquae: 96
Deposited: (c 400 +)
a) B.H.St.J. O'Neil, 'The Sproxton Theodosian Hoard', Numismatic Chronicle, Series 5, Volume 14, 1934, pp 61-73.

A51 Sturmer
Essex
TL 69 43
1793
Emperors.
Siliquae: 29
Solidi: 1
Deposited: (c 400 +)
a) Archaeologia, Volume 14, 1803, pp 17ff.

A52 Terling, Chelmsford
Esssex
TL 77 15
?
Emperors & mintmarks.
Siliquae: 295
Solidi: 26
Deposited: (c 420 +)
a) B.H.St.J. O'Neil, 'The Terling Treasure', Numismatic Chronicle, Series 5, Volume 13, 1933, pp145-170

A53 Thetford
Norfolk
TL 87 83
1978
Emperors & RIC Nos.
Siliquae: 47
Deposited: (c 388 +)
a) B. Green, Norfolk Archaeology, Volume 37, 1979, pp 221-223.
b) Coin Hoards from Roman Britain, Volume 7, A.M. Burnett, 1987, pp 199-200.

A54 Tower of London
London
TQ 33 80
1777
Emperors.
Solidi: 3
Deposited: (c 393-410 +)
a) A. Evans, 'Notes on the coinage and silver currency in Roman Britain from Valentinian I to Constantine III', Numismatic Chronicle, Series 4, Volume 15, 1915, pp 433-519.

A55 Traprain Law
Lothian (East Lothian)
-
1919
Emperors & mintmarks.
Siliquae: 4
Deposited: (c 400 +)
% clipped Siliquae: 50%
a) A.D. Curle, The Treasure of Traprain, 1923.
b) = S159

A56 Tredington
Gloucestershire (Worcestershire)
SO 90 29
1861
Emperors.
Siliquae: 5
Deposited: (c 387-388 +)
a) Victoria County History, Worcestershire, Volume 1, p 220.

A57 Tuddenham St Martin — Siliquae: 114
Suffolk — Deposited: (c 400 +)
TL 73 71 or TM 19 48
1938/1939
Emperors & mintmarks.
a) H. Mattingly and J.W. Pearce, 'The Tuddenham Hoard of Siliquae', Numismatic Chronicle, Series 6, Volume 6, 1946, pp 169-173.

A58 Uphill — Siliquae: (?) ? <129
Avon (Somerset) — Bronze: ? <129
ST 31 58
1846
Some Emperors listed.
a) Gentleman's Magazine, 1846, p 633.
b) Victoria County History, Somerset, Volume 1, p 355.

A59 Waternewton — Solidi: 26
Cambridgeshire (Huntingdonshire) — Deposited: (c 350 +)
TL 10 97
1974
RIC Nos.
a) Durobrivae, Volume 3, 1975, pp 10-12.
b) Recent Coin Hoards from Roman Britain, (Volume 1), R.A.G. Carson, 1979, pp 99-102.

A60 Whorlton — Siliquae: 1000s
North Yorkshire (Yorkshire) — Miliarensia: 1 +
NZ 48 02 — Deposited: (c 410 +)
1810 — % clipped Siliquae: 100%
Emperors & mintmarks of a sample of 39.
a) Gentleman's Magazine 1811, II, p 616
b) Recent Coin Hoards from Roman Britain, (Volume 1), C.M. Johns, 1979, pp 110-117.
c) B.H. St J. O'Neil, 'A Hoard of Late Roman Coin from Northamptonshire: its parallels and significance' Archaeological Journal, Volume 90, 1933, pp 282-305, Reference p 302.
d) = S170

A60a Wilton — Solidi: 1
Yorkshire — Siliquae: (?) 79
SE 86 82 — Deposited: (c 393 +)
1856
Some Emperors listed.
a) F. Elgee, Romans in Cleveland, 1923
b) = S171

A61 Wivelscombe — Siliquae: 1
Somerset — Bronze 1139
ST 08 27 — Deposited: (c 388 +)
1944
Emperor.
a) Proceedings of the Somerset Archaeological & Natural History Society, 1946, pp 65-75.

A62 Willersey — Siliquae: 56
Gloucestershire — Miliarensia 1
SP 10 39 — Deposited: (c 365 +)
24 June 1968
Emperors mintmarks and types.
a) R.A.G. Carson, 'Willersey (Glos.) treasure trove of fourth century imperial silver coins', Numismatic Chronicle, 1971, pp 203-206.
b) Coin Hoards Volume 1, 1975, no. 222, Royal Numismatic Society, London, p 55.

A63 Wookey Hole — Siliquae: 11
Somerset — Miliarensia 1
ST 53 47 — Bronze ?
1859 — Deposited: (c 367-383 +)
Some details.
a) Victoria County History, Somerset, Volume 1, p 356.
b) Numismatic Chronicle, New Series, Volume 3, 1863, p 8 [problematic reference].

A64 Zennor
Cornwall
SW 45 38
1702
Some Emperors listed.
a) Victoria County History, Cornwall, Voume 5, p 42.

Siliquae: 80
Deposited: (c 393-410 +)

A65 Uncertain Locality
Uncertain County
N.A.
?
Emperors & mintmarks.
a) J.P.C. Kent, 'Mr Wood's hoard of late Roman silver coins', Numismatic Chronicle, Series 6, Volume 14, 1954, pp 209-211.

Siliquae: 53
Miliarensia 2
Deposited: (c 390 +)

Appendix 2.21 Part 4
Additional Hoards:

C1 Aldworth
Berkshire
SU 55 79
5th September 1984
RRC & BMC Nos.
Sestertii: 2
Denarii: 75
Deposited: (c 176-177 +)
a) Coin Hoards from Roman Britain Volume 6, 1986, I.A. Carradice, pp 39-46.

C2 Agden, near Altrincham
Cheshire
SJ 781 872
January 1957
RIC & Elmer Nos.
Antoniniani: 2412
Radiate Copies 23
Illegible 8
Deposited: (276-282 +)
a) F.H. Thompson, 'A hoard of antoniniani from Agden, near Altrincham, Cheshire', Numismatic Chronicle, Series 7, Volume 2, 1962, pp 143-155.

C3 Alcester
Warwickshire
SP 088 566
13 April 1967
RIC Nos.
Sestertii: 51
Antoniniani: 95
Deposited: (259-260 +)
a) R.A.G. Carson, Alcester (Warwickshire) find of Roman antoniniani and sestertii', Numismatic Chronicle, Series 7, Volume 9, 1969, pp 123-128.

C3n Alfreton, Greenhill Lane
Derbyshire
SK 41 55
September 1748
No details.
Denarii: 2000-3000
Deposited: (c 193-211 +)
a) Victoria County History, Derbyshire, Volume 1, pp 235-254.
b) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 158.

C3q Almondbury
West Yorkshire (Yorkshire, West Riding)
SE 15 15
1829
Few details.
Corieltauvi: 16-18
Republican Denarii: c 200
Deposited: (c 43 + ?)
a) J. Yonge Akerman, 'Further observations on the coinage of the ancient Britons', Numismatic Chronicle, Series 1, Volume 1, 1839, pp 81-82.
b) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 154.

C4 Akenham
Suffolk
TM 148 485
1981-1982
RRC & BMC Nos.
Denarii: 59
Deposited: (c 222 +)
a) Coin Hoards from Roman Britain Volume 4, 1984, I.A. Carradice, pp 30-32.

C5 Allerton Bywater, the Churchyard
West Yorkshire (Yorkshire, West Riding)
SE 42 27
Late 1923
Cohen Nos.
Denarii: 296
Deposited: (c 162 +)
a) H. Mattingly, 'Allerton Bywater', Numismatic Chronicle, Series 5, Volume 5, 1925, pp 400-401.

C5n Amersham (Hoard ?)
Buckinghamshire
SU 96 98
c.1751
Few details.
Antoniniani: 'a great number'
Deposited: (c 287-293 +)
a) Stukeley, Letters and Diaries, Volume 2, p 9.
b) N. Shiel, The Episode of Carausius and Allectus, British Archaeological Reports 40, 1977, p 39.

C5q Ashwell — Denarii: 500+
Hertfordshire — Deposited: (c 161-180 +)
TL 26 39
Autumn 1876
Few details.
a) Victoria County History, Hertfordshire, Volume 4, p 148.
b) Cussans, History of Hertfordshire, Addenda to Odsey Hund., p 316.
c) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 156.

C5s Askham, near Retford — Denarii: 14+
Nottinghamshire — Bronze: ?
SK 74 74 — Deposited: (c 81-96 +)
c.1850
Few details, 'Julius Caesar to Domitian'.
a) F. Ouvry, 'Proceedings...', Proceedings of the Society of Antiquaries, Series 1, Volume 2, 1853, p 100.
b) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 155.

C6 Aylesbury, Haydon Hill — Solidi: 2
Buckinghamshire — Depisited: (c 388 +)
SP 79 14
October 1979
Emperors listed.
a) Coin Hoards Volume 7, 1985, no. 331, p 172, The Royal Numismatic Society, London.
b) Coin Hoards from Roman Britain Volume 2, 1981, A.M. Burnett & M.E. Farley, p 107.

C6n Ayott Saint Lawrence, Prior's Wood — Denarii: 200
Hertfordshire — Deposited: (c 43 + ?)
TL 19 16
c.1851
Description of a sample of 20 coins.
a) J. Evans, 'Miscellanea', Numismatic Chronicle, First Series, Volume 14, 1852, pp 83-84.
b) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 154.

C6q Babworth, Morton Hall — Denarii: 29
Nottinghamshire — Bronze: 62
SK 68 80 — Deposited: (c 161-180 +)
1802
Some Emperors listed.
a) Victoria County History, Nottinghamshire, Volume 2, p 23.
b) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 157.

C7 Bancroft Roman Villa, Milton Keynes — Folles: 76
Buckinghamshire — Deposited: (c 337-348 +)
SP 8 3
1978
RIC & LRBC Nos.
a) Coin Hoards Volume 6, 1981, no. 175, p 36, also C.E. King pp 40-49, The Royal Numismatic Society, London.

C8 Barley Pound, Crondall — Antoniniani: c 300
Hampshire — Deposited: (c 293-296 +)
SU 79 48
1869
Some Emperors known.
a) P.H. Webb, 'A Hampshire Hoard', Numismatic Chronicle, Series 5, Volume 14, 1934, p 310.

C9 Barton-upon-Humber, Burwell Farm — Denarii: 56
Humberside (Lincolnshire) — Antoniniani: 22
TA 027 209 — Radiate Copy: 1
October 1983 — Deposited: (c 260 +)
BMC Nos.
a) Coin Hoards from Roman Britain Volume 6, 1986, A.M. Burnett & D. Williams, pp 59-63.

C9n Barton Wood, near Osbourne — Bronze: 'a gallon'
Isle of White — Deposited: (c 161-180 +)
SZ 52 94
1833
Some Emperors mentioned.
a) Victoria County History, Hampshire, Volume 1, p 347.
b) Anon., 'Proceedings of the Association', Journal of the British Archaeological Assoiation, Volume 19, 1863, p 307.

C10 Barway — Aurei: 5
Cambridgeshire — Denarii: 433
TL 54 75 — Deposited: (c 180-192 +)
1958,1977,1979,1981
RIC Nos.
a) R.A.G. Carson, 'The Barway, Cambs, Treasure Trove of Roman Coins', Numismatic Chronicle, Series 6, Volume 20, 1960, pp 237-239.
b) Coin Hoards Volume 4, 1978, no. 123, p 36, also R.A.G. Carson, p 46, The Royal Numismatic Society, London.
c) Coin Hoards from Roman Britain Volume 4, 1984, A.M. Burnett, p 29.
d) Coin Hoards from Roman Britain Volume 6, 1986, A.M. Burnett, p 35.

C10n Bath, near St. Swithin's Church — Denarii: 92
Somerset — Deposited: (c 98-117 +)
ST 74 64
1816
Emperors listed.
a) Victoria County History, Somerset, Volume 1, p 287.
b) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 155.

C11 near Bath — Antoniniani: 1805
Somerset — Denarius: 1
? ST 74 64 — Quinarius: 1
1980? — Deposited: (c 295- 296 +)
RIC, Elmer & Cunetio Nos.
a) Coin Hoards Volume 7, 1985, no. 303, p 168, The Royal Numismatic Society, London.
b) Coin Hoards from Roman Britain Volume 6, 1986, D.Rudling and P.C. Shilling, pp 161-182.

C11n Beachamwell — Denarii: c 50
Norfolk — Deposited: (c 177-180 +)
TF 74 03
1846
Emperors for 37 coins listed.
a) Anon., 'Discovery of Roman coins in Norfolk', Numismatic Chronicle, Series 1, Volume 10, 1848, p 102.
b) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 156.

C12 Beachy Head — Antoniniani: 549
Sussex — Radiate Copies: 1
TV 57 96 — Deposited: (c 276-282 +)
1914
Emperors listed.
a) R.F. Bland, 'The 1973 Beachy Head Treasure Trove of Third Century Antoniniani', Numismatic Chronicle, Series 7, Volume 19, 1979, pp 61-107.
b) W. Budgen, 'A Hoard of Roman Coins', Sussex Archaeological Collections, Volume 58, pp 193-194.

C13 Beachy Head — Antoniniani: 579
Sussex — Illegible: 103
TV 57 96 — Deposited: (c 276-282 +)
1879
Some Emperor Groups listed.
a) R.F. Bland, 'The 1973 Beachy Head Treasure Trove of Third Century Antoniniani', Numismatic Chronicle, Series 7, Volume 19, 1979, pp 61-107.
b) C. Roach Smith & T. Calvert, 'Short Notice of a find of Roman Coins near Eastbourne' Sussex Archaeological Collections, Volume 31, pp 201 -205.

C14 Beachy Head
Sussex
TV 57 96
1899
Some Emperor Groups listed.

Antoniniani:	1895
Radiate Copies:	9
Illegible:	169
Deposited:	(c 276-282 +)

a) R.F. Bland, 'The 1973 Beachy Head Treasure Trove of Third Century Antoniniani', Numismatic Chronicle, Series 7, Volume 19, 1979, pp 61-107.

C15 Beachy Head
Sussex
TV 577 962
1961,1964,1973
RIC & Elmer nos. for a large sample.

Antoniniani:	13774
Radiate Copies:	185
Denarii:	28
Illegible:	15
Deposited:	(c 274 +)

a) R.H.M. Dolley & M.A. O'Donavan, 'The 1961 Beachy Head (Bullock Down) Hoard of third century coins of the central Gallic Empires', Numismatic Chronicle, Series 7, Volume 2, 1962, pp 163-188.
b) R.A.G. Carson, 'Beachy Head Treasure Trove of Roman Imperiam Silver Coins', Numismatic Chronicle, Series 7, Volume 8, 1968, pp 67-81.
c) Coin Hoards Volume 1, 1975, no. 196, p 52, The Royal Numismatic Society, London.
d) R.F. Bland, 'The 1973 Beachy Head Treasure Trove of Third Century Antoniniani', Numismatic Chronicle, Series 7, Volume 19, 1979, pp 61-107.

C15n Belbroughton
Hereford & Worcestershire (Worcestershire)
SO 91 76
1833
Few details.

Coins:	100 +
Deposited:	(c 244-249 +)

a) Victoria County History, Worcestershire, Volume 1, p 218.
b) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 159.

C16 Barrow-upon-Humber, Deepdale
Humberside (Lincolnshire)
TA 07 20
1980s
RIC Nos.

Siliquae:	260
Deposited:	(c 400 +)
% clipped siliquae	2.3%

a) Coin Hoards from Roman Britain Volume 2, 1981, A.M. Burnett & J.B. Whitwell, pp 113-121.
b) Coin Hoards from Roman Britain Volume 5, 1984, A.M. Burnett & J.B. Whitwell, pp 113-115.

C17 ? Bawtry
? South Yorkshire
? SK 65 93
1881
Emperors listed.

Antoniniani:	600
Deposited:	(c 296 +)

a) W. Wroth, 'Find of Roman Coins', Numismatic Chronicle Series 3, Volume 6, 1886, pp 245-246.
b) 'Everton (Notts) Hoard of 1887', Numismatic Chronicle, Series 6, Volume 5, 1945, pp 153-155.
c) Victoria County History, Nottinghamshire, Volume 2, p 26.
d) Coin Hoards from Roman Britain Volume 2, 1981, E.M. Besley, p 68.
[Note: this hoard could also have come from Everton, Notts.]

C17n Benacre
Suffolk
TM 51 84
c.1786
Few details

Denarii:	920
Deposited:	(c 161-180 +)

a) F. Haverfield, 'Note on hoards of Roman silver coins found in Britain with special reference to the Silchester Hoard', Archaeologia, Volume 54, 1895, pp 489-494.
b) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 156.

C17q near Bicester
Oxfordshire
c. SP 58 22
pre 1982
RIC Nos.

Antoniniani:	17
Deposited:	(c 287-293 +)

a) C.E. King, 'A small hoard of Carusius found near Bicester, Oxfordshire', British Numismatic Journal, 1982, Volume 52, pp 7-16.

C18 Bicester — Folles: c 440
Oxfordshire — Deposited: (c 348 +)
SP 58 22
1979
RIC & LRBC.
a) Coin Hoards Volume 7, 1985, no. 314, The Royal Numismatic Society, London, p 170.
b) Coin Hoards from Roman Britain Volume 2, 1981, C.E. King, pp 77-106.

C19 Billingsgate — Irregular Denarii: 142
London — Deposited: (c 212-217 +)
TQ 32 80
pre 1986
RIC Nos.
a) Coin Hoards from Roman Britain Volume 6, 1984, Jenny Hall, pp 57-58.

C19n Bitterne — Antoniniani: ?
Hampshire — Deposited: (c 293-296 +)
SU 45 13
1799
Noted that they were all Allectan.
a) Victoria County History, Hampshire, Volume 1, p 344.
b) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 163.
c) N. Shiel, The Episode of Carausius and Allectus, British Archaeological Reports 40, 1977, p 58.

C20 Blackmoor — Antoniniani: 20,697 +
Hampshire — Radiate Copies: 1,739 +
SU 779 322 — Deposited: (c 296 +)
1873
RIC Nos. for 22,436, original size probably c.29,802.
a) Rt Hon Lord Selborne, 'On a hoard of Roman coins found at Blackmoor, Hants.', Numismatic Chronicle, Series 2, Volume 17, 1877, pp 90-156.
b) Victoria County History, Hampshire, pp 340-342.
c) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 163.
d) Coin Hoards from Roman Britain Volume 3, The Blackmoor Hoard, R. Bland, 1982
e) Coin Hoards Volume 4, 1978, no. 157, p 40, The Royal Numismatic Society, London.
f) In Trade: Christie & Co. Sale Catalogue, December 9th 1975, introduction by N. Shiel.

C21 Blackmoor — Antoniniani: 46
Hampshire — Deposited: (c 270-273 +)
SU 77 32
1875
RIC Nos.
a) G. Askew, 'A Third Century Hoard from Blackmore Hants.', Numismatic Chronicle, Series 5, Volume 15, 1935, pp 55-56.
b) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p160.

C22 Bletchley, Bow Brickhill — Denarii: 296
Buckinghamshire — Deposited: (c 183 +)
SP 86 34
20th May 1967
CRR & RIC Nos.
a) M.H. Crawford, 'Bletchley Treasure Trove of Roman Imperial Denarii', Numismatic Chronicle, Series 7, Volume 9, 1969, pp 113-122.

C23 Blyth — Folles: 94
Nottinghamshire — Deposited: (c 333 +)
SK 62 87
Emperors & Mintmarks.
a) R.A.G. Carson, 'A Constantinian hoard from Blyth, Notts.', Numismatic Chronicle, Series 6, Volume 7, 1947, pp 179-180.

C23n Boking — Coins: 'a vast quantity'
Essex — Deposited: (c 287-293 +)
TL 76 26
17th-18th century.
Few details.
a) Stukeley, Letters and Diaries, Volume 2, p 167.
b) N. Shiel, The Episode of Carausius and Allectus, British Archaeological Reports 40, 1977, Oxford, p 39.

C24 Bonnington, Rushcliffe Halt — Denarius: 1 +
Nottinghamshire — Antoniniani: c 180
SK 552 279 — Deposited: (c 270-273 +)
1895
RIC & Elmer Nos for a sample of 25.
a) R.J. Sherlock & A. Oswald, 'A Hoard of Roman Coins from Sutton Bonington, in Nottinghamshire', Numismatic Chronicle, Series 6, Volume 18, 1958, pp 181-182.

C25 Boothstown — Antoniniani: 540
Greater Manchester (Lancashire) — Deposited: (c 273-275 +)
SD 72 00
August 1947
RIC & Cohen Nos.
a) R.A.G. Carson, 'A Find of Antoniniani at Boothstown, Lancashire', Numismatic Chronicle, Series 6, Volume 7, 1947, pp 74-80.

C25n Borden — Antoniniani: 35 +
Kent — Deposited: (c 293-296 +)
TQ 8863
pre 1849
Emperors of 35 listed.
a) Victoria County History, Kent, Volume 3, p 105.
b) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 163
c) Anon., 'Proceedings of the Association', Journal of the British Archaeological Association, Volume 4, 1849, p 68-69.

C26 Bourne End, Hemel Hempstead — Sestertii: 29
Hertfordshire — Asses: 4
TL 019 063 — Antoniniani: 5
1976 — Deposited: (c 270 +)
Some RIC Nos.
a) Coin Hoards Volume 3, 1977, no. 174, p 61, also A. Burnett, pp 77-78, The Royal Numismatic Society, London.

C27 Bourton-on-the-Water, Whiteshoots Hill — Antoniniani: 2
Gloucestershire — Folles: 3422 +
SP 16 20 — Deposited: (c 318-319 +)
22nd March 1970
Mints and Emperors.
a) Coin Hoards Volume 1, 1975, no. 209, p 54, The Royal Numismatic Society, London.
b) D.W. Burge, Bourton-on-the-Water (Gloucestershire) Hoard of Constantinian Folles', Numismatic Chronicle, Series 7, Volume 13, 1973, pp 98-125.
c) Coin Hoards from Roman Britain Volume 7, 1987, D.W. Burge, pp 27-34.

C28 Braughing — Denarii: 61
Hertfordshire — Deposited: (c 171 +)
TL 39 24
4 July 1956
BMC Nos.
a) R.A.G. Carson, 'The Braughing Treasure Trove of Roman Denarii', Numismatic Chronicle, Series 6 Volume 17, 1957, p 239.

C28n Brecon, Y Gaer — Denarii: 9
Powys — Deposited: (c 121 +)
SO 04 28
1924-5
Emperors listed.
a) R.E.M. Wheeler, The Roman Fort near Brecon, Cymmrodorion Society Publications, London, 1926, p 101.
b) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 155.

C29 Bredgar — Aureii: 34
Kent — Deposited: (41-42 +)
TQ 88 60
30 July 1957
Sydenham & BMC Nos.
a) R.A.G. Carson, 'The Bredgar Treasure Trove of Roman Coins', Numismatic Chronicle, Series 6, Volume 19, 1959, pp 17-22.

C29n Bredicot — Antoniniani: 140
Worcestershire — Deposited: (c 287-293 +)
SO 90 50
Emperors listed for a sample of 58 coins.
a) Allies, History of Worcester, 1852, p 95.
b) Victoria County History, Worcestershire, Volume 1, p 218.
c) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 163.
d) N. Shiel, The Episode of Carausius and Allectus, British Archaeological Reports 40, 1977, Oxford, p 39.

C30 ? Brentford — Bronze: 67
? Greater London (Middlesex) — Deposited: (c 326-328 +)
? TQ 18 77
pre 1970
RIC Nos.
a) Coin Hoards Volume 1, 1975, no. 212, The Royal Numismatic Society, London, p 54.
b) P.J. Casey, 'A Hoard of Constantinian Reduced Folles from Brentford, Middlesex', Numismatic Chronicle, Series 7, Volume 12, 1972, pp 141-144.

C30n near Brighton — Denarii: 1000
East Sussex (Sussex) — Deposited: (c 244-249 +)
c. TQ 31 06
1750
No details.
a) Victoria County History, Sussex, Volume 3, p 51.
b) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 159.

C31 Brighton — Antoniniani: 703
Sussex — Radiate Copies: 225
TQ 31 06 — Deposited (c 275 +)
1904
RIC Nos.
a) Coin Hoards Volume 2, 1976, no. 280, p 72, The Royal Numismatic Society, London.
b) In Trade: Glendining & Co. 24th-25th of May 1972. Lot No. 219
c) P.J. Casey, 'A Mid-third-century hoard from Brighton, Sussex', Numismatic Chronicle Series 7, Volume 14, 1974, pp 185-9.

C31n near Bristol — Antoniniani: 6
Avon — 4th c. Bronze: 341
c. ST 58 72 — Deposited: (c 322 +)
c. 1875
Emperors listed
a) J. Evans, 'On a hoard of Roman coins principally of the London mint', Numismatic Chronicle, Series 3, Volume 5, 1885, p 118.
b) Victoria County History, Somerset, p 358.
c) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 164.
d) N. Shiel, The Episode of Carausius and Allectus, British Archaeological Reports 40, 1977, p 62.

C32 Bristol, Rochester Road
Avon
ST 59 72
28th July 1937
RIC & Cohen Nos.
a) H. Mattingly & B.W. Pearce, 'The Bristol Hoard of 1937', Numismatic Chronicle, Series 5, Volume 18, 1938, pp 85-98.

As:	1
Dupondius:	1
Denarii	1476
Drachm:	2
Deposited:	(c 208 +)

C33 Brixworth
Northamptonshire
SP 74 70
1892
RIC Nos.
a) H. Mattingley, 'The Brixworth Hoard', Numismatic Chronicle, Series 6, Volume 5, 1945, pp 164-165.

Denarii:	25
Deposited:	(c 180-192 +)

C34 Bromham
Wiltshire
ST 975 663
March 1981
RIC Nos.
a) Coin Hoards from Roman Britain Volume 5, 1984, A.M. Burnett & P.H. Robinson, pp 100-112.
b) Coin Hoards from Roman Britain Volume 7, 1987, A.M. Burnett, p 187.

Miliarensia:	21
Siliquae:	396
Deposited:	(c 375 +)

C35 Bromley
Kent
?
pre 1956
Mintmarks, types & Emperors.
a) R.A.G. Carson & J.P.C. Kent, 'Constantinian Hoards and other studies in the later Roman Bronze Coinage', Numismatic Chronicle, Series 6, Volume 16, 1956, pp 83-161.

Folles:	300
Deposited:	(c 310 +)

C36 Budge Row
London
TQ 32 80
29th May 1958
Sydenham & RIC Nos.
a) R. Merrifield, 'A First Century Coin Hoard from Budge Row (London)', Numismatic Chronicle, Series 6, Volume 20, 1960, pp 279-283.

Denarii:	74 +
Deposited:	(c 78-79 +)

C36n Bulwick
Northamptonshire
SP 95 94
June 1879
Emperors of three coins mentioned.
a) Assheton Pownall, 'Miscellanea', Numismatic Chronicle, New Series, Volume 19, 1879, p 219.
b) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 155.

Denarii:	100 +
Deposited:	(c 98-117 +)

C36q Burton Latimer
Northamptonshire
SP 89 74
December 1954
RIC Nos.
a) R. Bland, 'A hoard of Carausius and Allectus from Burton Latimer', British Numismatic Journal, Volume 54, 1984, pp 41-50.
b) Kettering Leader & Guardian, 13th December 1954.

Antoniniani:	108
Deposited:	(c 293-296 +)

C36s Cadeby
South Yorkshire
SK 52 99
pre 1912
RIC Nos.
a) N. Smedley, 'The Cadeby (Doncaster) Hoard', Numismatic Chronicle, Series 6, Volume 6, 1946, p151.

Denarii:	28+
Deposited:	(c 235-238 +)

C37 Cadeby
South Yorkshire
SK 5207 9954
April 1978
RIC & Elmer Nos.
a) Coin Hoards Volume 7, 1985, no. 283, The Royal Numismatic Society, London, p 165.
b) Coin Hoards from Roman Britain Volume 2, 1981, A.M. Burnett & T.G. Manby, pp 9-24.

Antoniniani: 1580
Radiate Copies: 16
Illegible: 73
Deposited: (c 273 +)

C38 Caernarfon (Llanrug)
Gwynedd
SH 53 63
c 1966/1967
Emperors listed for 4 coins.
a) Coin Hoards Volume 1, 1975, no. 179, The Royal Numismatic Society, London, p 50.
b) G.C. Boon, Bulletin of Board of Celtic Studies, Volume 26, 1975, no.119, p 239.

Sestertii: c 12
Deposited: 3rd century ?

C38n Caerwent
Gwent
ST 46 90
c.1909
Emperors of 12 coins listed.
a) T. Ashby et al, 'Excavation at Caerwent, Monmouthshire...', Archaeologia, Volume 62, 1911, pp 405-448, Reference p 409.
b) G.C. Boon, Bulletin of the Board of Celtic Studies, Volume 26, 1975, no.123, p 239.

Antoniniani: c 20
Deposited: (c 293-296 +)

C39 Caerwent
Gwent
ST 46 90
1973
Some Emperors mentioned.
a) Coin Hoards Volume 1, 1975, no. 179, The Royal Numismatic Society, London, p 50.
b) G.C. Boon, Bulletin of Board of Celtic Studies, Volume 26, 1975, no.122, p 239.

Antoniniani: 25
Deposited: late 3rd century

C39n Caistor St Edmund, near Norwich
Norfolk
TG 23 03
1895
Cohen Nos.
a) F. Haverfield, 'A find of Roman coins near Caistor, Norfolk', Numismatic Chronicle, Series 4, Volume 2, 1902, pp 186-188.
b) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 156.

Denarii: 20
Deposited: (c 161-180 +)

C40 Caister-by-Sea
Norfolk
TG 52 12
pre 1954
Emperors & some Cohen Nos. [Nearly all the coins are from eastern mints - very unusual]
a) B.W. Pearce, 'Some Notable Roman Coins', Numismatic Chronicle, Series 6, Volume 13, 1953, pp 135-136.

Folles: 24
Deposited: (337-341 +)

C41 Caister-by-Yarmouth
Norfolk
TG 52 12
28th November 1946
RIC & Cohen Nos for a very large sample.
a) G.K. Jenkins, 'The Caister by Yarmouth Hoard', Numismatic Chronicle, Series 6, Volume 7, 1947, pp 175-179.

Denarii: 664
Antoniniani: 183
Deposited: (c 260 +)

C42 Caister-by-Yarmouth
Norfolk
TG 52 12
30th January 1936
Emperors, types & mintmarks.
a) A.S. Robertson, 'A Find of Constantinian Coins from Caister by Yarmouth', Numismatic Chronicle, Series 5, Volume 16, 1936, pp 164-168.

Antoniniani: 3
Folles: 34
Irregular Folles: 24
Deposited: (330-341 +)

C43 Camborne Roman Vila — Denarii: 13
Cornwall — Deposited: (222-235 +)
SW 64 40
September 1931
Cohen Nos.
a) B.H.St.J. O'Neil, 'The Coins found at the Camborne Roman Villa', Numismatic Chronicle, Series 5, Volume 11, 1931, pp 233-234.

C44 Camerton — Radiates Copies: 85
Somerset — Deposited: late 3rd c.
ST 68 57
Summer 1948
Some types given with RIC similarities.
a) R.A.G. Carson, 'A Hoard of radiate minimi from Camerton, near Bath', Numismatic Chronicle, Series 6, Volume 8, 1948, pp 81-82.

C44f Camerton — Antoniniani: 114
Somerset — Deposited: (c 287-293 +)
ST 68 57
1817
Few details.
a) Victoria County History, Somerset, p 292
b) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 162.
c) N. Shiel, The Episode of Carausius and Allectus, British Archaeological Reports 40,1977, p 39.

C44n Camerton — Antoniniani: c 67
Somerset — Deposited: (c 293-296 +)
ST 68 57
1817
Few details.
a) Victoria County History, Somerset, p 292.
b) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 163
c) A.E. Hudd, 'Proceedings...', Proceedings of the Society of Antiquaries, Series 2, Volume 11, 1885, p 314.
d) N. Shiel, The Episode of Carausius and Allectus, British Archaeological Reports 40, 1977, p 52.

C45 Campsmount, near Doncaster — Antoniniani: c 300
South Yorkshire — Deposited: (c 273 +)
SE 53 14
1841
RIC Nos for a sample of 209.
a) Tomlinson, Doncaster from the Roman Occupation to the Present Time, 1887, p 8n.
b) N. Smedley, 'The Campsmount (Doncaster) Hoard', Numismatic Chronicle, Series 6, Volume 7, 1947, pp 85-86.

C45f Canterbury — Antoniniani: 2
Kent — Radiate Copies: 4
TR 14 57 — Deposited: (c 287-293 +)
pre 1977
Emperors given.
a) N. Shiel, The Episode of Carausius and Allectus, British Archaeological Reports 40, 1977, p 40.

C45h Canterbury, Marlowe Theatre — Antoniniani: 150
Kent — Deposited: (c 287-293 +)
TR 14 57
pre 1957
Few details.
a) Journal of Roman Studies, Volume 47, 1957, p 225.
b) N. Shiel, The Episode of Carausius and Allectus, British Archaeological Reports 40, 1977, p 40.

C45j Canterbury, Bredman Church
Kent
TR 14 57
1868
Few details.

Antoniniani:	41
Deposited:	(c 287-293 +)

a) Victoria County History, Kent, Volume 3, p 68
b) J. Pilbrow, 'Discoveries made during excavations at Canterbury in 1868', Archaeologia, Volume 43, 1871, p 151-164, Nos. 54 & 55.
c) N. Shiel, The Episode of Carausius and Allectus, British Archaeological Reports 40, 1977, p 40.

C45l Canterbury
Kent
TR 14 57
pre 1977
Some details of Carausian coins included.

Antoniniani:	117
Deposited:	(c 289 +)

a) N. Shiel, The Episode of Carausius and Allectus, British Archaeological Reports 40, 1977, p 40.

C45n Canterbury
Kent
TR 14 57
1969
RIC Nos.

Antoniniani:	7
Radiate Copy:	1
Deposited:	(c 293-295 +)

a) N. Shiel, The Episode of Carausius and Allectus, British Archaeological Reports 40, 1977, p 52.

C46 Canterbury
Kent
TR 14 57
31st October 1956
Emperors, types & mintmarks.

Antoninianus:	1
Folles:	106
Deposited:	(c 323 +)

a) R.A.G. Carson, 'The Canterbury Hoard', Numismatic Chronicle, Series 6, Volume 17, 1957, pp 249-257.

C47 Cardiff (Llanedeyrn)
South Glamorgan
ST 20 80
March 1975
Emperors given.

Antoniniani:	1050 +
Radiate Copies:	34 +
Deposited:	(c 275 +)

a) Coin Hoards Volume 2, 1976, no. 274/277, The Royal Numismatic Society, London, pp 71-72.
b) G.C. Boon in Bulletin of Board of Celtic Studies, Volume 22, 1967, [To be published in full in a later volume].
c) Coin Hoards Volume 3, 1977, no. 181, The Royal Numismatic Society, London, p 62.

C48 Cardiff (Llanedeyrn)
Glamorgan
ST 20 80
1892
Emperors given.

Antoniniani:	c 800
Deposited:	(c 275 +)

a) Coin Hoards Volume 3, 1977, no. 182, The Royal Numismatic Society, London, p 63.
b) G.C. Boon in Bulletin of Board of Celtic Studies, Volume 22 1967, [To be published in full in a later volume].

C48n Castle Bromwich, Shard End Farm
West Midlands
SP 15 89
Summer 1909
Cohen Nos.

Denarii:	181
Irregular Denarii:	18
Deposited:	(c 177 +)

a) G.C. Brooke, 'A find of Roman denarii at Castle Bromwich', Numismatic Chronicle, Series 4, Volume 10, 1910, pp 13-40.

C48q Castle Thorpe, Burtles Hill — Denarii: 20
Buckinghamshire — Sestertii (?): 25
SP 79 44 — Deposited: (c 170 +)
pre 1847
Three Emperors mentioned.
a) Victoria County History, Buckinghamshire, Volume 2, p 5.
b) Anon., 'Proceedings of the Association', British Archaeological Association Journal, Volume 2, 1847, p 352-353.
c) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 157.

C48s Castell-Y-Bere — Antoniniani: 4+
Merion — Deposited: (c 287-293 +)
SH 67 08
Few details.
a) G.C. Boon, 'Roman Remains from Castell-y-bere (Merion)', Bulletin of the Board of Celtic Studies, Volume 19, 1962, p 346.
b) G.C. Boon, Bulletin if the Board of Celtic Studies, Volume 23, 1967, p 306.
c) N. Shiel, The Episode of Carausius and Allectus, British Archaeological Reports 40,1977, p 40.

C48u Castor, near Watton — Coins: 300
Norfolk — Deposited: (c 161-180 +)
c. TF 91 10
4th November 1820
Some Emperors listed.
a) Anon., 'Appendix', Archaeologia, Volume 20, 1824, pp 577-579.
b) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 157.

C49 Catsgore — Folles: 27
Somerset — Deposited: (c 337 +)
ST 50 25
1972
Some data ranges given.
a) Coin Hoards Volume 4, 1978, no. 165, The Royal Numismatic Society, London, p 42.

C50 Catsgore — Folles: 13
Somerset — Deposited: (c 320 +)
ST 50 25
1971
Emperors & Type given.
a) Coin Hoards Volume 4, 1978, no. 161, The Royal Numismatic Society, London, p 40.

C51 Chadwell St. Mary, Chadwell Hall Farm — Denarii: 100
Essex — Deposited: (c 213-217 +)
TQ 64 78
July 1956
Sydenham & BMC Nos.
a) R.A.G. Carson, 'The Chadwell St Mary find of Roman denarii', Numismatic Chronicle, Series 6, Volume 17, 1957, p 238.

C52 Chalfont St. Giles — Sestertii: 12
Buckinghamshire — Denarii: 40
SU 98 93 — Deposited: (c 150 +)
26th March 1934
Emperors listed.
a) H. Mattingly, 'The Chalfont St. Giles Hoard', Numismatic Chronicle, Series 5, Volume 14, 1934, pp 219-220.

C53 Chatburn — Denarii: c 1000; Deposited: (c 150 +)
Lancashire
SD 767 432
17 December 1717
RIC/RRC Nos for a sample of 45.
a) Coin Hoards Volume 7, 1985, no. 238, p 156, also D.C.A. Shotter, pp 182-184, The Royal Numismatic Society, London.
b) W.T. Watkin, Roman Lancashire, p 233.
c) Letter of 1778 by T. Barritt quoted in Manchester Courier, 18th August 1876.
d) London Chronicle, 16th January 1779.
e) Anon., 'Appendix', Archaeologia, Volume 7, 1785, p 414.
f) History of Whalley and Clitheroe, 1876, Volume 2, p 118.

C54 Chatteris — *Problem Hoard*
Cambridgeshire
TL 39 85
pre 1983
Mack, Allen, RRC & RIC Nos.
a) Coin Hoards from Roman Britain Volume 6, 1986, A.M. Burnett, pp 5-6.

C54n Cheddar — Antoniniani: c 100; Deposited: (c 287-296 +)
Somerset
ST 45 53
pre 1847
Emperors listed for a sample of 93 coins.
a) Journal of the British Archaeological Association, Volume 2, 1847, p 270.
b) Victoria County History, Somerset, Volume 1, p 359.
c) Anon., 'Miscellanea', Numismatic Chronicle, Series 1, Volume 7, 1847, p 48.
d) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 162.
e) N. Shiel, The Episode of Carausius and Allectus, British Archaeological Reports 40, 1977, p 61.

C55 near Cheltnham — Coins: 250-300; Deposited: ?
Gloucestershire
c. SO 94 22
1818
Few details.
a) Coin Hoards Volume 6, 1981, no. 135, The Royal Numismatic Society, London, p 30.
b) Shrewsbury Chronicle, 21st August 1818.

C56 near Cheltnham — Antoniniani: 372+; Radiate Copies: 6+; Deposited: (c 274 +)
Gloucestershire
c. SO 94 22
1980-1981
Emperors listed.
a) Coin Hoards Volume 7, 1985, no. 290, The Royal Numismatic Society, London, p 166.
b) Details on file in BM [note: the hoard appears to have been 'picked over']

C57 Chester — Antoniniani: 64+; Deposited: (c 273 +)
Cheshire
SJ 40 66
1858
RIC Nos.
a) Coin Hoards Volume 5, 1979, no. 157, G. Lloyd-Morgan, The Royal Numismatic Society, London, p 54.

C58 Chesterfield — Dupondii: 1; Denarii: 19; Deposited: (c 238-244 +)
Derbyshire
SK 38 71
May 1939
RIC Nos.
a) W.V. Wade, 'A Hoard of Roman Coins from Chesterfield, N. Derbyshire', Numismatic Chronicle, Series 5, Volume 19, 1939, pp 284-289.

C59 Child's Ercall
Shropshire
SJ 6672 2755
7 March 1980
RIC & Elmer Nos.

Antoniniani:	2853
Radiate Copies:	40
Illegible:	4
Deposited:	(c 281 +)

a) Coin Hoards from Roman Britain Volume 5, 1984, A.M. Burnett & A. Tyler, pp 6-21.

C60 Chippenham, near Ely
Cambridgeshire
TL 66 69
1981
RRC & BMC Nos.

Aurei:	4
Denarii:	37
Deposited:	(c 41 +)

a) Coin Hoards from Roman Britain Volume 6, 1986, A.M. Burnett, pp 1-4.
[the Cunobelin staters have not been accepted as part of the hoard]

C61 Chipperfield, Scatterdell Woodlands
Hertfordshire
TL 048 031
Spring 1972
RIC Nos.

Folles:	67
Deposited:	(c 307 +)

a) Coin Hoards Volume 2, 1976, no. 288, The Royal Numismatic Society, London, p 73.
b) R.A.G.Carson, 'Chipperfield (Herts.) Treasure Trove', Numismatic Chronicle, Series 7, Volume 14, 1974, pp 182-184.

C62 Chorleywood
Hertfordshire
TQ 03 96
21 April 1977
RIC & LRBC Nos.

Bronze:	4089 +
Irregular Bronze:	248 +
Deposited:	(c 348 +)

a) Coin Hoards Volume 5, 1979, no. 183, The Royal Numismatic Society, London, p 58.
b) Recent Coin Hoards from Roman Britain (Volume 1), R. Carson & A. Burnett, 1979, pp 41-97.

C62n Cilhaul, near Trefeglwys
Powys (Montgomeryshire)
SN 95 90
c.1835
Few details.

Denarii:	c 200
Deposited:	(c 161-180 +)

a) F. Haverfield, 'Note on hoards of Roman silver coins found in Britain with special reference to the Silchester Hoard', Archaeologia, Volume 54, 1895, pp 489-494.

C63 Cirencester
Gloucestershire
SP 02 01
1975
Emperors Listed.

Denarii:	22
Deposited:	(c 93 +)

a) Coin Hoards Volume 3, 1977, no. 140, The Royal Numismatic Society, London, p 56.
b) List by R. Reece, to be published.

C64 Cirencester, St. Michael's Field
Gloucestershire
SP 02 01
29 September 1975
RRC & RIC Nos.

Denarii:	22
Deposited:	(c 94 +)

a) Coin Hoards Volume 5, 1979, no. 115, The Royal Numismatic Society, London, p 48.
b) Recent Coin Hoards from Roman Britain (Volume 1), R. Carson & A. Burnett, 1979, pp 7-8.

C65 Cirencester Park
Gloucestershire
SP 00 01
pre 1952
Some descriptive information.

Bronze:	214
Deposited:	(c 386-393 +)

a) B.H.St.J. O'Neil, 'Cirencester Park Theodosian Hoard', Numismatic Chronicle, Series 6, Volume 12, 1952, pp 128-9.

C66 Clapton-in-Gordano
Avon (Somerset)
ST 47 74
1922-1924
Cohen Nos.

Irregular Sestertius:	1
Antoniniani:	3437
Deposited:	(c 286 +)

a) F.S.Salisbury, 'A find of Roman coins at Clapton-in-Gordano, Somerset', Numismatic Chronicle, Series 5, Volume 7, 1927, pp 209-218.
b) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 163.
c) N. Shiel, The Episode of Carausius and Allectus, British Archaeological Reports 40, 1977, p 61.

C67 Claydon Pike, Fairford
Gloucestershire
SP 19 00
1983
RIC & Elmer Nos.

Antoniniani:	42
Deposited:	(c 296 +)

a) Coin Hoards from Roman Britain Volume 6, 1986, C.E. King, pp 183-186.

C67n Cleckheaton
Yorkshire
SE 19 25
pre 1714
Some Emperors mentioned.

Antoniniani & Folles:	?
Deposited:	(c 306 +)

a) Hearns edition of Leland's Itinerary, 1714, Volume 9, p 144.
b) Yorkshire Archaeological Journal, Volume 27, p 214.
c) N. Shiel, The Episode of Carausius and Allectus, British Archaeological Reports 40, 1977, p 62.

C68 Colchester
Essex
TL 96 21
c.1965
Emperors listed.

AE:	4
Deposited:	(c 50-60 +)

a) Coin Hoards Volume 1, 1975, no. 167, The Royal Numismatic Society, London, p 49.
b) R. Reece & R. Dunnett, Transactions of the Essex Archaeological Society, 1971, 36ff.
[Note: this is a problem hoard]

C68n Colchester
Essex
TL 96 21
c.1891
Cohen Nos.

Denarii:	32
Antoniniani:	1
Deposited:	(c 223 +)

a) J. Evans, 'Miscellanea', Numismatic Chronicle, Series 3, Volume 11, 1891, p 413.
b) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 158.

C69 Colchester, Olivers Orchard 1
Essex
TL 96 21
9 May 1983
BMC, Elmer & Cunetio Nos.

As:	1
Dupondius:	1
Denarii:	14
Antoniniani:	1530
Radiate Copies:	13
Deposited:	(c 269 +)

a) Coin Hoards from Roman Britain Volume 6, 1986, R.F. Bland & I.A. Carradice, pp 65-118.

C70 Colchester, Olivers Orchard 2
Essex
TL 96 21
9 May 1983
BMC, Elmer & Cunetio Nos.

As:	1
Denarii:	3
Antoniniani:	4018
Radiate Copies:	50
Deposited:	(c 273 +)

a) Coin Hoards from Roman Britain Volume 6, 1986, R.F. Bland & I.A. Carradice, pp 65-118.

C71 Colchester, Olivers Orchard 3
Essex
TL 96 21
9 May 1983
BMC, Elmer & Cunetio Nos.

Antoniniani:	485
Radiate Copies:	9
Deposited:	(c 274 +)

a) Coin Hoards from Roman Britain Volume 6, 1986, R.F. Bland & I.A. Carradice, pp 65-118.

C72 near Colchester — Antoniniani + Quinarii: 298
Essex — Deposited: (c 295-296 +)
c. TM 00 25
July 1927
Cohen Nos. for all, pluss full descriptions of coins of Carausius & Allectus.
a) A.H.F. Baldwin, 'A Find of Coins of Carrausius and Allectus from Colchester', Numismatic Chronicle, Series 5, Volume 10, 1930, pp 173-195.
b) M.R. Hull, Roman Colchester, p 277.
c) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London; p 163.
d) Anon. 'The Evans Collection at Oxford' Numismatic Chronicle, Series 6, Volume 4, 1944, pp 1-26. (3 extra coins, numbers 125, 126 & 128)

C73 Coleby — Antoniniani: c 9,200
Lincolnshire — Radiate Copies: 799 +
SK 97 60 — Deposited: (c 281 +)
March 1975
RIC, Elmer & Bastien Nos. for a 'picked over' sample of 7767.
a) Coin Hoards Volume 4, 1978, no. 153, p 39, The Royal Numismatic Society, London.
b) R.W. Higginbottom, Lincolnshire History & Archaeology, Volume11, 1976, p 62.
c) Coin Hoards From Roman Britain Volume 5, 1984, E. Besly & R. Bland, pp 22-60.

C74 Compton Cowdown, near Ilsley — Antoniniani: c 500
Berkshire — Deposited: 3rd century
SU 52 80
1852
Few details, Victorinus mentioned.
a) Catalogue of Donations to the Ashmolean Museum, 1836-1868, p18.
b) Victoria County History, Berkshire, Volume 1, p 205.
c) C.H.V. Sutherland, 'Three Roman Coin Hoards', Numismatic Chronicle, Series 5, Volume 16, 1936, pp 318-319.

C75 Compton Downs — Siliquae: 281
Berkshire — Deposited: (c 410 +)
SU 520 800 — % clipped siliquae 98.9%
August 1981
RIC Nos.
a) Coin Hoards from Roman Britain Volume 5, 1984, A.M. Burnett & A.R. Higgot, pp 145-150.
b) Coin Hoards from Roman Britain Volume 7, 1987, A.M. Burnett & A.R. Higgot, pp 207-208.

C75n Conwy — Antoniniani: c 50
Caernarvonshire — Deposited: (c 287-293 +)
SH 77 77
Late 1940s
Few details.
a) N. Shiel The Episode of Carausius and Allectus, British Archaeological Reports 40, 1977, p 40, Oxford.

C75q Coygan Cave, Llansadwrnin — Antoniniani: 'numerous'
Carmarthonshire — Deposited: (c 293-296 +)
SN 69 31
c 1839
Few details.
a) Anon., 'Antiuities and Works of Art Exhibited', Archaeological Journal, Volume 29, 1872, p 102
b) Archaeologia Cambrensis, 1901, p 21.
c) A.J. Kempe, 'Proceedings...', Proceedings of the Society of Antiquaries, Volume 1, 1849, p 8.
d) Bulletin of the Board of Celtic Studies, Volume 4, 1928; Volume 22, 1967, p 306.
e) N. Shiel, The Episode of Carausius and Allectus, British Archaeological Reports 40, 1977, p 53.

C76 Cranfield, Wharley Farm — Antoniniani: 3
Bedfordshire — Folles: 1697
SP 95 42 — Deposited: early 4th cent.
February 1946
Emperors & types.
a) P.V. Hill, 'The Cranfield (Bedford) Hoard', Numismatic Chronicle, Series 6, Volume 6, 1946, pp 159-162.

C77 Crewkerne — Folles: 6
Somerset — Deposited: (c 335 +)
ST 44 09
pre 1978
Emperors listed.
a) Coin Hoards Volume 4, 1978, no. 164, The Royal Numismatic Society, London, p 42.
b) To be published by N. Shiel

C77n Crondall, the Barley Pond — Antoniniani: 200-300
Hampshire — Deposited: (c 293-296 +)
SU 79 48
1873
Variable sketchy details.
a) J. Evans, 'A new type of Carausius', Numismatic Chronicle, Series 4, Volume 4, 1904, p 136-143, reference in note 6, p 143.
b) P.H. Webb, 'A Hampshire Hoard', Numismatic Chronicle, Series 5, Volume 14, 1934, p 310.
c) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 163.

C77q Croydon, 'South End' — Sestertii: 117
Greater London (Surrey) — Dupondii: 68
TQ 33 64 — Asses: 60
Summer 1905 — Dupondii/Asses: 35
Emperors & denom. given (total out by 1). — Deposited: (c 145-161 +)
a) F.A. Walters, 'Early Roman Bronze Coins found in England', Numismatic Chronicle, Series 4, Volume 7, 1907, pp 353-372.

C78 Croydon, Addington Palace, — Antoniniani: 169
Greater London (Surrey) — Radiate Copies: 1
TQ 33 64 — Deposited: (c 270 +)
pre 1978
RIC & Elmer Nos.
a) Coin Hoards Volume 4, 1978, no. 144, The Royal Numismatic Society, London, p 39.
b) Coin Hoards from Roman Britain Volume 2, 1981, E. Besly, pp 3-6.

C78n Croydon — Antoniniani: 116
Greater London (Surrey) — Radiate Copy: 4
TQ 33 64 — Deposited: (c 287-293 +)
June 1893
RIC Nos for 84 coins.
a) A. Burnett & P.J. Casey, 'A Carausian hoard from Croydon, Surrey; and a note on Carausius's continental possessions', British Numismatic Journal, Volume 54, 1984, pp 10-20.

C78q Darfield 1 — Denarii: 480
South Yorkshire (Yorkshire, West Riding) — Antoniniani: 1
SE 41 04 — Deposited: (c 235-238 +)
10th January 1947
BMC & RIC Nos.
a) J. Walker, 'The Darfield hoard of Roman Denarii', Numismatic Chronicle, Series 6, 1946, Volume 6, pp 147-150.

C79 Darfield 2 — Denarii: 500
South Yorkshire (Yorkshire, West Riding) — Deposited: (c 213 +)
SE 41 04
7th September 1948
BMC Rep. and RIC Nos.
a) R.A.G. Carson, 'A Second Hoard of Roman Denarii from Darfield', Numismatic Chronicle, Series 6, Volume 8, 1948, pp 78-81.

C80 Darfield 3 — Antoniniani: 541
South Yorkshire (Yorkshire, West Riding) — Deposited: (c 276-282 +)
SE 41 04
19th April 1950
Emperors Listed.
a) J.W. Baggaley & P. Corder, 'A Third Hoard of Roman Coins from Darfield', Numismatic Chronicle, Series 6, Volume 10, 1950, pp 315-317.

C81 Darfield 4 — Denarii and Aurei: 500
South Yorkshire (Yorkshire, West Riding) — Deposited: (c 213 +)
SE 41 04
c 1682
Few Details.
a) Diary of Abraham de la Pryme, Surtees Society, 1870.
b) R.A.G. Carson, 'A Second Hoard of Roman Denarii from Darfield', Numismatic Chronicle, Series 6, Volume 8, 1948, pp 78-81.

C82 Darlington — Antoniniani: 203
County Durham — Deposited: (c 274 +)
NZ 28 14
pre 1980
Few details.
a) Coin Hoards Volume 7, 1985, no. 289, The Royal Numismatic Society, London, p 166.
b) M.Sekulla, Transactions of the Arch. & Arch. Society of Durham & Northumberland, 5, 1980, pp 51-52.

C82n Deal — Antoniniani: 25
Kent — Deposited: (c 287-293 +)
TR 37 52
c.1830
Few details.
a) Victoria County History, Kent, Volume 3, p 152.
b) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 163.
c) N. Shiel, The Episode of Carausius and Allectus, British Archaeological Reports 40, 1977, p 41.

C83 Deeping St James, Priory Farm — Antoniniani: 515
Lincolnshire — Deposited: (c 274 +)
TF 165 101
July 1967
RIC & Elmer Nos.
a) Coin Hoards Volume 1, 1975, no. 194, The Royal Numismatic Society, London, p 52.
b) R.A.G. Carson, 'A Hoard of Third Century Roman Coins from Deeping St James, Lincs.', Numismatic Chronicle, Series 7, Volume 13, 1973, pp 69-74.

C84 Dewsbury — Denarii: 26
West Yorkshire — Deposited: (c 117-138 +)
SE 24 22
c.1925
Emperors listed.
a) H. Mattingly, 'The Dewsbury Hoard, 1938', Numismatic Chronicle, Series 5, Volume 19, 1939, p104.
b) Jounal of Roman Studies, Volume 15, 1925, p 277.

C85 Dewsbury, Thornhill — Denarii: 27
West Yorkshire — Deposited: (c 166 +)
SE 24 22
September 1938
RIC & Cohen Nos.
a) H. Mattingly, 'The Dewsbury Hoard, 1938', Numismatic Chronicle, Series 5, Volume 19, 1939, p104.

C85f Dinas Dinlle — Antoniniani: ?
Caernarvonshire — Deposited: (c 293-296 +)
SH 27 36
c.1800
Few details, mainly ant. of Allectus.
a) Hutton, Remarks on North Wales, p 117.
b) Bulletin of the Board of Celtic Studies, Volume 1, p 348; Volume 22, 1967, p 307.
c) N. Shiel, The Episode of Carausius and Allectus, British Archaeological Reports 40, 1977, p 58.

C85n Dinorben — Antoniniani: 4
Clwyd — Radiate Copies: 2
SH 94 77 — Deposited: (c 287-293 +)
1965-69
RIC Nos.
a) Excavations at Dinorben 1965-69, Cardiff, 1971, pp 33ff.
b) N. Shiel, The Episode of Carausius and Allectus, British Archaeological Reports 40, 1977, p 41.

C86 Dolydd (near Caernarvon) — Antoniniani: 18
Gwynedd — Deposited: (c 273 +)
SH 47 57
pre 1845
RIC Nos.
a) Coin Hoards Volume 1, 1975, no. 200, The Royal Numismatic Society, London, p 53.
b) G.C. Boon, Bulletin of Board of Celtic Studies, Volume 26, 1975, no.121.
c) Archaeologia Cambrensis, 1846, p 78.

C86n near Doncaster — Denarii: 20 +
South Yorkshire — Deposited: (c 161-180 +)
c. SE 57 02
c.1864
Some Emperors listed.
a) J. Evans, 'Misellanea', Numismatic Chronicle, New Series, Volume 5, 1865, p 371.
b) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 156.

C87 Dorchester — Denarii: 16
Dorset — Antoniniani: 20748 +
SY 68 90 — Deposited: (c 257 +)
11th May 1936
a) H. Mattingly, 'The Great Dorchester Hoard of 1936', Numismatic Chronicle, Series 5, Volume 19, 1936, pp 21-61.

C88 Duston (?) — Irregular Bronze: 12
Northamptonshire — Deposited: (341 +)
? SP 72 60
pre 1934
Full description of coins.
a) H. Mattingly 'Three hoards of Barbarous Roman Coins', Numismatic Chronicle, Series 5, Volume 14, 1934, pp 266-268.

C89 Droitwich (Bays Meadow) — Antoniniani: 14
Worcestershire — Deposited: (c 293-295 +)
SO 86 93
1973
RIC Nos.
a) Coin Hoards Volume 2, 1976, no. 185, p 52, The Royal Numismatic Society, London.
b) N. Shiel, The Episode of Carausius and Allectus, British Archaeological Reports 40, 1977, p 58.

C89n East Anglia — Denarii: 3062
N.A. — Antininani: 107
N.A. — Deposited: (c 222-235 +)
pre 1898
Cohen Nos.
a) J.Evans, 'A hoard of Roman Coins', Numismatic Chronicle, Series 3, Volume 18, 1898, pp 126-184.
b) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 158.

C90 East Harnham — Antoniniani: 3705 +
Wiltshire — Aurelianic Denarii: 4
SU 14 29 — Deposited: (c 293 +)
8 April 1871
List of Emperors.
a) A.S. Robertson, 'Two Hoards of Roman Coins from Wiltshire', Numismatic Chronicle, Series 6, Volume 9, 1949, pp 245-252.
b) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 164.
c) N. Shiel, The Episode of Carausius and Allectus, British Archaeological Reports 40, 1977, p 61.

C91 East Harnham — Folles: 69
Wiltshire — Deposited: (c 317 +)
SU 13 28
November 1875
List of Emperors.
a) Wiltshire Archaeological Magazine, Volume 48, pp 48 ff.
b) C.H.V. Sutherland, 'A Hoard of Roman Coins from East Harnham', Numismatic Chronicle, Series 5, Volume 18, 1938, pp 128-129.

C92 East Mersea — Antoniniani: 627; Radiate Copies: 8; Deposited: (c 273 +)
Essex
TM 05 14
1980-1981
RIC & Elmer Nos.
a) Coin Hoards from Roman Britain Volume 4, 1984, A.M. Burnett, pp 39–44. [Note: there are major problems with the addition in this catalogue]

C92n Easton, Bristol — Antoniniani: 9+; 4th c. Bronze: 723+; Deposited: (Constantinian)
Avon
ST 58 72
pre 1879
a) J.F. Nicholls, 'The discovery of a hoard of coins at Bristol', Proceedings of the Society of Antiquaries, Series 2, Volume 8, 1879-81, p 287.
b) J. Evans, 'On a hoard of Roman coins principally of the London mint', Numismatic Chronicle, Series 3, Volume 5, 1885, p 118.
c) Bristol and Gloucestershire Archaeological Society, 1885, p 46; 1939, p 194 [problematic references].
d) N. Shiel, The Episode of Carausius and Allectus, British Archaeological Reports 40, 1977, p 63.

C93 Edlington Wood, Doncaster, Hoards 1&2 — Denarii: 436; Antoniniani: 173; Deposited: (c 259 +)
Yorkshire, West Riding
SK 55 98
early 1935
Cohen Nos.
a) A.S. Robertson, 'The Edlington Wood Find', Numismatic Chronicle, Series 5, Volume 15, 1935, pp 202-207.
[Note: the hoard was in two parts]

C94 Edlington Wood, Doncaster, Hoard 3 — Antoniniani: 59; Deposited: (c 276-282 +)
Yorkshire, West Riding
SK 55 98
Summer 1935
RIC & Cohen Nos.
a) P. Corder & W. Percy Hedley, 'The Edlington Wood Find III (the Crags)', Numismatic Chronicle, Series 6, Volume 5, 1945, pp 155-158.

C95 Edlington Wood, Doncaster, Hoard 4 — Antoniniani: 8; Deposited: (c 269 +)
Yorkshire, West Riding
SK 55 98
1975
Few details.
a) Coin Hoards Volume 3, 1977, no. 173, The Royal Numismatic Society, London, p 61.
[probably not part of one of the 1935 Hoards as suggested]

C96 Edlington Wood, Doncaster, Hoard 5 — Denarii: 23; Deposited: (c 225 +)
Yorkshire, West Riding
SK 5575 9806
6th September 1978
RRC & RIC Nos.
a) Coin Hoards Volume 7, 1985, no. 255, The Royal Numismatic Society, London, p 161.
b) Coin Hoards From Roman Britain Volume 2, 1981, T.G. Manby & A.M. Burnett, pp 1-2.

C97 Edwinstone, Kingsland Farm — Denarii: 368; Irregular Denarii: 1; Deposited: (c 177-180 +)
Nottinghamshire:
SK 62 66
pre 1911
Cohen Nos.
a) G.C. Brooke, 'The Edwinstone find of Roman Coins', Numismatic Chronicle, Series 4, Volume 12, 1912, pp 149-178.
[Note: Includes a Lycian denarius of Trajan, treated as a normal denarius]

C97n Elland Hall Wood — Antoniniani: ?
Yorkshire — Deposited: (c 287-293 +)
SE 10 20
pre 1775
Few details.
a) Thoresby Society Miscellanea, Volume 6.
b) I.A. Richmond, Huddersfield in Roman Times, 1925, pp 103, 115.
c) Watson, History of Halifax, 1775, p 55.
d) J.H. Turner, History of Brighouse, Rastrick and Hipperholme, Bingley, 1893, p 25.
e) N. Shiel, The Episode of Carausius and Allectus, British Archaeological Reports 40, 1977, p 41.

C98 Ellesmere — Denarii: 7
Shropshire — Antoniniani: 355
SJ 39 34 — Deposited: (c 280 +)
1st March 1950
RIC Nos.
a) R.A.G. Carson, 'A Roman Hoard from Ellesmere, Shropshire', Numismatic Chronicle, Series 6, Volume 9, 1949, pp 260-261.

C98n Elmham, North — Denarii: 'a pint and a half'
Norfolk — Deposited: (c 161-180 +)
TF 98 20
pre 1901
Some Emperors mentioned.
a) Victoria County History, Norfolk, Volume 1, p316.
b) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 157.

C99 Elveden — Denarii: 964
Suffolk — Antoniniani: 182
TL 82 80 — Deposited: (c 248 +)
23 March 1953
BMC & RIC Nos.
a) R.A.G. Carson, 'The Elveden (Suffolk) Treasure Trove', Numismatic Chronicle, Series 6, Volume 14, 1954, pp 204-208.

C100 Emneth — Antoniniani: c 2000
Norfolk — Deposited: (c 274 +)
TF 48 07
c.1938
RIC & Cohen Nos. for a sample of 1594.
a) A.S. Robertson, 'A Roman coin Hoard from Emneth, Norfolk', Numismatic Chronicle, Series 6, Volume 5, 1945, pp 147-153.

C100n Emneth — Antoniniani: ?
Norfolk — Deposited: (c 287-293)
TF 48 07
pre 1800
Few details.
a) Victoria County History, Norfolk, Volume 1, p 317.
b) N. Shiel, The Episode of Carausius and Allectus, British Archaeological Reports 40, 1977, p 41.

C101 Enfield — Antoniniani: 2
Greater London — Bronze: 324
TQ 33 96 — Deposited: (c 335 +)
1976
RIC/LRBC Nos. for sample of 250.
a) Coin Hoards Volume 3, 1977, no. 199, p 66, also J.P.C. Kent, pp 78-79. The Royal Numismatic Society, London.

C101n Epperstone — Antoniniani: c 1000
Nottinghamshire — Deposited: (c 287-293 +)
SK 65 48
1776
Some Emperors listed.
a) Thoroton, History of Nottinghamshire, ed. Thoresby, 1797, Volume 3, p 40.
b) Brayley and Britton, XII (1), 1813, p 273.
c) Victoria County History, Nottinghamshire, Volume 2, p 26
d) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 162.
e) N. Shiel, The Episode of Carausius and Allectus, British Archaeological Reports 40, 1977, p 41.

C102 Epping Forest — Antoniniani: 51
Essex — Radiate Copies: 2
TQ 42 98 — Deposited: (c 275 +)
November 1977
RIC & Elmer Nos.
a) Coin Hoards Volume 7, 1985, no. 291, The Royal Numismatic Society, London, p 166.
b) Coin Hoards from Roman Britain Volume 2, 1981, A.M. Burnett, pp 25-26.

C103 Eriswell — Iceni: 327
Suffolk — Denarii: 72
TL 72 78 — Deposited: (c 60-61 +)
early 1972
Mack, Allen, RRC & RIC Nos.
a) Coin Hoards Volume 1, 1975, no. 150, The Royal Numismatic Society, London, p 43.
b) Coin Hoards from Roman Britain Volume 4, 1984, J.P.C. Kent & A. Burnett, pp 6-13.

C104 Erw-hên, near Pumsaint — Antoniniani: 684
Carmarthonshire — Deposited: (c 291 +)
SN 6735 4360
27 September 1965
RIC Nos.
a) G.C. Boon, 'The Erw-Hên Treasure Trove of Roman Antoniniani', Numismatic Chronicle, Series 6, Volume 26, 1966, pp 157-163.
b) G.C. Boon, 'The Penard Imperial Hoard: an interim report and a list of Roman Hoards in Wales', Bulletin of the Board of Celtic Studies, Volume 22, 1967, pp 291-310, Reference p 306.
c) Journal of Roman Stidies, Volume 56, 1966, p 196.
d) N. Shiel, The Episode of Carausius and Allectus, British Archaeological Reports 40, 1977, p 42.

C104f Evenley — Antoniniani: 705
Northamptonshire — FOlles: 2-48
SP 58 34 — Deposited: (c 287-296 +)
1826
Some details.
a) R. Stuart Poole, 'Some account of a hoard of Roman coins found in Northamptonshire', Numismatic Chronicle, Series 1, Volume 17, 1855, pp 38-48.
b) Victoria County History, Northamptonshire, p 217.
c) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 164.
d) N. Shiel, The Episode of Carausius and Allectus, British Archaeological Reports 40, 1977, p 61.

C104n Everton — Antoniniani: 600
Nottinghamshire — Deposited: (c 292 +)
SK 68 91
1881
Some details.
a) W. Wroth, 'Find of Roman Coins', Numismatic Chronicle, Series 3, Volume 6, 1886, pp 245-246.
b) J.D.A. Thompson, 'Everton (Notts.) Hoard of 1881', Numismatic Chronicle, Series 6, Volume 5, 1945, pp 153-155.
c) Victoria County History, Notinghamshire, Volume 2, p 26.
d) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 163.
e) N. Shiel, The Episode of Carausius and Allectus, British Archaeological Reports 40, 1977, p 42.

C104q Ewelme — AE2: 1+; Antoniniani: 336+; Deposited: (c 287-296 +)
Oxfordshire
SU 64 91
1772
Some Emperors listed.
a) Victoria County History, Oxfordshire, Volume 1, p 327
b) P. Manning & E. Thurlow Leeds, 'An Archaeological Survey of Oxfordshire', Archaeologia, Volume 71, 1921, pp 227-265, Reference p 242.
c) N. Shiel, The Episode of Carausius and Allectus, British Archaeological Reports 40, 1977, p 42.

C105 Exeter — Denarii: A large number; Antoniniani: A large number; Deposited: Late 3rd Century
Devon
SX 92 92
1715
Some sketchy details, 17 RIC Nos.
a) J.G. Milne, 'An Exeter find of 1715', Numismatic Chronicle, Series 6, Volume 8, 1948, pp##-##.

C106 Exeter — Folles: 33; Deposited: (c 340 +)
Devon
SX 92 92
1874
Emperors & some types given.
a) Coin Hoards Volume 4, 1978, no. 166, p 42, The Royal Numismatic Society, London.
b) To be published by N. Shiel.

C107 Exeter — Asses: 10; Deposited: (c 75 +)
Devon
SX 92 92
1973
Emperors listed.
a) Coin Hoards Volume 5, 1979, no. 112, The Royal Numismatic Society, London, p 48.
b) To be published by N. Shiel

C108 Eynsham — As: 1; Antoniniani: 1; Folles: 31; Deposited: (c 330-333)
Oxfordshire
SP 43 09
pre 1936
Cohen Nos.
a) C.H.V. Sutherland, 'A Roman Hoard from Eynsham Oxon.', Numismatic Chronicle, Series 5, Volume 16, 1936, pp 251-253.

C109 Farley Hill — Antoniniani: 30; Deposited: (c 273 +)
Berkshire
SU 75 64
Late 19th century
RIC Nos.
a) C.H.V. Sutherland, 'A Berkshire Hoard of Roman Coins', Numismatic Chronicle, Series 5, Volume 19, 1939, pp169-170.

C110 Felinrhyd, near Penrhyndeundraeth — Bronze: c 5000; Deposited: (c 335-340 +)
Gwynedd
SH 64 39
c.1850
Few details.
a) Coin Hoards Volume 1, 1975, no. 215, The Royal Numismatic Society, London, p 55.
b) G.C. Boon, Bulletin of Board of Celtic Studies, Volume 26, 1975, no.125.

C111 Felixstowe — Sestertii: 25+; Deposited: (c 240 +)
Suffolk
TM 30 34
1977
BMC Nos.
a) Coin Hoards Volume 4, 1978, no. 120, The Royal Numismatic Society, London, p 35.
b) Coin Hoards Volume 6, 1981, no. 121, The Royal Numismatic Society, London, p 29.
c) Ipswich Numismatic Society Notes, 1, 1978-80, pp70-76.

C111n Fleet, near Ravensclough
Lincolnshire
TF 38 23
1698
Few details.

Antoniniani:	'three pecks'
Deposited:	(c 293-296 +)

a) Cambridge Antiquarian Society Occasional Papers, 1883, p 74.
b) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 163

C112 Folds Farm, near Doncaster
South Yorkshire
SK 57 90
9 October 1945
RIC Nos.

Antoniniani:	1220
Deposited:	(c 273 +)

a) N. Smedley, 'The Folds Farm (Doncaster) Hoard', Numismatic Chronicle, Series 6, Volume 6, 1946, pp 69-72.
b) N. Smedley, 'The Folds Farm (Doncaster) Hoard (Additions)', Numismatic Chronicle Series 6, Volume 7, 1947, p 85.

C113 Freckenham, West Row
Suffolk
TL 675 745
December 1980
RIC Nos.

Siliquae:	202
Irregular Siliquae:	10
Deposited:	(c 410-420 +)
% clipped siliquae	30.7%

a) Coin Hoards from Roman Britain Volume 5, 1984, R.Bland, pp 135-144.

C114 Freston, Potash Farm
Suffolk
TM 1649 3758
April 1959
RIC & LRBC Nos for sample of 2637.

Antoniniani:	2
Folles:	2
Bronze:	3114
Deposited:	(c 350 +)

a) Coin Hoards Volume 1, 1975, no. 219, The Royal Numismatic Society, London, p 55.
b) E. Owles, N. Smedley, H. Webb, 'A Hoard of Constantinian Coins from Freston, Suffolk', Numismatic Chronicle, Series 7, Volume 12, 1972, pp 145-157.

C115 Gare, Sett Bridge
Cornwall
SW 88 43
March 1967
RIC Nos.

Asses:	7
Sestertii:	1028
Dupondius:	1
Denarii:	7
Antoniniani:	40
Deposited:	(c 270 +)

a) Coin Hoards Volume 1, 1975, no. 193, p 52, The Royal Numismatic Society, London.
b) R.A.G. Carson, 'Gare (Cornwall) Find of Roman Silver and Bronze Coins', Numismatic Chronicle, Series 7, Volume 11, 1971, pp 181-188.

C115n Gloucester, Cross
Gloucestershire
SO 83 18
1959
Few details

Antoniniani:	15544
Deposited:	(c 293-296 +)

a) 'Roman Britain in 1960', Journal of Roman Studies, Volume 51, 1961, p 186.
b) N. Shiel, The Episode of Carausius and Allectus, British Archaeological Reports 40, 1977, p 62.

C116 Goadby Marwood
Leicestershire
SK 78 26
1955
Few details.

Antoniniani:	1917
Deposited:	(c 280 +)

a) Coin Hoards Volume 7, 1985, no. 294, p 167, The Royal Numismatic Society, London.
b) R. Abbott, Transactions of the Leicestershire Archaeological and Historical Society, 32, 1956, pp 25-35.

C117 Goring-by-Sea
West Sussex
TQ 11 03
February 1907
Few details.

Radiates Copies:	c 500
Deposited:	3rd century

a) G.D. Lewis & H.B. Mattingly, 'A Hoard of barbarous radiates from Mill Road, Worthing', Numismatic Chronicle, Series 7, Volume 4, 1964, pp 187-199, Reference p190.
b) Newspaper Cutting, c. February 1907, in Worthing Public Library, Local History Collection.

C118 Great Chesells, near Lower Slaughter
Gloucestershire
SP176 230
1958
RIC Nos.

Sestertius:	1
Antoniniani:	125
Radiate Copies:	8
Deposited:	(c 273 +)

a) C.M. Kraay, 'A Third Century Roamn Hoard from Great Chesells, Glos.', Numismatic Chronicle, Series 6, Volume 20, 1960, pp 275-277.

C118n Great Chesterford
Essex
TL 50 42
1847
BMC Nos.

Sestertii:	195
Dupondii:	2
As:	1
Deposited:	(c 161-180 +)

a) Unpublished Catalogue by P.J. Casey.

C119 Great Chesterford
Essex
TL 50 42
1952
RIC Nos.

Denarii:	35
Antoniniani:	60
Deposited:	(c 247-249 +)

a) B.W. Pearce, 'The Great Chesterford Hoard of Denarii and Antoniniani, 1952', Numismatic Chronicle, Series 6, Volume 13, 1953, p136.

C120 Great Melton
Norfolk
TG 13 06
April to May 1984
RRC & BMC Nos.

Denarii:	190
Deposited:	(c 195 +)

a) Coin Hoards from Roman Britain Volume 6, 1986, A.M. Burnett, pp 47-56.

C120n Great Orme's Head
Caernarvonshire
SH 75 84
pre 1888
Emperors listed.

Antoniniani:	17
Deposited:	(c 291 +)

a) B.V. Heaad, 'Miscellanea', Numismatic Chronicle, Series 3, Volume 8, 1888, p 163-164.
b) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 162.
c) G.C. Boon, Bulletin of the Board of Celtic Studies, Volume 22, 1967, p 306.
d) N. Shiel, The Episode of Carausius and Allectus, British Archaeological Reports 40, 1977, p 42.

C121 Gurnard
Isle of White
SZ 4733 9554
1983-1984
BMC Nos.

As:	1
Irregular Denarii:	15
Deposited:	(c 170-174 +)

a) Coin Hoards from Roman Britain Volume 6, 1986, R.F. Bland & M.R. Cowell, pp 31-34.

C122 Hackensall, Knott End
Lancashire
SD 34 47
1926
Few details.

Antoniniani:	400-500
Deposited:	(c 273 +)

a) F.H Cheetham, 'Roman coins found in Lancashire', Antiquaries Journal, Volume 7, 1927, pp 325-326.
b) D.C.A. Shotter, Lancashire Archaeological Journal, 1978, pp 47-52.
c) Coin Hoards Volume 4, 1978, No. 150, The Royal Numismatic Society, London, p 39.
d) Coin Hoards Volume 6, 1981, no. 156, The Royal Numismatic Society, London, p 33.
e) Coin Hoards Volume 7, 1985, no. 288, p 166, also D.C.A. Shotter, p 185, The Royal Numismatic Society, London [4 additional cons].

C123 Hambleden
Buckinghamshire
SU 78 86
pre 1917
RIC Nos.

Antoniniani: 6
Radiate Copies: 1
Folles: 282
Fractions: 4
Deposited: (c 317-330 +)

a) C.E. King, 'The Hambleden (Bucks.) Hoard of Folles', Numismatic Chronicle, Series 7, Volume 20, 1980, pp 48-63.
b) A.H. Cocks, 'A Romano-British Homestead, in the Hambledon Valley, Bucks.', Archaeologia, Volume 71, 1920-1, pp 141-198. References p 148 & 190.

C123n Hambledon Valley
Buckinghamshire
c. SU 78 86
25 April 1912
Emperors listed

Antoninani & Folles: 294
Deposited: (Constantinian)

a) M. Stephenson, 'A Romano-British homestead, in the Hambledon Valley, Bucks.; Appendix V: the coins', Archaeologia, Volume 71, pp 189-190.
b) N. Shiel, The Episode of Carausius and Allectus, British Archaeological Reports 40, 1977, p 63.

C124 Ham Hill, Montacute
Somerset
ST 47 16
1802-1814

Denarius: 1
Antoniniani: 491
Deposited: (c 270-273 +)

a) Journal of Roman Studies, Volume 21, 1931, p 241.
b) J.N.L. Myres & C.H.V. Sutherland, 'Roman Coins from Ham Hill, Som.', Numismatic Chronicle, Series 5, Volume 16, 1936, pp 30-42.

C124n Hammersmith
London
TQ 22 78
pre 1929
Emperors given.

Antoniniani: 7
Deposited: (c 287-290 +)

a) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 163.
b) N. Shiel, The Episode of Carausius and Allectus, British Archaeological Reports 40, 1977, p 58.

C125 Handley, Upwood Farm
Dorset
? SU 01 16
7 August 1877
Emperors for 571 coins, RIC Nos. for 440.

Denarii: 639
Deposited: (c 194-195 +)

a) A.S. Robertson, 'A Hoard of Denarii From Handley, Dorset', Numismatic Chronicle, Series 6, Volume 10, 1950, pp 311-315.

C125n Hanwell
Oxfordshire
SP 43 43
October 1828
Some Emperors listed.

Denarii: 70
Deposited: (c 161-180 +)

a) Victoria County History, Oxfordshire, Volume 1, p 327.
b) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 157.

C126 Hayle
Cornwall
SW 55 37
1825
Few details.

Radiate Copies: 161
Deposited: late 3rd century

a) Victoria County History, Cornwall, Volume 5, pp 35-36; cf. p 12.
b) C.H.V. Sutherland, 'The Hayle Hoard of Radiate minimi', Numismatic Chronicle, Series 5, Volume 16, 1936, pp 202-209.

C127n Hengistbury Head, Site 33
Hampshire
SZ 17 90
c.1911
Cohen & Grueber reference Nos.

Iron Age Coins	c 3000
Denarii:	24
Deposited:	(c 140-144 +)

a) J.P. Bushe-Fox, Excavations at Hengistbury Head, Hampshire, in 1911-12, Society of Antiquaries of London, 1915, Oxford, p 65.
b) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 156.

C128 Hollingbourne, Old Mill Farm
Kent
TQ 84 55
c 1960
RIC &Elmer Nos.

Denarii:	2
Antoniniani:	4996
Irregular Radiates:	359
Deposited:	(c 276-282 +)

a) R.A.G. Carson, 'Hollingbourne Treaure Trove', Numismatic Chronicle, Series 7, Volume 1, 1961, pp 211-223.

C128n Holt
Norfolk
TG 07 38
pre 1944
Emperors listed.

Antoniniani:	1063
'Silver':	42
Deposited:	(c 293-295 +)

a) Journal of Roman Studies, Volume 34, 1944, p 79.
b) N. Shiel, The Episode of Carausius and Allectus, British Archaeological Reports 40, 1977, p 54.

C128q Honley, Northgate Mount
Yorkshire
SE 13 11
7 November 1893
Emperors & denominations.

Corieltauvi:	5
Denarii:	13
Large AE:	1
Middle AE:	2
Deposited:	(c 69-79 +)

a) G.F. Hill, 'Cartimandua', Numismatic Chronicle, Series 3, Volume 17, 1897, pp 293-301.
b) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 154.

C128s Horseheath
Cambridgeshire
TL 61 47
pre 1895
Few details.

Denarii:	'many'
Deposited:	(c 161-180 +)

a) F. Haverfield, 'Note on hoards of Roman silver coins found in Britain with special reference to the Silchester hoard', Archaeologia, Volume 54, 1895, pp 489-494.
b) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 156.

C128v Hove Edge
West Yorkshire
SE 08 25
Few details.

Antoniniani & Folles:	?
Deposited:	(c 305 +)

a) I.A. Richmond, Huddersfield in Roman Times, 'Hoard 9', p 155.
b) N. Shiel, The Episode of Carausius and Allectus, British Archaeological Reports 40, 1977, p 63.

C129 Hoveringham
Nottinghamshire
SK 69 46
1949
RIC Nos.

Antoniniani:	289
Deposited:	(c 287-293 +)

a) R.A.G. Carson, 'A Roman Hoard from Hoveringham (Notts)', Numismatic Chronicle, Series 6, Volume 9, 1949, p 259.
b) Journal of Roman Studies, Volume 41, 1951, p 130.
c) N. Shiel, The Episode of Carausius and Allectus, British Archaeological Reports 40, 1977, p 43.

C130 The Howe
Norfolk
TM 2803 9968
1981-1982
BMC & RRC Nos.

Aureii:	11
Denarii:	75
Deposited:	(c 87 +)

a) Coin Hoards from Roman Britain Volume 4, 1984, A.M. Burnett, pp 25-28.

C131 Icklingham
Suffolk
TL 77 72
c.1906
Full description of irregular coins.
a) H. Mattingly, 'Three Hoards of Barbarous Roman Coins', Numismatic Chronicle, Series 5, Volume 14, 1934, pp 262-266.

Bronze: 8+
Irregular Bronze: 21
Deposited: (c 341-346 +)

C132 Isle of White (in a cave somewhere)
Isle of White
N.A.
c.1890
BMC Nos for a sample of 8.
a) Coin Hoards Volume 2, 1976, no. 235, The Royal Numismatic Society, London, p 65.

Sestertii: 9
Deposited: (188-189 +)

C133 Kempsford
Gloucestershire
-
c.1978
RIC/BMC Nos.
a) Coin Hoards from Roman Britain Volume 6, 1986, C.E. King, pp 15-22.
[the 4 later coins have not been included as part of the hoard]

Asses: 20
Irregular Asses: 1
Dupondii: 6
Deposited: (c 87 +)

C134 Kingscote
Gloucestershire
SU 16 96
-
Few Details.
a) Coin Hoards Volume 7, 1985, no. 297, The Royal Numismatic Society, London, p 167.
b) F.O. Grew, 'Roman Britain in 1979', Britannia, Volume 11, 1980, 385 (no details)

Antoniniani: ?
Deposited: (c 285 +)

C134n King William Street, near Lloyd's Bank
London
-
pre 1920
Emperors known, but no details about the denominations.
a) F. Lambert, 'Some recent excavations in London', Archaeologia, Volume 71, 1921, p 57.
b) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 154.

Coins: 17
Deposited: (c 43-54 +)

C135 Kirkham
Lancashire
SD 42 32
pre 1924
RIC & Cohen nos.
a) Journal of Roman Studies, 1924, p 222.
b) C.H.V. Sutherland, 'Three Roman Coin-Hoards', Numismatic Chronicle, Series 5, Volume 16, 1936, pp 316-318.

Semis: 1
Denarii: 35
Deposited: (c 238 +)

C136 Knapwell
Cambridgeshire
TL 33 62
17 January 1840
Emperors Listed.
a) R. Fox, 'Roman Coins at Knapwell in Cambridgeshire', Numismatic Chronicle, Series 1, Volume 4, 1841, p 64-65.
b) A.S. Robertson, 'A Hoard of denarii from Knapwell, Cambs.', Numismatic Chronicle, Series 5, Volume 19, 1939, pp 175-177.

Denarii: 78
Deposited: (c 170 +)

C137 Lackford
Suffolk
TL 78 70
-
Few details.
a) Coin Hoards Volume 7, 1985, no. 319, The Royal Numismatic Society, London, p 171.
b) F.O. Grew, 'Roman Britain in 1979', Britannia, Volume 11, 1980, 376 (no details)

Bronze: 251
Deposited: (c 360 +)

C138 Lancaster, Mitre Yard — Antoniniani: 15
Lancashire — Deposited: (c 286 +)
SD 47 61
Emperors given.
a) Coin Hoards Volume 4, 1978, no. 154, p 40, The Royal Numismatic Society, London.
b) D.C.A. Shotter, Contrebis, Volume 5, 1977.

C139 Lancaster, Bridge Lane — Denarii: 100
Lancashire — Deposited: (c 118 +)
SD 47 61
1856
RIC & CRR for a sample of 19.
a) Coin Hoards Volume 4, 1978, no. 111, p 33, also D.C.A. Shotter, pp 44-45, The Royal Numismatic Society, London.
b) W.T. Watkin, Roman Lancashire, 1883, p 232.
c) Ms.Notebooks by Thomas Dazell and Corbyn Barrow discovered by S. Penney of Lancaster Museum & Art Gallery.

C140 Langford — Asses: 25
Bedfordshire — Deposited: (c 155 +)
TL 18 40
1977
RIC Nos.
a) Coin Hoards Volume 4, 1978, no. 114, p 35, also A. Burnett, p 45, The Royal Numismatic Society, London.

C141 Lathom, Ormskirk — Denarii: 125
Lancashire — Deposited: (c 120 +)
SD 46 09
1949
Emperors listed, some RIC, CRR & BMC Rep. Nos.
a) Coin Hoards Volume 4, 1978, no. 112, p 33, also D.C.A. Shotter, pp 44-45, The Royal Numismatic Society, London.
b) R.A.G. Carson, 'Roman Denarii from Ormskirk, Lancashire', Numismatic Chronicle, Series 6, Volume 8, 1948, pp 232-235.

C141n Laugharne Castle — Antoniniani: ?
Carmarthenshire — Deposited: (c 287-293 +)
SN 30 11
1830
Few details.
a) Curtis, Antiquities of Laugharne, 1880, p 136.
b) A.J. Kempe, 'Proceedings...', Proceedings of the Society of Antiquaries, Volume 1, 1849, p 8.
c) R.E.M. Wheeler, 'Roman Coin Hoards in Wales', Bulletin of the Board of Celtic Studies, Volume 1, 1923, pp 345-352.
d) Archaeologia Cambrensis, Volume 56, 1901, p 21.
e) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 162.
f) N. Shiel, The Episode of Carausius and Allectus, British Archaeological Reports 40, 1977, p 43.

C141q Lavenham — Denarii: 197
Suffolk — Deposited: (c 98-117 +)
TL 91 49
10th June 1874
Emperors listed for a sample of 183.
a) Victoria County History, Suffolk, Volume 1, p 312.
b) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 155.

C142 Leegrave, Warlords Bank — Sestertii: 10
Bedfordshire — Deposited: (c 190 +)
?
pre 1978
BMC Nos.
a) Coin Hoards Volume 4, 1978, no. 122, The Royal Numismatic Society, London, p 36.

C142n Leigh Church — Antoniniani: c 30
Essex — Deposited: (c 293-296 +)
TQ 83 86
1960's
Mainly, Allectus, possibly some Carrausian.
a) N. Shiel, The Episode of Carausius and Allectus, British Archaeological Reports 40, 1977, p 59.

C143 Leysdown, Warden Bay — Sestertii: 492
Kent — Irregular Sestertii: 1
TR 03 69 — Irregular Asses: 7
Spring 1969 — Deposited: (c 260)
Some Emperors listed.
a) Coin Hoards Volume 1, 1975, no. 186, The Royal Numismatic Society, London.
b) R.A.G. Carson, 'Leysdown (Kent) Hoard of Early Roman Imperial Bronze', Numismatic Chronicle, Series 7, Volume 11, 1971, pp 189-197.
[Note: there are numerical problems in the Hadrianic section of the catalogue, setertii add up to 116 not 122]

C143f Lightcliffe, near Halifax — Corieltauvi Gold: 15 +
West Yorkshire — Denarii: 24 +
SE 14 25 — Deposited: (c 43 + ?)
1827
Description of 24 denarii given.
a) J. Evans, 'An account of british gold and Roman silver coins found at Lightcliffe near Halifax in the year 1827', Numismatic Chronicle, New Series, Volume 1, 1861, pp 79-84.
b) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 154.
c) R.D. Van Arsdell, Celtic Coinage of Britain, 1989.

C143n Lilly Horn, Bisley Villa — Antoniniani: 1223
Gloucestershire — Deposited: (c 293-295 +)
SO 90 06
pre 1845
Some Emperors listed.
a) Numismatic Chronicle, Series 1, Volume 5, 1845, p 149; Volume 6, 1846, p 3; Volume 9, 1849, p 34; Series 2, Volume 11, 1871, p 175.
b) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 163.
c) N. Shiel, The Episode of Carausius and Allectus, British Archaeological Reports 40, 1977, p 5.

C144 Linchmere — Antoniniani: 812
Sussex — Deposited: (c 290 +)
SV 86 30
December 1924
Cohen Nos.
a) P.H. Webb, 'The Linchmere Hoard', Numismatic Chronicle, Series 5, Volume 5, 1925, pp 173-235.
b) P.H. Webb, 'The Linchmere Hoard', Sussex Archaeological Collections, Volume 67, pp 93-102.
c) Victoria County History, Sussex, Volume 1, p 60.
d) Anon., 'Dated Roman pottery', Antiquaries Journal, Volume 5, 1925, p 282.
e) Journal of Roman Studies, Volume 15, 1925, p 244
f) Journal of Roman Studies, Volume 22, 1932, p 94.
g) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, pp 58, 64, 162.
h) N. Shiel, The Episode of Carausius and Allectus, British Archaeological Reports 40, 1977, p 43.

C145 Lincoln — Folles: 20
Lincolnshire — Deposited: (c 330)
SK 97 71
pre 1897
Few details.
a) Coin Hoards Volume 7, 1985, no. 312, The Royal Numismatic Society, London, p 170.
b) A.J. White, 'A Roman pottery money-box from Lincoln', Britannia, Volume 12, 1981, pp 302-305.

C145n Lingwell Gate — Antoniniani: ?
Yorkshire — Folles: ?
SE 32 25 — Deposited: (c 330-341 +)
1812
a) Proceedings of the Society of Antiquaries, Volume 1, Appendix, p 34 [problematic reference].
b) N. Shiel, The Episode of Carausius and Allectus, British Archaeological Reports 40, 1977, p 64.

C146 Liskeard (?)
Cornwall
SX 25 64
pre 1952
Types given.
Radiate Copies: 20
Deposited: Late 3rd Century
a) P.V. Hill, 'A Hoard of Barbarous Radiates from East Cornwall', Numismatic Chronicle, Series 6, Volume 12, 1952, pp 96-98.

C146n Little Chester
Derbyshire
SK 35 37
1887
Few details.
Coins: 80-90
Denarii: ?
Deposited: (c 69-79 +)
a) Victoria County History, Derbyshire, Volume 1, p 220.
b) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 154.

C147 Little Orme's Head, Hoard 1
Caernarvon
SH 81 82
1873
Partial RIC Nos. given.
Folles: 98
Deposited: (c 325 +)
a) Coin Hoards Volume 4, 1978, no. 163, p 42, also Glenys Lloyd-Morgan, pp 56-59, The Royal Numismatic Society, London.

C148 Little Orme's Head, Hoard 2
Caernarvon
SH 81 82
10th January 1907
RIC Nos.
Sestertius (?): 1
Antoniniani: c 700
Deposited: (c 289-293 +)
a) H.A. Seaby, 'A find of coins of Carausius from the Little Orme's Head', Numismatic Chronicle, Series 6, 1956, Volume 16, pp 205-246.
[Note: Includes details of Carausian overstrikes]
b) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 162.
c) N. Shiel, The Episode of Carausius and Allectus, British Archaeological Reports 40, 1977, p 59.

C148n Little Orme's Head, Hoard 3
Caernarvon
SH 81 82
pre 1907
Few details
Antoniniani: ?
Folles: ?
Deposited: (Constantinian)
a) British Numismatic Journal, 1912, pp81ff.
b) H. Mattingly, 'Hoards of Roman coins found in Britain', Journal of Roman Studies, Volume 22, 1932, p 94.
c) Archaeologica Cambrensis, 1908, p 117; 1909, p 318; 1915, p 87.
d) N. Shiel, The Episode of Carausius and Allectus, British Archaeological Reports 40, 1977, p 64.

C149 Llanarmon Dyffryn Ceiriog
Clwyd (Denbighshire)
SJ 15 32
19th March 1918
Cohen Nos. for a sample of 507 coins.
Denarii: c 548
Antoniniani: c 3
Deposited: (c 226 +)
a) H.Mattingly, 'A Find of Roman Denarii in Denbighshire', Numismatic Chronicle, 1923, Series 5, Volume 3, pp 152-155.

C150 Llanbethery, near Barry
County Glamorgan
ST 0355 7010
September 1957
Emperors, Types & Mints; RIC Nos for the radiates.
Antoniniani: 5+
Radiate Copies: 1+
Folles: 803 +
Deposited: (c 341-346 +)
a) G.C. Boon, 'A Constantinian Hoard from Llanbethery, near Barry, County Glamorgan' Numismatic Chronicle, Series 6, Volume 20,1960, pp 253-265.

C151 Llandovery
Dyfed
SN 76 34
c.1755
Some Emperors mentioned
Antoniniani: 12 +
Deposited: (c 260 +)
a) Coin Hoards Volume 3, 1977, no. 169, The Royal Numismatic Society, London, p 61.
b) 'Mr Harris's Observations on the Roman Stations etc...', Archaeologia Volume 2, 1809, pp 1-24, Reference p 18.

C151n Llanfaethlu
Gwynedd (Anglesey)
Sh 31 86
c.1912
Cohen Nos.
Denarii: 32
Sestertii: 1
Asses/Dupondii: 6
Deposited: (c 87 +)
a) G.F. Hill, 'Roman Coins form Anglesey', Numismatic Chronicle, Series 4, Volume 12, 1912, pp 255-257.

C152 Llanfairfechan
Gwynedd (Anglesey)
SH 68 74
pre 1955
Emperors given.
Antoniniani: 30
Deposited: (c 293 +)
a) Coin Hoards Volume 3, 1977, no. 185, The Royal Numismatic Society, London, p 63.
b) MS. in National Museum of Wales

C153 Llangarron, Hill Farm
Hereford and Worcestershire (Herefordshire)
SO 52 21
December 1921
Emperors, types & mintmarks for a sample of 2589 coins.
Follies: 2823
Deposited: (c 327-328 +)
a) M. Stephenson, 'Note on a Hoard of late Roman coins found at Langarren, Herts.', Numismatic Chronicle, Series 5, Volume 9, 1929, pp 334-335.
b) R.A.G. Carson & J.P.C. Kent, 'Constantinian Hoards and other studies in the later Roman bronze coinage', Numismatic Chronicle, Series 6, Volume 16, 1956, pp 83-161.

C153n Llangeinwen, Rhydd Gaer
Gwynedd (Anglesey)
SH 43 65
pre 1856
Emperors given for a sample of 22.
Antoniniani: 23
Deposited: (c 291 +)
a) Archaeologia Cambrensis, 1856, p 326; 1857, p 218; 1861, p 37.
b) R.E.M. Wheeler, 'Roman Coin Hoards in Wales', Bulletin of the Board of Celtic Studies, Volume 1, 1923, pp 345-352.
c) G.C. Boon, 'The Penard Imperial Hoard: an interim report and a list of Roman hoards in Wales', Bulletin of the Board of Celtic Studies, Volume 22, 1967, pp 291-310, Reference p 307.
d) Cymmrodorion Society Transactions, 1920-1921, p 71 n.4.
e) N. Shiel, The Episode of Carausius and Allectus, British Archaeological Reports 40, 1977, p 43.
[Note: Constantine Follis treated as a stray]

C153q Llanidan, Tan Ben y Cefn
Gwynedd (Anglesey)
SH 56 39
1844
Few details.
Sestertii: ?
Antoniniani: ?
Deposited: (c 287-293 +)
a) Archaeologia Cambrensis, 1852, p 209
b) G.C. Boon, 'The Penard Imperial Hoard: an interim report and a list of Roman hoards in Wales', Bulletin of the Board of Celtic Studies, Volume 22, 1967, pp 291-310, Reference p 306.
c) N. Shiel, The Episode of Carausius and Allectus, British Archaeological Reports 40, 1977, p 44.

C153t Llanllechid, Gerlan — Antoniniani: 200
Caernarvonshire — Deposited: (c 287-293 +)
SH 62 68
pre 1870
Few details.
a) Archaeologia Cambrensis, 1870, p 356.
b) G.C. Boon, 'The Penard Imperial Hoard: an interim report and a list of Roman hoards in Wales', Bulletin of the Board of Celtic Studies, Volume 22, 1967, pp 291-310, Reference p 307
c) N. Shiel, The Episode of Carausius and Allectus, British Archaeological Reports 40, 1977, p 44.

C153u Llanvihangel-Tyn-Silwy — Antoniniani: 61
Anglesey — Deposited: (c 289-291 +)
SH 58 92
c.1900
Some details.
a) R.E.M. Wheeler, 'Roman Coin Hoards in Wales', Bulletin of the Board of Celtic Studies, Volume 1, 1923, pp 345-352.
b) G.C. Boon, 'The Penard Imperial Hoard: an interim report and a list of Roman hoards in Wales', Bulletin of the Board of Celtic Studies, Volume 22, 1967, pp 291-310, Reference p 306.
c) R.E.M. Wheeler, 'Roman and native in Wales: an imperial frontier problem', Cymmrodorion Society Transactions, 1920-1921, pp 40-96, see p 67 n3.
d) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 162.
e) N. Shiel, The Episode of Carausius and Allectus, British Archaeological Reports 40, 1977, p 44.

C154 Llanymynech Hill — Denarii: 33
Powys (Montgomeryshire) — Deposited: (c 149 +)
SJ 26 22
11th November 1965
RIC Nos.
a) G.C. Boon, 'The Late Roman Imprial Treasure Trove', Numismatic Chronicle, Series 7, Volume 6, 1966, pp 155-156.

C155 London, Lime Street — Denarii/Antoniniani: 227+
London — Deposited: (c 251 +)
TQ 32 80
1881/2
Emperors and Cohen numbers listed.
a) Coin Hoards Volume 2, 1976, no. 253, The Royal Numismatic Society, London, p 69.
b) Glendining 24, IX, 75, lists 111 to 127 (227 coins)
c) J. Evans, 'Further note of some Roman coins discovered in Lime Street, London, Numismatic Chronicle, Series 3, Volume 3, 1883, pp 278-281.
d) J. Evans, 'Roman coins discovered in Lime Street, London', Numismatic Chronicle, Series 3, Volume 2, 1882, pp 57-60.

C156 London, Lime Street — Radiates Copies: 32
London — Deposited: (c 273 +)
TQ 32 80
May 1952
Types & Photographs.
a) R. Merrifield, 'The Lime Street (1952) hoard of barbarous radiates', Numismatics Chronicle, Series 6, Volume 15, 1955, pp 113-124.

C157 London, St. Swithin's Lane — Irregular Denarii: 89
London — Deposited: (c 41-54 +)
TQ 32 80
1856
BMC Nos.
a) Catalogue of the Museum of London Antiquities collected by C. Roach Smith, p 86 n.387.
b) L.A. Lawrence, 'On a hoard of plated Roman Denarii', Numismatic Chronicle, Series 5, Volume 20, 1940, pp 185-189.

C158 Londonthorpe, Alma Wood — Denarii: 420
Lincolnshire — Deposited: (c 154 +)
SK 95 37
8th November1976
RRC & RIC Nos.
a) Coin Hoards Volume 5, 1979, no. 124, The Royal Numismatic Society, London, p 49.
b) Recent Coin Hoards from Roman Britain (Volume 1), R. Carson & A. Burnett, 1979, pp 9-24.

C159 Londonthorpe, near Grantham — Denarii: 420
Lincolnshire — Deposited: (c 138 +)
SK 95 37
1976
Few details.
a) Coin Hoards Volume 3, 1977, no. 146, The Royal Numismatic Society, London, p 57.
b) R.W. Higginbottom, Numismatic Chronicle, 1977, p 53 [problematic rference].
[posibly the same hoard as C158, but none of the references interlink]

C160 ? Long Wittenham — Antoniniani: 101+
? Oxfordshire — Aurelianic Denarii: 1
? SU 54 93 — Deposited: (c 270 +)
pre 1936
RIC & Cohen Nos.
a) C.H.V. Sutherland, 'Three Roman Coin Hoards', Numismatic Chronicle, Series 5, Volume 16, 1936, pp 319-320.

C161 Lostwithiel — Antoniniani: 102
Cornwall — Radiate Copies: 1
SX 10 59 — Deposited: (c 274 +)
pre 1986
Elmer Nos.
a) Coin Hoards from Roman Britain Volume 6, 1986, A.M. Burnett, pp 157-160.

C162 Lowestoft — Denarii: 38
Suffolk — Deposited: (c 186-189)
TM 53 92
1877
RRC & BMC Nos.
a) Coin Hoards from Roman Britain Volume 6, 1986, I.A. Carradice, pp 45-46.
[Note: the Republican coin, 121 bc, has not been excluded]

C162n near Lydney — Denarii: 155
Gloucestershire — Deposited: (c 180-192 +)
c. SO 63 03
1854
Emperors listed.
a) M.E. Bagnall-Oakeley, 'Roman Coins from the Forest of Dean', Numismatic Chronicle, Series 3, Volume 2, 1882, p 53-56.
b) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 157.

C162q Macsbury — Coins: ?
Somerset — Deposited: (c 138-161 +)
ST 61 47
18th century?
Few details.
a) Victoria County History, Somerset, Volume 1, p 365.
b) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 156.

C163 Magdalen — Antoniniani: 27
Norfolk — Deposited: (c 268 +)
? TF 57 12
19th century
RIC & Cohen Nos.
a) C.H.V. Sutherland, 'A Hoard of Roman Coins from Magdalen, Norfolk', Numismatic Chronicle, Series 5, Volume 17, 1937, pp 309-311.

C164 Maltby, Roche Abbey — Folles: 56
South Yorkshire — Deposited: (c 332 +)
SK 538 908
Spring 1979
RIC Nos.
a) Coin Hoards Volume 7, 1985, no. 313, The Royal Numismatic Society, London, p 170.
b) Coin Hoards from Roman Britain Volume 2, 1981, A.M. Burnett & C. Millar, pp 75-76.

C165 Maltby — Antoniniani: 3496
South Yorkshire — Deposited: (c 282 +)
SK 528 916
August 1978
RIC & Elmer Nos.
a) Coin Hoards Volume 7, 1985, no. 295, The Royal Numismatic Society, London, p 167.
b) Coin Hoards from Roman Britain Volume 2, 1981, I. Carradice, pp 27-48.

C165n Mansfield — Denarii: 300-400
Nottinghamshire — Deposited: (c 209-212 +)
SK 53 61
1849
Some Emperors mentioned.
a) Victoria County History, Nottinghamshire, Volume 2, p 28.
b) W. Thompson Watkin, 'Roman Nottinghamshire', Archaeological Journal, Volume 43, 1886, pp 11-44, Reference p 38.
c) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 158.

C165q March — Denarii: 100+
Cambridgeshire — Deposited: (c 138-161 +)
TL 43 98
1730
Few details.
a) F. Haverfield, 'Note on hoards of Roman silver coins found in Britain, with special reference to the Silchester hoard', Archaeologia, Volume 54, 1895, pp 489ff.
b) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 156.

C166 March, Flaggrass — Sestertii: 9
Cambridgeshire — Deposited: (c 260 +)
TL 434 985
1949
RIC Nos.
a) Coin Hoards Volume 4, 1978, no. 141, p 38, also D.C.A. Shotter, p 47, The Royal Numismatic Society, London.
b) C.W. Philips (Ed.), The Fenland in Roman Times, London, 1970, p 211.

C167 March, Flaggrass
Cambridgeshire
TL 434 985
1949
RIC Nos.

Denarii:	1
Antoniniani:	14
Deposited:	(c 273 +)

a) Coin Hoards Volume 4, 1978, no. 147, p 39, also D.C.A. Shotter, pp 47-48, The Royal Numismatic Society, London.
b) C.W. Philips (Ed.), The Fenland in Roman Times, London, 1970, p 211.

C168 March, Flaggrass
Cambridgeshire
TL 434 985
1949
RIC Nos.

Denarius:	1
Antoniniani:	14
Deposited:	(c 260 +)

a) Coin Hoards Volume 4, 1978, no. 140, p 38, also D.C.A. Shotter, p 47, The Royal Numismatic Society, London.
b) C.W. Philips (Ed.), The Fenland in Roman Times, London, 1970, p 211.

C169 March, Linwood Farm
Cambridgeshire
c. TL 43 98
October 1934
Cohen Nos.

Antoniniani:	806
Radiate Copies:	10
Deposited:	(c 270-273 +)

a) A.S. Robertson, 'The Linwood (March) Hoard', Numismatic Chronicle, Series 5, Volume 15, 1935, pp 57-62.

C169n Margaretting
Essex
TL 66 01
1930
Emperors listed, though accounts conflicting.

Antoniniani:	32
Deposited:	(c 287-290 +)

a) Colchester Museum Report, 1934, p 9.
b) Journal of Roman Studies, Volume 21, 1931, p 236.
c) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 162.
d) Victoria County History, Essex, Volume 3, p 157.
e) N. Shiel, The Episode of Carausius and Allectus, British Archaeological Reports 40, 1977, Oxford, p 44.

C170 Market Deeping
Lincolnshire
TF 1650 1020
16 February 1980
RIC Nos.

Denarii:	11
Antoniniani:	2819
Radiate Copies:	39
Deposited:	(c 272-273 +)

a) Coin Hoards from Roman Britain Volume 4, 1984, I.A. Carradice, pp 45-62.

C171 Market Stainton, Great Westings
Lincolnshire
TF 22 79
1915, 1938
Emperor, mint & type for 1938 find, 259 coins.

Folles:	400 +
Deposited:	(c 298 +)

a) A. Robertson, Grantham Museum 17th Annual Report, 1938/9.
b) J.C. Mossop, 'A hoard of folles from Market Stainton', Numismatic Chronicle, Series 6, Volume 18, 1958, pp 59-71.

C172 ? Marr Thick, near Brodsworth Hall
? North Yorkshire
? TE 64 85
21 March 1949
RIC Nos.

Antoniniani:	62
Deposited:	(c 273 +)

a) N. Smedley, 'The Marr Thick Hoard', Numismatic Chronicle, Series 6, Volume 9, 1949, pp 244-245.

C173 Mattishall
Norfolk
TG 0488 1115
18 January 1968
RIC Nos. for 1086, though originally there were c.1100.
Denarii: 753+
Antoniniani: 333+
Deposited: (c 259+)
a) R.A.G. Carson, 'Mattishall (Norfolk) treasure trove of Roman silver coins', Numismatic Chronicle, Series 7, Volume 9, 1969, pp 129-144.
b) B. Green & T.H. McK. Clough, Norfolk Archaeology, Volume 34, 3, 1968, p 273.

C174 Mear Heath
Somerset
?
Early 1972
RIC & Elmer.
Antoniniani: 385
Radiate Copies: 869
Blanks: 150
Deposited: (c 280-283+)
a) Coin Hoards Volume 2, 1976, no. 184, The Royal Numismatic Society, London, p 46.
b) J.A. Davies, 'The Mear Heath, Somerset, hoard and the coinage of barbarous radiates', Numismatic Chronicle, Volume 146, 1986, pp 107-118.

C174f Melton Magna
Norfolk
?
1887
Few details.
Denarii: 19+
Deposited: (c 161-180+)
a) Victoria County History, Norfolk, Volume 1, p 319.
b) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 156.

C174n Mendips
Somerset
ST 5 5
c.1846
Few details.
Antoniniani: 'a large number'
Deposited: (c 287-293+)
a) Anon., 'Miscellanea', Numismatic Chronicle, Series 1, Volume 7, 1847, p 48.
b) Victoria County History, Somerset, Volume 1, p 338.
c) N. Shiel, The Episode of Carausius and Allectus, British Archaeological Reports 40, 1977, Oxford, p 45.

C175 Mere
Wiltshire
ST 81 32
c.1870
Some types listed.
Radiate Copies: 100
Deposited: Late 3rd Century
a) H. Mattingly, 'Hoard of Barbarous Radiate Coins from Mere, Wiltshire.', Numismatic Chronicle, Series 5, Volume 14, 1934, pp 300-302.

C176 Mereclough, near Burnley
Lancashire
SD 87 30
1695
RIC & CRR for a sample of 12.
Denarii: 12+
Deposited: (c 98+)
a) Coin Hoards Volume 4, 1978, no. 109, p 33, also D.C.A. Shotter, p 44-45. The Royal Numismatic Society, London.
b) W.T. Watkin, Roman Lancashire, 1883, p 232.
c) R. Thoresby's collection listed in Ducatus Leodensis, London, 1715.

C177 Mickleham
Surrey
TQ 17 53
1971
RIC Nos.
Folles: 23
Irregular Folles: 1
Deposited: (c 324)
a) Coin Hoards Volume 2, 1976, no. 293, The Royal Numismatic Society, London, p 73.

C178 Mildenhall
Suffolk
TL 71 74
13th May 1833
RIC Nos.

Denarii:	1
Antoniniani:	1285
Deposited:	(c 270 +)

a) A. Robertson, 'A Roman coin hoard from Mildenhall, Sufolk', Numismatic Chronicle, Series 6, Volume 14, 1954, pp 40-52.

C179 Mildenhall, Beck Row
Suffolk
TL 71 74
1979-1981
BMC & RRC Nos.

Denarii:	277
Deposited:	(c 80-85 +)

a) Coin Hoards Volume 6, 1981, no. 94, The Royal Numismatic Society, London, p 25.
b) Coin Hoards from Roman Britain Volume 4, 1984, A. Burnett, pp 15-24.

C179n Minster Lovell
Oxfordshire
SP 31 10
12th February 1881
Emperors listed.

Sestertii:	24
Deposited:	(c 43-54 +)

a) Victoria County History, Oxfordshire, Volume 1, p 325-326.
b) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 155.

C180 Moel Fenlli, Llanferres
Clwyd
c. SJ 18 60
July 1816
RIB & LRBC Nos.

Billon:	41
Deposited:	(c 341-346 +)

a) Coin Hoards Volume 4, 1978, no. 167, p 42, also Glenys Lloyd-Morgan, pp 59-61, The Royal Numismatic Society, London.
b) Davies & Longbottom, Journal of the Chester Archaeological Society, Volume 24, part 2, 1922, pp 154-155.

C181 Monkton Farleigh
Wiltshire
ST 0843 6557
3 May 1980
RIC & Elmer Nos.

Antoniniani:	3331
Radiate Copies:	135
Deposited:	(c 286 +)

a) Coin Hoards from Roman Britain Volume 5, 1984, I.A. Carradice, pp 61-88.

C182 Much Wenlock, Westwood Farm
Shropshire
SO 62 99
13 October 1977
RIC & Elmer Nos.

Antoniniani:	2591
Deposited:	(c 284 +)

a) Coin Hoards Volume 7, 1985, no. 296, The Royal Numismatic Society, London, p 167.
b) Coin Hoards from Roman Britain Volume 2, 1981, S. Ivens and A.M. Burnett, pp 49-61.

C183 Muswell Hill, Cranley Gardens
London
TQ 28 90
6th September 1928
Cohen Nos.

Denarii:	153
Drachm:	1
Deposited:	(c 209 +)

a) H. Mattingly, 'Hoards of Roman Coins: Muswell Hill', Numismatic Chronicle, Series 5, Volume 9, 1929, pp 315-318.

C184 Mytholmroyd, Scout Rocks
West Yorkshire
SE 01 26
19 October 1952
RIC Nos.

Antoniniani:	595
Radiate Copies:	2
Deposited:	(c 274 +)

a) R.A.G. Carson, 'A third century Roman hoard from Mytholmroyd, Yorkshire', Numismatic Chronicle, Series 6, Volume 13, 1953, pp 140-141.

C184n Narberth, Newton — Antoniniani: 18,000
Pembrookshire — Deposited: (c 287-293 +)
SN 11 14
pre 1857
Some Emperors listed.
a) Archaeologia Cambrensis, 1857, p 313; 1864, p 363; 1924, p 23.
b) Royal Commission on Historical Monuments, Pembrookshire, 1925, p28.
c) Laws, Little England, 1888, p 45.
d) R.E.M. Wheeler, 'Roman Coin Hoards in Wales', Bulletin of the Board of Celtic Studies, Volume 1, 1923, pp 345-352.
e) G.C. Boon, 'The Penard Imperial Hoard: an interim report and a list of Roman hoards in Wales', Bulletin of the Board of Celtic Studies, Volume 22, 1967, pp 291-310, Reference p 306.
f) N. Shiel, The Episode of Carausius and Allectus, British Archaeological Reports 40, 1977, Oxford, p 45.

C184q Naseby — Denarii: 38
Northamptonshire — Deposited: (c 161-180 +)
SP 68 77
1874
Emperors listed.
a) Victoria County History, Northamptonshire, Volume 1, p 218.
b) H.F. Church, 'Antiquities and works of art exhibited', Archaeological Journal, Volume 32, 1875, p 112.
c) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 157.

C185 Neath, Skewen, Coed y Ffranc — Antoniniani: c 150-200
Glamorganshire — Deposited: (c 293-296 +)
SS 72 97
Spring 1919
Cohen Nos. for 45 coins & Webb Nos. for Carausian coins.
a) G.A. Taylor, 'A Find of Roman Coins near Neath, Glamorganshire', Numismatic Chronicle, Series 5, Volume 10, 1930, pp 164-171.
b) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 163.
c) G.C. Boon, 'The Penard Imperial Hoard: an interim report and a list of Roman hoards in Wales', Bulletin of the Board of Celtic Studies, Volume 22, 1967, pp 291-310, Reference p 307.
d) N. Shiel, The Episode of Carausius and Allectus, British Archaeological Reports 40, 1977, p 56.

C186 Northampton — Antoniniani: 36
Northamptonshire — Radiate Copies: 9
SP 75 61 — Deposited: (c 273 +)
1976
Few details.
a) Coin Hoards Volume 3, 1977, no. 176, The Royal Numismatic Society, London, p 62.

C187 ? Northamptonshire — Antoniniani: 27
Northamptonshire — Deposited: (c 276 +)
N.A.
1974
RIC Nos.
a) Coin Hoards Volume 7, 1985, no. 293, The Royal Numismatic Society, London, p 166.
b) D.E. Friendship-Taylor, 'Archaeology in Northamptonshire 1974', Northamptonshire Archaeology, 10, 1975, pp 157-158.

C187n Nottingham — Denarii: 19
Nottinghamshire — Bronze: c 46
SK 56 41 — Deposited: (c 157-161 +)
pre 1910
Emperors listed for the denarii; no details for the bronze..
a) H.A. Grueber, 'A find of Roman coins at Nottingham', Numismatic Chronicle, Series 4, Volume 10, 1910, p 205-206.

C188 Nuneaton, Griff Granite Quarry
Warwickshire
SP 36 91
pre 1921
Cohen Nos.

Denarii:	29
Deposited:	(c 222-235 +)

a) H. Mattingly, 'Find of Roman Denarii near Nuneaton', Numismatic Chronicle, Series 5, Volume 1, 1921, pp 145-149.

C188n Nunney, near Frome
Somerset
ST 73 45
15th October 1860
Coins described in the account.

Iron Age Gold:	10
Iron Age Silver:	232
Denarii:	4
AE2	4
Deposited:	(c 43-54 +)

a) J. Evans, 'An account of a hoard of ancient British coins discovered in the neighbourhood of Frome', Numismatic Chronicle, New Series, Volume 1, 1861, pp 1-17; also 'Miscellanea', p 133.
b) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 154.

C189 Ogof yr Esgyrn, Glyntawe
Powys
SN 83 16
1972
LRBC Nos.

Bronze:	6
Deposited:	(c 337 +)

a) Coin Hoards Volume 3, 1977, no. 201, The Royal Numismatic Society, London, p 67.
b) Archaeologia Cambrensis, 117, 1968, pp 18-71.

C189n Old Ford Bow
London
TQ 36 83
February 1866
Few details.

Quinarii:	?
Deposited:	(c 295-296 +)

a) W.M. Allen, 'Find of coins of Allectus, at Old Ford, Bow', Numismatic Chronicle, Series 2, Volume 6, 1866, pp 304-306.
b) 'Discovered in London and Middlesex', Transactions of the London and Middlesex Archaeological Society, Volume 3, 1870, p 207.
c) Victoria County History, Middlesex, Volume 1, p 73.
d) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 189.
e) N. Shiel, The Episode of Carausius and Allectus, British Archaeological Reports 40, 1977, p 59.

C190 Old Sleaford
Lincolnshire
?
pre 1980
Some details.

Asses:	18
Dupondii:	6
Deposited:	(c 160 +)

a) Coin Hoards Volume 7, 1985, no. 242, The Royal Numismatic Society, London, p 157.
b) A.J. White, Lincolnshire Historical & Archaeological Society, Volume 1, 1980.

C190n Olney, Steeple Claydon
Buckinghamshire
SP 70 27
?
Few details.

'Silver':	?
Deposited:	(c 293-296 +)

a) Victoria County History, Buckinghamshire, Volume 2, p 10.
b) Anon., 'Proceedings of the Society', Journal of the British Archaeological Association, Volume 3, 1848, p 255.
c) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 163.
d) N. Shiel, The Episode of Carausius and Allectus, British Archaeological Reports 40, 1977, p 55.

C190q Oughtibridge, Middlewood
South Yorkshire
SK 30 93
pre 1932
Emperors listed.

Denarii:	5
Deposited:	(c 103-111 +)

a) 'Roman Britain in 1931', Journal of Roman Studies, Volume 22, 1932, p 204.
b) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 155.

C191 Osbournby
Lincolnshire
TF 06 38
1979-1980
RIC Nos.

Siliquae:	316
Irregular Siliquae:	4
Miliarensia:	1
Deposited:	(c 410 +)
% clipped siliquae	11.6%

a) Coin Hoards from Roman Britain Volume 5, 1984, R.Bland & A. White, pp 125-134.
b) Coin Hoards from Roman Britain Volume 7, 1987, R. Bland, pp 205-206.

C192 Otterbourne 2
Hampshire
SU 4563 2362
August-October 1980
RIC Nos.

Siliquae:	155
Deposited:	(c 410 +)
% clipped siliquae	26.4%

a) Coin Hoards from Roman Britain Volume 5, 1984, A.M. Burnett, pp 119-124.

C192n Oundle
Northamptonshire
TL 04 88
1844
Emperors listed.

Antoniniani:	1205
AE2:	2
AE1:	3
Deposited:	(c 293-296 +)

a) Anon., 'Miscellanea', Numismatic Chronicle, Series 1, Volume 5, 1845, pp 193-195.
b) N. Shiel, The Episode of Carausius and Allectus, British Archaeological Reports 40, 1977, p 55.
[Note: there is a problem in the hoard's addition, at least one Allectan and Postumus coin has been allowed for, bringing the total from 1203 to 1205]

C193 Owston Ferry
Humberside (Lincolnshire)
SE 794 011
October 1952
CRR & BMC Nos.

Asses:	2
Sestertii:	58
HS/Dupondii:	53
? Bronze:	3
Denarii:	4
Deposited:	(c 196 +)

a) R.A.G. Carson, 'Owston Ferry hoard of Roman imperial coins', Numismatic Chronicle, Series 6, Volume 13, 1953, pp 138-140.

C193f Oxnead
Norfolk
TG 23 24
17th century
Few details.

Denarii:	?
Deposited:	(c 193 +)

a) Victoria County History, Norfolk, Volume 1, p 320.
b) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 158.

C193h Padfield, near Hooleywood
Derbyshire
SK 02 96
1838
Few details.

Denarii:	8+
Deposited:	(c 222-235 +)

a) Victoria County History, Derbyshire, Volume 1, p 260.
b) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 158.

C193n Park End, Forest of Dean
Gloucestershire
SO 57 10
1852
Only 614 could be identified by emperor.

Antoniniani:	c 1000
Deposited:	(c 293-296 +)

a) M.E. Bagnall-Oakeley, 'On Roman coins found in the Forest of Dean', Bristol and Gloucester Archaeological Society, Volume 6, pp 107-122.
b) Anon., 'Proceedings...', Journal of the British Archaeologcal Association, Volume 23, 1867, p 393.
c) Anon., 'Proceedings...', Journal of the British Archaeologcal Association, Volume 25, 1869, p 158.
c) N. Shiel, The Episode of Carausius and Allectus, British Archaeological Reports 40, 1977, p 56.

C193q Parwich Hill, Lombards Green
Derbyshire
SK 18 55
1769
Emperors listed for 65 coins.
a) Victoria County History, Derbyshire, Volume 1, p 260.
b) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 156.

Denarii:	c 80
Deposited:	(c 161-180 +)

C194 Paternoster Row
London
-
1961
RIC Nos for the regular coins.
a) H.B. Mattingly, 'The Paternoster Row hoard of barbarous radiates', Numismatic Chronicle, Series 7, Volume 7, 1967, pp 61-69.

Antoniniani:	15
Radiate Copies:	528
Deposited:	(c 276 +)

C194n Penard Gower, Heathslade Park
Glamorganshire
SS 52 90
1966
Emperors listed.
a) G.C. Boon, 'The Penard Roman Imperial hoard: an interim Report...', Bulletin of the Board of Celtic Studies, Volume 22, 1967, pp 291-310.
b) Journal of Roman Studies, Volume 57, 1967, p 174.
c) N. Shiel, The Episode of Carausius and Allectus, British Archaeological Reports 40, 1977, Oxford, p 46.

Denarius:	1
Antoniniani & copies:	2582
Deposited:	(c 287-293 +)

C194q Penrhyn
Caernarvon
SH 82 81
1880
Emperors & types
a) Willoughby Gardner, 'A discovery of ROman coins on the Little Orm's Head', Archaeologia Cambrensis, Volume 63, 1908, pp 116-118.
b) W.M. Sharp Ogden, 'A find of Roman bronze coins on the Little Orm, North Wales', Archaeologia Cambrensis, Volume 64, 1909, pp 381-406.
c) N. Shiel, The Episode of Carausius and Allectus, British Archaeological Reports 40, 1977, p 64.

Antoniniani:	3
4th c. Bronze:	c 5000
Deposited:	(Constantinian)

C195 Pen-y-Corddyn
Clywd
SH 91 76
1978
Emperors listed.
a) Coin Hoards Volume 6, 1981, no. 164, The Royal Numismatic Society, London, p 34.
b) R. Brewer, to be published.

As:	1
Irregular As:	1
Sestertii:	2
Antoniniani:	128
Radiate Copies:	12
Quinarius:	1
Deposited:	(c 296 +)

C195n Peterborough
Northamptonshire
TL 1999
pre 1904
Emperors given.
a) British Numismatic Journal, Volume 1, 1904, p 349.
b) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 162.
c) N. Shiel, The Episode of Carausius and Allectus, British Archaeological Reports 40, 1977, Oxford, pp 45-46.
[Note: thought to be an antique 'souvenir collection']

Sestertii:	9
Antoniniani:	3
Radiate Copies:	2
Deposited:	(c 287-296 +)

C195q Pevensey
East Sussex
TQ 65 04
1840
Emperors & some types given
Radiate Copies?: 5
4th c. Bronze: 35
Deposited: (c 367-383 +)

a) C. Roach Smith, 'Discovery of Roman coins at Pevensey Castle, Sussex', Numismatic Chronicle, Series 1, Volume 3, 1841, pp 65-67.
b) C. Roach Smith, Excavations at Pevensey, 1858, p 25.
c) J.P Bushe-Fox, 'Some Notes on Roman coast defences', Journal of Roman Studies, Volume 22, 1932, p 66.
d) Victoria County History, Sussex, Volume 3, 1935, p 7.
e) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 166
f) N. Shiel, The Episode of Carausius and Allectus, British Archaeological Reports 40, 1977, p 65.

C196 Piercebridge
Durham
NZ 21 15
December 1921
Few Details.
Antoniniani: +
Bronze: c 250
Deposited: (c 378 +)

a) N.V. Taylor & R.G. Collingwood, 'Roman Britain in 1921 & 1922', Journal of Roman Studies, 1921, Volume 11, p 202.
b) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p167

C197 Piercebridge
Durham
NZ 21 15
1970s
RIC Nos.
Antoniniani: 13
Radiate Copies: 8
Deposited: (c 270-273 +)

a) R. Brickstock catalogue in P. Scott, Piercebridge Report (forthcoming).

C198 Piercebridge, Tofts Field
Durham
NZ 21 15
1974
RIC Nos.
Sestertii: 2
Denarii: 8
Deposited: (c 164-169 +)

a) R. Brickstock catalogue in P. Scott, Piercebridge Report (forthcoming).

C199 Piercebridge
Durham
NZ 21 15
1970s
RIC Nos.
Denarii: 6
Irregular Denarii: 15
Deposited: (c 203-211 +)

a) R. Brickstock catalogue in P. Scott, Piercebridge Report (forthcoming).

C200 Piercebridge
Durham
NZ 21 15
1970s
RIC Nos.
Miliarensia: 2+
Deposited: (c 352-355 +)

a) R. Brickstock catalogue in P. Scott, Piercebridge Report (forthcoming).

C201 Pitstone, Moneybury Hill
Buckinghamshire
SP 94 14
1977
Emperors listed.
Antoniniani: 21
Radiate Copies: 9
Deposited: (c 270-280 +)

a) Coin Hoards Volume 6, 1981, no. 157, The Royal Numismatic Society, London, p 33.

C202 Polegate
East Sussex
TQ 58 04
-
Few details.
Antoniniani: 17
Deposited: (c 273 +)

a) Coin Hoards Volume 7, 1985, no. 282, The Royal Numismatic Society, London, p 165.
b) F. Brodribb, 'The Polegate hoard', Sussex Archaeological Collections, Volume 114, 1976, pp 332-333.

C202n Polesworth, Hall End — Coins: ?
Warwickshire — Deposited: (c 161-180 +)
SK 26 02
1848
No details.
a) Victoria County History, Warwickshire, Volume 1, p 248.
b) Anon., 'Proceedings...', Journal of the British Archaeological Association, Volume 4, 1849, p 151.
c) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 157.

C203 Poole — Antoniniani: 964
Dorset — As: 1
SZ 01 91 — Deposited: (c 273-274 +)
Autumn 1930
Cohen Nos.
a) H. Mattingly, 'Poole Hoard of Roman Coins', Numismatic Chronicle, Series 5, Volume 13, 1933, pp 229-232.

C204 Poole Harbour, Week's Quay — Antoniniani: 34
Hampshire — Deposited: (c 253-260 +)
SZ 00 88
May 1936
Cohen Nos.
a) J. Allan, 'Roman Coins from Poole Harbour', Numismatic Chronicle, Series 5, Volume 18, 1938, p 300.

C205 Portsdown Hill, near Drayton — Antoniniani: 10
Hampshire — Deposited: (c 260 +)
SU 64 06
1976
RIC Nos.
a) Coin Hoards Volume 3, 1977, no. 165, The Royal Numismatic Society,London, p 60.

C206 Poughill — Bronze: 14
Devon — Denarii: 28
SS 85 08 — Deposited: (c 177 +)
1836
RIC Nos. for denarii, no details of bronze coins.
a) Gentleman's Magazine, 1836 (2), p 311.
b) W.T.P. Shortt, Sylva, 1841, pp VI,63.
c) W.T.P. Shortt, Collectanea Curiosa, 1842, pp 7-8.
d) Davidson, Notes on the Antiquities of Devonshire, 1861, p 68.
e) C.H.V. Sutherland, 'The Poughill (Devonshire) Hoard of Roman Coins', Numismatic Chronicle, Series 5, Volume 19, 1939, pp 170-175.

C207 Preesall Hill — Radiate Copies: 11 +
Lancashire — Deposited: (c 274 +)
SD 37 46
September 1934
RIC Nos for a sample of 11.
a) Coin Hoards Volume 7, 1985, no. 287, p165, also D.C.A. Shotter, pp 184-185, The Royal Numismatic Society, London.

C208 Preshaw Park — Follies: 290
Hampshire — Deposited: (c 309 +)
SU 58 22
1855
Emperors, mints & types for a sample of 284.
a) R.A.G. Carson & J.P.C. Kent, 'Constantinian hoards and other studies in the late Roman bronze coinage', Numismatic Chronicle, Series 6, Volume 16, 1956, pp 83-161.

C209 Puncknoll, Pucknowle
Dorset
SY 53 88
c.1850
Cohen Nos.
Antoniniani: 107+
Deposited: (c 287-290 +)
a) H. Symonds, 'A Find of Third Century Roman Coins at Puncknoll, County Dorset', Numismatic Chronicle, Series 4, Volume 14, 1914, pp 92-95.
b) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 162.
c) N. Shiel, The Episode of Carausius and Allectus, British Archaeological Reports 40, 1977, Oxford, p 46.

C210 Purbrook Heath
Hampshire
SU 67 07
? pre 1984
RIC & Elmer Nos.
Antoniniani: 206
Radiate Copies: 1
Deposited: (c 272 +)
a) Coin Hoards from Roman Britain Volume 4, 1984, A.M. Burnett, pp 33-37.

C211 Pyle
West Glamorgan
SS 88 82 or SS 58 88
1957
Few details.
Antoniniani: 1
Radiate Copies: 9
Deposited: (c 280 +)
a) Coin Hoards Volume 3, 1977, no. 184, The Royal Numismatic Society, London, p 63.

C212 Pyrford, Bolton's Lane
Surrey
TQ 03 59
1st January 1957
BMC Nos.
Denarii: 82
Deposited: (c 159-160 +)
a) R.A.G.Carson, 'Pyrford Roman treasure trove', Numismatic Chronicle, Series 6 Volume 20, 1960, p 235.

C213 Quennevais
Jersey
-
1848
RIC & LRBC Nos for a sample of 317.
Folles: 400+
Deposited: (c 325-330 +)
a) Coin Hoards Volume 7, 1985, no. 311, The Royal Numismatic Society, London, p 170.
b) Coin Hoards from Roman Britain Volume 2, 1981, R.W. Higginbottom, pp 69-74.
[the post AD330 coins have not been included]

C214 Rembridge Foreshore (Hoard?)
Isle of White
?
1985
Emperors listed.
Asses: 1+
Dupondii: 1+
Sestertii: 11+
Deposited: (c 180 +)
a) Coin Hoards from Roman Britain Volume 6, 1986, I.A. Carradice, p 37.

C215 Ribchester
Lancashire
SD 64 35
1978
RRC & RIC Nos.
Denarii: 9
Deposited: (c 165)
a) Coin Hoards Volume 7, 1985, no. 244, p 159, also D.C.A. Shotter, p 182, The Royal Numismatic Society, London.

C216 Riby, Wold Farm, near Caistor
Lincolnshire
TA 18 07
1953
Some details.
Antoniniani: 15-20,000
Deposited: (c 276 +)
a) Coin Hoards Volume 2, 1976, no. 278, The Royal Numismatic Society, London, p 72
b) 'Roman Britain in 1953', Journal of Roman Studies, Volume 44, 1954, p 92.
c) P. Tyler, The Persian Wars of the 3rd Century A.D. and Roman imperial monetary policy AD253-268, Wiesbaden, 1975.

C216f Richborough
Kent
TR 33 58
1920's
RIC Nos.
Sestertii: 16
Deposited: (c 43-54 +)
a) J.P. Bushe-Fox, Second Report on the Excavations of the Roman Fort at Richborough,Kent, Society of Antiquaries of London, Oxford, 1928, pp 119, 122.
b) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 155.
[Note: Catalogue Nos. 2517-2528 and 2556-2559]

C216n Richborough
Kent
TR 33 58
1930s
Emperors listed.
Antoniniani: 11
Deposited: (c 287-293 +)
a) Richborough IV, pp 70, 280.
b) B.W. Pearce, 'The coins from Richborough, a survey', Numismatic Chronicle, Series 5, Volume 20, 1940, pp 57-75, Reference: 'Hoard 7', p 70.
c) N. Shiel, The Episode of Carausius and Allectus, British Archaeological Reports 40, 1977, Oxford, p 46-47.

C216q Richborough
Kent
TR 33 58
Emperors listed.
Antoniniani: 6
Deposited: (c 293 +)
a) B.W. Pearce, 'The coins from Richborough, a survey', Numismatic Chronicle, Series 5, Volume 20, 1940, pp 57-75, Reference: 'Hoard 6', p 70.
b) Richborough IV, p 280.
c) N. Shiel, The Episode of Carausius and Allectus, British Archaeological Reports 40, 1977, p 60.

C216r Ripley
Derbyshire
SK 39 50
1730
Some Emperors mentioned.
Antoniniani: 'an urn full'
Deposited: (c 287-293 +)
a) Victoria County History, Derby, Volume 1, p 261.
b) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 162.
c) N. Shiel, The Episode of Carausius and Allectus, British Archaeological Reports 40, 1977, Oxford, p 47.

C216s Rushall Down
Wiltshire
SU 12 55
pre 1862
Few details
Antoniniani: ?
Follies: ?
Deposited: (Constantinian)
a) F.W. Madden, 'Find of coins', Numismatic Chronicle, Series 2, Volume 2, 1862, p 325.
b) N. Shiel, The Episode of Carausius and Allectus, British Archaeological Reports 40, 1977, p 65.

C219 Saint Albans
Hertfordshire
TL 15 07
pre 1975
Few details, one Emperor named (Elagabalus).
Denarii: 21
Deposited: (221 +)
a) Coin Hoards Volume 2, 1976, no. 241, p 67, The Royal Numismatic Society, London.
b) D.R. Wilson, 'Roman Britain in 1974', Britannia, Volume 6, 1975, p 258.

C220 Saint Mary Cray
Greater London (Kent)
TQ 46 67
July 1934
RIC & Cohen Nos.
Denarii: 376
Deposited: (c 226 +)
a) A.Robertson, 'The Saint Mary Cray Hoard', Numismatic Chronicle, Series 5, Volume 15, 1935, pp 62-66.

C220f Santon Downham, near Brandon
Suffolk
TL 81 87
c.1869
Full description of the coins.

Iceni:	107
Dupondii:	2
Deposited:	(c 60-61 +)

a) J. Evans, 'Note on a hoard of Ancient British Coins found at Santon Downham, Suffolk', Numismatic Chronicle, New Series, Volume 9, 1869, pp 319-326.
b) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 154.

C220n Sapperton Tunnel, Lark's Bush
Gloucestershire
SS 72 97
14 September 1844
Some Emperors mentioned.

Antoniniani:	70
Deposited:	(c 293-296 +)

a) T. Baker, 'Miscellanea', Numismatic Chronicle, Series 1, Volume 5, 1845, p 195.
b) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 45.
c) N. Shiel, The Episode of Carausius and Allectus, British Archaeological Reports 40, 1977, p 56.

C221 Scole
Norfolk
TM 15 79
1982-1983
Mack, Allen, RRc & BMC Nos.

Iceni:	202
Denarii:	87
Deposited:	(c 60-61 +)

a) Coin Hoards from Roman Britain Volume 6, 1986, A.M. Burnett, pp 7-12.

C221f Segontium
Caernarvonshire
SH 48 62
1922
RIC Nos.

Denarii:	9
Deposited:	(c 226 +)

a) R.E.M. Wheeler, Segontium and the Roman Occupation of Wales, pp 54-56.
b) G.C. Boon, Bulletin of the Board of Celtic Studies, Volume 26, 1975, p 239.

C221n Segontium
Caernarvonshire
SH 48 62
pre 1922
Emperors listed.

Antoniniani:	38
Radiate Copies:	18
Deposited:	(c 287 +)

a) Archaeologia Cambrensis, Volume 82, 1922, pp 291, 316-320.
b) R.E.M. Wheeler, Segontium and the Roman Occupation of Wales, p 218.
c) Y Cymmrodor, Volume 33, p 115.
d) G.C. Boon, Bulletin of the Board of Celtic Studies, Volume 22, 1967, p 305.
e) F.S. Salisbury, 'Late 4th century currency in Britain', Numismatic Chronicle, Series 5, Volume 11, 1931, pp 14-27, Refeence p 23.
f) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, pp 66, 115, 117, 162.
g) Journal of Roman Studies, Volume 11, 1921, p 225; Volume 12, 1922, p 243.
h) N. Shiel, The Episode of Carausius and Allectus, British Archaeological Reports 40, 1977, Oxford, p 47.

C222 Selsey
West Sussex
SZ 85 93
16 November 1932
Cohen No.

Denarii:	9
Antoniniani:	966
Deposited:	(c 270 +)

a) H. Mattingly, 'The Selsey Hoard', Numismatic Chronicle, Series 5, Volume 13, 1933, pp 223-228.

C222f Selston
Nottinghamshire
SK 46 53
1830
Few details.

Denarii:	?
Deposited:	(c 98-117 +)

a) Victoria County History, Nottinghamshire, Volume 2, p 33.
b) W. Thompson Watkin, 'Roman Nottinghamshire', Archaeological Journal, Volume 43, pp 11-44, Reference p 39.
c) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 153

C222h Sheffield, Scott Road — Denarii: 35
South Yorkshire — Deposited: (c 161-180 +)
SK 35 87
1906
Few details.
a) 'Roman Britain in 1931', Journal of Roman Studies, Volume 22, 1932, p 204.
b) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 157.

C222j Sheffield, Brightside — Coins: ?
South Yorkshire — Deposited: (c 161-180 +)
SK 35 87
1854
Few details.
a) 'Roman Britain in 1931', Journal of Roman Studies, Volume 22, 1932, p 204.
b) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 157.

C222n Shotover, Lark Rise — Antoniniani: 560
Oxfordshire — Deposited: (c 287-293 +)
SP 50 55
May 1842
Some Emperors mentioned.
a) Anon., 'Discovery of Roman coins at Shotover', Numismatic Chronicle, Series 1, Volume 5, 1845, p 43.
b) Victoria County History, Oxfordshire, Volume 1, p 327.
c) P. Manning & E Thurlow Leeds, 'An archaeological survey of Oxfordshire' Archaeologia, Volume 71, 1921, pp 227-265, Reference p 255.
d) J.W., 'Antiquities found at Woodperry, Oxon.', Archaeological Journal, Volume 3, 1846, pp 116-128, Reference p 125.
e) N. Shiel, The Episode of Carausius and Allectus, British Archaeological Reports 40, 1977, Oxford, p 48.

C223 Silchester Hoard 1 — Denarii: 258 +
Hampshire — Deposited: (c 194-195 +)
SU 62 62
1894
Syd.Rep., & RIC Nos.
a) G.E. Fox, 'Excavation on the site of the Roman city at Silchester, Hants., in 1894', Archaeologia, Volume 54, 1895, pp 439-494, Reference p 455.
b) H.A. Grueber,, 'Appendix 1: On a hoard of Roman coins found at Silchester', Archaeologia, Volume 54, 1895, pp 473-489, Reference p 473.
c) G.C. Boon, 'Hoards of Roman coins found at Silchester', Numismatic Chronicle, Series 6, Volume 20, 1960, pp 241-245.

C224 Silchester Hoard 2 — Antoniniani: 22
Hampshire — Deposited: (c 290-293 +)
SU 62 62
1897
RIC Nos.
a) G.C. Boon, 'Hoards of Roman coins found at Silchester', Numismatic Chronicle, Series 6, Volume 20, 1960, pp 241-245.
b) N. Shiel, The Episode of Carausius and Allectus, British Archaeological Reports 40, 1977, Oxford, p 48.

C225 Silchester Hoard 3 — Antoniniani: 40
Hampshire — Deposited: (c 287-293 +)
SU 62 62
1865
Emperors & types listed.
a) J.G. Joyce, 'Account of further excavations at Silchester', Archaeologia, Volume 46, 1881, pp 329-365, Reference p 340 (cf. plan, pl. xi).
b) J.G. Joyce, 'The excavations at Silchester', Archaeological Journal, Volume 30, 1873, pp 10-27, Reference p 20.
c) Ms. by J.G. Joyce, Journal of Excavations at Silchester, 24th November 1865, in Reading Museum.
d) G.C. Boon, 'Hoards of Roman coins found at Silchester', Numismatic Chronicle, Series 6, Volume 20, 1960, pp 241-245.
e) N. Shiel, The Episode of Carausius and Allectus, British Archaeological Reports 40, 1977, Oxford, p 48.

C226 Silchester Hoard 4
Hampshire
SU 62 62
19th c.?
Maurice Nos.
Folles: 6
Deposited: (c 330-335 +)
a) G.C. Boon, 'Hoards of Roman coins found at Silchester', Numismatic Chronicle, Series 6, Volume 20, 1960, pp 241-245.

C227 Silchester Hoard 6
Hampshire
SU 62 62
1908
Maurice Nos.
Bronze: 87
Deposited: (c 346 +)
a) W.H. St.John Hope, 'Excavations at the site of the Roman city at Silchester, Hants., in 1908', Archeaologia, Volume 61, 1909, pp 473-486.
b) G.C. Boon, 'Hoards of Roman coins found at Silchester', Numismatic Chronicle, Series 6, Volume 20, 1960, pp 241-245.

C227n Slay Hills Saltings, Greenborough
Kent
TQ 86 70
1864
Emperors listed.
Denarii: 15
AE: 2+
Deposited: (c 180 +)
a) Victoria County History, Kent, Volume 3, p 168.
b) Payne, Collectanea Cantiana, p 75.
c) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 157.

C228 'Southants. Hoard'
Hampshire
N.A.
pre 1911
Cohen, Grueber, Babelon & Evans Nos.
Denarii: 15
Irregular Denarii: 2
Asses: 30
Irregular Asses: 14
I.A. Silver: 83
I.A. Struck Bronze: 215
I.A. Cast Bronze: 317
Deposited: (c 117-138 +)
a) G.F. Hill, 'A Hoard of Roman and British Coins from Southants.', Numismatic Chronicle,Series 4, Volume 11, 1911, pp 42-56.

C228n South Norwood
Kent
TQ 33 65
pre 1977
Emperors listed
Antoniniani: 52
Radiate Copies: 3
Deposited: (c 287-290 +)
a) N.Shiel, The Episode of Carausius and Allectus, British Archaeolgical Reports 40, 1977, pp 48-49.

C228q Southwark
Greater London
TQ 32 80
April 1902
Full description and some Cohen Nos.
AE: 17
Deposited: (c 72-73 +)
a) G.F. Hill, 'Miscellanea', Numismatic Chronicle, Series 4, Volume 3, 1903, pp 99-102.
b) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 154.

C229 near Sparkford
Somerset
c. ST 60 26
1973
RIC & Elmer Nos. for a sample of 191.
Antoniniani: c. 375
Radiate Copies: 25+
Deposited: (c 294 +)
a) Coin Hoards Volume 4, 1978, no. 155, The Royal Numismatic Society, London, p 40.
b) Coin Hoards Volume 7, 1985, no. 302, The Royal Numismatic Society, London, p 168.
c) Coin Hoards from Roman Britain Volume 2, 1981, E. Besly, pp 63-68.

C230 Spotbrough
South Yorkshire
SK 532 010
pre 1982
Few Details.
Radiate Copies: 313
'Blanks': 186
Deposited: (3rd Century ?)
a) H.B. Mattingly & M.J. Dolby, 'A hoard of barbarous radiates & associated materials from Spotbrough, South Yorkshire', Numismatic Chronicle, 1982, pp 21-33.

C231 Springhead, near Gravesend
Kent
TQ 61 72
23 April 1984
RIC & Bastien.
Antoniniani: 2
Folles: 652
Deposited: (c 311 +)
a) Coin Hoards from Roman Britain Volume 7, 1987, P.W. Green, pp 1-26.

C232 Stanton Harcourt 1
Oxfordshire
SP 41 05
pre 1987
RIC Nos.
Bronze: 22
Deposited: (c 320 +)
a) Coin Hoards from Roman Britain Volume 7, 1987, C.E. King, pp 35-44.

C233 ? Stiffkey
? Norfolk
? TF 97 43
pre 1931
Cohen Nos.
Antoniniani: 18
Deposited: (268-270)
a) C.E. Blunt, 'Roman Coins from Norfolk', Numismatic Chronicle, Series 5, Volume 11, 1931, pp 316-317.

C234 Stonea Camp, Wimblington
Cambridgeshire
TL 448 931
pre 1970
RIC Nos.
Antoniniani: 25
Deposited: (c 273 +)
a) Coin Hoards Volume 4, 1978, no. 148, p 39, also D.C.A. Shotter, p 48, The Royal Numismatic Society, London.
b) C.W. Philips (Ed.), The Fenland in Roman Times, p 218, London, 1970.

C234n Strata Florida
Cardiganshire
SN 74 65
1853
Emperors of 15 coins listed.
Antoniniani: 15
Carausian Denarius: 1
Deposited: (c 290 +)
a) R.E.M. Wheeler, 'Roman Coin Hoards in Wales', Bulletin of the Board of Celtic Studies, Volume 1, 1923, pp 345-352.
b) G.C. Boon, 'The Penard Imperial Hoard: an interim report and a list of Roman hoards in Wales', Bulletin of the Board of Celtic Studies, Volume 22, 1967, pp 291-310, Reference p 306.
c) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 162.
d) N.Shiel, The Episode of Carausius and Allectus, British Archaeolgical Reports 40, 1977, p 49.

C234q Sully Moor
Glamorgonshire
ST 15 68
1899
Emperors listed
Gold: 7
Silver: 1
Deposited: (c 287 +)
a) H.A. Grueber, 'Find of Roman coins and gold rings at Sully, near Cardiff', Numismatic Chronicle, Series 3, Volume 20, 1900, pp 27-65.
b) Archaeologia Cambrensis, Volume 55, 1900, p 65.
c) G.C. Boon, 'The Penard Imperial Hoard: an interim report and a list of Roman hoards in Wales', Bulletin of the Board of Celtic Studies, Volume 22, 1967, pp 291-310, Reference p 305.
d) P.J. Isaac, A Study of Roman Gold Coins Found in Britain, and Their Implications, M.A. Thesis, Durham, 1971, pp 67-68.
e) N. Shiel, The Episode of Carausius and Allectus, British Archaeological Reports 40, 1977, p 65.

C235 (?) Surrey
Surrey
N.A.
c 1970
Emperors listed
Antoniniani: 9
Deposited: (c 293 +)
a) Coin Hoards Volume 2, 1976, no. 286, The Royal Numismatic Society, London, p 73.
b) N. Shiel in Num. Circ., Volume 83, No.6, 1975, p 236.

C236 Swaby
Lincolnshire
TF 38 77
27th June 1934
Cohen & RIC Nos.
Denarii: 178
Deposited: (c 137-138 +)
a) H. Mattingly, 'The Swaby Hoard', Numismatic Chronicle, Series 5, Volume 14, 1934, pp 216-219.

C237 Tattershall Thorpe
Lincolnshire
TF 21 59
pre 1984
RIC & Elmer Nos.
Antoniniani: 4789
Radiate Copies: 285
Deposited: (c 281 +)
a) Coin Hoards from Roman Britain Volume 4, 1984, E. Besley & R. Bland, pp 105-138.

C237n Thurstonland
Yorkshire
SE 16 10
c.1838
Some details, sample of 65 recorded in N. Shiel.
Denarii: 1 +
Antoniniani: c 500-700
Deposited: (c 287-293 +)
a) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 162.
b) I.A. Richmond, Huddersfield in Roman Times, 1925, pp 103, 116.
c) N.Shiel, The Episode of Carausius and Allectus, British Archaeolgical Reports 40, 1977, p 49.

C237p Tickenham
Somerset
ST 45 71
1829
Few details.
Antoniniani: ?
Deposited: (c 293-296 +)
a) Victoria County History, Somerset, p 367.
b) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 163.
c) N. Shiel, The Episode of Carausius and Allectus, British Archaeological Reports 40, 1977, p 57.

C238 Timberland, Kesteven
Lincolnshire
TF 12 58
1808
Few reliable details.
Bronze: c 1500
Deposited: ?
a) M. Dolley & M. Todd, 'The Roman coin hoard from Timberland (Lincs.): a revision', Numismatic Chronicle, Series 7, Volume 9, 1969, pp 107-112.
b) C.W. Phillips, 'The present state of archaeology in Lincolnshire', Archaeological Journal, Volume 91, 1934, pp 97-187, Reference p 184
c) M. Todd, 'A large hoard of early imperial bronze from Lincolnshire', Numismatic Chronicle, Series 7, Volume 6, 1966, ppp 145-146.
d) Annual Register, 1808, p 155.

C238n Timsbury, near Romsey
Hampshire
SU 34 24
February 1907
Emperors listed.
Iron Age: 18
Sestertii: 1
AE2: 42
Deposited: (c 86 +)
a) J. Evans, 'Ancient British Coins found with Roman Coins in England', Numismatic Chronicle, Series 4, Volume 8, 1908, pp 80-81.
b) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 155.

C239 Upavon
Wiltshire
SU 143 552
June 1980
RIC Nos.
Folles: 111
Deposited: (c 299 +)
a) Coin Hoards from Roman Britain Volume 5, 1984, A.M. Burnett & P.H. Robinson, pp 89-99.

C240 Upchurch, Slayhills Marsh — Sestertii: 37
Kent — Deposited: (c 180 +)
TQ 84 67
1952
RIC Nos.
a) P.H.K. Gray, 'A hoard of sestertii (Domitian-Commodus) from Slayhills Marsh, Upchurch, Kent', Numismatic Chronicle, Series 6, Volume 14, 1954, pp 201-203.

C240n Upton — Denarii: 20
Nottinghamshire — Deposited: (c 96 +)
SK 73 54 or SK 74 76
18th Century
Few details.
a) Victoria County History, Nottinghamshire, Volume 2, p 35.
b) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 155.

C241 Usk (Hoard No.1) — Denarii: 6
Gwent — Deposited: (c 55-57 +)
SO 37 00
1967
Emperors listed.
a) Coin Hoards Volume 1, 1975, no. 168, The Royal Numismatic Society, London, p 49.
b) G.C. Boon, 'A list of Roman hoards in Wales - first supplement 1973', Bulletin of Board of Celtic Studies, Volume 26, 1975, pp 237-240, Reference no.116.
c) W.H. Manning, Usk Excavations.

C242 Usk (Hoard No.2) — Sestertius: 2
Gwent — Dupondius: 1
SO 37 00 — As: 1
1969 — Deposited: (c 85-90 +)
Emperors listed
a) Coin Hoards Volume 1, 1975, no. 168, The Royal Numismatic Society, London, p 49.
b) G.C. Boon, 'A list of Roman hoards in Wales - first supplement 1973', Bulletin of Board of Celtic Studies, Volume 26, 1975, pp 237-240, Reference no.118
c) W.H. Manning, Usk Excavations.

C243 Usk (Hoard No.3) — Folles: 35+
Gwent — Deposited: (c 336 +)
SO 37 00
1971
Few details.
a) Coin Hoards Volume 1, 1975, no. 216, The Royal Numismatic Society, London, p 55.
b) G.C. Boon, 'A list of Roman hoards in Wales - first supplement 1973', Bulletin of Board of Celtic Studies, Volume 26, 1975, pp 237-240, Reference no.124
c) W.H. Manning, Usk Excavations.

C244 Usk (Hoard No.5) — Dupondii: 5
Gwent — Asses: 2
SO 37 00 — Deposited: (c 64 +)
1973
Emperors listed.
a) Coin Hoards Volume 1, 1975, no. 168, The Royal Numismatic Society, London, p 49.
b) G.C. Boon, 'A list of Roman hoards in Wales - first supplement 1973', Bulletin of Board of Celtic Studies, Volume 26, 1975, pp 237-240, Reference no.117
c) W.H. Manning, Usk Excavations.

C245 Verulamium — Radiate Copies: c 800
Hertfordshire — Deposited: Late 3rd Century
TL 15 07
pre 1938
Few details.
a) T.V. Wheeler, 'A Hoard of Radiate Coins from the Verulamium Theatre', Numismatic Chronicle, Series 5, Volume 17, 1937, pp 211-228.

C246 Verulamium
Hertfordshire
TL 15 07
1958
Denarii: 49
Irregular Denarii: 1
Deposited: (c 117 +)
Syd. Repb. & RIC Nos., plus wear and weight details.
a) C.M. Kraay, 'A hoard of denarii from Verulamium, 1958', Numismatic Chronicle, Series 6, Volume 20, 1960, pp 271-273.

C246f Verulamium
Hertfordshire
TL 15 07
1930s
Denarii: 5
Deposited: (c 227-229 +)
RIC Nos.
a) R.E.M. and T.V. Wheeler, Verulamium, A Belgic and Two Roman Cities, Oxford, 1936, p 62.
b) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 158.

C246n Verulamium
Hertfordshire
TL 15 07
1930s
Antoniniani: 33
Radiate Copies: 3
Deposited: (c 287-293 +)
RIC Nos.
a) R.E.M. and T.V. Wheeler, Verulamium, A Belgic and Two Roman Cities, Oxford, 1936, p 110.
b) N. Shiel, The Episode of Carausius and Allectus, British Archaeological Reports 40, 1977, Oxford, p 47.

C246p Verulamium
Hertfordshire
TL 15 07
1930s
Radiate Copies: 19
Deposited: (c 289 +)
RIC Nos.
a) R.E.M. and T.V. Wheeler, Verulamium, A Belgic and two Roman Cities, Oxford, 1936, pp 110-111.
b) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 162.
c) N. Shiel, The Episode of Carausius and Allectus, British Archaeological Reports 40, 1977, p 60.

C246q Verulamium
Hertfordshire
TL 15 07
-
Antoniniani: 144
Deposited: (c 290-293 +)
Some details.
a) Archaeologia, Volume 84, pp 236-237.
b) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 163.
c) N. Shiel, The Episode of Carausius and Allectus, British Archaeological Reports 40, 1977, Oxford, p 47

C246s Verulamium
Hertfordshire
TL 15 07
1930s
Antoniniani: 52
Deposited: (c 273 +)
RIC Nos.
a) R.E.M. and T.V. Wheeler, Verulamium, A Belgic and Two Roman Cities, Oxford, 1936, p 62.
b) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 160.

C247 Vintners Park, Maidstone
Kent
TQ 777 566
1979
Antoniniani: 58
Deposited: (c 272 +)
RIC & Elmer Nos.
a) Coin Hoards Volume 7, 1985, no. 280, The Royal Numismatic Society, London, p 165.
b) Coin Hoards from Roman Britain Volume 2, 1981, A.M. Burnett, pp 7-8.
c) Coin Hoards from Roman Britain Volume 4, 1984, A.M. Burnett, p 38.

C249 Waddington, Bracebridge Heath — Denarii: 16
Lincolnshire — Deposited: (c 161 +)
SK 98 64
June 1977
RIC Nos.
a) Coin Hoards Volume 4, 1978, no. 117, The Royal Numismatic Society, London, p 35.
b) Coin Hoards Volume 5, 1979, no. 124, The Royal Numismatic Society, London, p 49.
c) Recent Coin Hoards from Roman Britain (Volume 1), R. Carson & A. Burnett, 1979, p 25.

C250 Waddington — Antoniniani: 10
Lincolnshire — Folles: 2948
SK 98 64 — Deposited: (c 318 +)
1976
Few details.
a) Coin Hoards Volume 5, 1979, no. 178, The Royal Numismatic Society, London, p 57.
b) Recent Coin Hoards from Roman Britain Volume 1, R. Carson & A. Burnett, 1979, p 26-##.

C251 Waddington — Denarii: 5
Lincolnshire — Sestertius: 1
SK 98 64 — Dupondius: 1
1976 — Deposited: (c 138 +)
Some details.
a) Coin Hoards Volume 3, 1977, no. 145, The Royal Numismatic Society, London, p 57.
b) R.W. Higginbottom, Numismatic Chronicle, 1977, pp 52-53. [spurious reference]

C251n Walmersley — Antoniniani: 500-700
Lancashire — Deposited: (c 287-293 +)
SO 80 13
1864
Some Emperors listed.
a) W.T. Watkin, Roman Lancashire, p 241.
b) Transactions of the History Society of Lancashire and Cheshire, Volume 18, 1865-1856, p 279.
c) F. Havefield, 'Some notable Romano-British Inscriptions', Archaeological Journal, Volume 49, 1892, pp 215-233, Refrence p 224 n.
d) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 162.
e) N.Shiel, The Episode of Carausius and Allectus, British Archaeolgical Reports 40, 1977, pp 49-50.

C252 Warsop, Bury Lane — Folles: 341
Nottinghamshire — Deposited: (c 330 +)
SK 56 67
11 January 1973
RIC Nos.
a) Coin Hoards Volume 2, 1976, no. 297, The Royal Numismatic Society, London, p 74.
b) R.F. Bland & R.A.G. Carson, 'Warsop (Notts.) treasure trove of Constantinian folles', Numismatic Chronicle, 1974, Series 7, Volume 14, pp 53-64.

C252n Watchfield — Antononiani: 23
Berkshire — Deposited: (c 293-297 +)
SU 24 90
1905
Emperors listed.
a) Numismatic Chronicle, Series 4, Volume 6, 1907, p 5 [problematic reference].
b) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 163.
c) N. Shiel, The Episode of Carausius and Allectus, British Archaeological Reports 40, 1977, p 57.

C253 Wateringbury — Antoniniani: 10 +
Kent — Deposited: (c 265 +)
TQ 69 53
-
RIC Nos.
a) Coin Hoards Volume 4, 1978, no. 142, The Royal Numismatic Society, London, p 38.
b) Details in Ms. in B.M.

C254 Waternewton (Durobrivae)
Cambridgeshire
TL 10 97
1974
Few details.
a) Coin Hoards Volume 2, 1976, no. 304, p 75, The Royal Numismatic Society, London.
b) C. Johns & R.A.G. Carson in Durobrivae 3, 1975, pp 10-12.

Solidi: 29
Solidi copy: 1
Deposited: (c 350 +)

C255 Watling Court
Greater London
-
1980
MacDowall Nos. (The western Aes Coinage of Nero)
a) Coin Hoards from Roman Britain Volume 4, 1984, A.M. Burnett, p14.

Asses: 12 +
Deposited: (c 70 +)

C255f Wedmore, Cocklade
Somerset
ST 43 47
20 May 1926 or 1927
Possibly one or two hoards, some emperors listed.
a) Anon., 'Hoard of Roman coins from Somerset', Antiquaries Journal, Volume 8, 1928, p 97.
b) Journal of Roman Studies, Volume 17, 1927, p 205.
c) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 163 (as if two hoards).
d) N. Shiel, The Episode of Carausius and Allectus, British Archaeological Reports 40, 1977, p 57.

Antoniniani: 54
Deposited: (c 293-296 +)

C255n Well
Lincolnshire
TF 44 73
1725
Few details.
a) C.W. Phillips, 'The present state of archaeology in Lincolnshire', Archaeological Journal, Volume 91, 1934, pp 97-187, Reference p 185.
b) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 162.
c) N.Shiel, The Episode of Carausius and Allectus, British Archaeolgical Reports 40, 1977, p 50.

Antoniniani: 600-700
AV: ?
Deposited: (c 287-293 +)

C255p Well Street/Jewin Street
London
TQ 29 79
c.1847
Some Emperors listed.
a) Anon., 'Miscellanea', Numismatic Chronicle, Series 1, Volume 9, 1847, p 85.
b) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 156.

Denarii: 70-80
Deposited: (c 138-161 +)

C255q Welney
Cambridgeshire
TL 5294
1718
Few details.
a) Stukley's Letters and Diaries, Volume 2, p 22.
b) Victoria County History, Norfolk, p 332.
c) G.E. Fox, 'Roman Norfolk', Archaeological Journal, Volume 46, 1889, pp 331-367, Reference p 365.
d) N.Shiel, The Episode of Carausius and Allectus, British Archaeolgical Reports 40, 1977, p 50.

Antoniniani: several 'urns'
Deposited: (c 287-293 +)

C256 Welwyn, Glebe Road
Hertfordshire
TL 22 16
19th September 1961
RIC & Elmer Nos.
a) R.A.G. Carson, 'The Welwyn treasure trove of Roman imperial denarii', Numismatic Chronicle, Series 7, Volume 9, 1969, pp 143-144.

Denarii: 5
Antoniniani: 145
Deposited: (c 270 +)

C256n Wentwood Mill — Antoniniani: 1200-1300
Mons. — Deposited: (c 290-293 +)
ST 41 94
1860
Some details, 1051 coins in Cardiff.
a) Numismatic Chronicle, Series 3, Volume 10, 1890, pp 260ff.
b) J. Lee, Isca Silurum, p 83.
c) R.E.M. Wheeler, 'Roman Coin Hoards in Wales', Bulletin of the Board of Celtic Studies, Volume 1, 1923, pp 345-352.
d) G.C. Boon, 'The Penard Imperial Hoard: an interim report and a list of Roman hoards in Wales', Bulletin of the Board of Celtic Studies, Volume 22, 1967, pp 291-310, Reference p 306.
e) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 162.
f) 'Proceedings...', Journal of the British Archaeological Association, Volume 23, 1867, p 394.
g) N.Shiel, The Episode of Carausius and Allectus, British Archaeolgical Reports 40, 1977, p 50.

C257 Westgate — Denarii: 9
Durham — Deposited: (c 170 +)
NY 9062 9914
May 1983
BMC Nos.
a) Coin Hoards from Roman Britain Volume 6, 1986, A.M. Burnett, pp 29-30.

C258 Westmeston — Denarii: 9
East Sussex — Deposited: (c 140 +)
TQ 340 130
April 1985
BMC Nos.
a) Coin Hoards from Roman Britain Volume 6, 1986, D.R. Rudling, pp 25-26.

C259 Westmeston — Antoniniani: 61
East Sussex — Deposited: (c 273-274 +)
TQ 340 130
1984
RIC & Elmer Nos.
a) Coin Hoards from Roman Britain Volume 6, 1986, D.R. Rudling, pp 143-146.

C260 Westmoor, Chatteris — Antoniniani: 34
Cambridgeshire — Deposited: (c 273 +)
TL 37 86
pre 1960
RIC Nos.
a) Coin Hoards Volume 4, 1978, no. 149, p 39, also D.C.A. Shotter, p48, The Royal Numismatic Society, London.

C260n Weston Longville, near Attlebridge — Iceni: 200-300
Norfolk — Denarii: 2
TG 11 15 — Deposited: (c 60-61 +)
20th March 1852
Some details.
a) C. Roach-Smith, 'British Silver coins recently found at Weston in Norfolk', Numismatic Chronicle, Series 1, Volume 15, 1853, pp 98-102.
b) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 154.

C261 Weston, Green Farm — Denarii: 12
Cheshire — Deposited: (c 134-138 +)
? SJ 69 52
August 1982
RIC Nos.
a) Coin Hoards from Roman Britain Volume 6, 1986, I.A. Carradice, p 23.

C262 ? Weymouth *problem hoard*
? Dorset
? SY 67 79
pre 1927
Cohen Nos.
a) A.S. Robertson, 'A Find of Roman Brass coins from Weymouth (?) Dorset', Numismatic Chronicle, Series 6, Volume 9, 1949, pp 252-253.
[Note: This is a Folles hoard of c. 307. There are no coins from the London mint, and few from Trier. I cannot see this hoard originally being found in Britain]

C262n Wheathampstead
Hertfordshire
TL 17 14
1932
Emperors listed for 41 coins.
Denarii: 100
Deposited: (c 118 +)
a) R.E.M. and T.V. Wheeler, Verulamium, A Belgic and Two Roman Cities, Oxford, 1936, p 17-18.
b) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 155.

C262q Whichwood Forest, Roustage
Oxfordshire
?
March 1858
Some details.
Iron Age AV: 1
AE2: 4
Deposited: (c ### +)
a) A.W. Franks, 'Miscellanea', Numismatic Chronicle, New Series, Volume 3, 1863, p 145.
b) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 154.

C263 Whitchurch
Somerset
? ST 63 53
c 1870
Few details.
Radiate Copies: 'hundreds'
Deposited: late 3rd century
a) C.H.V. Sutherland, 'The Whitchurch Hoard of Radiate Minimi', Numismatic Chronicle, Series 5, Volume 15, 1935, pp 16-20.
b) Victoria County History, Somerset.
c) J.H. Nicholls, Archaeological Journal, Volume 27, 1870, p 69 f.

C263n Whitchurch Wier (Thames)
Oxfordshire
? SU 63 77
June 1911
Emperors listed.
AE1: 1
AE2: 33
Deposited: (c 161-180 +)
a) Victoria County History, Oxfordshire, Volume 1, p 327.
b) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 157.

C264 Wickham Market
Suffolk
TM 3013 5639
3rd October 1983
RIC, Elmer & Cunetio Nos.
Antoniniani: 1562
Radiate Copies: 26
Deposited: (c 273 +)
a) Coin Hoards from Roman Britain Volume 6, 1986, A.M. Burnett, R.F. Bland & J. Plouviez, pp 119-142.

C265 Wigan, Standish
Greater Manchester (Lancashire)
SD 58 05
1926
Few details.
Denarii: 131
Deposited: (c 222 +)
a) Journal of Roman Studies, Volume 16, 1926, p 220.
b) Coin Hoards Volume 4, 1978, no. 125, The Royal Numismatic Society, London, p 36.
c) to be published by D.A.C. Shotter.

C265n Wilcote
Oxfordshire
SP 37 15
pre 1939
Emperors listed.
Sestertii: 25
Deposited: (c 43-54 +)
a) Victoria County History, Oxfordshire, Volume 1, p 326.
b) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 154.

C266 Willingdon, Combe Hill
East Sussex
TQ 577 025
1980
RIC & Elmer.
Sestertii: 4
Antoniniani: 140
Deposited: (c 273 +)
a) Coin Hoards from Roman Britain Volume 6, 1986, D.R. Rudling, pp 147-155.

C267 Wimblington, Stonea Grange
Cambridgeshire
TL 44 93
1848
Details of 52 Coins exist.
Antoniniani: c 2000
Deposited: (c 273 +)
a) A.S. Robertson, 'A Roman coin hoard from Wimblington, Cambs.', Numismatic Chronicle, Series 5, Volume 19, 1939, pp 177-178.
b) Babington, Ancient Cambridgeshire, Cambridgeshire Antiquarian Society's Publications, Volume 20, 1883, p 87.

C268 Winchester
Hampshire
SU 48 29
1946
Emperors, types & mints.
Folles: 30
Deposited: (c 333+)
a) H. Mattingly, 'A small hoard from Winchester', Numismatic Chronicle, Series 6, Volume 6, 1946, pp 152-153.

C269 Winterbourne Earls
Wiltshire
SU 17 34
1865
Cohen Nos.
Folles: 32
Deposited: (c 307 +)
a) A.S. Robertson, 'Two Hoards of Roman Coins from Wiltshire', Numismatic Chronicle, Series 6, Volume 9, 1949, pp 245-253.

C270 Wint Hill, Branwell
Somerset
?
Summer 1967
Some Emperors listed.
Antoniniani: 30
Deposited: (c 286 +)
a) Coin Hoards Volume 1, 1975, no. 203, The Royal Numismatic Society, London, p 53.
b) P. Curnow, 'Roman coins from Wint Hill, Branwell, Somerset', Numismatic Chronicle, Series 7, Volume 11, 1971, pp 227-235.

C270a near Wirksworth
Derbyshire
c. SK 30 54
1735
Some Emperors mentioned.
Denarii: 83
Deposited: (c 161-180 +)
a) Victoria County History, Derbyshire, Volume 1, p 262.
b) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 156.

C271 Wisbeach
Lincolnshire
-
1948
RIC Nos.
Antoniniani: 9
Deposited: (c 293 +)
a) Coin Hoards Volume 4, 1978, no. 156, p 40, also D.C.A. Shotter, p 48, The Royal Numismatic Society, London.

C272 Woodcaton
Oxfordshire
SP 53 11
pre 1930
Mints given.
Antoniniani: 2
Radiate Copies: 4
Folles: 1469
Irregular Folles: 90
Deposited: (c 338-339 +)
a) Coin Hoards Volume 5, 1979, no. 182,
The Royal Numismatic Society, London, p 58.
b) C.E. King, 'The Woodeaton (Oxfordhire) hoard and the problem of Constantinian imitations, AD 330-341', Numismatic Chronicle, 1978, pp 38-65

C273 Wookey Hole — Antoniniani: 15
Somerset — Deposited: (c 274 +)
ST 53 47
1975
Few Details.
a) Coin Hoards Volume 2, *1976, no. 276, The Royal Numismatic Society, London, p 71.*
b) to be published by G.C. Boon in Pro. Univ. Bristol Spelaeological Society

C274 Woolaston — Folles: c 250
Gloucestershire — Deposited: (c 341-348 +)
ST 58 99
1887-8
Emperors, types & mints for a sample of 206.
a) M.E. Bagnall Oakley, 'Coins found at Caerwent, Caerleon', Numismatic Chronicle, Series 3, Volume 10, 1890, pp 260-266, Reference p 262.
b) G.C. Boon, 'Part of a Constantinian hoard from Woolaston, Glos. (1887-8)', Numismatic Chronicle, Series 6, Volume 20, 1960, pp 267-270.

C274n Woolmer Pond — AE: c 200
Hampshire — Deposited: (c 192 +)
SU 78 31
1740's
Few details.
a) Victoria County History, Hampshire, Volume 1, p 340.
b) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 157.

C275 Worcester — As: 1
Hereford & Worcestershire (Worcestershire) — Irregular Asses: 7
SO 85 55 — Irregular Dupondii: 2
February 1963 — Deposited: (c 60 +)
RIC Nos.
a) C.H.V. Sutherland, 'A late Julio-Claudian aes hoard from Worcester', Numismatic Chronicle, Series 7, Volume 3, 1963, pp 57-59.

C276 Worden, near Leyland — Antoniniani: 126
Lancashire — Deposited: (c 276-282 +)
SD 53 20
1850
RIC Nos.
a) W.T. Watkin, Roman Lancashire, 1886, p 236
b) A.S. Robertson, 'Roman Coins in the Harris Museum, Preston', Numismatic Chronicle, Series 6, Volume 8, 1948, pp 214-216.

C277 Worthing, Mill Road — Radiate Copies: 2068
West Sussex — Deposited: (3rd Century ?)
SQ 1337 0285
June 1958
Few details.
a) G.D. Lewis & H.B. Mattingly, 'A hoard of barbarous radiates from Mill Road, Worthing', Numismatic Chronicle, Series 7, Volume 4, 1964, pp 189-199.

C277f Wroxeter — Denarii & Dupondii: 23
Shropshire — Deposited: (c 121-122)
SJ 56 08
c.1914
Emperors listed, but not denominations.
a) J.P. Bushe-Fox, Third Report on the Excavations on the site of the Roman Town at Wroxeter, Shropshire, 1914, Society of Antiquaries of London, Oxford, 1916, pp 70-71.
b) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 155.

C277h Wroxeter
Shropshire
SJ 56 08
c.1914
Emperors listed, but not denominations.
a) J.P. Bushe-Fox, Third Report on the Excavations on the site of the Roman Town at Wroxeter, Shropshire, 1914, Society of Antiquaries of London, Oxford, 1916, pp 70-71.
b) C.H.V. Sutherland, Coinage and Currency in Roman Britain, 1937, London, p 155.

Denarii & Dupondii: 20
Deposited: (c 121-122)

C277n Wroxeter
Salop.
SJ 56 08
c.1912
Emperors listed.
a) J.P. Bushe-Fox, Excavations on the site of the Roman Town at Wroxeter 1912-1914, 1913, p 72.
b) N.Shiel, The Episode of Carausius and Allectus, British Archaeolgical Reports 40, 1977, p 51.

Antoniniani: 12
Carausian Denarii: 4
Deposited: (c 287-293 +)

C278 Wroxton Heath, Banbury
Oxfordshire
SP 41 41
Spring 1950
RIC Nos.
a) C.H.V. Sutherland, 'A hoard of Roman folles from Wroxton Heath near Banbury, Oxon.', Numismatic Chronicle, Series 6, Volume 14, 1954, pp 62-67.

Antoniniani: 3
Folles: 133
Deposited: (306-317 +)

C279 York, Hovingham Park
North Yorkshire
SE 6592 7548
1980
RIC Nos.
a) Coin Hoards from Roman Britain Volume 5, 1984, A.M. Burnett, pp 116-18.

Siliquae: 43
Irregular SIliquae: 1
Deposited: (c 410-420 +)
% clipped siliquae 13.6%

C280 York, Langwith
North Yorkshire
-
1891
Emperors & types for a sample of 1453.
a) Report of the Yorkshire Philosophical Society for 1913, p 12
b) Spink's Nimismatic Circular, 1924, Cols. 432 ff.
c) A.S. Robertson, 'A Hoard of Constantinian Coins from Langwith, York', Numismatic Chronicle, Series 5, Volume 16, 1936, pp 235-244.

Folles: c 6000
Deposited: (c 341-348 +)

C281 Yorkshire (?)
Yorkshire
-
pre 1952
RIC Nos.
a) E.J.W. Hildyard & W.V. Wade, 'A third century Roman hoard from Yorkshire (?)', Numismatic Chronicle, Series 6, Volume 12, 1952, pp 130-131.

Antoniniani: 32 +
Deposited: (c 270-273 +)

Unprovenenced Hoards, ordered by date of discovery

C282 ? England, West Country
N.A.
N.A.
pre 1934
Some types listed.
a) C.H.V. Sutherland, 'A Hoard of Radiate Minimi from the West of England', Numismatic Chronicle, Series 5, Volume 14, 1934, pp 92-105.

Antoniniani: 6
Radiate Copies: 317
Deposited: (c 270-273 +)

C283 ? Britain
N.A.
N.A.
pre 1939
Emperors listed.
a) H. Mattingly, 'The Great Dorchester Hoard of 1936', Numismatic Chronicle, Series 5, 1939, Volume 19, pp 32-33.

Denarii: 29
Antoninaini: 290
Deposited: (c 260 +)

C284 ? Britain
N.A.
N.A.
pre 1943
RIC Nos.
Denarii: 147
Deposited: (c 230-235 +)
a) C.H.V. Sutherland, 'A hoard of Roman Denarii of the Early third century', Numismatic Chronicle, Series 6, Volume 3, 1943, pp 99-101.

C285 ? England
N.A.
N.A.
pre 1975
Emperors given.
Antoniniani: 988
Deposited: (c 273 +)
a) Coin Hoards Volume 3, 1977, no. 177, The Royal Numismatic Society, London, p 62.
b) L. Villaronga, (to be published), found in trade in Barcelona 1975.

C286 ? England
N.A.
N.A.
Few details.
Siliquae: 74
Deposited: (c 388 +)
pre 1975
a) Coin Hoards Volume 3, 1977, no. 211 + 215, The Royal Numismatic Society, London, p 68.
b) Trade list: M.J. Vincenzi, Sales List, Colchester, September 1975, items 38-51.
c) Trade list: Irelands (Norwich), Sale Catalogue 20th October 1976, Lots Nos. 730-759 & 25th January 1977 Lots Nos. 790-819.

Appendix 2.22
Denarii in Coin Hoards

This appendix is divided into four parts. Part 1 contains summary information and details of denarii from Group D1 to D5; part 2 records D6-22; part 3 records D23-39 and part 4 records D40-57 denarii. The hoards are in chronological order. Italics denote copies. The value 0 denotes a missing data code.

Part 1; Groups D1 to D5

Ref.No.	Hoard Name	Date	Av	Status	Count	No.	1	2	3	4	5
C 060	Chippenham	c.41	(41)	Full	OK	37	22	3	12	.	.
C 143f	Lightcliffe	c.43	(43)	Part	No	24	21	.	3	.	.
C 003q	Almondbury	c.43	(43)	Full	OK	200	200	.	.	.	
C 006n	Ayott St Lawrence	c.43	(43)	Part	OK	200	11	.	9	.	.
C 157	*London*	41 to 54	(47)	Full	OK	*89*	*33*	*10*	*44*	*1*	.
C 188n	Nunney	43 to 54	(48)	Full	OK	4	3	.	1	.	.
C 241	Usk, Hoard 1	55 to 57	(56)	Full	OK	6	2	.	1	3	.
C 103	Eriswell	60 to 61	(60)	Full	OK	72	37	8	25	1	1
C 221	Scole	60 to 61	(60)	Full	OK	87	49	15	22	.	1
C 260n	Weston Longville	60 to 61	(60)	Full	OK	2	1	.	1	.	.
S 082	Glamis	c.68	(68)	None	No	0	.	.	.	.	.
S 024	Brough	c.73	(73)	None	No	0	.	.	.	.	.
C 146n	Little Chester	69 to 79	(74)	Poor	No	0	1	.	1	.	.
C 128q	Honley	69 to 79	(74)	Full	OK	13	12	.	.	.	1
S 176	York, Blake Street	c.74	(74)	Full	OK	35	3	.	10	.	3
C 036	Budge Row	78 to 79	(78)	Part	No	74	25	12	14	1	2
S 014	Binnington Carr	c.78	(78)	Full	OK	12	1	.	.	.	1
S 080	Gillingwood Hall	c.79	(79)	None	OK	14	.	.	.	.	.
C 179	Mildenhall	80 to 85	(82)	Full	OK	277	80	41	32	.	8
C 130	The Howe	c.87	(87)	Full	OK	75	30	4	14	.	2
C 151n	Llanfaethlu	c.87	(87)	Full	OK	32	11	6	7	.	1
C 005s	Askham	81 to 96	(88)	None	No	14	.	.	.	.	.
C 064	Cirencester	c.94	(94)	Full	OK	22	9	2	.	.	.
C 240n	Upton	c.96	(96)	None	OK	20	.	.	.	.	.
C 176	Mereclough	c.98	(98)	Part	No	12	6	1	1	.	.
S 142	Shap	c.98	(98)	None	OK	580	.	.	.	.	.
S 058	Corbridge 1914	c.99	(99)	Full	OK	32	3	1	.	.	1
C 036n	Bulwick	98 to 117	(107)	None	No	100	.	.	.	.	.
C 222f	Selston	98 to 117	(107)	None	No	0	.	.	.	.	.
C 141q	Lavenham	98 to 117	(107)	Full	OK	197	.	3	2	1	4
C 190q	Oughtibridge	103 to 111	(107)	Full	OK	5	.	.	.	.	.
C 246	Verulamium	c.117	(117)	Full	OK	49	16	5	1	1	.
C 246	*Verulamium*	c.117	(117)	Full	OK	*1*	.	.	.	.	.
S 078	Gateshead	c.118	(118)	None	No	0	.	.	.	.	.
S 151	Sowerby	c.118	(118)	None	No	0	.	.	.	.	.
C 139	Lancaster	c.118	(118)	Full	OK	100	4	1	.	.	.
C 262n	Wheathampstead	c.118	(118)	Part	OK	100	18	1	2	.	.
S 011	Bewcastle	c.118	(118)	None	OK	30	.	.	.	.	.
S 093	Howstean Beck	c.118	(118)	None	OK	40	.	.	.	.	.
S 106	Lancaster	c.118	(118)	Part	OK	100	4	1	.	.	.
S 164	Wallsend	c.118	(188)	Full	OK	14	5	1	.	.	.
C 141	Lathom, Ormskirk	c.120	(120)	Full	OK	125	30	1	.	.	1
S 059	Corbridge 1965	119 to 122	(120)	Full	OK	6	.	.	.	.	.
S 155	Thorngrafton	119 to 122	(120)	Full	OK	60	9	.	.	.	1
C 277f	Wroxeter	121 to 122	(121)	None	No	0	.	.	.	.	.
C 277h	Wroxeter	121 to 122	(121)	None	No	0	.	.	.	.	.
C 028n	Brecon, Y Gaer	c.121	(121)	Full	OK	9	.	.	.	.	.

Ref.No.	Hoard Name	Date	Av	Status	Count	No.	1	2	3	4	5
S 015	Birdoswald	c.122	(122)	Full	OK	30	11	6	1	.	1
S 016	Birdoswald	c.122	(122)	Full	OK	28	7	1	.	.	1
S 087	Harrogate (near...)	100 to 150	(125)	None	No	6	.	.	.	.	.
S 084	Great Chesters	c.125	(125)	Part	OK	20	.	.	.	.	.
C 084	Dewsbury	117 to 138	(127)	Full	OK	26	.	.	.	.	.
C 228	Southants. (?)	117 to 138	(127)	Full	OK	15	11	2	1	.	.
C 228	*Southants .(?)*	117 to 138	(127)	Full	OK	2	*1*	.	.	.	.
S 056	Corbridge 1911c	c.128	(128)	Full	OK	7	.	.	.	.	.
S 113	Lochar Moss	70 to 200	(135)	None	OK	16	.	.	.	.	.
C 261	Weston	134 to 138	(136)	Full	OK	12	.	.	.	.	.
S 114	Mallerstang	134 to 138	(136)	Full	OK	138	.	.	.	.	.
C 236	Swaby	137 to 138	(137)	Full	OK	178	.	6	.	.	3
S 034	Carlisle	c.138	(138)	None	No	0	.	.	.	.	.
S 067	Deskford	c.138	(138)	None	No	27	.	.	.	.	.
S 101	Lanark	c.138	(138)	None	No	0	.	.	.	.	.
S 167	Westgate	c.138	(138)	None	No	15	.	.	.	.	.
C 159	Londonthorpe	c.138	(138)	None	OK	420	.	.	.	.	.
C 251	Waddington	c.138	(138)	None	OK	5	.	.	.	.	.
S 037	Carlisle	c.138	(138)	Full	OK	62	.	.	.	.	1
S 116	*Maryport*	c.138	(138)	Full	OK	*17*	.	.	.	.	.
S 003	Backworth	c.139	(139)	None	OK	280	.	.	.	.	.
C 258	Westmeston	c.140	(140)	Full	OK	9	.	.	.	.	.
S 112	Linlithgow	c.140	(140)	Part	OK	300	.	.	.	.	.
S 119	Mindrum	c.141	(141)	None	OK	600	.	.	.	.	.
C 127n	Hengistbury Head	140 to 144	(142)	Full	OK	24	4	.	2	.	.
S 127	Norton, Malton	143 to 144	(143)	Full	OK	39	.	1	.	.	.
S 005	Bar Hill	c.144	(144)	Full	OK	2	.	1	.	.	.
S 005	*Bar Hill*	c.144	(144)	Full	OK	*11*	.	.	.	.	.
S 031	Carlisle	c.144	(144)	Part	OK	100	.	.	.	.	1
S 161	Ugthorpe	c.147	(147)	None	No	0	.	.	.	.	.
S 098	Kirkintilloch	c.147	(147)	Full	OK	47	.	.	.	.	.
C 165q	March	138 to 161	(149)	None	No	100	.	.	.	.	.
C 154	Llanynynech Hill	c.149	(149)	Full	OK	33	.	1	.	.	.
C 255p	Well St./Jewin St.	138 to 161	(149)	None	OK	75	.	.	.	.	.
C 052	Chalfont St. Giles	c.150	(150)	Full	OK	40	.	.	.	.	.
C 053	Chatburn	c.150	(150)	Bias	OK	1000	.	1	.	.	2
S 180	York, Post Office	c.152	(152)	Full	OK	14	.	.	.	.	.
S 060	Corbridge 1969	145 to 161	(153)	Full	OK	12	.	.	.	.	.
C 158	Londonthorpe	c.154	(154)	Full	OK	420	.	7	.	.	4
S 129	Piercebridge	156 to 157	(156)	Full	OK	6	.	.	.	.	.
C 187n	Nottingham	157 to 161	(159)	Full	OK	19	.	.	.	.	.
C 212	Pyrford	159 to 160	(159)	Full	OK	82	.	.	.	.	.
S 070	Edinburgh	c.160	(160)	None	No	0	.	.	.	.	.
S 135	Rudchester	c.160	(160)	Full	OK	471	.	8	.	.	8
S 166	West Calder	c.161	(161)	None	No	0	.	.	.	.	.
C 005	Allerton Bywater	c.162	(162)	Full	OK	296	.	11	.	.	6
C 249	Waddington	c.162	(162)	Full	OK	16	.	.	.	.	.
C 215	Ribchester	c.165	(165)	Full	OK	9	.	1	.	.	.
C 085	Dewsbury	c.166	(166)	Full	OK	27	.	.	.	.	.
C 198	Piercebridge	164 to 169	(166)	Full	OK	8	.	.	.	.	.
S 086	Hampsthwaite	c.169	(169)	Full	OK	9	.	.	.	.	.
C 005q	Ashwell	161 to 180	(170)	None	No	500	.	.	.	.	.
C 086n	Doncaster (near...)	161 to 180	(170)	None	No	20	.	.	.	.	.
C 098n	Elmham, north	161 to 180	(170)	None	No	0	.	.	.	.	.
C 128s	Horseheath	161 to 180	(170)	None	No	0	.	.	.	.	.
C 174f	Melton Magna	161 to 180	(170)	None	No	19	.	.	.	.	.
C 257	Westgate	c.170	(170)	Part	No	9	.	.	.	.	.

Ref.No.	Hoard Name	Date	Av	Status	Count	No.	1	2	3	4	5
C 006q	Babworth	161 to 180	(170)	None	OK	29	.	.	.	.	.
C 017n	Benacre	161 to 180	(170)	None	OK	920	.	.	.	.	.
C 039n	Caistor St Edmund	161 to 180	(170)	Full	OK	20	.	.	1	.	.
C 048q	Castle Thorpe	c.170	(170)	None	OK	20	.	.	.	.	.
C 062n	Cilhaul	161 to 180	(170)	None	OK	200	.	.	.	.	.
C 125n	Hanwell	161 to 180	(170)	None	OK	70	.	.	.	.	.
C 136	Knapwell	c.170	(170)	Full	OK	78	.	.	.	.	.
C 184q	Naseby	161 to 180	(170)	Full	OK	38	.	.	.	.	.
C 193q	Parwich Hill	161 to 180	(170)	Full	OK	80	.	1	.	.	2
C 222h	Sheffield	161 to 180	(170)	None	OK	35	.	.	.	.	.
C 270a	Wirksworth	161 to 180	(170)	None	OK	83	.	.	.	.	.
C 028	Braughing	c.171	(171)	Full	OK	61	.	.	.	.	.
S 033	Carlisle	c.172	(172)	None	No	0	.	.	.	.	.
S 069	Drummond Castle	c.172	(172)	None	No	0	.	.	.	.	.
S 131	Pitcullo	c.172	(172)	None	No	19	.	.	.	.	.
C 121	*Gurnard*	170 to 174	(172)	Full	OK	*15*	.	.	.	.	.
S 181	York, Railway St.	c.172	(172)	None	OK	200	.	.	.	.	.
C 001	Aldworth	176 to 177	(176)	Full	OK	75	.	1	.	.	.
C 048n	Castle Bromwich	c.177	(177)	Full	OK	181	.	5	.	.	.
C 048n	*Castle Bromwich*	c.177	(177)	Full	OK	*18*	.	*1*	.	.	.
C 206	Poughill	c.177	(177)	Full	OK	28	.	.	.	.	.
C 011n	Beachamwell	177 to 180	(178)	Part	OK	50	1	.	.	.	.
C 097	Edwinstone	177 to 180	(178)	Full	OK	368	.	.	.	.	1
C 097	*Edwinstone*	177 to 180	(178)	Full	OK	*1*	.	.	.	.	.
S 019	Braco, Shotts	c.180	(180)	Poor	No	0	1	.	.	.	.
C 227n	Slay Hills Saltings	c.180	(180)	Full	OK	15	.	.	.	.	1
S 154	Taymouth	c.180	(180)	None	OK	13	.	.	.	.	.
S 158	Torfoot	c.180	(180)	None	OK	400	.	.	.	.	.
S 097	Kirkby Thore	180 to 183	(181)	Full	OK	234	.	.	.	.	2
C 022	Blerchley	c.183	(183)	Full	OK	296	.	9	.	.	3
S 146	South Shields	c.185	(185)	Full	OK	120	.	.	.	.	3
C 010	Barway	180 to 192	(186)	Full	OK	433	.	2	.	.	3
C 033	Brixworth	180 to 192	(186)	Full	OK	25	.	.	.	.	.
C 162n	Lydney (near...)	180 to 192	(186)	Full	OK	155	.	1	.	.	1
C 162	Lowestoft	186 to 189	(187)	Full	OK	38	1	.	.	.	.
S 022	Briglands	c.187	(187)	Full	OK	180	.	.	.	.	2
C 193f	Oxnead	c.193	(193)	None	No	0	.	.	.	.	.
S 048	Chesters	c.193	(193)	None	No	0	.	.	.	.	.
S 063	Cowie Moss	c.193	(193)	None	No	0	.	.	.	.	.
S 110	Leuchars	c.193	(193)	None	OK	100	.	.	.	.	.
C 223	Silchester Hoard 1	194 to 195	(194)	Part	No	258	.	9	.	.	4
C 125	Handley	194 to 195	(194)	Full	OK	639	.	20	.	.	3
C 120	Great Melton	c.195	(195)	Full	OK	190	.	6	.	.	2
C 193	Owston Ferry	c.196	(196)	Full	OK	4	.	1	.	.	.
S 132	Portmoak	196 to 197	(196)	Part	OK	600	.	1	.	.	1
C 003n	Alfreton	193 to 211	(202)	None	OK	2500	.	.	.	.	.
S 115	Malton	201 to 206	(203)	Full	OK	8	.	.	.	.	.
S 117	Hill of Megray	202 to 210	(206)	Part	OK	200	.	.	.	.	.
C 199	Piercebridge	203 to 211	(207)	Full	OK	6	.	.	.	.	.
C 199	*Piercebridge*	203 to 211	(207)	Full	OK	*15*	.	.	.	.	.
C 032	Bristol	c.208	(208)	Full	OK	1476	.	60	.	.	10
C 183	Muswell Hill	c.209	(209)	Full	OK	153	.	10	.	.	2
C 165n	Mansfield	209 to 212	(210)	None	OK	350	.	.	.	.	.
S 039	Carrawburgh	c.212	(212)	Full	OK	66	.	5	.	.	.
C 081	Darfield 4	c.213	(213)	None	No	500	.	.	.	.	.
C 079	Darfield 2	c.213	(213)	Full	OK	500	.	5	.	.	11
C 019	*Billingsgate*	212 to 217	(214)	Full	OK	*142*	.	.	.	.	.

Ref.No.	Hoard Name	Date	Av	Status	Count	No.	1	2	3	4	5
C 051	Chadwell St Mary	213 to 217	(215)	Full	OK	100	.	4	.	.	1
S 122	Nawton	217 to 218	(217)	Full	OK	33	.	.	.	.	.
C 004	Akenham	c.222	(222)	Full	OK	59	.	1	.	.	.
C 265	Wigan, Standish	c.222	(222)	None	OK	131	.	.	.	.	.
C 068n	Colchester	c.223	(223)	Full	OK	32	.	.	.	.	.
C 096	Edlington Wood	c.225	(225)	Full	OK	23	.	2	.	.	.
C 149	Llanarmon Dyff...	c.226	(226)	Part	OK	548	.	12	.	.	1
C 220	Saint Mary Cray	c.226	(226)	Full	OK	376	.	6	.	.	.
C 221f	Segontium	c.226	(226)	Full	OK	9	.	.	.	.	.
C 193h	Padfield	222 to 235	(228)	None	No	8	.	.	.	.	.
C 043	Camborne Villa	222 to 235	(228)	Full	OK	13	.	.	.	.	.
C 089n	East Anglia	222 to 235	(228)	Full	OK	3062	.	.	.	.	2
C 188	Nuneaton	222 to 235	(228)	Full	OK	29	.	1	.	.	.
C 246f	Verulamium	227 to 229	(228)	Full	OK	5	.	.	.	.	.
S 092	Housteads	c.229	(229)	Full	OK	5	.	.	.	.	.
S 071	Falkirk	c.230	(230)	Full	OK	1931	1	17	.	.	2
C 284	? Britain	230 to 235	(232)	Full	OK	147	.	2	.	.	.
C 036s	Cadeby	235 to 238	(236)	Part	No	28	.	.	.	.	.
C 078q	Darfield I	235 to 238	(236)	Wait	OK	480	.	11	.	.	3
C 135	Kirkham	c.238	(238)	Full	OK	35	.	.	1	.	.
C 058	Chesterfield	238 to 244	(241)	Full	OK	19	.	.	.	.	.
C 030n	Brighton (near...)	244 to 249	(246)	None	No	1000	.	.	.	.	.
S 173	York	c.246	(246)	None	OK	224	.	.	.	.	.
C 099	Elveden	c.248	(248)	Full	OK	964	.	.	.	.	.
C 119	Great Chesterford	247 to 249	(248)	Full	OK	35	.	.	.	.	.
C 155	London, Lime St.	c.251	(251)	None	No	0	.	.	.	.	.
S 162	Upper Holker	c.253	(253)	None	OK	524	.	.	.	.	.
C 087	Dorchester	c.257	(257)	Full	OK	16	.	.	.	.	.
C 093	Edlington Wood	c.259	(259)	Full	OK	436	.	.	.	.	.
C 173	Mattishall	c.259	(259)	Full	OK	753	.	.	.	.	.
C 009	Barton on Humber	c.260	(260)	Full	OK	56	.	.	.	.	.
C 041	Caistor by Yarm...	c.260	(260)	Full	OK	664	.	7	.	.	1
C 168	March, Flaggrass	c.260	(260)	Full	OK	1	.	.	.	.	.
C 283	? Britain	c.260	(260)	Full	OK	29	.	.	.	.	.
C 069	Colchester	c.269	(269)	Full	OK	14	.	.	.	.	.
C 115	Gare, Sett Bridge	c.270	(270)	Full	OK	7	.	.	.	.	.
C 178	Mildenhall	c.270	(270)	Full	OK	1	.	.	.	.	.
C 222	Selsey	c.270	(270)	Full	OK	9	.	.	.	.	.
C 256	Welwyn	c.270	(270)	Full	OK	5	.	.	.	.	.
C 024	Bonnington	270 to 273	(271)	Part	No	1	.	.	.	.	.
C 124	Ham Hill	270 to 273	(271)	Full	OK	1	.	.	.	.	.
C 170	Market Deeping	272 to 273	(272)	Full	OK	11	.	.	.	.	.
C 070	Colchester	c.273	(273)	Full	OK	3	.	.	.	.	.
C 167	March, Flaggrass	c.273	(273)	Full	OK	1	.	.	.	.	.
C 015	Beachy Head	c.274	(274)	Full	OK	28	.	.	.	.	.
C 105	Exeter	250 to 300	(275)	None	No	0	.	.	.	.	.
S 020	Hawkhurst	c.276	(276)	Poor	No	1	.	.	.	.	.
C 128	Hollingbourne	276 to 282	(279)	Full	OK	2	.	.	.	.	.
C 098	Ellesmere	c.280	(280)	Full	OK	7	.	.	.	.	.
C 237n	Thurstonland	287 to 293	(290)	None	No	1	.	.	.	.	.
C 010n	Bath	295 to 296	(295)	Full	OK	92	16	6	1	.	5
C 011	Bath (near...)	295 to 296	(295)	Full	OK	1	.	.	.	.	.
A 022	Fincham	c.395	(395)	Full	OK	1	.	.	.	.	.
S 010	Berwick on Tweed	?	(?)	None	No	0	.	.	.	.	.
S 143	Silver Burn	?	(?)	None	No	0	.	.	.	.	.
S 178	York, Foss Islands	?	(?)	None	OK	200	.	.	.	.	.

Total 217 hoards

The Denarius component of Coin Hoards; Raw Data
Part 2; Groups D6 to D22

Up until S176 (c.74AD) there are no occurrences of Group D6-D22 coins in hoards. Therefore these hoards have been left out of the following table.

Ref.N°	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
S 176	1	5	.	1	12	.	.	.	.	.	.	.	.	.	.	.	.
C 036	.	2	.	.	18	.	.	.	.	.	.	.	.	.	.	.	.
S 014	.	3	.	.	7	.	.	.	.	.	.	.	.	.	.	.	.
S 080	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 179	2	7	1	1	90	7	1	7	.	.	.	.	.	.	.	.	.
C 130	1	.	1	.	14	2	3	2	1	.	.	.	.	.	.	.	.
C 151n	.	1	.	.	3	.	1	1	1	.	.	.	.	.	.	.	.
C 005s	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 064	.	1	.	.	7	1	.	.	2	.	.	.	.	.	.	.	.
C 240n	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 176	1	.	.	.	.	.	.	1	.	2	.	.	.	.	.	.	.
S 142	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
S 058	2	3	.	.	12	1	3	2	4	.	.	.	.	.	.	.	.
C 036n	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 222f	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 141q	4	4	1	.	65	.	23	.	42	6	28	.	.	.	.	.	.
C 190q	.	.	.	.	1	.	1	.	1	.	2	.	.	.	.	.	.
C 246	.	1	.	.	7	1	1	2	7	2	5	.	.	.	.	.	.
C 246	.	.	.	.	.	.	.	.	.	.	*1*	.	.	.	.	.	.
S 078	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
S 151	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 139	1	.	.	.	8	.	3	.	.	.	1	.	1	.	.	.	.
C 262n	1	1	.	.	10	0	2	1	2	.	2	.	1	.	.	.	.
S 011	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
S 093	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
S 106	1	.	.	.	8	.	3	.	.	.	1	.	1	.	.	.	.
S 164	.	.	.	.	1	.	.	0	2	.	4	.	1	.	.	.	.
C 141	2	2	1	.	24	3	5	2	5	5	36	.	8	.	.	.	.
S 059	.	.	.	.	1	.	.	1	2	.	.	.	2	.	.	.	.
S 155	3	.	1	.	15	.	1	3	5	1	17	.	4	.	.	.	.
C 277f	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 277h	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 028n	.	.	.	.	2	1	.	.	.	1	3	.	2	.	.	.	.
S 015	.	.	.	.	4	0	1	.	1	.	3	.	2	.	.	.	.
S 016	.	2	.	1	3	0	2	2	1	1	6	.	1	.	.	.	.
S 087	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
S 084	.	.	.	.	1	.	1	.	.	.	5	.	2	.	.	.	.
C 084	.	1	.	.	4	.	.	0	3	.	8	.	9	1	.	.	.
C 228	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 228	.	*1*	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
S 056	1	.	.	.	1	.	1	.	1	.	2	.	1	.	.	.	.
S 113	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 261	.	.	.	.	.	.	.	.	1	.	7	.	4	.	.	.	.
S 114	1	1	1	.	5	1	5	4	10	12	65	.	33	.	.	.	.
C 236	1	4	.	.	27	0	11	0	32	5	48	.	34	5	2	.	.
S 034	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
S 067	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
S 101	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
S 167	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

Ref.N°	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
C 159	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 251	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
S 037	1	2	1	.	8	.	.	0	12	3	19	.	12	1	1	.	1
S 116	.	.	.	.	.	.	.	.	.	*3*	*7*	.	*1*	*2*	.	*4*	.
S 003	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 258	.	1	.	.	1	.	.	1	1	.	3	.	2	.	.	.	.
S 112	.	.	.	.	2	.	.	0	1	.	1	.	3	.	.	2	2
S 119	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 127n	1	.	.	.	5	0	1	.	3	1	2	.	4	.	.	1	.
S 127	.	2	.	.	5	.	1	.	5	1	10	.	10	.	1	3	.
S 005	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.
S 005	.	.	.	.	.	.	.	.	*1*	.	*8*	.	*1*	.	.	.	.
S 031	1	1	.	.	10	.	.	.	4	1	12	.	4	2	.	5	7
S 161	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
S 098	.	.	.	.	2	0	1	0	5	2	16	.	20	.	.	.	.
C 165q	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 154	.	1	.	.	1	1	.	1	1	1	11	.	11	.	.	2	1
C 255p	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 052	.	.	.	.	1	0	2	0	1	.	19	.	12	.	.	1	3
C 053	.	1	1	.	4	2	2	1	3	3	14	.	4	.	.	2	3
S 180	.	.	.	.	.	.	.	0	2	.	5	.	2	.	.	2	1
S 060	.	.	.	.	2	.	.	.	.	.	4	.	3	2	.	1	.
C 158	3	3	4	.	41	6	19	8	46	16	122	.	100	7	1	15	1
S 129	.	.	.	.	2	.	.	.	1	.	.	.	.	.	.	2	1
C 187n	.	.	.	.	1	0	1	.	1	.	4	.	5	.	.	2	3
C 212	.	.	.	.	2	.	3	3	4	3	23	.	32	1	1	5	3
S 070	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
S 135	2	6	.	.	137	0	26	0	40	6	96	.	74	5	.	32	1
S 166	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 005	1	4	3	.	54	6	4	8	6	4	62	.	51	7	1	30	19
C 249	.	.	.	.	1	.	.	.	2	.	2	.	5	.	1	4	.
C 215	.	.	.	.	1	.	1	.	.	.	2	.	.	.	.	3	.
C 085	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 198	.	.	.	.	2	.	.	.	.	.	1	.	1	.	.	.	.
S 086	.	.	.	.	2	.	.	.	1	.	4	.	.	.	.	1	.
C 005q	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 086n	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 098n	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 128s	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 174f	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 257	.	.	.	.	1	.	.	.	.	.	2	.	2	.	.	1	1
C 006q	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 017n	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 039n	.	.	1	.	4	.	.	.	.	1	2	.	3	1	.	1	1
C 048q	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 062n	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 125n	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 136	.	.	.	.	7	1	1	1	4	3	11	.	17	3	1	9	7
C 184q	.	.	.	.	2	.	.	.	.	1	12	.	9	1	.	6	2
C 193q	.	1	.	.	5	.	.	0	5	8	15	.	15	1	.	5	4
C 222h	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 270a	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 028	.	.	.	.	11	1	.	.	2	.	19	.	16	.	.	5	.
S 033	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
S 069	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

Ref.N°	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
S 131	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 121	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	*4*	*3*
S 181	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
C 001	.	.	.	.	8	1	.	1	2	2	11	.	13	3	.	13	8
C 048n	.	.	.	.	21	3	.	.	7	3	32	.	44	2	.	26	10
C 048n	.	.	.	.	*2*	.	.	.	.	.	*2*	.	*4*	.	.	*3*	.
C 206	.	.	.	.	2	.	.	.	1	.	6	.	8	1	.	5	1
C 011n	.	.	.	.	5	.	.	0	2	1	3	.	8	.	.	7	3
C 097	2	.	1	.	34	0	9	0	26	7	95	.	94	5	2	32	14
C 097	.	.	.	.	.	.	.	.	.	.	*1*	.	.	.	.	.	.
S 019	1	.	.	.	1	0	1	0	3	.	5	.	5	1	.	3	.
C 227n	.	.	.	.	2	.	.	0	1	.	3	.	2	.	.	2	.
S 154	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
S 158	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
S 097	1	2	1	.	11	.	4	.	4	1	27	.	35	6	.	29	13
C 022	1	4	.	.	30	5	5	4	14	10	45	.	58	2	.	37	16
S 146	5	.	.	.	11	2	2	.	5	2	22	.	22	1	.	15	6
C 010	2	3	3	.	29	1	4	4	12	17	95	.	67	4	.	70	42
C 033	.	.	.	.	1	.	1	.	1	1	5	.	2	.	.	4	3
C 162n	1	1	.	.	20	0	2	0	5	6	28	.	23	3	.	20	16
C 162	.	.	.	.	5	.	1	.	2	.	6	.	7	.	.	5	2
S 022	.	2	1	.	6	2	2	2	7	3	26	.	21	1	.	31	12
C 193f	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
S 048	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
S 063	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
S 110	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 223	1	4	.	.	39	3	6	4	3	.	29	.	47	4	.	29	16
C 125	2	3	4	.	60	.	5	c8	c22	19	55	.	78	4	.	c71	44
C 120	.	1	1	.	15	2	3	6	6	4	26	.	29	1	.	21	15
C 193	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1
S 132	2	3	1	.	6	1	3	1	3	2	13	.	18	1	.	19	13
C 003n	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
S 115	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
S 117	1	.	.	.	1	1	.	.	.	.	2	.	3	.	.	3	2
C 199	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 199	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 032	5	7	1	.	158	12	19	17	9	9	102	.	130	10	5	120	66
C 183	1	1	2	.	34	0	9	0	31	4	49	.	22	4	.	39	21
C 165n	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
S 039	.	1	1	.	3	.	.	.	.	.	.	.	.	.	.	1	.
C 081	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 079	.	4	2	.	75	.	9	.	17	5	53	.	54	4	.	45	37
C 019	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 051	.	.	.	.	8	.	.	2	.	1	3	.	2	1	.	7	2
S 122	.	.	.	.	3	.	.	.	.	.	3	.	.	.	.	1	.
C 004	.	.	.	.	4	1	.	2	.	.	.	.	.	.	.	4	.
C 265	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 068n	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	3	1
C 096	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	3	1
C 149	.	.	.	.	21	2	.	1	2	.	4	.	2	.	.	14	7
C 220	.	.	.	.	14	.	.	5	.	.	3	.	1	.	.	3	2
C 221f	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1
C 193h	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 043	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1

Ref.N°	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
C 089n	1	4	.	.	39	2	3	2	16	6	102	.	122	6	1	215	70
C 188	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 246f	.	.	.	.	.	.	1	.	.	.	.	.	1	.	.	.	.
S 092	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
S 071	14	15	7	.	337	20	57	47	38	19	215	.	235	19	5	188	10
C 284	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	2
C 036s	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	1	.
C 078q	.	3	.	.	34	0	8	0	2	.	4	.	8	1	.	27	.
C 135	.	.	1	.	3	.	.	.	1	2	1	.	2	.	.	3	2
C 058	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 030n	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
S 173	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 099	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	.
C 119	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	1	.
C 155	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
S 162	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 087	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 093	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.
C 173	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	1
C 009	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 041	1	.	.	.	4	.	1	.	1	3	5	.	5	.	.	21	9
C 168	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 283	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 069	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 115	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 178	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 222	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 256	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 024	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 124	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.
C 170	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 070	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.
C 167	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 015	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 105	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
S 020	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 128	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 098	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.
C 237n	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 010n	.	.	.	.	28	0	2	.	15	13	6	.	.	.	.	.	.
C 011	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
A 022	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.
S 010	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
S 143	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
S 178	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

The Denarius component of Coin Hoards; Raw Data
Part 3; Groups D23 to D39

Up until S037 (c.138AD) there are no occurrences of Group D23-D39 coins in hoards. Therefore these hoards have been left out of the following table.

Ref.N°	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39
S 037	0	0	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
S 116	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
S 003	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 258	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
S 112	0	0	0	2	.	.	.	.	.	.	.	.	.	.	.	.	.
S 119	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 127n	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
S 127	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
S 005	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
S 005	.	.	*1*	.	.	.	.	.	.	.	.	.	.	.	.	.	.
S 031	0	0	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.
S 161	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
S 098	1	0	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 165q	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 154	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 255p	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 052	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 053	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.
S 180	2	0	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
S 060	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 158	3	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.
S 129	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 187n	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 212	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.
S 070	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
S 135	0	4	0	10	.	.	.	.	.	.	.	.	.	.	.	.	.
S 166	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 005	6	3	7	1	.	1	1	.	.	.	.	.	.	.	.	.	.
C 249	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.
C 215	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.
C 085	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 198	1	.	2	.	.	.	1	.	.	.	.	.	.	.	.	.	.
S 086	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 005q	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 086n	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 098n	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 128s	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 174f	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 257	.	.	.	1	.	.	1	.	.	.	.	.	.	.	.	.	.
C 006q	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 017n	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 039n	.	1	2	2	.	.	.	.	.	.	.	.	.	.	.	.	.
C 048q	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 062n	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 125n	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 136	4	4	1	2	.	2	.	.	.	.	.	.	.	.	.	.	.
C 184q	.	.	0	5	.	.	.	.	.	.	.	.	.	.	.	.	.
C 193q	0	0	0	2	.	.	1	0	.	.	.	.	.	.	.	.	.

Ref.N°	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39
C 222h	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 270a	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 028	1	1	.	2	2	1	.	.	.	.	.	.	.	.	.	.	.
S 033	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
S 069	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
S 131	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 121	.	*6*	.	.	.	*2*	.	.	.	.	.	.	.	.	.	.	.
S 181	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 001	1	1	3	6	.	1	1	.	.	.	.	.	.	.	.	.	.
C 048n	9	0	8	9	.	1	.	.	1	.	.	.	.	.	.	.	.
C 048n	.	*1*	*1*	*3*	*1*	.	.	.	.	.	.	.	.	.	.	.	.
C 206	.	.	1	2	1	.	.	.	.	.	.	.	.	.	.	.	.
C 011n	1	0	0	2	.	3	.	.	0	1	.	.	.	.	.	.	.
C 097	9	0	0	22	4	2	6	.	2	.	.	.	.	.	.	.	.
C 097	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
S 019	.	.	0	1	.	1	1	0	0	1	1	.	.	.	.	.	.
C 227n	2	0	0	2	.	.	.	.	.	.	.	.	.	.	.	.	.
S 154	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
S 158	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
S 097	5	0	5	11	0	6	3	0	.	.	1	.	.	.	.	.	.
C 022	6	5	11	15	2	5	4	.	.	3	2	.	.	.	.	.	.
S 146	.	1	4	8	.	.	3	.	.	7	1	.	.	.	.	.	.
C 010	8	7	16	23	1	9	5	.	.	5	1	.	.	.	.	.	.
C 033	.	.	.	5	.	1	.	.	.	.	1	.	.	.	.	.	.
C 162n	5	0	0	17	.	5	.	.	.	1	.	.	.	.	.	.	.
C 162	.	1	2	3	.	1	.	.	.	2	.	.	.	.	.	.	.
S 022	4	11	6	20	1	6	4	.	1	8	1	.	.	.	.	.	.
C 193f	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
S 048	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
S 063	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
S 110	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 223	3	7	7	17	3	4	3	.	.	13	1	1	.	.	.	1	.
C 125	7.3	15.	4	63	7.2	14	13	.	.	38	5	.	1	.	.	2	.
C 120	3	10	1	16	2	2	3	.	3	11	.	1	.	.	.	.	.
C 193	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	.
S 132	.	6	5	7	6	3	4	.	1	.	.	.	.	.	.	.	.
C 003n	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
S 115	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	2	.
S 117	.	.	1	2	.	.	.	.	.	1	1	1	.	.	.	1	.
C 199	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.
C 199	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	*3*	.
C 032	28	29	31	60	12	19	9	.	6	56	4	1	2	.	.	181	.
C 183	14	0	0	31	.	7	5	.	0	21	3	5	.	.	.	151	31
C 165n	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
S 039	2	.	.	.	.	.	.	.	5	.	.	1	.	.	.	23	.
C 081	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 079	7	14	17	26	.	4	7	.	1	6	1	.	4	.	1	31	.
C 019	.	.	.	*1*	.	.	.	.	.	.	.	.	.	.	.	95	2
C 051	1	.	.	1	.	.	.	.	.	5	.	.	1	.	.	21	8
S 122	.	.	0	3	.	.	.	.	.	.	.	1	.	.	.	8	
C 004	2	.	2	.	1	.	.	.	.	5	.	1	.	.	.	14	6
C 265	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 068n	.	.	.	1	.	3	.	.	.	2	.	.	.	.	.	5	5
C 096	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	3	.
C 149	3	0	3	6	.	.	.	.	3	24	.	1	1	.	.	164	.

Ref.N°	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39
C 220	.	2	.	2	.	.	.	.	.	14	1	4	.	.	.	106	.
C 221f	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3	.
C 193h	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 043	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	1	.
C 089n	56	0	1	114	0	26	14	.	0	247	8	8	3	1	.	621	200
C 188	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	9	.
C 246f	.	1	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.
S 092	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
S 071	36	64	51	81	17	13	15	.	4	38	12	6	.	1	.	55	.
C 284	.	.	.	.	.	.	.	.	.	7	.	2	.	1	.	63	.
C 036s	2	0	.	.	.	1	.	.	.	1	.	.	.	.	1	2	.
C 078q	7	0	0	8	.	3	1	0	0	21	1	5	2	.	.	115	.
C 135	.	2	.	.	.	1	.	.	.	2	.	.	.	.	.	6	.
C 058	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	.
C 030n	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
S 173	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 099	.	.	.	1	.	.	.	.	1	8	.	1	.	.	.	101	22
C 119	.	.	.	2	.	.	.	.	.	1	.	.	.	.	.	7	.
C 155	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
S 162	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 087	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 093	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	30	.
C 173	.	.	.	.	.	.	.	.	.	1	.	1	.	.	.	70	12
C 009	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3	2
C 041	3	2	2	7	2	3	1	.	1	22	.	7	1	1	.	290	.
C 168	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 283	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6	.
C 069	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 115	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 178	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 222	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 256	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	.
C 024	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.
C 124	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 170	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 070	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.
C 167	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 015	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 105	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
S 020	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 128	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 098	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	4	.
C 237n	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 010n	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 011	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
A 022	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
S 010	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
S 143	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
S 178	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

The Denarius component of Coin Hoards; Raw Data
Part 4; Groups D40 to D57

Up until J125 (c.194AD) there are no occurrences of Group D40-D57 coins in hoards. Therefore these hoards have been left out of the following table.

Ref.No.	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57
C 125	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 120	.	.	.	.	.	.	.	.	.	.	.	.	2	.	.	.	.	.
C 193	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
S 132	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 003n	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
S 115	2	.	.	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.
S 117	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 199	.	3	.	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.
C 199	3	5	.	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.
J 032	80	83	.	30	.	105	.	.	.	.	.	.	.	.	.	.	.	.
C 183	.	68	.	25	63	.	.	.	.	.	.	.	.	.	.	.	.	.
C 165n	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
S 039	5	8	.	5	.	6	.	.	.	.	.	.	.	.	.	.	.	.
C 081	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 079	11	20	.	3	.	26	.	.	.	.	.	.	.	.	.	.	.	.
C 019	.	39	.	.	.	5	.	.	.	.	.	.	.	.	.	.	.	.
C 051	.	17	.	1	13	1	.	.	.	.	.	.	.	.	.	.	.	.
S 122	5	5	0	1	.	2	1	.	.	.	.	.	.	.	.	.	.	.
C 004	.	5	0	.	7	2	.	1	1	.	.	.	.	.	.	.	.	.
C 265	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 068n	.	1	0	.	.	6	.	.	2	.	.	.	2	.	.	.	.	.
C 096	1	1	.	.	.	1	1	.	2	1	.	.	3	2	.	.	.	.
C 149	27	66	.	2	51	28	6	1	30	3	.	8	9	2	.	.	.	.
C 220	9	36	.	2	.	57	4	2	45	8	2	12	30	6	.	.	.	.
C 221f	.	.	.	.	.	.	.	.	3	.	.	.	1	1	.	.	.	.
C 193h	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 043	.	2	.	.	.	1	.	.	2	.	.	.	4	.	1	.	.	.
C 089n	0	177	0	21	.	556	55	11	198	10	.	11	125	8	.	.	.	.
C 188	1	4	.	.	.	5	.	.	2	.	.	.	3	4	.	.	.	.
C 246f	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.
S 092	.	.	.	.	.	.	.	.	1	1	.	1	1	1	.	.	.	.
S 071	13	27	7	2	.	30	2	1	27	7	1	8	34	6	.	.	.	.
C 284	2	.	.	.	.	27	1	.	24	.	.	.	15	.	.	.	.	.
C 036s	2	2	0	.	.	3	1	.	3	.	2	.	3	1	2	.	.	.
C 078q	24	41	.	2	.	59	2	.	38	.	.	7	28	3	3	.	.	.
C 135	.	.	.	.	.	2	1	.	.	.	.	.	4	.	.	1	.	.
C 058	.	.	.	.	.	1	.	.	2	.	.	.	10	.	2	.	2	.
C 030n	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
S 173	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 099	1	23	4	3	36	8	1	.	192	26	9	54	364	65	31	2	9	.
C 119	2	3	.	.	.	5	.	.	6	.	.	1	5	1	.	.	.	.
C 155	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
S 162	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 087	.	.	.	.	.	.	.	.	.	.	.	.	5	1	6	1	3	.
C 093	4	6	.	.	.	23	1	.	103	17	3	37	168	27	12	.	3	.
C 173	10	21	2	1	28	7	5	.	165	15	12	49	314	.	29	2	6	.
C 009	.	2	1	.	1	1	.	.	17	1	.	1	22	4	1	.	.	.
C 041	17	85	13	9	.	78	1	.	19	.	2	7	11	7	7	1	7	.
C 168	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.

Ref.No.	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57
C 283	1	4	0	.	.	.	.	.	9	1	.	4	1	.	.	.	3	.
C 069	.	1	.	.	.	.	.	.	4	1	.	2	6	.	.	.	.	.
C 115	.	.	.	.	.	1	.	.	3	.	.	.	2	1	.	.	.	.
C 178	.	.	.	.	0	1	.	.	.	.	.	.	.	.	.	.	.	.
C 222	.	.	.	.	.	.	.	.	4	.	1	.	3	1	.	.	.	.
C 256	.	1	.	.	.	.	.	.	.	.	.	.	2	.	.	.	.	.
C 024	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 124	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 170	.	.	.	.	.	.	.	.	3	.	.	.	7	.	.	.	1	.
C 070	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.
C 167	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.
C 015	.	.	.	.	.	1	.	.	11	.	.	.	5	3	5	.	3	.
C 105	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
S 020	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.
C 128	.	.	.	.	.	1	.	.	.	.	.	.	1	.	.	.	.	.
C 098	.	.	.	.	.	.	.	.	.	.	.	.	2	.	.	.	.	.
C 237n	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 010n	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C 011	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1
A 022	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
S 010	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
S 143	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
S 178	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

Appendix 2.23
The Number of Antoniniani in Coin Hoards

This appendix is divided into 4 parts. Part 1 contains summary information and details of antoniniani from groups A1a-3a; part 2 records A3b-11b; part 3 records A11c-19a and part 4 records A19b-27. The hoards are in chronological order. Italics denote copies where these can be identified. The value 0 represents a missing data code.

Part 1: Groups A1a to A3a

Ref.N°.	Hoard Name	Date	Av.	R/C	Stat.	Count	N°	1a	1b	2	3a
C 068n	Colchester	c.223	(223)	Real	Full	OK	1	1	.	.	.
C 149	Llanarmon Dy...	c.226	(226)	Real	Full	OK	3	2	.	.	1
C 089n	East Anglia	222 to 235	(228)	Real	Full	OK	107	54	10	2	40
C 099	Elveden	c.248	(248)	Real	Full	OK	182	5	1	1	3
C 119	Great Chest...	247 to 249	(248)	Real	Full	OK	60	3	.	.	2
C 155	London,Lime St.	c.251	(251)	Real	None	No	.	.	.	.	.
C 204	Poole Harbour	253 to 260	(256)	Real	Full	OK	34	.	.	.	.
C 087	Dorchester	c.257	(257)	Real	Full	OK	20748	22	4	1	120
C 003	Alcester	259 to 260	(259)	Real	Full	OK	95	.	.	.	.
C 093	Edlington Wood	c.259	(259)	Real	Full	OK	173	.	.	.	2
C 173	Mattishall	c.259	(259)	Real	Full	OK	333	3	1	1	8
C 009	*Barton upon ...*	c.260	(260)	Copy	Full	OK	*1*	.	.	.	.
C 009	Barton upon ...	c.260	(260)	Real	Full	OK	22	.	.	.	.
C 009	Barton upon ...	c.260	(260)	R/C	Full	OK	23	.	.	.	.
C 283	Britain (?)	c.260	(260)	Real	Full	OK	290	.	.	.	1
C 041	Caistor by Yar...	c.260	(260)	Real	Full	OK	183	3	.	.	2
C 151	Llandovery	c.260	(260)	Real	None	No	12	.	.	.	.
C 168	March	c.260	(260)	Real	Full	OK	14	.	.	.	.
S 128	Piercebridge	c.263	(263)	Real	Full	OK	130	.	.	.	.
C 253	Wateringbury	c.265	(265)	Real	Part	No	10	.	.	.	.
S 077	Fulwell	c.268	(268)	Real	Full	No	6	.	.	.	.
C 163	Magdalen	c.268	(268)	Real	Full	OK	27	.	.	.	.
C 069	*Colchester*	c.269	(269)	Copy	None	OK	*13*	.	.	.	.
C 069	Colchester	c.269	(269)	Real	Full	OK	1530	1	.	.	.
C 069	Colchester	c.269	(269)	R/C	Part	OK	1543	1	.	.	.
C 095	Edlington Wood	c.269	(269)	Real	None	OK	8	.	.	.	.
C 233	Stiffkey (?)	268 to 270	(269)	Real	Full	OK	18	.	.	.	.
S 001	Adderstone	c.270	(270)	Real	Part	OK	13	.	.	.	.
S 017	Bolton Castle	c.270	(270)	Real	Poor	OK	1100	.	.	.	.
C 026	Bourne End	c.270	(270)	Real	Full	OK	5	.	.	.	.
S 038	*Carrawburgh*	c.270	(270)	Copy	None	OK	*78*	.	.	.	.
S 038	Carrawburgh	c.270	(270)	Real	Full	OK	3	.	.	.	.
S 038	Carrawburgh	c.270	(270)	R C	Part	OK	81	.	.	.	.
S 045	Chesterholme	c.270	(270)	Real	Full	OK	111	.	.	.	.
C 078	*Croydon*	c.270	(270)	Copy	None	OK	*1*	.	.	.	.
C 078	Croydon	c.270	(270)	Real	Full	OK	169	.	.	.	.
C 078	Croydon	c.270	(270)	R/C	Part	OK	170	.	.	.	.
C 115	Gare	c.270	(270)	Real	Full	OK	40	.	.	.	.
S 081	*Glaisdale Moor*	c.270	(270)	Copy	Poor	No	*10*	.	.	.	.
S 081	Glaisdale Moor	c.270	(270)	Real	Part	No	13	.	.	.	.
S 081	Glaisdale Moor	c.270	(270)	R C	Part	No	23	.	.	.	.
S 099	Kirklington	c.270	(270)	Real	None	No	.	.	.	.	.
C 160	Long Wittenham	c.270	(270)	Real	Part	OK	101	.	.	.	.
C 178	Mildenhall	c.270	(270)	Real	Full	OK	1285	.	.	.	.
S 138	Scratchmill ...	c.270	(270)	Real	Part	No	.	.	.	.	.
S 140	Seaton	c.270	(270)	Real	None	No	.	.	.	.	.
C 222	Selsey	c.270	(270)	Real	Full	OK	966	.	.	.	.
S 160	Uddingstone	c.270	(270)	Real	None	No	.	.	.	.	.
C 256	Welwyn	c.270	(270)	Real	Full	OK	145	.	.	.	.
C 021	Blackmoor	270 to 273	(271)	Real	Full	OK	46	.	.	.	.

Ref.N°.	Hoard Name	Date	Av.	R/C	Stat.	Count	N°	1a	1b	2	3a
C 024	Bonnington	270 to 273	(271)	Real	Part	OK	180	.	.	.	.
C 124	Ham Hill	270 to 273	(271)	Real	Full	OK	491	.	.	.	.
C 169	*March*	270 to 273	(271)	Copy	Full	OK	*10*	.	.	.	.
C 169	March	270 to 273	(271)	Real	Full	OK	806	.	.	.	1
C 169	March	270 to 273	(271)	R/C	Full	OK	816	.	.	.	1
C 197	*Piercebridge*	270 to 273	(271)	Copy	Full	OK	*8*	.	.	.	.
C 197	Piercebridge	270 to 273	(271)	Real	Full	OK	13	.	.	.	.
C 197	Piercebridge	270 to 273	(271)	R/C	Full	OK	21	.	.	.	.
C 282	*West Country ?*	270 to 273	(271)	Copy	None	OK	*317*	.	.	.	.
C 282	West Country ?	270 to 273	(271)	Real	Full	OK	6	.	.	.	.
C 282	West Country ?	270 to 273	(271)	R/C	Part	OK	323	.	.	.	.
C 281	Yorkshire ?	270 to 273	(271)	Real	Part	No	32	.	.	.	.
C 170	*Market Deeping*	272 to 273	(272)	Copy	None	OK	*39*	.	.	.	.
C 170	Market Deeping	272 to 273	(272)	Real	Full	OK	2819	.	.	.	.
C 170	Market Deeping	272 to 273	(272)	R/C	Part	OK	2858	.	.	.	.
C 210	*Purbrook Heath*	c.272	(272)	Copy	None	OK	*1*	.	.	.	.
C 210	Purbrook Heath	c.272	(272)	Real	Full	OK	207	.	.	.	.
C 210	Purbrook Heath	c.272	(272)	R/C	Part	OK	208	.	.	.	.
C 247	*Vintners Park*	c.272	(272)	Copy	Full	OK	*1*	.	.	.	.
C 247	Vintners Park	c.272	(272)	Real	Part	OK	57	.	.	.	.
C 247	Vintners Park	c.272	(272)	R/C	Part	OK	58	.	.	.	.
S 157	Wallbottle	c.272	(272)	Real	Part	OK	5024	.	.	.	.
S 006	Barton	c.273	(273)	Real	Full	OK	203	.	.	.	.
S 013	*Bewcastle*	c.273	(273)	Copy	Part	OK	*8*	.	.	.	.
S 013	Bewcastle	c.273	(273)	Real	Full	OK	5	.	.	.	.
S 013	Bewcastle	c.273	(273)	R/C	Part	OK	13	.	.	.	.
S 027	*Brougham Cas...*	c.273	(273)	Copy	Poor	No	*42*	.	.	.	.
S 027	Brougham Cas...	c.273	(273)	Real	Poor	No	8	.	.	.	.
S 027	Brougham Cas...	c.273	(273)	R/C	Poor	No	50	.	.	.	.
C 037	*Cadeby*	c.273	(273)	Copy	None	OK	*16*	.	.	.	.
C 037	Cadeby	c.273	(273)	Real	Full	OK	1580	.	.	.	.
C 037	Cadeby	c.273	(273)	R/C	Part	OK	1596	.	.	.	.
C 045	Campsmont	c.273	(273)	Real	Part	OK	300	.	.	.	.
C 057	Chester	c.273	(273)	Real	Part	OK	64	.	.	.	.
C 070	*Colchester*	c.273	(273)	Copy	None	OK	*50*	.	.	.	.
C 070	Colchester	c.273	(273)	Real	Full	OK	4018	.	.	.	.
C 070	Colchester	c.273	(273)	R/C	Part	OK	4068	.	.	.	.
S 068	Docker	c.273	(273)	Real	Part	OK	123	.	.	.	.
C 086	Dolydd	c.273	(273)	Real	Full	OK	18	.	.	.	.
C 092	*East Mersea*	c.273	(273)	Copy	None	OK	*8*	.	.	.	.
C 092	East Mersea	c.273	(273)	Real	Full	OK	627	.	.	.	.
C 092	East Mersea	c.273	(273)	R/C	Part	OK	635	.	.	.	.
C 285	England (?)	c.273	(273)	Real	Full	OK	988	.	.	.	.
C 109	Farley Hill	c.273	(273)	Real	Full	OK	30	.	.	.	.
C 112	Folds Farm	c.273	(273)	Real	Full	OK	1220	.	.	.	.
C 118	*Great Chesells*	c.273	(273)	Copy	None	OK	*8*	.	.	.	.
C 118	Great Chesells	c.273	(273)	Real	Full	OK	125	.	.	.	.
C 118	Great Chesells	c.273	(273)	R/C	Part	OK	133	.	.	.	.
C 122	Hackensall	c.273	(273)	Real	None	OK	450	.	.	.	.
C 156	*Lime St.*	c.273	(273)	Copy	Part	OK	*32*	.	.	.	.
C 167	March	c.273	(273)	Real	Full	OK	14	.	.	.	.
C 172	Marr Thick (?)	c.273	(273)	Real	Full	OK	62	.	.	.	.
S 028	*Ninekirks*	c.273	(273)	Copy	Full	OK	*23*	.	.	.	.
C 186	*Northampton*	c.273	(273)	Copy	None	OK	*9*	.	.	.	.
C 186	Northampton	c.273	(273)	Real	None	OK	36	.	.	.	.
C 186	Northampton	c.273	(273)	R C	None	OK	45	.	.	.	.
C 202	Polegate	c.273	(273)	Real	None	No	17	.	.	.	.
C 203	Poole	273 to 274	(273)	Real	Full	OK	964	.	.	.	.
B 085	*Richborough 12*	c.273	(273)	Copy	None	No	*860*	.	.	.	.
S 139	Seamer	c.273	(273)	Real	Full	OK	21	.	.	.	.
S 150	*South Shields*	c.273	(273)	Copy	Full	OK	*32*	.	.	.	.

Ref.N°.	Hoard Name	Date	Av.	R/C	Stat.	Count	N°	1a	1b	2	3a
S 150	South Shields	c.273	(273)	Real	Full	OK	13	.	.	.	.
S 150	South Shields	c.273	(273)	R/C	Full	OK	45	.	.	.	.
C 234	Stonea Camp	c.273	(273)	Real	Full	OK	25	.	.	.	.
C 246s	Verulamium	c.273	(273)	Real	Full	OK	52	.	.	.	.
C 259	Westmeston	273 to 274	(273)	Real	Full	OK	61	.	.	.	.
C 260	Westmoor	c.273	(273)	Real	Full	OK	34	.	.	.	.
C 264	*Wickham Mar...*	c.273	(273)	Copy	None	OK	*26*	.	.	.	.
C 264	Wickham Mar...	c.273	(273)	Real	Full	OK	1562	.	.	.	.
C 264	Wickham Mar...	c.273	(273)	R/C	Part	OK	1588	.	.	.	.
C 266	Willingdon	c.273	(273)	Real	Full	OK	140	.	.	.	.
C 267	Wimblingdon	c.73	(273)	Real	None	No	2000	.	.	.	.
C 015	*Beachy Head*	c.274	(274)	Copy	Full	OK	*185*	.	.	.	.
C 015	Beachy Head	c.274	(274)	Real	Full	OK	13774	1	.	1	1
C 015	Beachy Head	c.274	(274)	R/C	Full	OK	13959	1	.	1	1
C 025	Boothstown	273 to 275	(274)	Real	Full	OK	540	.	.	.	.
C 056	*nr. Cheltnham*	c.274	(274)	Copy	None	OK	*6*	.	.	.	.
C 056	nr. Cheltnham	c.274	(274)	Real	Full	OK	372	.	.	.	.
C 056	nr. Cheltnham	c.274	(274)	R/C	Part	OK	378	.	.	.	.
C 071	*Colchester*	c.274	(274)	Copy	None	OK	*9*	.	.	.	.
C 071	Colchester	c.274	(274)	Real	Full	OK	485	.	.	.	.
C 071	Colchester	c.274	(274)	R/C	Part	OK	494	.	.	.	.
C 082	Darlington	c.274	(274)	Real	None	OK	203	.	.	.	.
C 083	Deeping S.Jam...	c.274	(274)	Real	Full	OK	515	.	.	.	.
C 100	Emneth	c.274	(274)	Real	Part	OK	2000	.	.	.	.
C 161	*Lostwithiel*	c.274	(274)	Copy	None	OK	*1*	.	.	.	.
C 161	Lostwithiel	c.274	(274)	Real	Part	OK	102	.	.	.	.
C 161	Lostwithiel	c.274	(274)	R/C	Part	OK	103	.	.	.	.
C 184	*Mytholmroyd*	c.274	(274)	Copy	Part	OK	*2*	.	.	.	.
C 184	Mytholmroyd	c.274	(274)	Real	Part	OK	595	.	.	.	.
C 184	Mytholmroyd	c.274	(274)	R/C	Part	OK	597	.	.	.	.
C 207	*Preesall Hill*	c.274	(274)	Copy	Part	No	*11*	.	.	.	.
C 273	Wookey Hole	c.274	(274)	Real	None	OK	15	.	.	.	.
C 031	*Brighton*	c.275	(275)	Copy	Full	OK	*225*	.	.	.	.
C 031	Brighton	c.275	(275)	Real	Full	OK	703	.	.	.	.
C 031	Brighton	c.275	(275)	R/C	Full	OK	928	.	.	.	.
C 039	Caerwent	250 to 300	(275)	Real	None	No	.	.	.	.	.
C 044	*Camerton*	250 to 300	(275)	Copy	None	No	*85*	.	.	.	.
C 047	*Cardiff*	c.275	(275)	Copy	None	OK	*34*	.	.	.	.
C 047	Cardiff	c.275	(275)	Real	Full	OK	1050	.	.	.	.
C 048	Cardiff	c.275	(275)	R/C	None	OK	800	.	.	.	.
C 047	Cardiff	c.275	(275)	R/C	Part	OK	1084	.	.	.	.
C 074	Compton Cow...	250 to 300	(275)	Real	None	OK	500	.	.	.	.
C 117	*Goring by Sea*	250 to 300	(275)	Copy	None	No	*500*	.	.	.	.
C 102	*Epping Forrest*	c.275	(275)	Copy	None	OK	*2*	.	.	.	.
C 102	Epping Forrest	c.275	(275)	Real	Full	OK	51	.	.	.	.
C 102	Epping Forrest	c.275	(275)	R/C	Part	OK	53	.	.	.	.
C 105	Exeter	250 to 300	(275)	Real	None	No	.	.	.	.	.
C 126	*Hayle*	250 to 300	(275)	Copy	None	No	*161*	.	.	.	.
C 146	*Liskeard (?)*	250 to 300	(275)	Copy	Part	OK	*20*	.	.	.	.
C 175	*Mere*	250 to 300	(275)	Copy	Part	OK	*100*	.	.	.	.
C 201	*Pitstone*	270 to 280	(275)	Copy	Full	OK	*9*	.	.	.	.
C 201	Pitstone	270 to 280	(275)	Real	Full	OK	21	.	.	.	.
C 201	Pitstone	270 to 280	(275)	R/C	Full	OK	30	.	.	.	.
C 230	*Spotbrough*	250 to 300	(275)	Copy	None	OK	*313*	.	.	.	.
C 245	*Verulamium*	250 to 300	(275)	Copy	None	OK	*800*	.	.	.	.
S 168	Whickham	250 to 300	(275)	Real	None	No	.	.	.	.	.
C 263	Whitchurch	250 to 300	(275)	Real	None	No	.	.	.	.	.
C 277	*Worthing*	250 to 300	(275)	Copy	None	OK	*2068*	.	.	.	.
S 085	*Great Chesters*	c.276	(276)	Copy	Part	OK	*81*	.	.	.	.
S 085	Great Chesters	c.276	(276)	Real	Full	OK	38	.	.	.	.

Ref.N°.	Hoard Name	Date	Av.	R/C	Stat.	Count	N°	1a	1b	2	3a
S 085	Great Chesters	c.276	(276)	R/C	Part	OK	119	.	.	.	.
S 020	Hawkhurst	c.276	(276)	Real	None	OK	5000	.	.	.	.
C 187	Northants. ?	c.276	(276)	Real	None	OK	27	.	.	.	.
C 194	*PaternosterRow*	c.276	(276)	Copy	None	OK	*528*	.	.	.	.
C 194	Paternoster Row	c.276	(276)	Real	Full	OK	15	.	.	.	.
C 194	Paternoster Row	c.276	(276)	R/C	Part	OK	543	.	.	.	.
C 216	Riby	c.276	(276)	Real	None	OK	17500	.	.	.	.
C 002	*Agden*	276 to 282	(279)	Copy	None	OK	*23*	.	.	.	.
C 002	Agden	276 to 282	(279)	Real	Full	OK	2412	.	.	.	.
C 002	Agden	276 to 282	(279)	R/C	Part	OK	2435	.	.	.	.
C 012	*Beachy Head*	276 to 282	(279)	Copy	None	OK	*1*	.	.	.	.
C 014	*Beachy Head*	276 to 282	(279)	Copy	None	OK	*9*	.	.	.	.
C 012	Beachy Head	276 to 282	(279)	Real	Part	OK	549	.	.	.	.
C 013	Beachy Head	276 to 282	(279)	Real	Part	OK	682	.	.	.	.
C 014	Beachy Head	276 to 282	(279)	Real	Full	OK	1895	.	.	.	.
C 012	Beachy Head	276 to 282	(279)	R/C	Part	OK	550	.	.	.	.
C 014	Beachy Head	276 to 282	(279)	R/C	Part	OK	1904	.	.	.	.
C 080	Darfield 3	276 to 282	(279)	Real	Full	OK	541	.	.	.	.
C 094	Edlington Wood	276 to 282	(279)	Real	Full	OK	59	.	.	.	.
C 128	*Hollingbourne*	276 to 282	(279)	Copy	Part	OK	*359*	.	.	.	.
C 128	Hollingbourne	276 to 282	(279)	Real	Full	OK	4996	.	.	.	1
C 128	Hollingbourne	276 to 282	(279)	R/C	Part	OK	5355	.	.	.	1
C 276	Worden	276 to 282	(279)	Real	Full	OK	126	.	.	.	.
C 098	Ellesmere	c.280	(280)	Real	Full	OK	355	.	.	.	.
C 116	Goadby Mar...	c.280	(280)	Real	None	No	1917	.	.	.	.
C 211	*Pyle*	c.280	(280)	Copy	None	OK	*9*	.	.	.	.
C 211	Pyle	c.280	(280)	Real	Full	OK	1	.	.	.	.
C 211	Pyle	c.280	(280)	R/C	Part	OK	10	.	.	.	.
C 059	*Child's Ercall*	c.281	(281)	Copy	None	OK	*40*	.	.	.	.
C 059	Child's Ercall	c.281	(281)	Real	Full	OK	2857	.	.	.	.
C 059	Child's Ercall	c.281	(281)	R/C	Part	OK	2897	.	.	.	.
C 073	*Coleby*	c.281	(281)	Copy	None	No	*799*	.	.	.	.
C 073	Coleby	c.281	(281)	Real	Part	OK	10000	.	.	.	.
C 073	Coleby	c.281	(281)	R/C	Part	No	10799	.	.	.	.
C 174	*Mear Heath*	280 to 283	(281)	Copy	Part	OK	*869*	.	.	.	.
C 174	Mear Heath	280 to 283	(281)	Real	Full	OK	385	.	.	.	.
C 174	Mear Heath	280 to 283	(281)	R/C	Part	OK	1254	.	.	.	.
C 237	*Tattershall T...*	c.281	(281)	Copy	None	OK	*285*	.	.	.	.
C 237	Tattershall Th...	c.281	(281)	Real	Full	OK	4789	.	.	.	.
C 237	Tattershall Th...	c.281	(281)	R/C	Part	OK	5074	.	.	.	.
C 165	Maltby	c.282	(282)	Real	Full	OK	3496	.	.	.	.
C 182	Much Wenlock	c.284	(284)	Real	Full	OK	2591	.	.	.	.
C 134	Kingscote	c.285	(285)	Real	None	No	.	.	.	.	.
C 066	Clapton in Gor...	c.286	(286)	Real	Full	OK	3437	.	.	.	.
S 107	*Lancaster*	c.286	(286)	Copy	Full	OK	*4*	.	.	.	.
C 138	Lancaster	c.286	(286)	Real	Full	OK	15	.	.	.	.
S 107	Lancaster	c.286	(286)	Real	Full	OK	15	.	.	.	.
S 108	Lancaster	c.286	(286)	Real	None	No	.	.	.	.	.
S 107	Lancaster	c.286	(286)	R/C	Full	OK	19	.	.	.	.
C 181	*Monkton Farl...*	c.286	(286)	Copy	None	OK	*135*	.	.	.	.
C 181	Monkton Farl...	c.286	(286)	Real	Full	OK	3331	.	.	.	.
C 181	Monkton Farl...	c.286	(286)	R/C	Part	OK	3466	.	.	.	.
S 163	Upsall Castle	c.286	(286)	Real	None	No	.	.	.	.	.
C 270	Wint Hill	c.286	(286)	Real	Full	OK	30	.	.	.	.
C 221n	*Segontium*	c.287	(287)	Copy	None	OK	*18*	.	.	.	.
C 221n	Segontium	c.287	(287)	Real	Full	OK	38	.	.	.	.
C 221n	Segontium	c.287	(287)	R/C	Part	OK	56	.	.	.	.
C 124n	Hammersmith	287 to 290	(288)	Real	Full	OK	7	.	.	.	.
C 169n	Margaretting	287 to 290	(288)	Real	None	OK	32	.	.	.	.
C 228n	*South Norwood*	287 to 290	(288)	Copy	None	OK	*3*	.	.	.	.

Ref.N°.	Hoard Name	Date	Av.	R/C	Stat.	Count	N°	1a	1b	2	3a
C 228n	South Norwood	287 to 290	(288)	Real	Full	OK	52	.	.	.	.
C 228n	South Norwood	287 to 290	(288)	R/C	Part	OK	55	.	.	.	.
C 045l	Canterbury	c.289	(289)	Real	Full	OK	117	.	.	.	.
C 246p	*Verulamium*	c.289	(289)	Copy	Full	OK	*19*	.	.	.	.
C 005n	Amersham	287 to 293	(290)	Real	None	No	.	.	.	.	.
C 017q	Bicester (near)	287 to 293	(290)	Real	Full	OK	17	.	.	.	.
C 029n	Bredicot	287 to 293	(290)	Real	Part	OK	140	.	.	.	.
C 044f	Camerton	287 to 293	(290)	Real	None	No	114	.	.	.	.
C 045f	*Canterbury*	287 to 293	(290)	Copy	None	OK	*4*	.	.	.	.
C 045f	Canterbury	287 to 293	(290)	Real	Full	OK	2	.	.	.	.
C 045h	Canterbury	287 to 293	(290)	Real	None	No	150	.	.	.	.
C 045j	Canterbury	287 to 293	(290)	Real	None	OK	41	.	.	.	.
C 045f	Canterbury	287 to 293	(290)	R/C	Part	OK	6	.	.	.	.
C 048s	Castell y Bere	287 to 293	(290)	Real	None	No	.	.	.	.	.
C 075n	Conway	287 to 293	(290)	Real	None	OK	50	.	.	.	.
C 078n	*Croydon*	287 to 293	(290)	Copy	Part	OK	*4*	.	.	.	.
C 078n	Croydon	287 to 293	(290)	Real	Part	OK	116	.	.	.	.
C 078n	Croydon	287 to 293	(290)	R/C	Part	OK	120	.	.	.	.
C 082n	Deal	287 to 293	(290)	Real	None	OK	25	.	.	.	.
C 085n	*Dinorben*	287 to 293	(290)	Copy	Full	OK	*2*	.	.	.	.
C 085n	Dinorben	287 to 293	(290)	Real	Full	OK	4	.	.	.	.
C 085n	Dinorben	287 to 293	(290)	R/C	Full	OK	6	.	.	.	.
C 097n	Elland Hall	287 to 293	(290)	Real	None	No	.	.	.	.	.
C 100n	Emneth	287 to 293	(290)	Real	None	No	.	.	.	.	.
C 129	Hoveringham	287 to 293	(290)	Real	Full	OK	289	.	.	.	.
C 141n	Laugharne Cas...	287 to 293	(290)	Real	None	No	.	.	.	.	.
C 144	Linchmere	287 to 293	(290)	Real	Full	OK	812	.	.	.	.
C 153q	Llanidan	287 to 293	(290)	Real	None	No	.	.	.	.	.
C 153t	Llanlechid	287 to 293	(290)	Real	None	No	200	.	.	.	.
C 153u	Llanyihangel ..	289 to 291	(290)	Real	None	OK	61	.	.	.	.
C 174n	Mendips	287 to 293	(290)	Real	None	No	.	.	.	.	.
C 184n	Narberth	287 to 293	(290)	Real	None	No	18000	.	.	.	.
C 194n	Penard Gower	287 to 293	(290)	R/C	Part	OK	2583	.	.	.	.
C 209	Puncknoll	287 to 293	(290)	Real	Part	No	107	.	.	.	.
C 216n	Richborough	287 to 293	(290)	Real	Full	OK	11	.	.	.	.
C 216r	Ripley	287 to 293	(290)	Real	None	No	.	.	.	.	.
C 222n	Shotover	287 to 293	(290)	Real	None	OK	560	.	.	.	.
C 234n	Strata Florida	c.290	(290)	Real	Full	OK	15	.	.	.	.
C 237n	Thurstonland	287 to 293	(290)	Real	None	No	60	.	.	.	.
C 246n	*Verulamium*	287 to 293	(290)	Copy	None	OK	*3*	.	.	.	.
C 246n	Verulamium	287 to 293	(290)	Real	Full	OK	33	.	.	.	.
C 246n	Verulamium	287 to 293	(290)	R/C	Part	OK	36	.	.	.	.
C 251n	Walmersley	287 to 293	(290)	Real	None	OK	600	.	.	.	.
C 255n	Well	287 to 293	(290)	Real	None	OK	650	.	.	.	.
C 255q	Wenley	287 to 293	(290)	Real	None	No	.	.	.	.	.
C 277n	Wroxeter	287 to 293	(290)	Real	Full	OK	12	.	.	.	.
C 054n	Ceddar	287 to 296	(291)	Real	Part	OK	100	.	.	.	.
C 101n	Epperstone	287 to 296	(291)	Real	None	OK	1000	.	.	.	.
C 104	Erw hen	c.291	(291)	Real	Full	OK	684	.	.	.	.
C 104f	Evenley	287 to 296	(291)	Real	Full	OK	705	.	.	.	.
C 104q	Ewelme	287 to 296	(291)	Real	None	OK	336	.	.	.	.
C 120n	Great Orme	c.291	(291)	Real	Full	OK	17	.	.	.	.
C 153n	Llangeinwen	c.291	(291)	Real	Full	OK	23	.	.	.	.
C 195n	*Peterborough*	287 to 296	(291)	Copy	None	OK	*2*	.	.	.	.
C 195n	Peterborough	287 to 296	(291)	Real	Part	OK	3	.	.	.	.
C 195n	Peterborough	287 to 296	(291)	R/C	Part	OK	5	.	.	.	.
C 246q	Verulamium	290 to 293	(291)	Real	None	OK	144	.	.	.	.
C 256n	Wentwood Mill	290 to 293	(291)	Real	None	OK	1250	.	.	.	.
C 104n	Everton	c.292	(292)	Real	None	OK	600	.	.	.	.
C 090	East Harnham	c.293	(293)	Real	Full	OK	3705	.	.	.	.

Ref.N°.	Hoard Name	Date	Av.	R/C	Stat.	Count	N°	1a	1b	2	3a
C 148	Little Orm's H...	c.293	(293)	Real	Full	OK	700	.	.	.	.
C 152	Llanfairfrechan	c.293	(293)	Real	Part	OK	30	.	.	.	.
C 216q	Richborough	c.293	(293)	Real	Full	OK	6	.	.	.	.
C 224	Silchester	c.293	(293)	Real	Full	OK	22	.	.	.	.
C 225	Silchester	c.293	(293)	Real	Full	OK	40	.	.	.	.
C 235	Surrey (?)	c.293	(293)	Real	Full	OK	9	.	.	.	.
C 271	Wisbeach	c.293	(293)	Real	Full	OK	9	.	.	.	.
C 008	Crondal	293 to 296	(294)	Real	None	OK	300	.	.	.	.
C 019n	Bitterne	293 to 296	(294)	Real	None	No	.	.	.	.	.
C 025n	Borden	293 to 296	(294)	Real	Part	No	.	.	.	.	.
C 036q	Burton Latimer	293 to 296	(294)	Real	Full	OK	108	.	.	.	.
C 038n	Caerwent	293 to 296	(294)	Real	Part	OK	20	.	.	.	.
C 044n	Camerton	293 to 296	(294)	Real	None	OK	67	.	.	.	.
C 045n	*Canterbury*	293 to 295	(294)	Copy	None	OK	*1*	.	.	.	.
C 045n	Canterbury	293 to 295	(294)	Real	Full	OK	7	.	.	.	.
C 045n	Canterbury	293 to 295	(294)	R/C	Part	OK	8	.	.	.	.
C 072	nr. Colchester	293 to 296	(294)	Real	Full	OK	298	.	.	.	.
C 075q	Coygan Cave	293 to 296	(294)	Real	None	No	.	.	.	.	.
C 077n	Crondall	293 to 296	(294)	Real	None	OK	250	.	.	.	.
C 085f	Dinas Dinlle	293 to 296	(294)	Real	None	No	.	.	.	.	.
C 089	Droitwich	293 to 295	(294)	Real	Full	OK	14	.	.	.	.
C 111n	Fleet	293 to 296	(294)	Real	None	No	.	.	.	.	.
C 115n	Gloucester	293 to 296	(294)	Real	None	OK	15544	.	.	.	.
C 128n	Holt	293 to 295	(294)	Real	None	No	1063	.	.	.	.
S 104	Lancaster	c.294	(294)	Real	None	No	.	.	.	.	.
C 142n	Leigh Church	293 to 296	(294)	Real	None	No	30	.	.	.	.
C 143n	Lilly Horn	293 to 295	(294)	Real	None	No	1223	.	.	.	.
C 185	Neath	293 to 296	(294)	Real	Part	OK	175	.	.	.	.
C 192n	Oundle	293 to 296	(294)	Real	Full	OK	1205	.	.	.	.
C 193n	Park End	293 to 296	(294)	Real	Part	OK	1000	.	1	.	.
C 229	*nr. Sparkford*	c.294	(294)	Copy	Poor	OK	*25*	.	.	.	.
C 229	nr. Sparkford	c.294	(294)	Real	Full	OK	375	.	.	.	.
C 229	nr. Sparkford	c.294	(294)	R/C	Part	OK	400	.	.	.	.
C 237p	Tickenham	293 to 296	(294)	Real	None	No	.	.	.	.	.
C 255f	Wedmore	293 to 296	(294)	Real	None	OK	54	.	.	.	.
C 011	Bath (near)	295 to 296	(295)	Real	Full	OK	1805	.	.	.	.
S 056	*Kiddington*	c.295	(295)	Copy	None	OK	*9*	.	.	.	.
S 056	Kiddington	c.295	(295)	Real	Full	OK	1	.	.	.	.
S 056	Kiddington	c.295	(295)	R/C	Part	OK	10	.	.	.	.
C 252n	Watchfield	293 to 297	(295)	Real	Full	OK	23	.	.	.	.
C 017	Bawtree ?	c.296	(296)	Real	Part	OK	600	.	.	.	.
C 020	*Blackmoor*	c.296	(296)	Copy	Full	OK	*1739*	.	.	.	.
C 020	Blackmoor	c.296	(296)	Real	Full	OK	20697	.	.	.	.
C 020	Blackmoor	c.296	(296)	R/C	Full	OK	22436	.	.	.	.
C 067	Claydon Pyke	c.296	(296)	Real	Part	OK	42	.	.	.	.
C 195	*Pen y Corddyn*	c.296	(296)	Copy	None	OK	*12*	.	.	.	.
C 195	Pen y Corddyn	c.296	(296)	Real	Part	OK	116	.	.	.	.
C 195	Pen y Corddyn	c.296	(296)	R/C	Part	OK	128	.	.	.	.
C 128q	Hove Edge	c.305	(305)	Real	None	No	.	.	.	.	.
C 067n	Cleckheaton	c.306	(306)	Real	None	No	.	.	.	.	.
C 231	Springhead	c.311	(311)	Real	Full	OK	2	.	.	.	.
C 278	Wroxton Heath	306 to 317	(311)	Real	Full	OK	3	.	.	.	.
C 027	Bourton on...	318 to 319	(318)	Real	Full	OK	2	.	.	.	.
C 250	Waddington	c.318	(318)	Real	Full	OK	10	.	.	.	.
C 046	Canterbury	c.323	(323)	Real	Full	OK	1	.	.	.	.
C 123	*Hambledon*	317 to 330	(323)	Copy	Full	OK	*1*	.	.	.	.
C 123	Hambledon	317 to 330	(323)	Real	Full	OK	6	.	.	.	.
C 123	Hambledon	317 to 330	(323)	R/C	Full	OK	7	.	.	.	.
C 076	Cranfield	300 to 350	(325)	Real	None	OK	3	.	.	.	.
C 092n	Easton	300 to 350	(325)	Real	Part	No	9	.	.	.	.

Ref.N°.	Hoard Name	Date	Av.	R/C	Stat.	Count	N°	1a	1b	2	3a
C 123n	Hambledon	300 to 350	(325)	Real	Full	OK	7	.	.	.	.
C 148n	Little Orme	300 to 350	(325)	Real	None	No	.	.	.	.	.
C 194q	Penrhyn	300 to 350	(325)	Real	Full	OK	3	.	.	.	.
C 216s	Rushall Down	300 to 350	(325)	Real	Full	OK	5	.	.	.	.
C 220n	Sapperton Down	300 to 350	(325)	Real	None	OK	70	.	.	.	.
C 108	Eynsham	330 to 333	(331)	Real	Full	OK	1	.	.	.	.
C 042	Caistor by Yar...	330 to 341	(335)	Real	Full	OK	3	.	.	.	.
C 101	Enfield	c.335	(335)	Real	Part	OK	*2*	.	.	.	.
B 089	Silchester V	c.337	(337)	Real	Full	OK	1	.	.	.	.
C 272	*Woodeaton*	338 to 339	(338)	Copy	Full	OK	*4*	.	.	.	.
C 272	Woodeaton	338 to 339	(338)	Real	Full	OK	2	.	.	.	.
C 272	Woodeaton	338 to 339	(338)	R/C	Full	OK	6	.	.	.	.
C 150	*Llanbethery*	341 to 346	(343)	Copy	Full	OK	*1*	.	.	.	.
C 150	Llanbethery	341 to 346	(343)	Real	Full	OK	5	.	.	.	.
C 150	Llanbethery	341 to 346	(343)	R/C	Full	OK	6	.	.	.	.
B 069	Pembroke Cas...	337 to 350	(343)	Real	Poor	No	.	.	.	.	.
B 090	*Silchester VII*	341 to 348	(344)	Copy	None	OK	*1*	.	.	.	.
B 090	Silchester VII	341 to 348	(344)	Real	Full	OK	1	.	.	.	.
B 090	Silchester VII	341 to 348	(344)	R/C	Part	OK	2	.	.	.	.
C 031n	Bristol (near)	c.347	(347)	Real	Full	OK	6	.	.	.	.
B 002	Appleford	348 to 350	(349)	Real	Poor	No	.	.	.	.	.
B 045	Halifax	348 to 350	(349)	Real	Full	OK	1	.	.	.	.
B 046	Hamble	348 to 350	(349)	Real	Full	OK	1	.	.	.	.
B 060	Llwchwr	348 to 350	(349)	Real	None	No	.	.	.	.	.
B 080	Richborough 7	348 to 350	(349)	Real	Full	OK	6	.	.	.	.
B 030	Dinorben	350 to 351	(350)	Real	None	OK	1	.	.	.	.
C 114	Freston	c.350	(350)	Real	Full	OK	2	.	.	.	.
B 061	Long Wittenham	350 to 351	(350)	Real	Full	OK	1	.	.	.	.
B 038	*Gadebridge*	350 to 353	(351)	Copy	None	OK	*7*	.	.	.	.
B 038	Gadebridge	350 to 353	(351)	Real	Full	OK	3	.	.	.	.
B 038	Gadebridge	350 to 353	(351)	R/C	Part	OK	10	.	.	.	.
S 064	Cowlam	351 to 353	(352)	Real	Full	OK	4	.	.	.	.
B 047	Hanham	351 to 353	(352)	Real	Full	OK	1	.	.	.	.
S 062	*Covesea*	c.353	(353)	Copy	Full	OK	*1*	.	.	.	.
B 062	Lydney	353 to 354	(353)	Real	Full	OK	2	.	.	.	.
B 063	Nettleton	353 to 354	(353)	Real	Full	OK	1	.	.	.	.
B 084	*Richborough 11*	c.353	(353)	Copy	Full	OK	*11*	.	.	.	.
B 084	Richborough 11	c.353	(353)	Real	Full	OK	4	.	.	.	.
B 084	Richborough 11	c.353	(353)	R/C	Full	OK	15	.	.	.	.
B 049	Heslington	c.355	(355)	Real	Full	OK	2	.	.	.	.
B 001	Abergele	c.364	(364)	Real	Full	OK	27	.	.	.	.
B 055	Kenchester	367 to 375	(371)	Real	Full	OK	3	.	.	.	.
B 108	Wroxeter 2	364 to 378	(371)	Real	Full	OK	2	.	.	.	.
C 195q	Pevensey	367 to 383	(375)	Real	None	OK	5	.	.	.	.
B 109	Wroxeter 3	367 to 383	(375)	Real	Full	OK	18	.	.	.	.
C 196	Piercebridge	c.378	(378)	Real	None	No	.	.	.	.	.
B 075	Richborough 2	379 to 395	(387)	Real	Part	OK	12	.	.	.	.
B 066	*Nobottle*	c.388	(388)	Copy	Part	OK	*2*	.	.	.	.
B 066	Nobottle	c.388	(388)	Real	Full	OK	5	.	.	.	.
B 066	Nobottle	c.388	(388)	R/C	Part	OK	7	.	.	.	.
B 102	*Wiveliscombe*	c.388	(388)	Copy	Full	OK	*2*	.	.	.	.
B 102	Wiveliscombe	c.388	(388)	Real	Full	OK	8	.	.	.	.
B 102	Wiveliscombe	c.388	(388)	R/C	Full	OK	10	.	.	.	.
B 006	*Bermondsey*	c.392	(392)	Copy	None	OK	*3*	.	.	.	.
B 018	*Cirencester 1*	c.393	(393)	Copy	None	OK	*2*	.	.	.	.
B 018	Cirencester 1	c.393	(393)	Real	Full	OK	1	.	.	.	.
B 018	Cirencester 1	c.393	(393)	R/C	Part	OK	3	.	.	.	.
B 040	*Gloucester 2*	c.393	(393)	Copy	None	OK	2	.	.	.	.
B 058	Laxton	c.393	(393)	Real	Full	OK	3	.	.	.	.
B 076	Richborough 3	c.393	(393)	Real	None	OK	4	.	.	.	.

Ref.N°.	Hoard Name	Date	Av.	R/C	Stat.	Count	N°	1a	1b	2	3a
B 077	Richborough 4	c.393	(393)	Real	Part	OK	4	.	.	.	.
B 078	Richborough 5	c.393	(393)	Real	Full	OK	1	.	.	.	.
B 079	Richborough 6	c.393	(393)	Real	None	OK	1	.	.	.	.
B 098	Waldersea	c.393	(393)	Real	Full	OK	1	.	.	.	.
B 101	Wisbeach	c.393	(393)	Real	Full	OK	4	.	.	.	.
B 103	*Woodbridge*	c.393	(393)	Copy	Full	OK	*3*	.	.	.	.
B 103	Woodbridge	c.393	(393)	Real	Full	OK	2	.	.	.	.
B 103	Woodbridge	c.393	(393)	R/C	Full	OK	5	.	.	.	.
B 053	Icklingham	393 to 395	(394)	Real	Part	OK	23	.	.	.	.
B 073	*Redenhall*	c.394	(394)	Copy	Part	OK	*15*	.	.	.	.
B 073	Redenhall	c.394	(394)	Real	Full	OK	14	.	.	.	.
B 073	Redenhall	c.394	(394)	R/C	Part	OK	29	.	.	.	.
B 105	*Worle Camp*	c.394	(394)	Copy	Part	OK	*2*	.	.	.	.
B 105	Worle Camp	c.394	(394)	Real	Full	OK	1	.	.	.	.
B 105	Worle Camp	c.394	(394)	R/C	Part	OK	3	.	.	.	.
B 012	Canterbury 2	388 to 402	(395)	Real	None	OK	2	.	.	.	.
B 013	Canterbury 3	388 to 402	(395)	Real	None	OK	5	.	.	.	.
B 031	Dorchester on...	388 to 402	(395)	Real	None	OK	1	.	.	.	.
B 032	Dorchester on...	388 to 402	(395)	Real	None	OK	15	.	.	.	.
B 099	Weymouth	388 to 402	(395)	Real	Full	OK	34	.	.	.	.
B 042	'Gravesend'	c.395	(395)	Real	Part	OK	2	.	.	.	.
S 130	*Piercebridge*	393 to 402	(397)	Copy	Part	OK	*1*	.	.	.	.
S 130	Piercebridge	393 to 402	(397)	Real	Full	OK	2	.	.	.	.
S 130	Piercebridge	393 to 402	(397)	R/C	Part	OK	3	.	.	.	.

The Number of Antoniniani in Coin Hoards

Part 2: Groups A3b to A11b

Only those hoards containing coins of these groups are shown.

Ref.No.	R/C	3b	4	5a	5b	6	7a	7b	8	9a	9b	10	11a	11b
C 089n	Real	1	.	.	.	.	.	.	.	.	.	.	.	.
C 099	Real	.	.	1	.	107	56	8	.	.	.	.	.	.
C 119	Real	.	.	.	.	46	8	1	.	.	.	.	.	.
C 204	Real	.	.	.	.	18	7	3	3	1	1	.	1	.
C 087	Real	7	.	29	38	8890	5939	1050	2321	769	632	52	366	36
C 003	Real	.	.	.	.	6	3	2	2	4	1	.	8	3
C 093	Real	1	.	.	.	62	42	7	19	5	8	.	13	.
C 173	Real	.	.	1	1	148	92	5	23	11	5	1	8	3
C 009	Copy	.	.	.	.	.	.	.	*1*	.	.	.	.	.
C 009	Real	.	.	.	.	4	2	1	1	.	2	.	4	1
C 009	R/C	.	.	.	.	4	2	1	2	.	2	.	4	1
C 283	Real	.	.	.	.	45	35	4	23	12	.	2	29	29
C 041	Real	1	.	1	4	86	45	9	13	4	1	.	1	5
C 168	Real	.	.	.	.	3	.	.	3	1	.	.	1	.
S 128	Real	.	1	.	.	.	1	.	4	1	1	1	27	5
C 163	Real	.	.	.	.	.	.	.	.	.	.	.	5	1
C 069	Real	.	.	.	.	56	45	8	36	21	11	3	102	72
C 069	R/C	.	.	.	.	56	45	8	36	21	11	3	102	72
C 233	Real	.	.	.	.	.	.	.	.	.	1	.	.	.
C 026	Real	.	.	.	.	1	.	.	.	.	.	.	.	.
S 045	Real	.	.	.	.	.	.	.	.	.	1	.	7	.
C 078	Real	.	.	.	.	.	.	.	.	.	.	.	1	3
C 078	R/C	.	.	.	.	.	.	.	.	.	.	.	1	3
C 115	Real	.	.	.	.	.	.	.	.	.	.	.	4	.
C 178	Real	.	.	.	.	.	.	.	.	.	.	.	9	1
C 222	Real	.	.	.	.	22	27	6	20	24	17	3	41	16
C 256	Real	.	.	.	.	11	3	.	.	.	.	.	1	1
C 124	Real	.	.	.	.	.	.	.	.	.	.	.	.	1
C 169	Real	.	.	.	.	5	1	.	.	2	.	.	12	2
C 169	R/C	.	.	.	.	5	1	.	.	2	.	.	12	2

Ref.No.	R/C	3b	4	5a	5b	6	7a	7b	8	9a	9b	10	11a	11b
C 170	Real	.	.	.	.	10	10	1	6	5	6	.	76	36
C 170	R/C	.	.	.	.	10	10	1	6	5	6	.	76	36
C 210	Real	.	.	.	.	.	.	.	1	.	1	.	7	2
C 210	R/C	.	.	.	.	.	.	.	1	.	1	.	7	2
S 157	Real	.	.	.	.	.	1	.	1	1	2	1	50	11
S 006	Real	.	.	.	.	.	.	.	.	.	.	.	1	.
S 027	Real	.	.	.	.	.	.	.	.	.	.	.	3	.
S 027	R/C	.	.	.	.	.	.	.	.	.	.	.	3	.
C 037	Real	.	.	.	.	.	.	.	.	.	.	.	8	2
C 037	R/C	.	.	.	.	.	.	.	.	.	.	.	8	2
C 057	Real	.	.	.	.	1	2	0	.	.	.	.	3	.
C 070	Real	.	.	.	.	.	.	.	2	1	1	1	36	17
C 070	R/C	.	.	.	.	.	.	.	2	1	1	1	36	17
C 092	Real	.	.	.	.	.	.	.	.	.	.	.	.	1
C 092	R/C	.	.	.	.	.	.	.	.	.	.	.	.	1
C 112	Real	.	.	.	.	.	2	.	.	3	.	.	18	1
C 167	Real	.	.	.	.	2	.	1	.	.	.	.	1	.
C 203	Real	.	.	.	.	1	.	.	1	.	1	.	12	6
C 259	Real	.	.	.	.	.	.	.	.	.	.	.	1	.
C 264	Real	.	.	.	.	.	.	.	1	.	1	.	24	5
C 264	R/C	.	.	.	.	.	.	.	1	.	1	.	24	5
C 266	Real	.	.	.	.	.	1	.	.	.	.	.	.	.
C 015	Real	.	.	1	1	296	223	20	102	76	55	6	236	97
C 015	R/C	.	.	1	1	296	223	20	102	76	55	6	236	97
C 025	Real	.	.	.	.	.	.	.	.	1	1	.	9	3
C 071	Real	.	.	.	.	.	.	.	.	.	.	.	6	.
C 071	R/C	.	.	.	.	.	.	.	.	.	.	.	6	.
C 083	Real	.	.	.	.	.	.	.	.	.	.	.	4	.
C 100	Real	.	.	.	.	2	.	.	.	.	.	1	9	4
C 161	Real	.	.	.	.	2	.	.	.	.	.	.	.	2
C 161	R/C	.	.	.	.	2	.	.	.	.	.	.	.	2
C 184	Real	.	.	.	.	1	1	.	.	1	.	1	1	2
C 184	R/C	.	.	.	.	1	1	.	.	1	.	1	1	2
C 031	Real	.	.	.	.	.	.	.	.	.	.	.	1	.
C 031	R/C	.	.	.	.	.	.	.	.	.	.	.	1	.
C 047	Real	.	.	.	.	.	.	.	.	.	1	.	11	3
C 047	R/C	.	.	.	.	.	.	.	.	.	1	.	11	3
S 085	Real	.	.	.	.	.	.	.	.	.	.	.	1	.
S 085	R/C	.	.	.	.	.	.	.	.	.	.	.	1	.
C 002	Real	.	.	.	.	1	.	.	.	.	.	.	7	2
C 002	R/C	.	.	.	.	1	.	.	.	.	.	.	7	2
C 012	Real	.	.	.	.	.	.	.	0	.	.	.	2	0
C 013	Real	.	.	.	.	.	.	.	0	.	.	.	3	0
C 014	Real	.	.	.	.	.	.	.	0	.	.	.	8	0
C 012	R/C	.	.	.	.	.	.	.	0	.	.	.	2	0
C 014	R/C	.	.	.	.	.	.	.	0	.	.	.	8	0
C 128	Real	.	.	.	.	43	48	4	19	17	8	.	77	31
C 128	R/C	.	.	.	.	43	48	4	19	17	8	.	77	31
C 059	Real	.	.	.	.	.	.	.	.	.	.	.	8	.
C 059	R/C	.	.	.	.	.	.	.	.	.	.	.	8	.
C 073	Real	.	.	.	.	.	.	.	.	.	.	.	20	5
C 073	R/C	.	.	.	.	.	.	.	.	.	.	.	20	5
C 174	Real	.	.	.	.	.	.	.	.	.	.	.	1	.
C 174	R/C	.	.	.	.	.	.	.	.	.	.	.	1	.
C 237	Real	.	.	.	.	.	.	.	.	.	.	.	10	3
C 237	R/C	.	.	.	.	.	.	.	.	.	.	.	10	3
C 165	Real	.	.	.	.	.	1	.	.	.	1	.	14	3
C 182	Real	.	.	.	.	1	1	.	.	.	.	.	2	1
C 181	Real	.	.	.	.	.	.	.	.	.	.	.	5	1
C 181	R/C	.	.	.	.	.	.	.	.	.	.	.	5	1
C 045l	Real	.	.	1	.	.	.	.	.	.	.	.	.	.

Ref.No.	R/C	3b	4	5a	5b	6	7a	7b	8	9a	9b	10	11a	11b
C 194n	R/C	.	.	.	.	.	.	.	.	.	.	.	5	.
C 277n	Real	.	.	.	.	.	1	.	1	.	.	.	.	.
C 104	Real	.	.	.	.	.	.	.	1	.	.	.	.	.
C 104f	Real	.	.	.	.	.	.	.	.	.	.	.	1	.
C 153n	Real	.	.	.	.	.	1	.	.	.	.	.	.	.
C 090	Real	.	.	.	.	.	.	.	.	.	.	.	3	2
C 192n	Real	.	.	.	.	.	.	.	.	.	.	.	2	.
C 193n	Real	.	.	.	.	1	9	.	2	.	.	.	2	.
C 011	Real	.	.	.	.	.	.	.	.	.	.	.	3	.
C 017	Real	.	.	.	.	.	.	.	.	.	.	.	1	.
C 020	Copy	.	.	.	.	*1*	.	.	.	.	.	.	.	*1*
C 020	Real	.	.	.	.	1	2	.	.	1	1	.	23	6
C 020	R/C	.	.	.	.	2	2	.	.	1	1	.	23	7
C 195	Real	.	.	.	.	.	.	.	.	.	.	.	1	.
C 195	R/C	.	.	.	.	.	.	.	.	.	.	.	1	.
B 001	Real	.	.	.	.	1	.	.	.	.	.	.	.	.

The Number of Antoniniani in Coin Hoards

Part 3: Groups A11c to A19a

Only those hoards containing coins of these groups are shown.

Ref.No.	R/C	11c	11d	11e	12a	12b	13a	13b	14	15	16	17	18	19a
C 087	Real	.	346	110	.	.	.	.	.	.	.	.	.	.
C 003	Real	3	12	5	.	.	.	.	.	46	.	.	.	.
C 093	Real	.	11	3	.	.	.	.	.	.	.	.	.	.
C 173	Real	.	17	2	.	.	.	.	.	3	.	.	.	.
C 009	Real	2	4	2	.	.	.	.	.	.	.	.	.	.
C 009	R/C	2	4	2	.	.	.	.	.	.	.	.	.	.
C 283	Real	.	74	36	.	.	.	.	.	.	.	.	.	.
C 041	Real	.	2	*1*	.	.	.	.	.	*5*	.	.	.	.
C 168	Real	.	3	.	1	.	.	.	.	2	.	.	.	.
S 128	Real	.	21	21	7	.	.	.	.	34	.	.	.	.
C 253	Real	.	1	.	1	.	.	.	.	8	.	.	.	.
S 077	Real	.	.	.	.	.	1	.	.	.	.	.	5	.
C 163	Real	.	.	.	1	1	2	.	.	11	.	.	6	.
C 069	Real	37	163	68	3	.	.	.	.	904	.	.	.	.
C 069	R/C	37	163	68	3	.	.	.	.	904	.	.	.	.
C 233	Real	1	0	0	1	3	.	.	.	7	.	.	5	.
S 001	Real	.	.	1	.	.	.	.	.	8	.	.	.	.
S 017	Real	.	1	.	7	.	2	.	.	1	.	.	8	9
C 026	Real	.	.	.	1	.	2	.	.	.	.	.	1	.
S 038	Real	.	.	.	.	.	2	.	.	.	.	.	1	.
S 038	R/C	.	.	.	.	.	2	.	.	.	.	.	1	.
S 045	Real	2	5	3	17	1	8	.	.	33	1	2	31	.
C 078	Real	2	2	2	29	3	14	.	4	49	.	.	56	3
C 078	R/C	2	2	2	29	3	14	.	4	49	.	.	56	3
C 115	Real	1	2	1	2	.	1	.	.	19	.	.	10	.
S 081	Copy	.	.	.	.	.	.	.	.	.	.	.	.	2
S 081	Real	.	.	.	.	.	2	.	.	.	.	.	3	3
S 081	R/C	.	.	.	.	.	2	.	.	.	.	.	3	5
C 160	Real	.	.	.	38	2	44	0	2	.	.	.	1	.
C 178	Real	.	7	.	175	24	110	8	11	35	.	2	285	410
S 138	Real	.	.	.	.	.	.	.	.	2	.	.	13	36
C 222	Real	16	0	0	92	47	8	.	2	513	1	1	110	.
C 256	Real	1	6	.	18	1	5	.	2	48	.	.	47	.
C 021	Real	.	.	.	1	.	1	.	.	1	.	.	4	28
C 024	Real	.	.	.	1	.	2	.	.	1	.	.	6	11
C 124	Real	.	0	0	37	6	36	2	3	19	1	2	130	185
C 169	Copy	.	.	.	.	.	.	.	.	.	.	.	.	*8*
C 169	Real	3	0	0	110	7	82	0	8	116	1	3	252	143

Ref.No.	R/C	11c	11d	11e	12a	12b	13a	13b	14	15	16	17	18	19a
C 169	R/C	3	0	0	110	7	82	0	8	116	1	3	252	151
C 197	Copy	.	.	.	.	.	*1*	.	.	*1*	.	.	.	*3*
C 197	Real	.	.	.	5	.	1	1	.	.	.	.	1	3
C 197	R/C	.	.	.	5	.	2	1	.	1	.	.	1	6
C 282	Real	.	.	.	.	.	.	.	.	.	.	.	3	.
C 282	R/C	.	.	.	.	.	.	.	.	.	.	.	3	.
C 281	Real	.	1	.	7	.	2	.	.	1	.	.	8	9
C 170	Real	33	96	50	201	20	114	2	15	913	1	12	1056	148
C 170	R/C	33	96	50	201	20	114	2	15	913	1	12	1056	148
C 210	Real	2	4	2	2	2	8	1	.	130	.	1	42	1
C 210	R/C	2	4	2	2	2	8	1	.	130	.	1	42	1
C 247	Copy	.	.	.	.	.	.	.	.	*1*	.	.	.	.
C 247	Real	.	.	.	5	1	5	.	.	5	.	1	24	11
C 247	R/C	.	.	.	5	1	5	.	.	6	.	1	24	11
S 157	Real	11	29	41	887	95	696	0	95	454	6	24	1678	424
S 006	Real	.	.	.	5	.	9	.	.	2	.	.	50	97
S 013	Copy	.	.	.	.	.	.	.	.	.	.	.	.	*4*
S 013	Real	.	.	.	.	.	1	.	.	.	.	.	.	2
S 013	R/C	.	.	.	.	.	1	.	.	.	.	.	.	6
S 027	Copy	.	.	.	.	.	*4*	.	.	*2*	.	.	*7*	*26*
S 027	Real	.	.	.	.	.	.	.	.	*5*	.	.	.	.
S 027	R/C	.	.	.	.	.	4	.	.	7	.	.	7	26
C 037	Real	.	2	.	300	23	212	18	29	55	1	4	501	335
C 037	R/C	.	2	.	300	23	212	18	29	55	1	4	501	335
C 045	Real	.	1	.	11	3	14	0	1	.	.	2	50	89
C 057	Real	.	.	.	12	1	8	.	.	3	.	1	4	10
C 070	Real	11	28	25	618	36	501	45	79	533	3	27	1569	453
C 070	R/C	11	28	25	618	36	501	45	79	533	3	27	1569	453
S 068	Real	.	.	.	6	.	2	.	.	2	.	.	9	7
C 086	Real	.	.	.	3	1	2	.	2	.	.	.	2	4
C 092	Real	.	3	1	124	9	78	4	4	16	.	1	213	116
C 092	R/C	.	3	1	124	9	78	4	4	16	.	1	213	116
C 285	Real	.	.	.	172	8	69	113	7	6	.	.	129	354
C 109	Real	.	.	.	4	2	5	.	.	.	.	.	13	5
C 112	Real	4	20	12	131	11	122	0	12	246	1	2	485	120
C 118	Real	.	.	.	25	1	18	9	2	1	.	.	13	41
C 118	R/C	.	.	.	25	1	18	9	2	1	.	.	13	41
C 156	Copy	.	.	.	*2*	.	.	.	.	*1*	.	.	*1*	*19*
C 167	Real	.	.	.	.	.	2	.	.	7	.	.	1	.
C 172	Real	.	.	1	5	1	15	.	2	3	.	.	17	16
S 028	Copy	.	.	.	.	.	.	*1*	.	*1*	.	.	*1*	*12*
C 203	Real	2	0	0	215	30	121	0	10	95	.	.	249	160
S 139	Real	.	.	.	.	.	1	.	.	.	.	.	.	.
S 150	Copy	.	.	.	.	.	*3*	*9*	.	.	.	.	*1*	*15*
S 150	Real	.	.	.	4	1	2	3	.	.	.	.	2	.
S 150	R/C	.	.	.	4	1	5	12	.	.	.	.	3	15
C 234	Real	.	.	.	2	.	2	.	.	3	.	.	8	6
C 246s	Real	.	.	.	10	1	6	.	.	5	.	.	17	10
C 259	Real	.	.	1	9	3	8	1	.	.	.	.	26	12
C 260	Real	.	.	.	6	1	4	.	.	.	.	.	9	7
C 264	Real	1	19	16	345	26	212	9	41	201	1	9	514	116
C 264	R/C	1	19	16	345	26	212	9	41	201	1	9	514	116
C 266	Real	1	1	.	18	4	21	2	1	9	.	1	56	24
C 015	Copy	.	.	.	*41*	*5*	*13*	*5*	*3*	*12*	.	*2*	*23*	*56*
C 015	Real	50	321	131	1375	105	1110	96	88	1794	2	17	2741	3529
C 015	R/C	50	321	131	1416	110	1123	101	91	1806	2	19	2764	3585
C 025	Real	1	6	2	60	7	49	.	3	86	.	1	116	137
C 056	Real	.	.	.	47	0	47	.	1	2	.	.	121	153
C 056	R/C	.	.	.	47	0	47	.	1	2	.	.	121	153
C 071	Real	.	3	2	88	31	92	11	20	34	.	3	138	44
C 071	R/C	.	3	2	88	31	92	11	20	34	.	3	138	44

Ref.No.	R/C	11c	11d	11e	12a	12b	13a	13b	14	15	16	17	18	19a
C 083	Real	1	1	1	61	6	61	3	8	41	.	2	229	94
C 100	Real	.	14	8	244	36	192	16	21	175	3	5	530	274
C 161	Real	.	.	.	5	.	6	1	.	11	.	.	26	33
C 161	R/C	.	.	.	5	.	6	1	.	11	.	.	26	33
C 184	Copy	.	.	.	.	.	.	.	.	.	.	.	*1*	.
C 184	Real	1	7	4	64	8	49	0	1	59	.	5	135	129
C 184	R/C	1	7	4	64	8	49	0	1	59	.	5	136	129
C 207	Copy	.	.	.	*1*	.	.	.	.	*1*	.	.	*3*	*5*
C 031	Copy	.	.	.	*3*	.	*11*	*13*	.	.	.	.	*12*	*116*
C 031	Real	.	.	.	118	0	94	17	.	.	.	.	203	50
C 031	R/C	.	.	.	121	0	105	30	.	.	.	.	215	166
C 047	Real	.	9	4	89	21	99	9	7	158	2	6	374	188
C 047	R/C	.	9	4	89	21	99	9	7	158	2	6	374	188
C 102	Real	.	.	.	1	.	4	.	.	.	.	.	7	35
C 102	R/C	.	.	.	1	.	4	.	.	.	.	.	7	35
C 146	Copy	.	.	.	.	.	.	.	.	.	.	.	*3*	*1*
C 175	Copy	.	.	.	.	.	.	*6*	.	.	.	.	*3*	*17*
C 201	Copy	.	.	.	.	.	*1*	.	.	.	.	.	*3*	*4*
C 201	Real	.	.	.	.	.	1	.	.	2	.	.	4	6
C 201	R/C	.	.	.	.	.	2	.	.	2	.	.	7	10
S 085	Copy	.	.	.	.	.	*6*	.	.	.	.	.	*2*	*50*
S 085	Real	.	.	.	3	.	5	.	1	6	.	1	.	14
S 085	R/C	.	.	.	3	.	11	.	1	6	.	1	2	64
C 194	Real	.	.	.	4	.	7	2	1	.	.	.	.	1
C 194	R/C	.	.	.	4	.	7	2	1	.	.	.	.	1
C 002	Real	.	6	8	247	18	244	0	20	53	2	6	595	826
C 002	R/C	.	6	8	247	18	244	0	20	53	2	6	595	826
C 012	Real	0	0	0	74	0	41	20	4	3	0	0	88	187
C 013	Real	0	0	0	60	0	53	3	7	19	0	0	208	224
C 014	Real	0	0	0	260	0	211	39	11	40	0	0	477	838
C 012	R/C	0	0	0	74	0	41	20	4	3	0	0	88	187
C 014	R/C	0	0	0	260	0	211	39	11	40	0	0	477	838
C 080	Real	.	.	.	44	5	52	0	2	3	.	3	119	214
C 094	Real	.	.	.	5	1	3	.	.	1	.	.	25	13
C 128	Copy	.	.	.	.	.	.	.	.	2	.	1	7	220
C 128	Real	7	94	60	568	60	565	0	35	1214	4	19	914	905
C 128	R/C	7	94	60	568	60	565	0	35	1216	4	20	921	1125
C 276	Real	.	.	.	8	.	12	0	1	1	.	1	29	54
C 098	Real	.	.	.	13	3	25	0	2	5	.	2	92	145
C 211	Real	.	.	.	.	.	.	.	.	.	.	.	1	.
C 211	R/C	.	.	.	.	.	.	.	.	.	.	.	1	.
C 059	Real	1	3	5	303	38	256	32	21	35	.	11	675	1058
C 059	R/C	1	3	5	303	38	256	32	21	35	.	11	675	1058
C 073	Real	1	5	18	936	79	705	56	75	99	1	7	1343	2492
C 073	R/C	1	5	18	936	79	705	56	75	99	1	7	1343	2492
C 174	Copy	.	.	.	.	.	*12*	*26*	.	.	.	.	*32*	*314*
C 174	Real	.	1	1	57	6	50	6	3	12	.	.	69	130
C 174	R/C	.	1	1	57	6	62	32	3	12	.	.	101	444
C 237	Real	.	4	10	399	39	287	35	21	62	1	11	1113	1819
C 237	R/C	.	4	10	399	39	287	35	21	62	1	11	1113	1819
C 165	Real	3	14	8	458	29	273	42	43	259	3	25	943	859
C 182	Real	1	4	5	280	28	231	32	20	62	1	2	563	822
C 066	Part	2	0	0	541	37	492	0	38	47	1	7	706	1011
S 107	Copy	.	*3*	.	.	.	.	.	.	.	.	.	.	.
C 138	Real	.	.	.	3	.	2	.	.	1	.	.	.	6
S 107	Real	.	3	.	.	.	.	.	.	.	.	.	5	1
S 107	R C	.	6	.	.	.	.	.	.	.	.	.	5	1
C 181	Real	.	1	3	452	46	369	55	23	43	1	6	643	1120
C 181	R/C	.	1	3	452	46	369	55	23	43	1	6	643	1120
C 270	Real	.	.	.	2	.	.	.	.	.	.	.	3	1
C 221n	Real	.	.	.	2	.	4	.	1	2	.	1	5	15

Ref.No.	R/C	11c	11d	11e	12a	12b	13a	13b	14	15	16	17	18	19a
C 221n	R/C	.	.	.	2	.	4	.	1	2	.	1	5	15
C 228n	Real	.	.	.	1	.	.	.	.	.	.	.	2	.
C 228n	R/C	.	.	.	1	.	.	.	.	.	.	.	2	.
C 029n	Real	.	.	.	7	1	11	.	.	1	.	.	9	24
C 045f	Real	.	.	.	.	.	1	.	.	.	.	.	.	.
C 045f	R/C	.	.	.	.	.	1	.	.	.	.	.	.	.
C 078n	Real	.	.	.	1	.	.	1	.	.	.	.	2	2
C 078n	R/C	.	.	.	1	.	.	1	.	.	.	.	2	2
C 085n	Copy	.	.	.	.	.	.	.	.	.	.	.	*1*	.
C 085n	Real	.	.	.	1	.	.	.	.	.	.	.	1	.
C 085n	R/C	.	.	.	1	.	.	.	.	.	.	.	2	.
C 129	Real	.	.	.	31	5	41	0	.	2	.	.	59	69
C 144	Real	.	.	.	.	.	.	.	.	1	.	.	2	.
C 194n	R/C	.	0	0	331	29	256	61	18	30	.	5	514	866
C 209	Real	.	.	.	3	2	2	.	.	55	.	.	40	3
C 216n	Real	.	.	.	.	.	.	.	.	.	.	.	.	1
C 234n	Real	.	.	.	1	.	2	.	.	.	.	.	4	7
C 246n	Real	.	.	.	1	1	2	.	.	.	.	.	3	7
C 246n	R/C	.	.	.	1	1	2	.	.	.	.	.	3	7
C 277n	Real	.	.	.	3	1	.	.	.	6	.	.	.	.
C 054n	Real	.	.	.	1	1	.	.	.	2	.	.	.	.
C 104	Real	.	.	.	85	5	71	14	4	18	.	.	127	243
C 104f	Real	.	0	0	322	19	293	0	21	.	.	.	8	6
C 120n	Real	.	.	.	1	.	.	.	.	.	.	.	2	1
C 153n	Real	.	.	.	1	.	1	.	.	.	.	.	.	6
C 195n	Real	.	.	.	.	.	1	.	.	.	.	.	.	.
C 195n	R/C	.	.	.	.	.	1	.	.	.	.	.	.	.
C 090	Real	2	3	1	1516	119	1281	24	111	3	.	1	3	4
C 148	Real	.	.	.	1	.	2	.	1	1	.	.	1	2
C 152	Real	.	.	.	1	.	5	.	.	1	.	.	3	.
C 224	Real	.	.	.	1	.	1	.	.	.	.	.	1	1
C 225	Real	.	.	.	.	.	2	.	.	.	.	.	2	.
C 271	Real	.	.	.	.	1	.	.	.	.	.	.	3	3
C 025n	Real	.	.	.	3	.	.	.	.	.	.	.	.	28
C 036q	Real	.	.	.	.	.	.	.	.	.	.	.	1	.
C 038n	Real	.	.	.	.	.	6	.	.	.	.	.	.	2
C 045n	Real	.	.	.	.	.	.	.	.	.	.	.	.	1
C 045n	R/C	.	.	.	.	.	.	.	.	.	.	.	.	1
C 072	Real	.	.	.	3	1	5	0	.	.	.	.	3	10
C 185	Real	.	.	.	7	.	6	.	.	4	.	.	10	4
C 192n	Real	.	0	0	29	5	34	.	6	1	.	5	353	431
C 193n	Real	.	0	0	131	23	125	.	18	175	.	2	38	33
C 229	Real	.	.	.	57	4	50	1	4	.	.	.	.	6
C 229	R/C	.	.	.	57	4	50	1	4	.	.	.	.	6
C 011	Real	.	2	3	241	16	190	49	13	21	.	4	345	572
S 056	Real	.	.	.	.	.	1	.	.	.	.	.	.	.
S 056	R/C	.	.	.	.	.	1	.	.	.	.	.	.	.
C 252n	Real	.	.	.	1	.	1	.	.	.	.	.	3	5
C 017	Real	.	0	0	266	16	220	0	13	3	.	.	2	4
C 020	Copy	.	.	.	*82*	*2*	*341*	*481*	.	*15*	.	.	*64*	*467*
C 020	Real	2	21	7	1228	179	1956	81	163	252	3	34	3988	7805
C 020	R/C	2	21	7	1310	181	2297	562	163	267	3	34	4052	8272
C 067	Real	.	.	.	6	.	4	4	.	.	.	.	4	10
C 195	Real	.	.	.	24	3	15	4	3	.	.	.	22	19
C 195	R/C	.	.	.	24	3	15	4	3	.	.	.	22	19
C 250	Real	.	.	.	1	.	.	.	.	.	.	.	.	.
C 123	Copy	.	.	.	.	.	.	.	.	.	.	.	.	*1*
C 123	Real	.	.	.	.	.	.	1	.	.	.	.	.	2
C 123	R/C	.	.	.	.	.	.	1	.	.	.	.	.	3
C 092n	Real	.	.	.	3	.	2	.	.	.	.	.	.	.
C 123n	Real	.	.	.	.	.	1	0	.	.	.	.	.	2

Ref.No.	R/C	11c	11d	11e	12a	12b	13a	13b	14	15	16	17	18	19a
C 216s	Real	.	.	.	1	.	.	.	.	.	.	.	.	2
C 042	Real	.	.	.	.	.	.	2	.	.	.	.	.	1
C 101	Real	.	.	.	.	.	.	.	.	.	.	.	.	1
C 272	Copy	.	.	.	.	.	.	.	.	.	.	.	.	*4*
C 272	Real	.	.	.	.	.	.	.	.	.	.	.	.	2
C 272	R/C	.	.	.	.	.	.	.	.	.	.	.	.	6
C 150	Copy	.	.	.	.	.	.	.	.	.	.	.	.	*1*
C 150	Real	.	.	.	.	.	1	.	.	.	.	.	1	2
C 150	R/C	.	.	.	.	.	1	.	.	.	.	.	1	3
C 031n	Real	.	.	.	1	.	.	.	.	.	.	.	.	.
B 002	Real	.	.	.	1	.	.	.	.	.	.	.	.	.
B 045	Real	.	.	.	.	.	.	.	.	.	.	.	.	1
B 046	Real	.	.	.	.	.	1	.	.	.	.	.	.	.
B 080	Real	.	.	.	1	.	1	.	.	.	.	.	.	2
C 114	Real	.	.	.	.	.	.	.	.	.	.	.	.	2
B 038	Real	.	.	.	.	.	1	.	.	.	.	.	.	2
B 038	R/C	.	.	.	.	.	1	.	.	.	.	.	.	2
S 064	Real	.	.	.	2	.	1	.	.	.	.	.	1	.
B 047	Real	.	.	.	.	.	.	.	.	.	.	.	.	1
B 062	Real	.	.	.	1	.	.	.	.	1	.	.	.	.
B 063	Real	.	.	.	.	.	.	.	.	.	.	.	1	.
B 084	Copy	.	.	.	.	.	*9*	.	.	.	.	.	*2*	.
B 084	Real	.	.	.	1	.	1	.	.	.	.	.	.	1
B 084	R/C	.	.	.	1	.	10	.	.	.	.	.	2	1
B 049	Real	.	.	.	.	.	.	.	.	.	.	.	.	1
B 001	Real	.	.	.	1	.	3	0	3	4	.	.	2	9
B 055	Real	.	.	.	.	.	.	.	.	.	.	.	.	2
B 108	Real	.	.	.	.	.	1	.	.	.	.	.	.	1
B 109	Real	.	.	.	2	1	2	.	.	1	.	.	8	3
B 075	Real	.	.	.	.	.	1	0	.	1	.	.	1	3
B 066	Copy	.	.	.	.	.	.	*1*	.	.	.	.	.	.
B 066	Real	.	.	.	.	.	.	1	.	.	.	.	1	1
B 066	R/C	.	.	.	.	.	.	2	.	.	.	.	1	1
B 102	Copy	.	.	.	.	.	.	.	.	.	.	.	.	*2*
B 102	Real	.	.	.	.	.	.	.	.	.	.	.	.	5
B 102	R/C	.	.	.	.	.	.	.	.	.	.	.	.	7
B 018	Real	.	.	.	.	.	1	.	.	.	.	.	.	.
B 018	R/C	.	.	.	.	.	1	.	.	.	.	.	.	.
B 058	Real	.	.	.	.	.	1	1	.	.	.	.	.	1
B 077	Real	.	.	.	.	.	1	.	.	.	.	.	.	1
B 098	Real	.	.	.	.	.	1	.	.	.	.	.	.	.
B 101	Real	.	.	.	.	.	1	.	.	.	.	.	.	1
B 103	Copy	.	.	.	.	.	.	.	.	.	.	.	.	*3*
B 103	Real	.	.	.	.	.	.	.	.	.	.	.	.	2
B 103	R/C	.	.	.	.	.	.	.	.	.	.	.	.	5
B 053	Real	.	.	.	1	.	2	.	.	.	.	.	.	8
B 073	Copy	.	.	.	.	.	.	*1*	.	*1*	.	.	.	*8*
B 073	Real	.	.	.	.	.	6	2	1	1	.	.	1	1
B 073	R/C	.	.	.	.	.	6	3	1	2	.	.	1	9
B 105	Copy	.	.	.	.	.	.	*1*	.	.	.	.	.	.
B 105	Real	.	.	.	.	1	.	.	.	.	.	.	.	.
B 105	R/C	.	.	.	.	1	.	1	.	.	.	.	.	.
B 099	Real	.	.	.	.	.	4	.	.	1	.	.	.	20
S 130	Real	.	.	.	.	.	.	.	.	.	.	.	1	1
S 130	R/C	.	.	.	.	.	.	.	.	.	.	.	1	1

The Number of Antoniniani in Coin Hoards
Part 4: Groups A19b to A27
Only those hoards containing coins of these groups are shown.

Ref.No	R/C	19b	20a	20b	21	22	23	24a	24b	24c	25	26	27
S 001	Real	.	1	.	.	.	.	.	.	.	.	.	.
S 017	Real	4	.	.	.	.	.	.	.	.	.	.	.
S 081	Real	4	.	.	.	.	.	.	.	.	.	.	.
S 081	R/C	4	.	.	.	.	.	.	.	.	.	.	.
C 178	Real	200	5	.	.	.	.	.	.	.	.	.	.
S 138	Real	0	.	.	.	.	.	.	.	.	.	.	.
C 021	Real	11	.	.	.	.	.	.	.	.	.	.	.
C 024	Real	3	.	.	.	.	.	.	.	.	.	.	.
C 124	Real	66	.	.	.	.	.	.	.	.	.	.	.
C 169	Copy	*2*	.	.	.	.	.	.	.	.	.	.	.
C 169	Real	58	.	.	.	.	.	.	.	.	.	.	.
C 169	R/C	60	.	.	.	.	.	.	.	.	.	.	.
C 197	Copy	*3*	.	.	.	.	.	.	.	.	.	.	.
C 197	Real	2	.	.	.	.	.	.	.	.	.	.	.
C 197	R/C	5	.	.	.	.	.	.	.	.	.	.	.
C 282	Real	2	.	.	.	.	.	.	.	.	.	.	.
C 282	R/C	2	.	.	.	.	.	.	.	.	.	.	.
C 281	Real	4	.	.	.	.	.	.	.	.	.	.	.
C 170	Real	0	2	.	.	.	.	.	.	.	.	.	.
C 170	R/C	0	2	.	.	.	.	.	.	.	.	.	.
C 247	Real	1	.	.	.	.	.	.	.	.	.	.	.
C 247	R/C	1	.	.	.	.	.	.	.	.	.	.	.
S 157	Real	92	8	.	.	.	.	.	.	.	.	.	.
S 006	Real	38	.	.	.	.	.	.	.	.	.	.	.
S 013	Copy	*2*	.	.	.	.	.	.	.	.	.	.	.
S 013	Real	2	.	.	.	.	.	.	.	.	.	.	.
S 013	R C	4	.	.	.	.	.	.	.	.	.	.	.
S 027	Copy	*3*	.	.	.	.	.	.	.	.	.	.	.
S 027	R/C	3	.	.	.	.	.	.	.	.	.	.	.
C 037	Real	86	4	0	.	.	.	.	.	.	.	.	.
C 037	R/C	86	4	0	.	.	.	.	.	.	.	.	.
C 045	Real	38	.	.	.	.	.	.	.	.	.	.	.
C 057	Real	3	.	.	.	.	.	.	.	.	.	.	.
C 070	Real	29	2	.	.	.	.	.	.	.	.	.	.
C 070	R C	29	2	.	.	.	.	.	.	.	.	.	.
S 068	Real	1	1	.	.	.	.	.	.	.	.	.	.
C 086	Real	4	.	.	.	.	.	.	.	.	.	.	.
C 092	Real	22	.	.	.	.	.	.	.	.	.	.	.
C 092	R C	22	.	.	.	.	.	.	.	.	.	.	.
C 285	Real	130	.	.	.	.	.	.	.	.	.	.	.
C 109	Real	1	.	.	.	.	.	.	.	.	.	.	.
C 112	Real	27	3	.	.	.	.	.	.	.	.	.	.
C 118	Real	14	1	.	.	.	.	.	.	.	.	.	.
C 118	R C	14	1	.	.	.	.	.	.	.	.	.	.
C 156	Copy	*0*	.	.	.	.	.	.	.	.	.	.	.
C 172	Real	2	.	.	.	.	.	.	.	.	.	.	.
S 028	Copy	*4*	.	.	.	.	*1*	.	.	.	.	.	.
C 203	Real	60	1	.	.	.	.	.	.	.	.	.	.
S 139	Real	20	.	.	.	.	.	.	.	.	.	.	.
S 150	Copy	*4*	.	.	.	.	.	.	.	.	.	.	.
S 150	Real	1	.	.	.	.	.	.	.	.	.	.	.
S 150	R C	5	.	.	.	.	.	.	.	.	.	.	.
C 234	Real	4	.	.	.	.	.	.	.	.	.	.	.
C 246s	Real	3	.	.	.	.	.	.	.	.	.	.	.
C 260	Real	3	3	.	.	.	.	.	.	.	.	.	.
C 264	Real	16	5	.	.	.	.	.	.	.	.	.	.
C 264	R C	16	5	.	.	.	.	.	.	.	.	.	.

Ref.No	R/C	19b	20a	20b	21	22	23	24a	24b	24c	25	26	27
C 266	Real	1	.	.	.	.	.	.	.	.	.	.	.
C 015	Copy	*20*	*5*	.	.	.	.	.	.	.	.	.	.
C 015	Real	1279	20	.	.	.	.	.	.	.	.	.	.
C 015	R/C	1299	25	.	.	.	.	.	.	.	.	.	.
C 025	Real	57	1	0	.	.	.	.	.	.	.	.	.
C 056	Real	0	1	.	.	.	.	.	.	.	.	.	.
C 056	R/C	0	1	.	.	.	.	.	.	.	.	.	.
C 071	Real	10	1	.	.	.	.	.	.	.	.	.	.
C 071	R/C	10	1	.	.	.	.	.	.	.	.	.	.
C 083	Real	3	.	.	.	.	.	.	.	.	.	.	.
C 100	Real	55	3	.	.	.	.	.	.	.	.	.	.
C 161	Real	8	.	.	.	.	.	.	.	.	.	.	.
C 161	R/C	8	.	.	.	.	.	.	.	.	.	.	.
C 184	Real	75	.	.	.	.	.	.	.	.	.	.	.
C 184	R/C	75	.	.	.	.	.	.	.	.	.	.	.
C 207	Copy	*1*	.	.	.	.	.	.	.	.	.	.	.
C 031	Copy	*70*	.	.	.	.	.	.	.	.	.	.	.
C 031	Real	220	.	.	.	.	.	.	.	.	.	.	.
C 031	R/C	290	.	.	.	.	.	.	.	.	.	.	.
C 047	Real	66	3	.	.	.	.	.	.	.	.	.	.
C 047	R/C	66	3	.	.	.	.	.	.	.	.	.	.
C 102	Real	4	.	.	.	.	.	.	.	.	.	.	.
C 102	R/C	4	.	.	.	.	.	.	.	.	.	.	.
C 146	Copy	*5*	.	.	.	.	.	.	.	.	.	.	.
C 175	Copy	*19*	.	.	.	.	.	.	.	.	.	.	.
C 201	Copy	*1*	.	.	.	.	.	.	.	.	.	.	.
C 201	Real	6	.	.	.	.	.	.	.	.	.	.	.
C 201	R/C	7	.	.	.	.	.	.	.	.	.	.	.
S 085	Copy	*14*	.	.	.	.	*1*	.	.	.	.	.	.
S 085	Real	7	.	.	.	.	.	.	.	.	.	.	.
S 085	R/C	21	.	.	.	.	1	.	.	.	.	.	.
C 002	Real	372	1	.	2	.	2	.	.	.	.	.	.
C 002	R/C	372	1	.	2	.	2	.	.	.	.	.	.
C 012	Real	0	.	.	.	.	1	.	.	.	.	.	.
C 013	Real	0	2	0	.	.	.	.	.	.	.	.	.
C 014	Real	0	6	0	0	0	5	.	.	.	.	.	.
C 012	R/C	0	.	.	.	.	1	.	.	.	.	.	.
C 014	R/C	0	6	0	0	0	5	.	.	.	.	.	.
C 080	Real	88	.	.	.	.	2	.	.	.	.	.	.
C 094	Real	21	.	.	.	.	1	.	.	.	.	.	.
C 128	Copy	*64*	.	.	.	.	.	.	.	.	.	.	.
C 128	Real	276	5	0	5	1	2	.	.	.	.	.	.
C 128	R/C	340	5	0	5	1	2	.	.	.	.	.	.
C 276	Real	0	1	0	.	.	5	.	.	.	.	.	.
C 098	Real	60	1	0	.	.	1	.	.	.	.	.	.
C 059	Real	394	7	0	2	.	4	.	.	.	.	.	.
C 059	R/C	394	7	0	2	.	4	.	.	.	.	.	.
C 073	Real	986	19	0	59	.	62	.	.	.	.	.	.
C 073	R/C	986	19	0	59	.	62	.	.	.	.	.	.
C 174	Copy	*40*	.	.	.	.	2	.	.	.	.	.	.
C 174	Real	49	.	.	.	.	.	.	.	.	.	.	.
C 174	R/C	89	.	.	.	.	2	.	.	.	.	.	.
C 237	Real	754	11	0	133	3	68	.	.	.	.	.	.
C 237	R/C	754	11	0	133	3	68	.	.	.	.	.	.
C 165	Real	361	19	0	53	4	81	.	.	.	.	.	.
C 182	Real	356	9	0	18	.	14	.	1	.	.	.	.
C 066	Part	408	31	0	17	.	38	1	1	1	4	.	.
S 107	Copy	.	.	.	.	.	.	.	.	.	.	*1*	.
C 138	Real	1	.	.	.	.	.	.	.	.	.	2	.
S 107	Real	.	.	.	2	.	.	.	.	.	.	1	.
S 107	R/C	.	.	.	2	.	.	.	.	.	.	2	.

Ref.No	R/C	19b	20a	20b	21	22	23	24a	24b	24c	25	26	27
C 181	Real	467	23	0	11	1	53	.	4	1	3	.	.
C 181	R/C	467	23	0	11	1	53	.	4	1	3	.	.
C 270	Real	1	4	.	5	.	12	.	.	.	2	.	.
C 221n	Real	7	.	.	.	.	.	.	.	.	.	1	.
C 221n	R/C	7	.	.	.	.	.	.	.	.	.	1	.
C 124n	Real	.	.	.	.	.	.	.	.	.	.	7	.
C 228n	Real	1	.	.	.	.	.	.	.	.	.	48	.
C 228n	R/C	1	.	.	.	.	.	.	.	.	.	48	.
C 045l	Real	.	0	.	0	0	7	0	0	0	.	109	.
C 246p	Copy	.	.	.	.	.	.	.	.	.	.	*19*	.
C 017q	Real	.	.	.	.	.	.	.	.	.	.	17	.
C 029n	Real	.	.	.	.	.	1	.	.	.	.	4	.
C 045f	Real	.	.	.	.	.	.	.	.	.	.	1	.
C 045f	R/C	.	.	.	.	.	.	.	.	.	.	1	.
C 078n	Copy	.	.	.	.	.	.	.	.	.	.	*4*	.
C 078n	Real	1	.	.	.	.	.	.	.	.	.	73	.
C 078n	R/C	1	.	.	.	.	.	.	.	.	.	77	.
C 085n	Copy	.	.	.	.	.	.	.	.	.	.	*1*	.
C 085n	Real	1	.	.	.	.	.	.	.	.	.	1	.
C 085n	R/C	1	.	.	.	.	.	.	.	.	.	2	.
C 129	Real	31	1	.	.	.	1	.	.	.	.	40	.
C 144	Real	.	16	0	60	3	133	5	8	4	46	534	.
C 194n	R/C	293	1	9	13	2	32	.	1	.	3	81	.
C 209	Real	1	.	.	.	.	.	.	.	.	.	1	.
C 216n	Real	.	.	.	.	.	.	.	.	.	.	8	.
C 234n	Real	1	.	.	.	.	.	.	.	.	.	.	.
C 246n	Real	5	.	.	.	.	.	.	.	.	.	14	.
C 246n	R/C	5	.	.	.	.	.	.	.	.	.	14	.
C 054n	Real	.	1	7	20	.	30	.	2	.	29	.	.
C 104	Real	93	.	4	5	.	5	.	.	.	.	9	.
C 104f	Real	4	14	0	1	.	8	.	.	.	6	2	.
C 120n	Real	.	.	.	.	.	.	.	.	.	.	13	.
C 153n	Real	6	.	.	.	.	.	.	.	.	.	7	.
C 195n	Real	.	.	.	.	.	.	.	.	.	.	1	.
C 195n	R/C	.	.	.	.	.	.	.	.	.	.	1	.
C 090	Real	.	99	0	103	5	227	8	10	9	171	.	.
C 148	Real	1	1	0	2	.	.	.	.	.	.	563	.
C 152	Real	.	.	.	1	.	.	.	.	.	.	14	.
C 216q	Real	.	.	.	.	.	.	.	.	.	.	.	6
C 224	Real	.	.	.	.	.	.	.	.	.	.	18	.
C 225	Real	.	.	.	.	.	.	.	.	.	.	36	.
C 235	Real	.	.	.	.	.	.	.	.	.	.	8	1
C 271	Real	1	.	.	.	.	.	.	.	.	.	1	.
C 019n	Real	.	.	.	.	.	.	.	.	.	.	.	0
C 025n	Real	0	.	.	.	.	.	.	.	1	.	2	1
C 036q	Real	.	.	.	.	.	.	.	.	.	.	59	48
C 038n	Real	.	.	.	.	.	1	.	.	.	.	1	2
C 045n	Real	.	.	.	.	.	.	.	.	.	.	4	1
C 045n	R/C	.	.	.	.	.	.	.	.	.	.	4	1
C 072	Real	4	.	.	1	.	.	.	.	.	2	102	167
C 089	Real	.	.	.	.	.	.	.	.	.	.	4	10
C 185	Real	6	.	.	1	.	.	.	.	.	1	27	1
C 192n	Real	198	11	0	35	2	73	1	1	2	8	7	1
C 193n	Real	11	.	.	.	.	10	.	1	.	.	1	1
C 229	Copy	.	.	.	.	.	.	.	.	.	*1*	.	.
C 229	Real	4	9	0	4	.	15	.	1	.	11	.	.
C 229	R/C	4	9	0	4	.	15	.	1	.	12	.	.
C 011	Real	310	9	.	11	1	12	.	.	.	1	2	.
C 252n	Real	0	.	.	.	.	.	.	.	.	1	6	6
C 017	Real	2	6	0	.	.	1	.	.	.	2	.	.
C 020	Copy	*199*	.	.	.	.	.	.	.	.	.	*86*	.

Ref.No	R/C	19b	20a	20b	21	22	23	24a	24b	24c	25	26	27
C 020	Real	3640	156	0	154	10	315	9	22	12	112	436	78
C 020	R/C	3839	156	0	154	10	315	9	22	12	112	522	78
C 067	Real	0	.	.	1	.	.	.	.	.	.	2	2
C 195	Real	7	.	.	.	.	.	.	.	.	.	9	.
C 195	R/C	7	.	.	.	.	.	.	.	.	.	9	.
C 231	Real	.	.	.	.	.	1	.	.	.	1	.	.
C 278	Real	.	.	.	2	.	1	.	.	.	.	.	.
C 027	Real	.	.	.	.	.	.	.	.	.	2	.	.
C 250	Real	.	1	.	.	.	1	.	.	.	1	6	.
C 046	Real	.	.	.	.	.	1	.	.	.	.	.	.
C 123	Real	1	.	.	.	.	.	.	.	.	.	.	.
C 123	R/C	1	.	.	.	.	.	.	.	.	.	.	.
C 092n	Real	.	.	.	.	.	3	.	1	.	.	1	.
C 123n	Real	2	.	.	.	.	.	.	.	.	.	1	1
C 194q	Real	.	.	.	.	.	.	.	.	.	.	1	2
C 216s	Real	0	.	.	.	.	.	.	.	.	.	.	2
C 108	Real	.	.	.	.	.	1	.	.	.	.	.	.
B 089	Real	1	.	.	.	.	.	.	.	.	.	.	.
C 150	Real	1	.	.	.	.	.	.	.	.	.	.	.
C 150	R/C	1	.	.	.	.	.	.	.	.	.	.	.
B 069	Real	.	.	.	.	.	.	.	.	.	.	1	.
B 090	Real	.	1	0	.	.	.	.	.	.	.	.	.
B 090	R/C	.	1	0	.	.	.	.	.	.	.	.	.
C 031n	Real	.	.	.	.	.	3	.	.	.	1	1	.
B 080	Real	.	.	.	.	.	.	.	2	.	.	.	.
B 061	Real	.	.	.	.	.	.	.	.	.	.	1	.
S 062	Copy	*1*	.	.	.	.	.	.	.	.	.	.	.
B 084	Real	.	.	.	.	.	1	.	.	.	.	.	.
B 084	R/C	.	.	.	.	.	1	.	.	.	.	.	.
B 049	Real	.	.	.	1	.	.	.	.	.	.	.	.
B 001	Real	2	.	.	.	.	.	.	.	.	.	.	.
B 055	Real	.	.	.	.	.	.	.	.	.	.	1	.
B 109	Real	0	.	.	.	.	.	.	.	.	.	1	.
B 066	Real	.	.	.	.	.	.	.	.	.	.	.	2
B 066	R/C	.	.	.	.	.	.	.	.	.	.	.	2
B 102	Real	3	.	.	.	.	.	.	.	.	.	.	.
B 102	R/C	3	.	.	.	.	.	.	.	.	.	.	.
B 077	Real	0	.	.	.	.	.	.	.	.	.	.	.
B 078	Real	.	.	.	.	.	.	.	.	.	.	1	.
B 101	Real	1	.	.	.	.	.	.	.	.	.	1	.
B 103	Copy	*0*	.	.	.	.	.	.	.	.	.	.	.
B 103	Real	0	.	.	.	.	.	.	.	.	.	.	.
B 103	R/C	0	.	.	.	.	.	.	.	.	.	.	.
B 053	Real	3	.	.	.	.	1	.	.	.	.	1	1
B 073	Real	2	.	.	.	.	.	.	.	.	.	.	.
B 073	R/C	2	.	.	.	.	.	.	.	.	.	.	.
B 099	Real	8	.	.	.	.	.	.	.	.	.	.	1
B 042	Real	1	.	.	.	.	.	.	.	.	.	.	.
S 130	Copy	*1*	.	.	.	.	.	.	.	.	.	.	.
S 130	R/C	1	.	.	.	.	.	.	.	.	.	.	.

Appendix 2.24
Bronze coins in hoards

This appendix is divided up into three principle parts

Part A: Table of bronze coin hoards, their location, number and denominational contents.

Part B: *SESTERTII* IN HOARDS.
Here is the summary of the *sestertii* found in hoards. The termius post quem for each hoard may be derived from other coins within the the hoard. Sometimes bronze is describes as AE1, in which case this has been taken to mean *sestertii*. The raw data is given, with summaries (B1-3).

Part C: *DUPONDII & ASSES* IN HOARDS
Here is the summary of the 'middle bronze' coins found in hoards. The termius post quem for each hoard may be derived from other coins within the the hoard. Sometimes bronze is describes as AE2, in which case this has been taken to mean these. The raw data is given, with summaries (C1-3). In the summary tables *dupondii* and *asses* have not been distinguished.

PART A

Bronze coin hoards

Here are the principle hoards from the corpus which contain bronze coins. The terminus post quem for the hoard may be derived from other coins than the bronze component.

Ref	Name		Aur	Den	(Den)	Ant	(Ant)	Iron	Sest	(S)	Dup	(D)	As	(As)	Sem	Aes
C 220f	Santon Downham							107			2					
C 029	Bredgarovell	43-54							24							
C 216	Richborough	43-54							16							
C 265n	Wilcote	43-54							25							
C 188n	Nunney	43-54		4				242								4
C 068	Colchester	50-60														4
C 275	Worcester	60										2	1	7		
C 244	Usk	64									5		2			
C 255	Watling Court	70											12			
C 228q	Southwark	72-73														17
C 128q	Honley	69-79		13				5	1							2 AE2
C 107	Exeter	75											10			
C 238n	Timsbury	86						18	1							42 AE2
S 032	Carlisle	86											8			
C 242	Usk	85-90							2		1		1			
C 133	Kempsford	87									6		20	1		
C 151n	Llanfaethlu	87		32					1							6 AE2
S 058	Corbridge 1914	99		32												12
C 277f	Wroxeter	121-122		0							0					
C 277h	Wroxeter	121-122		0					0							
S 152	Stanwix	117-138														9
C 228	Southampshire (?)	117-138		15	2			615					30	14		
C 251	Waddington	138		5					1		1					
S 041	Castledykes	140														100
S 018	Bowness on Solway	141														15
S 123	Newbiggin	100-200														700
C 052	Chalfont St. Giles	150		40					12							
C 077q	Croydon	145-161							117		68		60			35
C 140	Langford	155											25			
S 055	Corbridge 1911b	159	160										1		1	
C 187n	Nottingham	157-161		19												46
C 190	Old Sleaford	160									6		18			
C 198	Piercebridge	164-169		8					2							
C 118n	Great Chesterford	161-180							195		2		1			
C 263n	Whitchurch Wier	161-180							1							33 AE2
C 048q	Castle Thorpe	170		20					25							
C 121	Gurnard	170-174			15								1			
C 001	Aldworth	176-177		75					2							
C 214	Rembridge	180							11		1		1			
C 240	Upchurch	180							37							
C 227n	Slay Hills Saltings	180		15												2
C 132	Isle of White (?)	188-189							9							
C 142	Leegrave	190							10							
C 274n	Woolmer Pond	192														200
C 193	Owston Ferry	196		4					53				2			56
S 096	Kirkby Thore	193-217		13												12
C 032	Bristol	208		1476							1		1			
S 091	Housteads	218														5
C 135	Kirkham	238		35											1	
C 111	Felixtowe	240							25							
C 058	Chesterfield	238-244		19							1					
C 003	Alcester	259-260				95			51							
C 143	Leysdown	260							492	1				7		
C 166	March	260							9							
C 069	Colchester	269		14		1530	13				1		1			
C 026	Bourne End	270				5			29				4			
S 001	Adderstone	270				13			5		1		9			
C 115	Gare	270		7		40			1028		1		7			
C 118	Great Chesells	273				125	8		1							
C 203	Poole	273-274				964							1			
C 266	Willingdon	273				140			4							
C 070	Colchester	273		3		4018	50						1			
C 066	Clapton-in-Gordano	286				3437				1						
C 153q	Llanidan	287-293				0			0							
C 104q	Ewelme	287-296				336										1
C 195n	Peterborough	287-296				3	2		9							
C 148	Little Orm's Head	293				700			1							
C 192n	Oundle	293-296				1205			3							2
C 195	Pen-y-Corddyn	296				116	12		2				1	1		
C 108	Eynsham	330-333				1							1			
C 038	Caernarvon	?							12							
C 262q	Whichwood Forest	?						1								4

PART B
Sestertii in Hoards

Table B1a

		C 179n 43-54	C216 43-54	C265n 43-54	C128q 72-73	C238n 86	C242 85-90	C151n 87	C052 150	C077q 145-61
D	Claudius	24	16	25	.	.	.	.	.	.
D	Nero	.	.	.	.	.	.	.	.	.
F	Vespasian	.	.	.	1	.	1	.	.	4
F	Titus Caesar	.	.	.	.	.	1	.	.	.
F	Titus Augustus	.	.	.	.	.	.	.	.	.
F	Domitian Caesar	.	.	.	.	.	.	.	.	.
G	Domitian Augustus	.	.	.	.	1	.	1	1	7
G	Nerva	.	.	.	.	.	.	.	.	7
H	Trajan	.	.	.	.	.	.	.	7	60
I	Hadrian	.	.	.	.	.	.	.	4	36
I	Sabina	.	.	.	.	.	.	.	.	.
I	Aelius	.	.	.	.	.	.	.	.	.
J	Antoninus Pius	.	.	.	.	.	.	.	.	2
J	Faustina 1	.	.	.	.	.	.	.	.	1
J	Faustina 2 (A.P.)	.	.	.	.	.	.	.	.	.
J	Faustina 2 (M.A.)	.	.	.	.	.	.	.	.	.
J	M Aurelius Caesar	.	.	.	.	.	.	.	.	.
K	M Aurelius Augustus	.	.	.	.	.	.	.	.	.
K	Div. Pius	.	.	.	.	.	.	.	.	.
K	Lucius Verus	.	.	.	.	.	.	.	.	.
K	Lucilla (under M.A.)	.	.	.	.	.	.	.	.	.
K	Lucilla (under Com.)	.	.	.	.	.	.	.	.	.
K	Commodus Caesar	.	.	.	.	.	.	.	.	.
L	Commodus Augustus	.	.	.	.	.	.	.	.	.
L	Div. Marcus Aurelius	.	.	.	.	.	.	.	.	.
L	Crispina	.	.	.	.	.	.	.	.	.
L	Clodius Albinus	.	.	.	.	.	.	.	.	.
L	Pertinax	.	.	.	.	.	.	.	.	.
L	Didius Julianus	.	.	.	.	.	.	.	.	.
M	Septimus Severus	.	.	.	.	.	.	.	.	.
M	Julia Domna (Sept.Sev.)	.	.	.	.	.	.	.	.	.
N	Julia Domna (Cara.)	.	.	.	.	.	.	.	.	.
N	Caracalla Augustus	.	.	.	.	.	.	.	.	.
P	Severus Alexander	.	.	.	.	.	.	.	.	.
P	Julia Mamaea	.	.	.	.	.	.	.	.	.
P	Maximinus 1	.	.	.	.	.	.	.	.	.
Q	Gordian III	.	.	.	.	.	.	.	.	.
Q	Otacilla Severa	.	.	.	.	.	.	.	.	.
Q	Postumus	.	.	.	.	.	.	.	.	.

Table B1b

		C 179n 43-54	C216 43-54	C265n 43-54	C128q 72-73	C238n 86	C242 85-90	C151n 87	C052 150	C077q 145-61
D	Julio Claudian 2	24	16	25	0	0	0	0	0	0
F	Flavian 1	0	0	0	1	0	2	0	0	4
G	Flavian 2	0	0	0	0	1	0	1	1	14
H	Trajanic	0	0	0	0	0	0	0	7	60
I	Hadrianic	0	0	0	0	0	0	0	4	36
J	Antonine 1	0	0	0	0	0	0	0	0	3
K	Antonine 2	0	0	0	0	0	0	0	0	0
L	Antonine 3	0	0	0	0	0	0	0	0	0
M	Severan 1a	0	0	0	0	0	0	0	0	0
N	Severan 1b	0	0	0	0	0	0	0	0	0
P	Severan 2b	0	0	0	0	0	0	0	0	0
Q	Severan 2c	0	0	0	0	0	0	0	0	0

Table B2a

		C198 164-9	C118n 161-80	C263n 161-80	C001 176-7	C240 180	C132 188-9	C142 190	C193 196	C003 259-60
D	Claudius	.	1	.	.	.	.	.	.	.
D	Nero	.	1	.	.	.	.	.	.	.
F	Vespasian	.	3	.	.	.	.	.	.	.
F	Titus Caesar	.	.	.	.	.	.	.	.	.
F	Titus Augustus	.	1	.	.	.	.	.	.	.
F	Domitian Caesar	.	2	.	.	.	.	.	.	.
G	Domitian Augustus	1	15	.	.	2	.	.	.	.
G	Nerva	.	4	.	.	.	.	.	.	.
H	Trajan	.	60	.	.	3	1	.	1	4
I	Hadrian	.	51	1	.	19	1	4	17	6
I	Sabina	.	1	.	.	.	.	.	1	.
I	Aelius	.	1	.	.	.	.	.	.	.
J	Antoninus Pius	1	35	.	1	3	2	.	14	10
J	Faustina 1	.	12	.	.	2	1	1	3	4
J	Faustina 2 (A.P.)	.	1	.	.	.	.	.	.	1
J	Faustina 2 (M.A.)	.	.	.	.	2	.	1	2	1
J	M Aurelius Caesar	.	4	.	1	.	.	.	5	.
K	M Aurelius Augustus	.	1	.	.	5	2	1	6	9
K	Div. Pius	.	.	.	.	.	.	.	.	.
K	Lucius Verus	.	.	.	.	.	.	.	1	1
K	Lucilla (under M.A.)	.	.	.	.	.	.	1	3	2
K	Lucilla (under Com.)	.	.	.	.	.	.	.	.	.
K	Commodus Caesar	.	.	.	.	.	.	.	.	1
L	Commodus Augustus	.	.	.	.	1	1	2	4	7
L	Div. Marcus Aurelius	.	.	.	.	.	.	.	.	.
L	Crispina	.	.	.	.	.	.	.	.	.
L	Clodius Albinus	.	.	.	.	.	.	.	.	.
L	Pertinax	.	.	.	.	.	.	.	.	1
L	Didius Julianus	.	.	.	.	.	.	.	1	.
M	Septimus Severus	.	.	.	.	.	.	.	.	.
M	Julia Domna (Sept.Sev.)	.	.	.	.	.	.	.	.	.
N	Julia Domna (Cara.)	.	.	.	.	.	.	.	.	.
N	Caracalla Augustus	.	.	.	.	.	.	.	.	.
P	Severus Alexander	.	.	.	.	.	.	.	.	.
P	Julia Mamaea	.	.	.	.	.	.	.	.	.
P	Maximinus 1	.	.	.	.	.	.	.	.	.
Q	Gordian III.	.	.	.	.	.	.	.	.	.
Q	Otacilla Severa.	.	.	.	.	.	.	.	.	.
Q	Postumus.	.	.	.	.	.	.	.	.	.

Table B2b

		C198 164-9	C118n 161-80	C263n 161-80	C001 176-7	C240 180	C132 188-9	C142 190	C193 196	C003 259-60
D	Julio Claudian 2	0	2	0	0	0	0	0	0	0
F	Flavian 1	0	6	0	0	0	0	0	0	0
G	Flavian 2	1	19	0	0	2	0	0	0	0
H	Trajanic	0	60	0	0	3	1	0	1	4
I	Hadrianic	0	53	1	0	19	1	4	18	6
J	Antonine 1	1	52	0	2	7	3	2	24	16
K	Antonine 2	0	0	0	0	0	0	1	4	4
L	Antonine 3	0	0	0	0	1	1	2	5	8
M	Severan 1a	0	0	0	0	0	0	0	0	0
N	Severan 1b	0	0	0	0	0	0	0	0	0
P	Severan 2b	0	0	0	0	0	0	0	0	0
Q	Severan 2c	0	0	0	0	0	0	0	0	0

Table B3a

		C143 260	C166 260	C026 270	S001 270	C115 270	C118 273	C266 273	C195n 287-96	C148 293	C192n 293-6	C1 2
D	Claudius	.	.	.	.	.	.	.	.	.	.	
D	Nero	.	.	.	.	.	.	.	.	.	.	
F	Vespasian	.	.	.	.	.	.	.	.	.	.	
F	Titus Caes	.	.	.	.	.	.	.	.	.	.	
F	Titus Aug	7	.	.	.	5	.	.	.	.	.	
F	Domitian Caes	.	.	.	.	.	.	.	.	.	.	
G	Domitian Aug	12	.	.	.	17	.	.	.	.	.	
G	Nerva	1	.	.	.	1	.	.	.	.	.	
H	Trajan	40	.	.	.	61	.	.	.	.	1	
I	Hadrian	116	4	2	1	151	.	1	1	.	.	
I	Sabina.	6	.	.	.	7	.	.	.	.	.	
I	Aelius	4	1	.	1	1	.	.	.	.	.	
J	Antoninus Pius	60	1	2	1	162	.	.	1	1	.	1
J	Faustina 1	32	.	1	.	64	.	.	2	.	2	
J	Faustina 2 (A.P.)	52	.	2	.	11	.	.	.	.	.	
J	Faustina 2 (M.A.)	0	.	2	.	112	.	.	.	.	.	
J	M Aurelius Caes	11	1	.	.	23	.	.	.	.	.	
K	M Aurelius Aug	73	.	3	.	171	.	2	4	.	.	
K	Div. Pius	2	.	.	.	4	.	.	.	.	.	
K	Lucius Verus	6	1	.	1	16	.	.	.	.	.	
K	Lucilla (M.A.)	9	1	1	.	27	.	.	.	.	.	
K	Lucilla (Com.)	0	.	0	.	.	.	.	.	.	.	
K	Commodus Caes	.	.	.	.	.	.	.	.	.	.	
L	Commodus Aug	35	.	1	.	114	1	.	.	.	.	1
L	Div. M Aurelius	4	.	.	.	6	.	.	.	.	.	
L	Crispina	6	.	.	.	8	.	.	.	.	.	
L	Clodius Albinus	1	.	1	.	2	.	.	.	.	.	
L	Pertinax	.	.	.	.	.	.	.	.	.	.	
L	Didius Julianus	1	.	.	.	.	.	.	.	.	.	
M	Septimus Sev.	5	.	.	.	17	.	.	.	.	.	
M	J. Domna (S.Sev.)	1	.	.	.	4	.	.	.	.	.	
N	J. Domna (Cara.)	0	.	.	.	0	.	.	.	.	.	
N	Caracalla Aug	.	.	.	.	1	.	.	.	.	.	
P	Severus Alex.	2	.	.	.	11	.	.	1	.	.	
P	Julia Mamaea.	2	.	1	.	4	.	.	.	.	.	
P	Maximinus 1	1	.	.	.	3	.	.	.	.	.	
Q	Gordian III.	1	.	1	.	2	.	.	.	.	.	
Q	Otacilla Severa.	.	.	.	.	1	.	.	.	.	.	
Q	Postumus.	1	1	1	.	21	.	1	.	.	.	

Table B3b

		C143 260	C166 260	C026 270	S001 270	C115 270	C118 273	C266 273	C195n 287-96	C148 293	C192n 293-6	C1 2
D	Julio Claudian 2	0	0	0	0	0	0	0	0	0	0	C
F	Flavian 1	7	0	0	0	5	0	0	0	0	0	C
G	Flavian 2	13	0	0	0	18	0	0	0	0	0	C
H	Trajanic	40	0	0	0	61	0	0	0	0	1	C
I	Hadrianic	126	5	2	2	159	0	1	1	0	0	C
J	Antonine 1	155	2	7	1	372	0	0	3	1	2	1
K	Antonine 2	17	2	1	1	47	0	0	0	0	0	C
L	Antonine 3	47	0	2	0	130	1	0	0	0	0	1
M	Severan 1a	6	0	0	0	21	0	0	0	0	0	C
N	Severan 1b	0	0	0	0	1	0	0	0	0	0	C
P	Severan 2b	5	0	1	0	18	0	0	1	0	0	C
Q	Severan 2c	2	1	2	0	24	0	1	0	0	0	C

PART C

Dupondii and Asses in Hoards

A = As; D = Dupondius; ? = Dupondius/As

Table C1a

		C220f 43-54	C 128q 69-79	C255 70	C107 75	C238n 86	C275 86	S032 86	C242 85-90	C151n 87
C	Antonia	.	.	.	.	.	.	.	.	.
C	Agrippa	.	.	.	.	3 ?	1 As	.	.	.
C	Germanicus	.	.	.	.	.	.	.	.	.
D	Claudius	2D	.	.	2A	24 ?	.	.	.	.
D	Nero	.	1 ?	12A	.	9 ?	.	.	.	1 ?
E	Galba	.	.	.	.	.	.	.	.	.
F	Vespasian	.	1 ?	.	8A	4 ?	.	6A	1D	1 ?
F	Titus Caesar	.	.	.	.	.	.	1A	1A	.
F	Titus Augustus	.	.	.	.	.	.	.	.	.
F	Domitian Caesar	.	.	.	.	.	.	.	.	.
G	Domitian Augustus	.	.	.	.	2	.	1A	.	4 ?
G	Nerva	.	.	.	.	.	.	.	.	.
H	Trajan	.	.	.	.	.	.	.	.	.
I	Hadrian	.	.	.	.	.	.	.	.	.
J	Antoninus Pius	.	.	.	.	.	.	.	.	.
J	Faustina 1	.	.	.	.	.	.	.	.	.
J	Faustina 2 (under A.P.)	.	.	.	.	.	.	.	.	.
J	Marcus Aurelius Caesar	.	.	.	.	.	.	.	.	.
K	Marcus Aurelius Augustus	.	.	.	.	.	.	.	.	
L	Commodus Augustus	.	.	.	.	.	.	.	.	.
M	Septimus Severus	.	.	.	.	.	.	.	.	.
M	Julia Domna (Sept.Sev.)	.	.	.	.	.	.	.	.	.
N	Julia Domna (Cara.)	.	.	.	.	.	.	.	.	.
N	Caracalla Augustus	.	.	.	.	.	.	.	.	.
Q	Postumus	.	.	.	.	.	.	.	.	.

Table C1b

		C220f 43-54	C 128q 69-79	C255 70	C107 75	C238n 86	C275 86	S032 86	C242 85-90	C151n 87
C	Julio Claudian 1	0	0	0	0	3	1	0	0	0
D	Julio Claudian 2	2	1	12	2	33	0	0	0	1
E	Civil War	0	0	0	0	0	0	0	0	0
F	Flavian 1	0	1	0	8	4	0	7	2	1
G	Flavian 2	0	0	0	0	2	0	1	0	4
H	Trajanic	0	0	0	0	0	0	0	0	0
I	Hadrianic	0	0	0	0	0	0	0	0	0
J	Antonine 1	0	0	0	0	0	0	0	0	0
K	Antonine 2	0	0	0	0	0	0	0	0	0
L	Antonine 3	0	0	0	0	0	0	0	0	0
M	Severan 1a	0	0	0	0	0	0	0	0	0
N	Severan 1b	0	0	0	0	0	0	0	0	0
Q	Severan 2c	0	0	0	0	0	0	0	0	0

Table C2a

		C133 87	C077q 145-61	C140 155	S055 159	C118n 161-180	C263n 161-80	C121 170-4	C032 208	C058 238-44
C	Antonia	.	.	.	.	.	1?	.	.	.
C	Agrippa	.	.	.	.	.	.	.	.	.
C	Germanicus	.	.	.	.	.	.	.	.	.
D	Claudius	1D 2Asses	1A	2A	.	.	.	.	.	.
D	Nero	4D 1A	1A	2A	.	.	.	.	.	.
E	Galba	.	.	.	.	.	1?	.	.	.
F	Vespasian	1D 9A	10D	10A	.	.	2?	.	.	.
F	Titus Caesar	3A	.	1A	.	.	1?	.	.	.
F	Titus Augustus	.	1A	.	.	.	.	.	.	.
F	Domitian Caesar	.	.	1A	.	.	.	.	.	.
G	Domitian Augustus	5A	10D	4A	.	.	4?	1A	.	.
G	Nerva	.	2D 1A	.	.	.	.	.	.	.
H	Trajan	.	23?	2A	.	1D 1A	3?	.	.	.
I	Hadrian	.	9D 1A	2A	1A	.	5?	.	1A	1D
J	Antoninus Pius	.	20D 25A	1A	.	1 D	2?	.	.	.
J	Faustina 1	.	11A	.	.	.	2?	.	.	.
J	Faustina 2 (under A.P.)	.	12D 8A	.	.	.	.	.	.	.
J	Marcus Aurelius Caesar	.	5D 10A	.	.	.	.	.	.	.
K	Marcus Aurelius Augustus	.	.	.	.	.	.	2?	.	
L	Commodus Augustus	.	.	.	.	.	.	.	.	.
M	Septimus Severus	.	.	.	.	.	.	.	.	.
M	Julia Domna (Sept.Sev.)		.	.	.	.	.	.	.	.
N	Julia Domna (Cara.)	.	.	.	.	.	.	.	.	.
N	Caracalla Augustus	.	.	.	.	.	.	.	.	.
Q	Postumus	.	.	.	.	.	.	.	.	.

Table C2b

		C133 87	C077q 145-61	C140 155	S055 159	C118n 161-180	C263n 161-80	C121 170-4	C032 208	C058 238-44
C	Julio Claudian 1	0	0	0	0	0	1	0	0	0
D	Julio Claudian 2	8	2	4	0	0	0	0	0	0
E	Civil War	0	0	0	0	0	1	0	0	0
F	Flavian 1	13	11	12	0	0	3	0	0	0
G	Flavian 2	5	13	4	0	0	4	1	0	0
H	Trajanic	0	23	2	0	2	3	0	0	0
I	Hadrianic	0	10	2	1	0	5	0	1	1
J	Antonine 1	0	91	1	0	1	4	0	0	0
K	Antonine 2	0	0	0	0	0	2	0	1	0
L	Antonine 3	0	0	0	0	0	0	0	0	0
M	Severan 1a	0	0	0	0	0	0	0	0	0
N	Severan 1b	0	0	0	0	0	0	0	0	0
Q	Severan 2c	0	0	0	0	0	0	0	0	0

Table C3a

		C069 269	C026 270	S001 270	C115 270	C203 273-4	C070 273	C192n 293-6	C195 296	C108 330-3
C	Antonia	.	.	.	.	.	.	.	.	.
C	Agrippa	.	.	.	.	.	.	.	.	.
C	Germanicus	.	.	.	.	.	.	2?	1A	.
D	Claudius	.	1A	.	.	.	.	.	.	.
D	Nero	.	1A	.	.	.	.	.	.	.
E	Galba	.	.	.	.	.	.	.	.	.
F	Vespasian	.	2A	.	.	.	.	.	.	.
F	Titus Caesar	.	.	.	.	.	.	.	.	.
F	Titus Augustus.	.	.	.	.	.	.	.	.	.
F	Domitian Caesar	.	.	.	.	.	.	.	.	.
G	Domitian Augustus	.	.	.	1D	.	1A	.	.	.
G	Nerva	.	.	.	.	.	.	.	1A	1A
H	Trajan	.	.	.	3A	.	.	.	.	.
I	Hadrian	1D	.	.	3A	.	.	.	.	.
J	Antoninus Pius	.	1A	.	.	.	.	.	.	.
J	Faustina 1	.	.	.	.	.	.	.	.	.
J	Faustina 2 (under A.P.)	.	.	3A	.	.	.	.	.	.
J	Marcus Aurelius Caesar	.	.	1A	.	.	.	.	.	.
K	Marcus Aurelius Aug	.	.	.	.	.	.	.	.	.
L	Commodus Augustus	.	.	2A	.	.	.	.	.	.
M	Septimus Severus	.	.	1A	.	.	.	.	.	.
M	Julia Domna (Sept.Sev.)	.	.	.	1A	.	.	.	.	.
N	Julia Domna (Cara.)	.	.	.	0A	.	.	.	.	.
N	Caracalla Augustus	.	.	1A	.	.	.	.	.	.
Q	Postumus	.	.	.	.	1A	.	.	.	.

Table C3b

		C069 269	C026 270	S001 270	C115 270	C203 273-4	C070 273	C192n 293-6	C195 296	C108 330-3
C	Julio Claudian 1	0	0	0	0	0	0	0	0	0
D	Julio Claudian 2	0	2	0	0	0	0	2	1	0
E	Civil War	0	0	0	0	0	0	0	0	0
F	Flavian 1	0	2	0	0	0	0	0	0	0
G	Flavian 2	0	0	0	1	0	1	0	1	1
H	Trajanic	0	0	0	3	0	0	0	0	0
I	Hadrianic	1	0	0	3	0	0	0	0	0
J	Antonine 1	0	1	4	0	0	0	0	0	0
K	Antonine 2	0	0	0	0	0	0	0	0	0
L	Antonine 3	0	0	2	0	0	0	0	0	0
M	Severan 1a	0	0	1	1	0	0	0	0	0
N	Severan 1b	0	0	1	0	0	0	0	0	0
Q	Severan 2c	0	0	0	0	1	0	0	0	0

Appendix 2.31
Weight of Denarii in Hoards

This appendix is divided into two parts, firstly the summary statistics of the information, then the complete database from which they are derived.

Summary Statistics:

1. Hoard reference; 2. Hoard name; 3. Hoard TPQ; 4. Average coin weight; 5. Standard deviation of average coin weight; 6. Sample size; 7. 'Expected' average weight; 8. Deviation from expected weight

1.	2.	3.	4.	5.	6.	7.	8.
GROUP 1: Republican							
C 060	Chippenham	(AD 43)	3.61	±0.15	n = 25		
C 103	Eriswell	(AD 61)	3.55	±0.16	n = 45		
C 221	Scole	(AD 61)	3.54	±0.21	n = 64		
C 179	Mildenhall	(AD 80)	3.44	±0.19	n = 119		
C 130	Howe	(AD 87)	3.24	±0.24	n = 41		
C 063	Cirencester	(AD 87)	3.33	±0.23	n = 11		
C 158	Londonthorpe	(AD 155)	3.24	±0.17	n = 7		
C 001	Aldworth	(AD 177)	3.59		n = 1		
C 120	Great Melton	(AD 195)	2.90	±0.36	n = 6		
C 004	Akenham	(AD 222)	2.64		n = 1		
GROUP 2: Claudius to Nero							
C 103	Eriswell	(AD 61)	3.58	±0.03	n = 2	3.61	-0.03
C 221	Scole	(AD 61)	3.67		n = 1	3.61	0.06
C 179	Mildenhall	(AD 80)	3.37	±0.12	n = 8	3.36	0.01
C 246	Verulamium	(AD 117)	3.18		n = 1	3.17	0.01
C 158	Londonthorpe	(AD 155)	3.16	±0.18	n = 4	3.16	0.00
C 120	Great Melton	(AD 195)	3.06	±0.12	n = 2	3.05	0.01
GROUP 3: Civil War							
C 179	Mildenhall	(AD 80)	3.40	±0.12	n = 11	3.38	0.02
C 064	Cirencester	(AD 94)	3.33		n = 1	3.32	0.01
C 246	Verulamium	(AD 117)	3.32		n = 1	3.26	0.06
C 158	Londonthorpe	(AD 155)	3.18	±0.13	n = 10	3.19	-0.01
C 010	Barway	(AD 186)	3.26		n = 1	3.04	0.22
C 120	Great Melton	(AD 195)	2.90	±0.01	n = 2	2.96	-0.06
GROUP 4: Vespasian							
C 179	Mildenhall	(AD 80)	3.32	±0.11	n = 103	3.33	-0.01
C 130	Howe	(AD 87)	2.87	±0.11	n = 4	3.32	-0.45
C 064	Cirencester	(AD 94)	3.32	±0.06	n = 8	3.31	0.01
C 246	Verulamium	(AD 117)	3.27	±0.12	n = 10	3.26	0.01
C 158	Londonthorpe	(AD 155)	3.16	±0.10	n = 47	3.12	0.04
-	Wervin; Cheshire	(AD 157)	2.26	±0.23	n = 3	3.11	-0.85
C 249	Waddington	(AD 161)	3.20		n = 1	3.09	0.11
C 257	Westgate	(AD 170)	2.44		n = 1	3.04	-0.60
C 001	Aldworth	(AD 177)	3.05	±0.15	n = 10	2.99	0.06
C 010	Barway	(AD 186)	3.12	±0.16	n = 4	2.93	0.19
C 120	Great Melton	(AD 195)	2.82	±0.29	n = 10	2.85	-0.03
C 004	Akenham	(AD 221)	2.56	±0.13	n = 7	2.57	-0.01
GROUP 5: Titus							
C 179	Mildenhall	(AD 80)	3.33		n = 1	3.47	-0.14
C 246	Verulamium	(AD 117)	3.38		n = 1	3.30	0.08
C 158	Londonthorpe	(AD 155)	3.21	±0.09	n = 11	3.23	-0.02
C 120	Great Melton	(AD 195)	3.12	±0.19	n = 4	3.06	0.06
GROUP 6: Domitian to Nerva							
C 064	Cirencester	(AD 94)	3.49	±0.05	n = 2	3.38	0.11
C 246	Verulamium	(AD 117)	3.28	±0.09	n = 9	3.30	-0.02
C 158	Londonthorpe	(AD 155)	3.22	±0.15	n = 63	3.23	-0.01
C 249	Waddington	(AD 161)	3.21	±0.06	n = 2	3.22	-0.01
C 001	Aldworth	(AD 177)	3.22	±0.10	n = 3	3.16	0.06
C 010	Barway	(AD 186)	3.35		n = 1	3.12	0.25
C 120	Great Melton	(AD 195)	2.99	±0.22	n = 10	3.06	-0.07
GROUP 7: Trajan							
C 246	Verulamium	(AD 117)	3.17	±0.18	n = 5	3.14	0.03
C 158	Londonthorpe	(AD 155)	3.19	±0.18	n = 122	3.20	-0.01
-	Wervin; Cheshire	(AD 157)	2.73	±0.12	n = 3	3.19	-0.46
C 249	Waddington	(AD 161)	3.24	±0.08	n = 2	3.19	0.05

C 257	Westgate	(AD 170)	2.94	±0.19	n = 2	3.18	-0.24
C 001	Aldworth	(AD 177)	3.23	±0.17	n = 11	3.16	0.07
C 010	Barway	(AD 186)	3.25	±0.15	n = 10	3.14	0.11
C 120	Great Melton	(AD 195)	3.50	±0.16	n = 24	3.10	0.40
GROUP 8: Hadrian							
C 158	Londonthorpe	(AD 155)	3.24	±0.14	n = 108	3.21	0.03
-	Wervin; Cheshire	(AD 157)	2.33	±0.44	n = 6	3.20	-0.87
C 249	Waddington	(AD 161)	3.25	±0.18	n = 6	3.18	0.07
C 257	Westgate	(AD 170)	2.58	±0.07	n = 2	3.15	-0.57
C 001	Aldworth	(AD 177)	3.14	±0.19	n = 15	3.12	0.02
C 010	Barway	(AD 186)	3.19	±0.23	n = 7	3.08	0.11
C 120	Great Melton	(AD 195)	3.01	±0.31	n = 29	3.04	-0.03
GROUP 9: Antoninus Pius							
C 158	Londonthorpe	(AD 155)	3.25	±0.20	n = 33	3.22	0.03
-	Wervin; Cheshire	(AD 157)	2.63	±0.31	n = 2	3.23	-0.60
C 249	Waddington	(AD 161)	3.23	±0.28	n = 4	3.23	0.00
C 257	Westgate	(AD 170)	2.53	±0.11	n = 2	3.24	-0.71
C 001	Aldworth	(AD 177)	3.32	±0.23	n = 25	3.22	0.10
C 010	Barway	(AD 186)	3.27	±0.27	n = 13	3.17	0.10
C 120	Great Melton	(AD 195)	3.04	±0.34	n = 39	3.10	-0.06
C 004	Akenham	(AD 221)	2.78	±0.24	n = 8	2.73	0.05
GROUP 10: Marcus Aurelius							
C 249	Waddington	(AD 161)	3.45		n = 1	3.10	0.35
C 257	Westgate	(AD 170)	2.37	±0.49	n = 2	3.13	-0.76
C 001	Aldworth	(AD 177)	3.21	±0.15	n = 9	3.12	0.09
C 010	Barway	(AD 186)	3.27	±0.30	n = 8	3.08	0.19
C 120	Great Melton	(AD 195)	2.97	±0.31	n = 48	3.01	-0.04
C 004	Akenham	(AD 221)	2.60	±0.41	n = 7	2.59	0.01
GROUP 11: Early Severan							
C 004	Akenham	(AD 221)	2.52	±0.30	n = 34		
C 009	Barton-upon-Humber	(AD 260)	2.99	±0.40	n = 10		
GROUP 12: Macrinus and Later							
C 004	Akenham	(AD 221)	2.89		n = 1		
C 009	Barton-upon-Humber	(AD 260)	2.67	±0.37	n = 43		

Full Data Set

The information is ordered by Group, then by hoard, then by the entry in the hoard catalogue, the reference number of which is given.

GROUP 1: Republican

C 060	Chippenham (AD 41)		
1	M Acilius M f	Cr 255	3.55 g
2	Elephant head	Cr 262	3.72 g
3	Q Max	Cr 265	3.69 g
4	M Porc Laeca	Cr 270	3.55 g
5	M Fan C f	Cr 275	3.72 g
6	C Font	Cr 290	3.51 g
7	L Flamini Cilo	Cr 302	3.75 g
8	L Saturn	Cr 317/3b	3.63 g
9	Q Therm M f	Cr 319	3.57 g
10	L Tituri	Cr 344/1a	3.59 g
11	C Licinius Macer	Cr 354	3.29 g
12	P Crepusi	Cr 361/1c	3.91 g
13	Imper	Cr 374/2	3.67 g
14	C Nae Balb	Cr 382/1b	3.63 g
15	L Papi	Cr 384/1	3.60 g
16	M Voltei M f	Cr 385/2	3.70 g
17	C Memmi C f	Cr 427/2	3.70 g
18	Caesar	Cr 443	3.57 g
19	T Carisius	Cr 464/1	3.29 g
20	T Carisius	Cr 464/5	3.51 g
21	T Carisius	Cr 464/5	3.64 g
22	P Clodius M f	Cr 494/23	3.73 g
23	M. Antony Leg IV	Cr 544/17	3.75 g
24	M. Antony Leg VIII	Cr 544/21	3.76 g
25	M. Antony Leg XXII	Cr 544/38	3.31 g
C 103	Eriswell (AD 61)		
256	Sex Pom	Cr 235	3.65 g
257	M Sergi Silus Q	Cr 286	3.68 g
258	Cn Blasio	Cr 296/1f	3.66 g
259	L Caleri Flacci	Cr 306	3.68 g
260	L Scip Asiag	Cr 311 1b	3.60 g
261	C Fabi C f	Cr 322 1b	3.69 g
262	L Senti C f	Cr 325/1a	3.65 g
263	L Piso Frugi	Cr 340/1	3.36 g
264	L Piso Frugi	Cr 340/1	3.57 g
265	L Piso Frugi	Cr 340 1	3.53 g
266	Q Titi	Cr 341/2	3.69 g
267	Q Titi	Cr 341/2	3.67 g
268	C Vibius Pansa	Cr 342/5b	3.48 g
269	L Rubri Dossen	Cr 348 1	3.52 g
270	Anon.	Cr 350a 2	3.40 g
271	L Censor	Cr 363 1d	3.29 g
272	Q Anto Balb Pr	Cr 364 1b	2.85 g
273	A Post Albin	Cr 372/2	3.63 g
274	M Voltei M f	Cr 385 1	3.41 g
275	C Egnatius Maxsumus	Cr 391 1a-b	3.45g
276	L Farsulei Mensor	Cr 392 1b	3.56 g
277	Paullus Lepidus	Cr 415 1	3.57 g
278	M Scaur, P Hypsaeus	Cr 422 1b	3.60 g
279	M Scaur, P Hypsaeus	Cr 422 1b	3.70 g
280	Philippus	Cr 425	3.33 g
281	Brutus	Cr 433 1	3.64 g
282	Brutus	Cr 433 1	3.50 g
283	Mn Acilius Illvir	Cr 442 1b	3.52 g
284	Plancus	Cr 453 1a	3.77 g
285	Caesar	Cr 458	3.64 g
286	Q. Metellus, Eppius ...	Cr 461/1	3.66 g
287	Mn Cordius Rufus ...	Cr 463/1a	3.70 g
288	Caesar	Cr 468 2	3.64 g
289	P Clodius	Cr 494/23	3.76 g
300	Mag Pius ...	Cr 511/3a	3.66 g
290	Octavian	Cr 540/2	3.72 g
291	Octavian	Cr 540/2	3.46 g
292	M. Ant. Chortium...	Cr 544/8	3.44 g
293	M. Antony XII A...	Cr 544/9	3.61 g
294	M. Antony Leg II	Cr 544/14	3.62 g
295	M. Antony Leg II	Cr 544/14	3.52 g
296	M. Antony Leg V	Cr 544/18	3.52 g
297	M. Antony Leg VI	Cr 544/19	3.25 g
298	M. Antony Leg VII	Cr 544/20	3.45 g
299	M. Antony Leg XV	Cr 544	3.67 g
C 221	Scole (AD 61)		
1	Anon.	Cr 222	3.80 g
2	P Mae Ant	Cr 249	3.45 g
3	M Fouri Phili	Cr 281	3.52 g
4	M Aureli Scauri	Cr 282/1	3.50 g
5	L Pomponi	Cr 282/4	3.52 g
6	M Cipi M f	Cr 289	3.50 g
7	C Font	Cr 290	3.57 g
8	C Pulcher	Cr 300	3.65 g
9	P Servili	Cr 328	3.42 g
10	D Silanus	Cr 337/3	3.63 g
11	Q Titi	Cr 341/2	3.70 g
12	Pansa	Cr 342/5b	3.44 g
13	Pansa	Cr 342/5b	3.66 g
14	Pansa	Cr 342/5b	3.58 g
15	C Censorin	Cr 346/1	3.59 g
16	C Licinius Macer	Cr 354	3.33 g
17	C Norbanus	Cr 357/1b	3.74 g
18	A Post Albin	Cr 372	3.61 g
19	A Post Albin	Cr 372	3.62 g
20	Imper	Cr 374	3.37 g
21	L Procili	Cr 379/2	3.39 g
22	Ti Claud Ti f Ap n	Cr 383	3.76 g
23	Mn Aquil	Cr 401	3.38 g
24	M Plaetorius Cest	Cr 405/5	3.58 g
25	M Plaetorius Cest ...	Cr 409/1	3.63 g
26	Longin III V	Cr 413	3.74 g
27	Paullus Lepidus	Cr 415	4.12 g
28	Paullus Lepidus	Cr 415	3.78 g
29	Libo	Cr 416/1a	3.79 g
30	Q Cassius	Cr 428/3	3.87 g
31	T Didi	Cr 429/2	3.53 g
32	Mn Acilius	Cr 442/1a	3.72 g
33	Mn Acilius	Cr 442/1a	3.95 g
34	Caesar	Cr 443	3.63 g
35	Caesar	Cr 443	3.60 g
36	Caesar	Cr 443	3.57 g
37	Pansa	Cr 449/1a	3.64 g
38	Pansa	Cr 449/1a	3.36 g
39	Caesar	Cr 458	3.36 g
40	C Considius	Cr 465/2b	3.49 g
41	M Poblici Leg Pro Pr	Cr 469/1a	3.67 g
42	M Poblici Leg Pro Pr	Cr 469/1a	3.53 g
43	Acisculus	Cr 474 1	3.42 g
44	Caesar P S.Macer	Cr 480/9	3.63 g
45	P Clodius M f	Cr 494 23	2.64 g
46	L Sesti Pro Q	Cr 502	3.63 g
47	Mag Pius Imp Iter	Cr 211/1	3.72 g
48	M Barbat Q P	Cr 517/2	3.46 g
49	M Antonius ...	Cr 533/2	3.26 g
50	M. Antony Chortis...	Cr 544/12	3.49 g
51	M. Antony Leg II	Cr 544/14	3.31 g
52	M. Antony Leg III	Cr 544/15	3.71 g
53	M. Antony Leg VI	Cr 544/19	3.27 g
54	M. Antony Leg VIII	Cr 544/21	3.43 g
55	M. Antony Leg VIII	Cr 544/21	3.61 g
56	M. Antony Leg X	Cr 544/24	3.55 g
57	M. Antony Leg XI	Cr 544/25	3.57 g
58	M. Antony Leg XV	Cr 544/30	3.51 g
59	M. Antony Leg X...	Cr 544/?	3.65 g
60	M. Antony Leg ?	Cr 544/?	3.54 g
61	M. Antony Leg XI...	Cr 544/?	3.45 g
62	M. Antony Leg ?	Cr 544/?	3.45 g

63	M. Antony Leg ?	Cr 544/?	3.21 g
64	M. Antony Leg ?	Cr 544/?	3.13 g
C 179	Mildenhall, Beck Row (AD 80)		
1	Trident	Cr 115	2.68 g
2	C Cur f Trige	Cr 240/16	3.39 g
3	Ti Minuci C f Augurini	Cr 243	3.48 g
4	M Varg	Cr 257	3.50 g
5	M Aureli/Scauri...	Cr 287/1	3.51 g
6	L Flamini Cilo	Cr 302	3.53 g
7	M Herenni	Cr 308/16	3.57 g
8	L Memmi Gal	Cr 313/1	3.81 g
9	Q Therm M f	Cr 319	3.66 g
10	L Tituri	Cr 344/1a	3.35 g
11	C Fabi C f	Cr 322/1a	3.42 g
12	M Lucili Ruf	Cr 324	3.50 g
13	P Servili M f Rulli	Cr 328	3.51 g
14	P Servili M f Rulli	Cr 328	3.59 g
15	L Piso Frugi	Cr 340	3.45 g
16	C Vibius Pansa	Cr 342/5b	3.44 g
17	L Tituri Sabin	Cr 344/3	3.41 g
18	C Licinus Macer	Cr 354	3.44 g
19	Q Anto Balb	Cr 364/1d	3.45 g
20	Q Anto Balb	Cr 364/1c	3.50 g
21	L Manli	Cr 367/3	3.31 g
22	Q C M P I	Cr 374/1	3.29 g
23	IMPER	Cr 374/2	3.54 g
24	L Procili	Cr 379/1	3.36 g
25	Ti Claud Ti f Ap n	Cr 383	3.60 g
26	Ti Claud Ti f Ap n	Cr 383	3.42 g
27	Ti Claud Ti f Ap n	Cr 383	3.19 g
28	L Papi	Cr 384	3.41 g
29	L Papi	Cr 384	3.52 g
30	M Votei M f	Cr 385/1	3.56 g
31	L Farsulei Mensor	Cr 392/1b	3.58 g
32	Cn Lem Q	Cr 393/1a	3.38 g
33	Mn Aquil Mn f Mn n	Cr 401	3.52 g
34	P Galb	Cr 406	3.66 g
35	C Hosidi Geta	Cr 407/1	3.57 g
36	L Cassi Longin	Cr 413	3.67 g
37	L Cassi Longin	Cr 413	3.65 g
38	L Furi Brocchi	Cr 414	3.54 g
39	Paullus Lepidus	Cr 415	3.62 g
40	Libo	Cr 416 1a	3.36 g
41	Libo	Cr 416	3.55 g
42	Libo	Cr 416	3.48 g
43	P Ypsae	Cr 420/1a	3.77 g
44	Phillipus	Cr 425	3.72 g
45	Phillipus	Cr 425	3.66 g
46	C Memmi C f	Cr 427 1	3.58 g
48	Brutus	Cr 433 1	3.67 g
49	Brutus	Cr 433 2	3.61 g
50	Caesar (elephant)	Cr 443	3.39 g
51	Caesar (elephant)	Cr 443	3.18 g
52	Caesar (elephant)	Cr 443	3.66 g
53	C Pansa C f C n	Cr 449 4	3.44 g
54	Albinus Bruti f	Cr 450 2	3.53 g
55	L Plautius Plancus	Cr 453 1a	3.61 g
56	Mn Cordius Rufus	Cr 463 1a	3.49 g
57	Mn Cordius Rufus	Cr 463/1b	3.18 g
58	Mn Cordius Rufus	Cr 463 3	3.37 g
59	M Poblici Leg Pro Pr	Cr 469 1	3.37 g
60	P Sepullius Macer	Cr 480/10	3.41 g
61	Q Nasidius	Cr 483 2	3.29 g
62	P Clodius M f	Cr 494/23	3.47 g
63	P Clodius M f	Cr 494/23	3.46 g
64	P Clodius M f	Cr 494/23	3.47 g
65	P Clodius M f	Cr 494/23	3.62 g
66	P Clodius M f	Cr 494/23	3.71 g
67	P Clodius M f	Cr 494/23	3.64 g
68	P Clodius M f	Cr 494/23	3.76 g
69	L Livineius Regulus	Cr 494/28	3.56 g
70	L Livineius Regulus	Cr 494/28	3.36 g
71	L Livineius Regulus	Cr 494/28	3.56 g
72	Lepidus ... IIIV RPC	Cr 295/2a	3.48 g
73	Brut Imp Eid Mar	Cr 508/2	3.51 g
74	Mag Pius...	Cr 511/2	3.21 g
75	L Servius Rufus	Cr 515/2	3.21 g
76	M Antonius...	Cr 516/5	3.62 g
77	M Ant, M Barbat Q P	Cr 217/2	2.86 g
78	M Ant, M Barbat Q P	Cr 217/2	3.55 g
79	M A.Imp IIIvir RPC	Cr 528/2a	3.68 g
81	M. Antony Leg II	Cr 552/14	3.25 g
82	M. Antony Leg II	Cr 552/14	3.40 g
83	M. Antony Leg II	Cr 552/14	3.35 g
84	M. Antony Leg III	Cr 544/15	3.34 g
85	M. Antony Leg III	Cr 544/15	3.46 g
86	M. Antony Leg III	Cr 544/15	3.47 g
87	M. Antony Leg IV	Cr 544/17	3.13 g
88	M. Antony Leg IV	Cr 544/17	3.23 g
89	M. Antony Leg VI	Cr 544/19	3.32 g
90	M. Antony Leg VI	Cr 544/19	3.45 g
91	M. Antony Leg VI	Cr 544/19	3.44 g
92	M. Antony Leg VII	Cr 544/20	3.22 g
93	M. Antony Leg VII	Cr 544/20	3.31 g
94	M. Antony Leg VII	Cr 544/20	3.50 g
95	M. Antony Leg VIII	Cr 544/21	3.61 g
96	M. Antony Leg VIIII	Cr 544/22	3.04 g
97	M. Antony Leg IX	Cr 544/23	3.70 g
98	M. Antony Leg XI	Cr 544/25	3.20 g
99	M. Antony Leg XI	Cr 544/25	3.20 g
100	M. Antony Leg XI	Cr 544/25	3.42 g
101	M. Antony Leg XI	Cr 544/25	3.32 g
102	M. Antony Leg XII	Cr 544/26	3.31 g
103	M. Antony Leg XII	Cr 544/26	3.31 g
104	M. Antony Leg XIII	Cr 544/27	3.55 g
105	M. Antony Leg XIV	Cr 544/29	3.35 g
106	M. Antony Leg XV	Cr 544/30	3.25 g
107	M. Antony Leg XV	Cr 544/30	3.25 g
108	M. Antony Leg XV	Cr 544/30	3.53 g
109	M. Antony Leg XVI	Cr 544/31	3.42 g
110	M. Antony Leg XIX	Cr 544/35	3.19 g
111	M. Antony Leg XIX	Cr 544/35	3.19 g
112	M. Antony Leg XIX	Cr 544/35	3.19 g
113	M. Antony Leg XX	Cr 544/36	3.68 g
114	M. A. Leg XX/XXI	Cr 544/36-7	3.66 g
115	M. Antony Leg XXI	Cr 544/37	3.46 g
116	M. Antony Leg XXI	Cr 544/37	3.30 g
117	M. Antony Leg XXI	Cr 544/37	3.39 g
118	M. Antony Leg XXII	Cr 544/38	3.41 g
119	Mark Antony Leg ?	Cr 544/?	3.52 g
120	Mark Antony Leg ?	Cr 544/?	3.16 g
121	Mark Antony Leg ?	Cr 544/?	2.86 g
C 130	Howe (AD 87)		
	L Cup	Cr 218	3.13 g
	P Mae Ant M f	Cr 249	3.45 g
	M Tulli	Cr 280	3.20 g
	M Sergi Silus Q	Cr 286	3.27 g
	M Cipi M f	Cr 289	3.47 g
	Mn Aemilio Lep	Cr 291	3.57 g
	Ap Cl T Mal Q Vr	Cr 299/1a	3.38 g
	L Flamini Cilo	Cr 302	3.43 g
	C Mall A Albinus L ...	Cr 335/1b	3.21 g
	L Piso frugi	Cr 340/1	3.27 g
	Q Ant Balb Pr	Cr 364/1d	2.52 g
	L Papi	Cr 384	3.33 g
	M Voltei	Cr 385/3	3.15 g
	L Furi Brocchi	Cr 414	3.06 g
	C Serveil Cf	Cr 423	3.44 g
	Phillipus	Cr 425	3.36 g
	Phillipus	Cr 425	2.86 g
	P Crassus M f	Cr 430	3.25 g
	Caesar	Cr 443	3.13 g

	Caesar	Cr 443	3.41 g
	Caesar	Cr 443	3.41 g
	Albinus Bruti f	Cr 450 2	2.95 g
	L Plautius Plancus	Cr 453	3.59 g
	Caesar	Cr 458	3.35 g
	Caesar	Cr 458	3.27 g
	P Sepullius Macer	Cr 480 9	3.66 g
	M Anton Imp	Cr 488 1	3.42 g
	C Vibius Varus	Cr 494 36	3.25 g
	Brutus Imp, Casca L.	Cr 507 2	3.30 g
	Antonius...	Cr 533 2	3.37 g
	Mark Antony Leg II	Cr 544 14	2.66 g
	Mark Antony Leg XII	Cr 544 26	2.98 g
	Mark Antony Leg XIII	Cr 544 27	2.87 g
	Mar Antony Leg XXI	Cr 544 37	3.07 g
17a	Philippus	Cr 425	3.30 g
17b	Q Cassius	Cr 428 3	3.28 g
25a	Caesar	Cr 458 1	3.26 g
29a	Mag Pius...	Cr 511 3	3.07 g
29b	Mag Pius...	Cr 511 4	3.33 g
33a	Mark Antony Leg XV	Cr 544 30	3.08 g
34a	Mark Antony Leg XXI	Cr 544 37	3.37 g
C 063	Cirencester (AD 93)		
	L Cup	Cr 218	3.01 g
	M Porc	Cr 270	3.79 g
	C Vibius Pansa	Cr 342 5b	3.14 g
	C Norbanus	Cr 357 1b	3.41 g
	A Post Albinus	Cr 372 2	3.39 g
	Kaleni, Cordi	Cr 403	3.16 g
	Paullus Lepidus, Libo	Cr 417 1a	3.46 g
	Albinus Bruti f	Cr 450 2	3.52 g
	M Antoni	Cr 488	3.45 g
	Imp Caesar Divi f	Cr 540 2	3.25 g
	Antoni (with Cleo.)	Cr 543	3.10 g
C 158	Londonthorpe (AD 155)		
	Mark Antony Leg XI	Cr 544 25	3.09 g
	Mark Antony Leg XI	Cr 544 25	3.37 g
	Mark Antony Leg XII	Cr 544 26	3.12 g
	Mark Antony Leg XII	Cr 544 26	3.37 g
	Mark Antony Leg ?	Cr 544 ?	3.04 g
	Mark Antony Leg ?	Cr 544 ?	3.50 g
	Mark Antony Leg ?	Cr 544 ?	3.17 g
C 001	Aldworth (AD 177)		
	Mark Antony Leg X	Cr 544 24	3.59 g
C 120	Great Melton (AD 195)		
1	Mark Antony Leg II	Cr 544 14	3.20 g
2	Mark Antony Leg ?	Cr 544 ?	2.69 g
3	Mark Antony Leg ?	Cr 544 ?	3.03 g
4	Mark Antony Leg ?	Cr 544 ?	2.28 g
5	Mark Antony Leg ?	Cr 544 ?	3.21 g
6	Mark Antony Leg ?	Cr 544 ?	2.99 g
C 004	Akenham (AD 222)		
	Mark Antony Leg ?	Cr 544 ?	2.64 g

GROUP 2: Claudius to Nero

C 103	Eriswell (AD 61)		
326	Claudius	BMC 75	3.56 g
327	Nero	BMC 8	3.61 g
C 221	Scole (AD 61)		
87	Nero	BMC 24	3.67 g
C 179	Mildenhall (AD 80)		
154	Nero	BMC 63	3.51 g
155	Nero	BMC 63	3.57 g
156	Nero	BMC 74	3.25 g
157	Nero	BMC 74	3.27 g
158	Nero	BMC 74	3.30 g
159	Nero	BMC 74	3.27 g
160	Nero	BMC 96	3.34 g
161	Nero	BMC 98	3.43 g
C 246	Verulamium (AD 117)		
23	Claudius (Nero)	RIC 95	3.18 g
C 158	Londonthorpe (AD 155)		
-	Nero	RIC 45	3.17 g
-	Nero	RIC 52	2.93 g
-	Nero	RIC 52	3.36 g
-	Nero	RIC 60	3.20 g
C 120	Great Melton (AD 195)		
7	Nero	BMC 54	3.14 g
8	Nero	BMC 74	2.97 g

GROUP 3: Civil War

C 179	Mildenhall (AD 80)		
162	Civil War	BMC 9	3.70 g
163	Galba	BMC 34	3.44 g
164	Galba	BMC 6	3.38 g
165	Otho	BMC 18	3.50 g
166	Vitellius	BMC 8	3.40 g
167	Vitellius	BMC 7	3.32 g
168	Vitellius	BMC 20	3.32 g
169	Vitellius	BMC 20	3.32 g
170	Vitellius	BMC 34	3.32 g
171	Vitellius	BMC 34	3.32 g
172	Vitellius	BMC 39	3.43 g
C 064	Cirencester (AD 94)		
12	Vitellius	RIC 20	3.33 g
C 246	Verulamium (AD 117)		
24	Vitellius	RIC 14	3.32 g
C 158	Londonthorpe (AD 155)		
-	Galba	RIC 20	3.20 g
-	Galba	RIC 4	3.27 g
-	Galba	RIC 4	3.25 g
-	Otho	RIC 3	3.04 g
-	Otho	RIC 3	3.06 g
-	Otho	RIC 12	3.29 g
-	Otho	RIC 12	3.41 g
-	Vitellius	RIC 2	3.06 g
-	Vitellius	RIC 20	3.25 g
-	Vitellius	RIC 24	3.02 g
C 010	Barway (AD 186)		
A 01	Vitellius	BMC 17	3.26 g
C 120	Great Melton (AD 195)		
10	Vitellius	BMC 3	2.90 g
9	Otho	BMC 17	2.91 g

GROUP 4: Vespasian

C 179	Mildenhall (AD 80)		
173	Vespasian	BMC 26	3.27 g
174	Vespasian	BMC 26	3.23 g
175	Vespasian	BMC 26	3.17 g
176	Vespasian	BMC 26	3.30 g
177	Vespasian	BMC 26	3.30 g
178	Vespasian	BMC 26	3.18 g
179	Vespasian	BMC 26	2.91 g
180	Vespasian	BMC 26	3.33 g
181	Vespasian	BMC 26	3.30 g
182	Vespasian	BMC 26	3.24 g
183	Vespasian	BMC 26	3.36 g
184	Vespasian	BMC 26	3.26 g
185	Vespasian	BMC 17	3.13 g
186	Vespasian	BMC 21	3.18 g
187	Vespasian	BMC 21	3.40 g
188	Vespasian	BMC 21	3.47 g
189	Vespasian	BMC 7	3.35 g
190	Vespasian	BMC 35	3.13 g
191	Vespasian	BMC 35	3.17 g
192	Vespasian	BMC 35	3.20 g
193	Vespasian	BMC 35	3.40 g
194	Vespasian	BMC 35	3.27 g

195	Vespasian	BMC 48	3.44 g
196	Vespasian	BMC 50	3.47 g
197	Vespasian	BMC 50	3.29 g
198	Vespasian	BMC 50	3.34 g
199	Vespasian	BMC 50	3.42 g
200	Vespasian	BMC 50	3.37 g
201	Vespasian	BMC 50	3.25 g
202	Vespasian	BMC 57	3.51 g
203	Vespasian	BMC 57	3.31 g
204	Vespasian	BMC 57	3.28 g
205	Vespasian	BMC 57	3.34 g
206	Vespasian	BMC 57	3.29 g
207	Vespasian	BMC 57	3.31 g
208	Vespasian	BMC 64	3.23 g
209	Vespasian	BMC 64	3.29 g
210	Vespasian	BMC 64	3.40 g
211	Vespasian	BMC 71	3.36 g
212	Vespasian	BMC 71	3.34 g
213	Vespasian	BMC 71	3.41 g
214	Vespasian	BMC 71	3.26 g
215	Vespasian	BMC 74	3.35 g
216	Vespasian	BMC 74	3.39 g
217	Vespasian	BMC 74	3.30 g
218	Vespasian	BMC 98n	3.46 g
219	Vespasian	BMC 105	3.47 g
220	Vespasian	BMC 98n	3.34 g
221	Vespasian	BMC 98n	3.36 g
222	Vespasian	BMC 98n	3.32 g
223	Vespasian	BMC 98n	3.36 g
224	Vespasian	BMC 98n	3.38 g
225	Vespasian	BMC 98n	3.38 g
226	Vespasian	BMC 98n	3.39 g
227	Vespasian	BMC 98n	3.36 g
228	Vespasian	BMC 135	3.40 g
229	Vespasian	BMC 135	3.37 g
230	Vespasian	BMC 135	3.09 g
231	Vespasian	BMC 135	3.37 g
232	Vespasian	BMC 135	3.45 g
233	Vespasian	BMC 135	3.31 g
234	Vespasian	BMC 137	3.37 g
235	Vespasian	BMC 137	3.32 g
236	Vespasian	BMC 137	3.19 g
237	Vespasian	BMC 137	3.35 g
238	Vespasian	BMC 137	3.10 g
239	Vespasian	BMC 161	3.07 g
240	Vespasian	BMC 161	3.29 g
241	Vespasian	BMC 161	3.31 g
242	Vespasian	BMC 161	3.24 g
243	Vespasian	BMC 161	3.18 g
244	Vespasian	BMC 161	3.32 g
245	Vespasian	BMC 161	3.38 g
246	Vespasian	BMC 161	3.41 g
247	Vespasian	BMC 161	3.43 g
248	Vespasian	BMC 161	3.33 g
249	Vespasian	BMC 166	2.94 g
250	Vespasian	BMC 166	3.34 g
251	Vespasian	BMC 177	3.31 g
252	Vespasian	BMC 179	3.37 g
253	Vespasian	BMC 180	3.20 g
254	Vespasian	BMC 180	3.41 g
255	Vespasian	BMC 180	3.42 g
256	Vespasian	BMC 184a	3.30 g
257	Vespasian	BMC 191	3.42 g
258	Domitian Caes.	BMC 193	3.43 g
259	Domitian Caes.	BMC 193	3.34 g
260	Vespasian	BMC 200	3.32 g
261	Vespasian	BMC 203n	3.14 g
262	Vespasian	BMC 221	3.38 g
263	Vespasian	BMC 221	3.40 g
264	Vespasian	BMC 225	3.46 g
265	Domitian Caes.	BMC 234	3.38 g
266	Domitian Caes.	BMC 240	3.48 g
267	Vespasian	BMC 276	3.24 g
268	Vespasian	BMC 276	3.26 g
269	Vespasian	BMC 305	3.33 g
270	Domitian Caes.	BMC 323	3.44 g
271	Vespasian	BMC 222	3.55 g
272	Vespasian	BMC 316	3.39 g
273	Domitian Caes.	BMC 269	3.47 g
274	Domitian Caes.	BMC 266	3.49 g
275	Vespasian	-	3.37 g
-	Howe (AD 87)		
61b	Vespasian	BMC 26	3.00 g
68a	Vespasian	BMC 71	2.90 g
76a	Domitiam Caes.	BMC 193	2.75 g
76b	Vespasian	BMC 212	2.82 g
C 064	Cirencester (AD 94)		
13	Vespasian	RIC 10	3.27 g
14	Vespasian	RIC 10	3.28 g
15	Vespasian	RIC 15	3.44 g
16	Vespasian	RIC as 2	3.29 g
17	Vespasian	RIC 37	3.34 g
18	Vespasian	RIC 113	3.31 g
19	Vespasian	RIC 131a	3.37 g
20	Titus Caesar	RIC 176	3.30 g
C 246	Verulamium (AD 117)		
25	Vespasian	RIC 5	3.17 g
26	Vespasian	RIC 37	3.30 g
27	Vespasian	RIC 75	3.34 g
28	Vespasian	RIC 77	3.49 g
29	Vespasian	RIC 77	3.20 g
30	Vespasian	RIC 89	3.19 g
31	Vespasian	RIC 131a	3.31 g
32	Titus Caesar	RIC 155	3.15 g
33	Domitian Caes.	RIC 238	3.15 g
34	Domitian Caes.	RIC 238	3.41 g
C 158	Londonthorpe (AD 155)		
-	Domitian Caes.	RIC 238	3.23 g
-	Domitian Caes.	RIC 238	3.17 g
-	Domitian Caes.	RIC 241	3.12 g
-	Domitian Caes.	RIC 241	3.31 g
-	Domitian Caes.	RIC 246	3.24 g
-	Domitian Caes.	RIC 246	3.26 g
-	Vespasian	RIC 9	3.09 g
-	Vespasian	RIC 9	3.24 g
-	Vespasian	RIC 10	3.16 g
-	Vespasian	RIC 10	3.23 g
-	Vespasian	RIC 10	3.32 g
-	Vespasian	RIC 15	3.17 g
-	Vespasian	RIC 30	3.20 g
-	Vespasian	RIC 30	3.30 g
-	Vespasian	RIC 37	3.11 g
-	Vespasian	RIC 39	2.90 g
-	Vespasian	RIC 39	2.96 g
-	Vespasian	RIC 42	3.14 g
-	Vespasian	RIC 49	3.08 g
-	Vespasian	RIC 50	3.12 g
-	Vespasian	RIC 50	3.15 g
-	Vespasian	RIC 50	3.23 g
-	Vespasian	RIC 52	3.34 g
-	Vespasian	RIC 65	3.13 g
-	Vespasian	RIC 65	3.15 g
-	Vespasian	RIC 65	3.24 g
-	Vespasian	RIC 65	3.29 g
-	Vespasian	RIC 75	3.21 g
-	Vespasian	RIC 77	3.07 g
-	Vespasian	RIC 90	3.03 g
-	Vespasian	RIC 90	3.04 g
-	Vespasian	RIC 90	3.06 g
-	Vespasian	RIC 90	3.09 g
-	Vespasian	RIC 90	3.10 g

-	Vespasian	RIC 90	3.11 g
-	Vespasian	RIC 90	3.19 g
-	Vespasian	RIC 91	3.14 g
-	Vespasian	RIC 94	3.11 g
-	Vespasian	RIC 98a	3.25 g
-	Vespasian	RIC 107	3.03 g
-	Vespasian	RIC 124a	3.10 g
-	Vespasian	RIC 124a	3.13 g
-	Vespasian	RIC 124a	3.26 g
-	Vespasian	RIC 124b	3.22 g
-	Vespasian	RIC 109	3.29 g
-	Vespasian	RIC 131b	3.08 g
-	Vespasian	RIC 131b	3.18 g
-	Wervin; Cheshire (AD 157)		
1	Vespasian	RIC 30	2.05 g
2	Vespasian	RIC 99	2.24 g
3	Vespasian	RIC 99	2.50 g
C 249	Waddington (AD 161)		
1	Vespasian	RIC 10	3.20 g
C 257	Westgate (AD 170)		
1	Vespasian	BMC 17	2.44 g
C 001	Aldworth (AD 177)		
2	Vespasian	BMC 26	2.90 g
3	Vespasian	BMC 35	3.30 g
4	Vespasian	BMC 61	2.82 g
5	Vespasian	BMC 116	3.02 g
6	Vespasian	BMC 138	3.11 g
7	Vespasian	BMC 161	2.92 g
8	Vespasian	BMC 177	3.00 g
9	Vespasian	*BMC 180*	*3.17 g*
10	Vespasian	BMC 184a	3.01 g
11	Domitian Caes.	BMC 265	3.23 g
C 010	Barway (AD 186)		
A 02	Vespasian	BMC 7	3.32 g
A 03	Vespasian	BMC 251	3.10 g
B 01	Vespasian	as BMC 7	3.14 g
B 02	Domitian Caes.	BMC 240	2.94 g
C 120	Great Melton (AD 195)		
11	Vespasian	BMC 26	2.95 g
12	Vespasian	BMC 26	2.68 g
13	Vespasian	BMC 26	3.01 g
14	Vespasian	BMC 26	2.86 g
15	Vespasian	BMC 57	3.07 g
16	Vespasian	BMC 65	2.87 g
17	Vespasian	BMC 98	2.84 g
18	Vespasian	BMC 166	3.04 g
19	Vespasian	BMC 168	2.97 g
20	Vespasian	BMC 168	2.01 g
21	Vespasian	BMC 168	2.97 g
22	Vespasian	BMC 172	2.92 g
23	Vespasian	BMC 212	2.34 g
24	Vespasian	BMC 121	2.95 g
25	Vespasian	BMC 295	2.58 g
27	Domitian Caes.	BMC 240	2.91 g
29	Domitian Caes.	BMC 240	2.99 g
30	Domitian Caes.	BMC 305	3.18 g
31	Domitian Caes.	BMC 323	2.40 g
32	Domitian Caes.	BMC 323	2.92 g
C 004	Akenham (AD 221)		
2	Vespasian	BMC 35	2.53 g
3	Vespasian	BMC 57	2.59 g
4	Vespasian	BMC 86	2.49 g
5	Vespasian	-	2.44 g
6	Titus Caesar	BMC 191	2.41 g
7	Domitian Caes.	BMC 193	2.69 g
8	Domitian Caes.	BMC 86	2.75 g

GROUP 5: Titus

C 179	Mildenhall (AD 80)		
277	Titus	BMC 13va	3.33 g
C 246	Verulamium (AD 117)		
35	Divus Vespasian	RIC 63	3.38 g
C 158	Londonthorpe (AD 155)		
-	Titus	RIC 12	3.04 g
-	Titus	RIC 22a	3.12 g
-	Titus	RIC 22a	3.31 g
-	Titus	RIC 23a	3.23 g
-	Titus	RIC 23a	3.28 g
-	Titus	RIC 23a	3.29 g
-	Titus	RIC 23a	3.30 g
-	Titus	RIC 24a	3.13 g
-	Titus	RIC 24a	3.18 g
-	Titus	RIC 24a	3.24 g
-	Titus	RIC 24a	3.29 g
-	Titus	RIC 27a	3.24 g
-	Titus	RIC 27a	3.14 g
-	Titus	RIC 27a	3.34 g
-	Divus Vespasian	RIC 63	3.09 g
-	Divus Vespasian	RIC 63	3.34 g
-	Divus Vespasian	-	3.09 g
-	Domitian Caesar	RIC 49	3.26 g
-	Domitian Caesar	RIC 50	3.18 g
-	Julia	RIC 56	3.12 g
-	Julia	RIC 56	3.20 g
C 120	Great Melton (AD 195)		
33	Titus	BMC 9	2.98 g
34	Titus	BMC 22	3.15 g
35	Titus	BMC 98	3.37 g
36	Divus Vespasian	BMC 129	2.97 g

GROUP 6: Domitian to Nerva

C 064	Cirencester (AD 94)		
21	Domitian	RIC 17	3.46 g
22	Domitian	RIC 177	3.53 g
C 246	Verulamium (AD 117)		
36	Domitian	RIC 93	3.17 g
37	Domitian	RIC 117a	3.39 g
38	Domitian	RIC 147	3.30 g
39	Domitian	RIC 150	3.23 g
40	Domitian	RIC 150	3.14 g
41	Domitian	RIC 152	3.38 g
42	Domitian	RIC 190	3.34 g
43	Nerva	RIC 13	3.30 g
44	Nerva	RIC 16	3.28 g
C 158	Londonthorpe (AD 155)		
-	Domitian	RIC 16	3.11 g
-	Domitian	RIC 16	3.15 g
-	Domitian	RIC 76	3.16 g
-	Domitian	RIC 80	3.29 g
-	Domitian	RIC 107	3.23 g
-	Domitian	RIC 107	3.24 g
-	Domitian	RIC 109	3.24 g
-	Domitian	RIC 138	3.23 g
-	Domitian	RIC 139	3.06 g
-	Domitian	RIC 139	3.19 g
-	Domitian	RIC 145	3.25 g
-	Domitian	RIC 148	2.95 g
-	Domitian	RIC 148	3.29 g
-	Domitian	RIC 150	3.10 g
-	Domitian	RIC 154	3.18 g
-	Domitian	RIC 155	2.93 g
-	Domitian	RIC 155	3.28 g
-	Domitian	RIC 155	3.46 g
-	Domitian	RIC 157	3.22 g
-	Domitian	RIC 159	3.24 g
-	Domitian	RIC 166	3.21 g
-	Domitian	RIC 166	3.23 g
-	Domitian	RIC 168	3.12 g
-	Domitian	RIC 169	3.20 g
-	Domitian	RIC 169	3.31 g

-	Domitian	RIC 169	3.31 g
-	Domitian	RIC 169	3.64 g
-	Domitian	RIC 172	3.24 g
-	Domitian	RIC 172	3.25 g
-	Domitian	RIC 172	3.28 g
-	Domitian	RIC 172	3.30 g
-	Domitian	RIC 173	3.17 g
-	Domitian	RIC 173	3.26 g
-	Domitian	RIC 173	3.31 g
-	Domitian	RIC 174	3.24 g
-	Domitian	RIC 174	3.24 g
-	Domitian	RIC 177	3.27 g
-	Domitian	RIC 178	3.36 g
-	Domitian	RIC 179	3.44 g
-	Domitian	RIC 190	3.31 g
-	Domitian	RIC 191	3.11 g
-	Domitian	RIC 193	3.30 g
-	Domitian	RIC 193	3.30 g
-	Domitian	RIC 193	3.17 g
-	Domitian	RIC 193	3.60 g
-	Domitian	RIC 194	2.67 g
-	Domitian	RIC 194	3.13 g
-	Nerva	RIC 3	3.26 g
-	Nerva	RIC 7	3.29 g
-	Nerva	RIC 13	3.29 g
-	Nerva	RIC 13	3.35 g
-	Nerva	RIC 14	3.34 g
-	Nerva	RIC 15	3.18 g
-	Nerva	RIC 15	3.21 g
-	Nerva	RIC 19	2.96 g
-	Nerva	RIC 19	3.26 g
-	Nerva	RIC 19	3.45 g
-	Nerva	RIC 24	3.04 g
-	Nerva	RIC 25	3.28 g
-	Nerva	RIC 30	3.27 g
-	Nerva	RIC 31	2.96 g
-	Nerva	RIC 44	2.94 g
-	Nerva	RIC 48	3.17 g
C 249	Waddington (AD 161)		
2	Domitian	RIC 110	3.25 g
3	Domitian	RIC 169	3.17 g
C 001	Aldworth (AD 177)		
13	Domitian	BMC 168	3.20 g
14	Nerva	BMC 29	3.13 g
15	Nerva	BMC 30	3.33 g
C 010	Barway (AD 186)		
A 04	Domitian	BMC 205	3.35 g
C 120	Great Melton (AD 195)		
37	Domitian	BMC 131	2.87 g
38	Domitian	BMC 164	3.12 g
39	Domitian	BMC 168	3.14 g
40	Domitian	BMC 182	2.67 g
41	Domitian	BMC 192	2.66 g
42	Domitian	BMC 230	3.28 g
43	Nerva	-	3.26 g
44	Nerva	BMC 24	2.97 g
45	Nerva	BMC 41	2.88 g
46	Nerva	BMC 56	3.10 g

GROUP 7: Trajan

C 246	Verulamium (AD 117)		
45	Trajan	RIC 22	3.18 g
46	Trajan	RIC 22	3.33 g
47	Trajan	RIC 52	3.35 g
48	Trajan	RIC 58	3.05 g
49	Trajan	RIC 252	2.92 g
C 158	Londonthorpe (AD 155)		
-	Trajan	RIC 6	3.30 g
-	Trajan	RIC 9	3.06 g
-	Trajan	RIC 9	3.32 g
-	Trajan	RIC 10	3.42 g
-	Trajan	RIC 11	2.70 g
-	Trajan	RIC 12	3.01 g
-	Trajan	RIC 16	3.44 g
-	Trajan	RIC 16	3.62 g
-	Trajan	RIC 32	3.15 g
-	Trajan	RIC 40	3.09 g
-	Trajan	RIC 40	3.15 g
-	Trajan	RIC 49	2.61 g
-	Trajan	RIC 50	3.66 g
-	Trajan	RIC 52	2.66 g
-	Trajan	RIC 52	3.28 g
-	Trajan	RIC 53	3.41 g
-	Trajan	RIC 58	3.27 g
-	Trajan	RIC 58	3.13 g
-	Trajan	RIC 58	3.13 g
-	Trajan	RIC 59	3.36 g
-	Trajan	RIC 59	3.39 g
-	Trajan	RIC 59	3.25 g
-	Trajan	RIC 60	3.08 g
-	Trajan	RIC 60	3.25 g
-	Trajan	RIC 65	3.45 g
-	Trajan	RIC 83	3.20 g
-	Trajan	RIC 91	3.17 g
-	Trajan	RIC 96	3.13 g
-	Trajan	RIC 100	3.29 g
-	Trajan	RIC 102	3.28 g
-	Trajan	RIC 108	2.88 g
-	Trajan	RIC 108	2.96 g
-	Trajan	RIC 115	2.92 g
-	Trajan	RIC 115	3.12 g
-	Trajan	RIC 115	3.12 g
-	Trajan	RIC 115	3.22 g
-	Trajan	RIC 115	3.40 g
-	Trajan	RIC 115	3.51 g
-	Trajan	RIC 116	3.03 g
-	Trajan	RIC 116	3.20 g
-	Trajan	RIC 116	3.22 g
-	Trajan	RIC 116	3.28 g
-	Trajan	RIC 118	3.07 g
-	Trajan	RIC 118	3.11 g
-	Trajan	RIC 118	3.32 g
-	Trajan	RIC 118	3.33 g
-	Trajan	RIC 118	3.34 g
-	Trajan	RIC 118v	2.97 g
-	Trajan	RIC 119	3.26 g
-	Trajan	RIC 119	3.33 g
-	Trajan	RIC 120	3.21 g
-	Trajan	RIC 121	3.11 g
-	Trajan	RIC 121	3.28 g
-	Trajan	RIC 121	3.29 g
-	Trajan	RIC 122	3.01 g
-	Trajan	RIC 122	3.14 g
-	Trajan	RIC 122	3.33 g
-	Trajan	RIC 127	3.14 g
-	Trajan	RIC 127	3.22 g
-	Trajan	RIC 128	2.97 g
-	Trajan	RIC 128	2.98 g
-	Trajan	RIC 128	3.06 g
-	Trajan	RIC 128	3.11 g
-	Trajan	RIC 128	3.25 g
-	Trajan	RIC 128	3.38 g
-	Trajan	RIC 129	3.17 g
-	Trajan	RIC 129	3.18 g
-	Trajan	RIC 129	3.31 g
-	Trajan	RIC 142	3.03 g
-	Trajan	RIC 142	3.06 g
-	Trajan	RIC 142	3.40 g
-	Trajan	RIC 147	2.98 g
-	Trajan	RIC 147a	3.27 g
-	Trajan	RIC 147b	3.13 g

-	Trajan	RIC 147b	3.17 g
-	Trajan	RIC 162	3.00 g
-	Trajan	RIC 165	3.45 g
-	Trajan	RIC 167	3.14 g
-	Trajan	RIC 176	2.88 g
-	Trajan	RIC 176	3.26 g
-	Trajan	RIC 178	3.37 g
-	Trajan	RIC 183	3.12 g
-	Trajan	RIC 187	3.10 g
-	Trajan	RIC 187	3.12 g
-	Trajan	RIC 219	3.15 g
-	Trajan	RIC 220	3.20 g
-	Trajan	RIC 223	2.84 g
-	Trajan	RIC 223	3.31 g
-	Trajan	RIC 252	3.27 g
-	Trajan	RIC 245	3.10 g
-	Trajan	RIC 254	3.33 g
-	Trajan	RIC 269	3.11 g
-	Trajan	RIC 271	3.33 g
-	Trajan	RIC 272	3.47 g
-	Trajan	RIC 275	3.36 g
-	Trajan	RIC 292	3.19 g
-	Trajan	RIC 296	3.05 g
-	Trajan	RIC 296	3.55 g
-	Trajan	RIC 307	3.00 g
-	Trajan	RIC 337	3.07 g
-	Trajan	RIC 337	3.18 g
-	Trajan	RIC 337	3.24 g
-	Trajan	RIC 337	3.56 g
-	Trajan	RIC 343	3.38 g
-	Trajan	RIC 347	3.12 g
-	Trajan	RIC 347	3.21 g
-	Trajan	RIC 347	3.48 g
-	Trajan	RIC 348	3.31 g
-	Trajan	RIC 356	3.25 g
-	Trajan	RIC 365	3.00 g
-	Trajan	RIC 315	3.10 g
-	Trajan	RIC 315	3.21 g
-	Trajan	RIC 331	2.89 g
-	Trajan	RIC 331	3.06 g
-	Trajan	RIC 331	3.16 g
-	Trajan	RIC 332	3.21 g
-	Trajan	RIC 332	3.29 g
-	Trajan	RIC 361	3.21 g
-	Trajan	RIC 361	3.37 g
-	Trajan	RIC 363	3.39 g
-	Trajan	RIC 370	3.33 g
-	Plotina	RIC 733	3.07 g
-	Wervin; Cheshire (AD 157)		
4	Trajan	RIC 147	2.60 g
5	Trajan	RIC 161	2.82 g
6	Trajan	RIC 332	2.79 g
C 249	Waddington (AD 161)		
4	Trajan	RIC 22	3.30 g
5	Trajan	RIC 157	3.19 g
C 257	Westgate (AD 170)		
2	Trajan	BMC 4	3.08 g
3	Trajan	BMC 26	2.81 g
C 001	Aldworth (AD 177)		
16	Trajan	BMC 47	3.39 g
17	Trajan	BMC 121	3.21 g
18	Trajan	BMC 169	3.44 g
19	Trajan	BMC 281	3.40 g
20	Trajan	BMC 288	3.24 g
21	Trajan	BMC 297	2.97 g
22	Trajan	BMC 301	3.34 g
23	Trajan	BMC 319	3.12 g
24	Trajan	BMC 300	3.33 g
25	Trajan	BMC 559	2.95 g
26	Trajan	BMC 578	3.21 g
C 010	Barway (AD 186)		
A 05	Trajan	BMC 86 v	3.47 g
A 06	Trajan	BMC 103	3.20 g
A 07	Trajan	BMC 383	3.13 g
B 03	Trajan	BMC 14	3.28 g
B 04	Trajan	BMC 271	3.22 g
B 05	Trajan	BMC 281	3.41 g
B 06	Trajan	BMC 337	2.94 g
B 07	Trajan	BMC 536	3.23 g
B 08	Trajan	BMC 590	3.30 g
B 09	Trajan	BMC 600	3.40 g
C 120	Great Melton (AD 195)		
47	Trajan	BMC 14	3.04 g
48	Trajan	BMC 26	3.04 g
49	Trajan	BMC 29	2.80 g
50	Trajan	BMC 41	3.20 g
51	Trajan	-	3.20 g
52	Trajan	BMC 106	2.93 g
54	Trajan	BMC 175	2.86 g
55	Trajan	BMC 214	3.08 g
56	Trajan	as BMC 222	3.14 g
57	Trajan	as BMC 230	3.14 g
58	Trajan	BMC 271	2.98 g
59	Trajan	BMC 281	3.14 g
60	Trajan	BMC 281	3.00 g
61	Trajan	BMC 297	2.97 g
62	Trajan	BMC 306	2.94 g
63	Trajan	BMC 328	2.66 g
64	Trajan	BMC 385	3.29 g
65	Trajan	BMC 474	2.98 g
66	Trajan	BMC 522	3.01 g
67	Trajan	BMC 536	3.13 g
68	Trajan	BMC 541	3.14 g
69	Trajan	BMC 541	2.98 g
70	Trajan	BMC 559	3.31 g
71	Trajan	BMC 590	3.34 g

GROUP 8: Hadrian

C 158	Londonthorpe (AD 155)		
-	Hadrian	RIC 2c	3.24 g
-	Hadrian	RIC 4c	3.37 g
-	Hadrian	RIC 6var	3.31 g
-	Hadrian	RIC 11a	3.09 g
-	Hadrian	RIC 38	3.29 g
-	Hadrian	RIC 39a	3.25 g
-	Hadrian	RIC 41a	3.14 g
-	Hadrian	RIC 41a	3.51 g
-	Hadrian	RIC 42a	3.13 g
-	Hadrian	RIC 44a	3.25 g
-	Hadrian	RIC 44a	3.47 g
-	Hadrian	RIC 47	3.24 g
-	Hadrian	RIC 47	3.32 g
-	Hadrian	RIC 67b	3.33 g
-	Hadrian	RIC 67b	3.34 g
-	Hadrian	RIC 75c	3.33 g
-	Hadrian	RIC 76b	3.31 g
-	Hadrian	RIC 77a	3.09 g
-	Hadrian	RIC 77b	3.19 g
-	Hadrian	RIC 77b	3.27 g
-	Hadrian	RIC 77b	3.41 g
-	Hadrian	RIC 77c	3.03 g
-	Hadrian	RIC 77c	3.45 g
-	Hadrian	RIC 80a	3.22 g
-	Hadrian	RIC 80b	3.09 g
-	Hadrian	RIC 80b	3.36 g
-	Hadrian	RIC 80b	3.38 g
-	Hadrian	RIC 80c	3.64 g
-	Hadrian	RIC 81b	3.29 g
-	Hadrian	RIC 83b	3.00 g
-	Hadrian	RIC 83b	3.36 g

-	Hadrian	RIC 86a	3.09 g
-	Hadrian	RIC 86a	3.35 g
-	Hadrian	RIC 94b	2.79 g
-	Hadrian	RIC 94b	3.17 g
-	Hadrian	RIC 94b	3.30 g
-	Hadrian	RIC 94b	3.57 g
-	Hadrian	RIC 98b	3.39 g
-	Hadrian	RIC 101a	3.17 g
-	Hadrian	RIC 101b	3.48 g
-	Hadrian	RIC 101c	3.25 g
-	Hadrian	RIC 101c	3.27 g
-	Hadrian	RIC 110b	3.24 g
-	Hadrian	RIC 118b	2.91 g
-	Hadrian	RIC 119b	3.19 g
-	Hadrian	RIC 126a	3.07 g
-	Hadrian	RIC 126b	3.02 g
-	Hadrian	RIC 127a	3.21 g
-	Hadrian	RIC 127c	3.25 g
-	Hadrian	RIC 137a	3.42 g
-	Hadrian	RIC 137b	3.11 g
-	Hadrian	RIC 137b	3.38 g
-	Hadrian	RIC 137c	3.19 g
-	Hadrian	RIC 141b	3.08 g
-	Hadrian	RIC 141b	3.37 g
-	Hadrian	RIC 147d	3.21 g
-	Hadrian	RIC 147d	3.28 g
-	Hadrian	RIC 147d	3.36 g
-	Hadrian	RIC 148	3.09 g
-	Hadrian	RIC 169d	3.22 g
-	Hadrian	RIC 170c	3.22 g
-	Hadrian	RIC 172d	3.27 g
-	Hadrian	RIC 172d	3.29 g
-	Hadrian	RIC 172d	3.36 g
-	Hadrian	RIC 175c	3.30 g
-	Hadrian	RIC 175d	3.22 g
-	Hadrian	RIC 175d	3.22 g
-	Hadrian	RIC 175d	3.33 g
-	Hadrian	RIC 178c	3.16 g
-	Hadrian	RIC 181d	3.16 g
-	Hadrian	RIC 184d	3.39 g
-	Hadrian	RIC 199d	3.39 g
-	Hadrian	RIC 200c	3.22 g
-	Hadrian	RIC 201b	3.12 g
-	Hadrian	RIC 201b	3.20 g
-	Hadrian	RIC 207	3.54 g
-	Hadrian	RIC 22b	3.34 g
-	Hadrian	RIC 230a	3.23 g
-	Hadrian	RIC 230a	3.33 g
-	Hadrian	RIC 234a	3.19 g
-	Hadrian	RIC 244a	3.32 g
-	Hadrian	RIC 256a	3.12 g
-	Hadrian	RIC 257d	3.22 g
-	Hadrian	RIC 257d	3.29 g
-	Hadrian	RIC 257d	3.49 g
-	Hadrian	RIC 262a	3.23 g
-	Hadrian	RIC 262d	3.13 g
-	Hadrian	RIC 264d	3.08 g
-	Hadrian	RIC 268d	3.17 g
-	Hadrian	RIC 299d	3.15 g
-	Hadrian	RIC 307d	3.41 g
-	Hadrian	RIC 311a	3.24 g
-	Hadrian	RIC 332e	3.23 g
-	Hadrian	RIC 333	2.96 g
-	Hadrian	RIC 344	3.28 g
-	Hadrian	RIC 360c	3.25 g
-	Hadrian	RIC 361c	2.77 g
-	Hadrian	RIC 363e	3.25 g
-	Aelius	RIC 436a	3.36 g
-	A. Pius Caes	RIC 452a	3.15 g
-	A. Pius Caes	RIC 452b	3.27 g
-	Sabina	RIC 390	3.02 g
-	Sabina	RIC 390	3.25 g
-	Sabina	RIC 390	3.34 g
-	Sabina	RIC 396	3.30 g
-	Sabina	RIC 398	3.20 g
-	Sabina	RIC 398	3.35 g
-	Sabina	RIC 401b	3.32 g
-	Wervin; Cheshire (AD 157)		
7	Hadrian	as RIC 86	2.11 g
8	Hadrian	as RIC 121	2.56 g
9	Hadrian	as RIC 137	1.88 g
10	Hadrian	as RIC 216	1.86 g
11	Hadrian	RIC 256	2.83 g
12	Hadrian	RIC 297	2.79 g
C 249	Waddington (AD 161)		
6	Hadrian	RIC 200d	3.14 g
7	Hadrian	RIC 200d	3.15 g
8	Hadrian	RIC 202d	3.29 g
9	Hadrian	RIC 282d	3.04 g
10	Hadrian	RIC 343c	3.50 g
11	Aelius	RIC 436a	3.42 g
C 257	Westgate (AD 170)		
4	Hadrian	BMC 27	2.63 g
5	Hadrian	BMC 112	2.53 g
C 001	Aldworth (AD 177)		
27	Trajan Posth.	BMC 13	3.10 g
28	Hadrian	BMC 139	3.47 g
29	Hadrian	BMC 157	3.32 g
30	Hadrian	BMC 368	3.18 g
31	Hadrian	BMC 379	3.28 g
32	Hadrian	BMC 402	3.02 g
33	Hadrian	BMC 426	3.26 g
34	Hadrian	BMC 483	2.86 g
35	Hadrian	BMC 608	2.85 g
36	Hadrian	BMC 627	3.33 g
37	Hadrian	BMC 738	3.17 g
38	Hadrian	BMC 883	3.26 g
39	Sabina	BMC 895	3.14 g
40	Sabina	BMC 944	2.81 g
41	Sabina	BMC 944	3.16 g
C 010	Barway (AD 186)		
A 09	Hadrian	BMC 250	2.95 g
A 10	Hadrian	BMC 563	3.10 g
A 11	Hadrian	BMC 288	3.00 g
A 12	Hadrian	BMC 391	3.27 g
A 13	Hadrian	BMC 491	3.30 g
A 14	Hadrian	BMC 859	3.13 g
B 10	Hadrian	BMC 277	3.63 g
C 120	Great Melton (AD 195)		
73	Hadrian	BMC 69	3.01 g
74	Hadrian	BMC 139	2.75 g
75	Hadrian	BMC 139	2.91 g
76	Hadrian	BMC 154	2.79 g
77	Hadrian	BMC 162	2.81 g
78	Hadrian	BMC 164	3.23 g
79	Hadrian	BMC 170	3.05 g
80	Hadrian	BMC 170	3.46 g
81	Hadrian	BMC 194	3.28 g
82	Hadrian	BMC 212	2.20 g
83	Hadrian	BMC 314	2.64 g
84	Hadrian	BMC 318	2.41 g
85	Hadrian	BMC 320	3.05 g
86	Hadrian	BMC 338	3.03 g
87	Hadrian	BMC 361	2.79 g
88	Hadrian	BMC 391	2.89 g
89	Hadrian	BMC 422	2.73 g
90	Hadrian	BMC 455	3.06 g
91	Hadrian	BMC 461	3.18 g
92	Hadrian	BMC 462	3.23 g
93	Hadrian	BMC 495	3.33 g
94	Hadrian	BMC 595	3.44 g

95	Hadrian	BMC 627	3.28 g
97	Hadrian	BMC 685	3.38 g
98	Hadrian	BMC 741	2.66 g
99	Hadrian	BMC 779	3.25 g
100	Hadrian	BMC 862	3.30 g
101	Hadrian	BMC 878	3.04 g
102	Sabina	BMC 929	3.30 g

GROUP 9: Antoninus Pius

C 158	Londonthorpe (AD 155)		
-	Antoninus Pius	RIC 7a	3.26 g
-	Antoninus Pius	RIC 9a	3.32 g
-	Antoninus Pius	RIC 10a	3.67 g
-	Antoninus Pius	RIC 61c	3.13 g
-	Antoninus Pius	RIC 61c	3.21 g
-	Antoninus Pius	RIC 62c	3.13 g
-	Antoninus Pius	RIC 64c	3.03 g
-	Antoninus Pius	RIC 111b	3.15 g
-	Antoninus Pius	RIC 65	2.97 g
-	Antoninus Pius	RIC 117	3.46 g
-	Antoninus Pius	RIC 154	3.23 g
-	Antoninus Pius	RIC 167	3.01 g
-	Antoninus Pius	RIC 181	3.57 g
-	Antoninus Pius	RIC 221	3.38 g
-	Antoninus Pius	RIC 231	2.96 g
-	Faustina II	RIC 500b	2.95 g
-	Faustina II	RIC 500b	3.46 g
-	Faustina II	RIC 515	3.34 g
-	Faustina I	RIC 335	2.98 g
-	Faustina I	RIC 338	3.30 g
-	Faustina I	RIC 342a	3.46 g
-	Faustina I	RIC 382a	3.08 g
-	Faustina I	RIC 287	3.07 g
-	Faustina I	RIC 344	3.04 g
-	Faustina I	RIC 344	3.30 g
-	Faustina I	RIC 358	3.24 g
-	Faustina I	RIC 358	3.39 g
-	Faustina I	RIC 360	3.24 g
-	Faustina I	RIC 360	3.51 g
-	Faustina I	RIC 361	3.24 g
-	Faustina I	RIC 362	3.64 g
-	M. Aurelius Caes.	RIC 424a	3.14 g
-	M. Aurelius Caes.	RIC 444	3.46 g
-	Wervin; Cheshire (AD 157)		
14	Antoninus Pius	as RIC 156	2.85 g
16	Antoninus Pius	RIC 262	2.41 g
C 249	Waddington (AD 161)		
12	Antoninus Pius	RIC 129	3.51 g
13	Antoninus Pius	RIC 137	3.20 g
14	Antoninus Pius	RIC 289	2.85 g
15	Antoninus Pius	RIC 272a	3.38 g
C 257	Westgate (AD 170)		
6	Antoninus Pius	BMC 956	2.61 g
7	Faustina I	BMC 301	2.46 g
C 001	Aldworth (AD 177)		
42	Antoninus Pius	BMC 191	3.21 g
43	Antoninus Pius	BMC 207	3.47 g
44	Antoninus Pius	BMC 207	3.28 g
45	Antoninus Pius	BMC 222	3.21 g
46	Antoninus Pius	BMC 496v	3.59 g
47	Antoninus Pius	BMC 621	3.34 g
48	Antoninus Pius	BMC 736	3.19 g
49	Antoninus Pius	BMC 809	3.30 g
50	Antoninus Pius	BMC 829	3.57 g
51	Antoninus Pius	BMC 832	3.81 g
52	Antoninus Pius	BMC 856	3.33 g
53	Antoninus Pius	BMC 883	2.57 g
54	Antoninus Pius	BMC 976	3.17 g
55	Faustina I	BMC 280	3.44 g
56	Faustina I	BMC 345	3.32 g
57	Faustina I	BMC 345	3.54 g
58	Faustina I	BMC 351	3.33 g
59	Faustina I	BMC 376	3.19 g
60	Faustina I	BMC 400	3.09 g
61	Faustina I	BMC 461	3.24 g
62	Faustina I	BMC 465	3.26 g
63	M. Aurelius Caes.	BMC 594	3.06 g
64	M. Aurelius Caes.	BMC 594	3.42 g
65	M. Aurelius Caes.	BMC 892	3.48 g
66	Faustina II	BMC 1092	3.55 g
C 010	Barway (AD 186)		
A 15	Antoninus Pius	BMC 222	2.86 g
A 16	Faustina I	BMC 373	2.93 g
A 17	Faustina I	BMC 375	3.08 g
A 19	Antoninus Pius	BMC 876	3.33 g
A 20	Faustina II	BMC 1088	3.13 g
B 12	Antoninus Pius	BMC 834	3.49 g
B 13	Antoninus Pius	BMC 932	3.11 g
B 14	Antoninus Pius	BMC 932	3.17 g
B 16	M. Aurelius Caes.	BMC 873	3.44 g
B 17	Faustina I	BMC 339	3.57 g
B 18	Faustina I	BMC 354	3.49 g
B 19	Faustina I	BMC 421	3.79 g
B 20	Faustina II	BMC 1086	3.18 g
C 120	Great Melton (AD 195)		
103	Antoninus Pius	BMC 55	3.35 g
104	Antoninus Pius	BMC 155	3.08 g
105	Antoninus Pius	BMC 160	2.99 g
106	Antoninus Pius	BMC 496	2.81 g
107	Antoninus Pius	BMC 521	3.59 g
108	Antoninus Pius	BMC 530	2.79 g
109	Antoninus Pius	BMC 536	3.35 g
110	Antoninus Pius	BMC 567	2.62 g
111	Antoninus Pius	BMC 582	3.01 g
112	Antoninus Pius	BMC 621	3.45 g
113	Antoninus Pius	BMC 729	3.19 g
114	Antoninus Pius	BMC 765	3.02 g
115	Antoninus Pius	BMC 768	3.46 g
116	Antoninus Pius	BMC 786	2.96 g
117	Antoninus Pius	BMC 806	3.23 g
118	Antoninus Pius	BMC 806	3.19 g
119	Antoninus Pius	BMC 806	2.76 g
120	Antoninus Pius	BMC 836	3.10 g
121	Antoninus Pius	BMC 847	2.70 g
122	Antoninus Pius	BMC 878	2.47 g
124	Faustina I	BMC 136	2.64 g
125	Faustina I	BMC 280	2.95 g
126	Faustina I	BMC 315	3.35 g
127	Faustina I	BMC 346	2.91 g
128	Faustina I	BMC 346	3.27 g
129	Faustina I	BMC 354	2.78 g
130	Faustina I	BMC 373	3.80 g
131	Faustina I	BMC 389	3.09 g
132	Faustina I	BMC 393	2.71 g
133	Faustina I	BMC 393	2.75 g
134	Faustina I	BMC 410	2.68 g
135	Faustina I	as BMC 434	3.04 g
136	Faustina I	BMC 440	3.44 g
137	Faustina I	BMC 455	3.17 g
138	Faustina I	BMC 461	3.11 g
139	M. Aurelius Caes.	BMC 917	2.11 g
140	Faustina II	BMC 1048	2.93 g
141	Faustina II	BMC 1067	3.51 g
142	Faustina II	BMC 1106	3.29 g
C 004	Akenham (AD 221)		
9	Antoninus Pius	BMC 189	2.69 g
10	Antoninus Pius	BMC 571	2.79 g
11	Antoninus Pius	BMC 670	2.70 g
12	Antoninus Pius	BMC 707	3.01 g
13	M. Aurelius Caes.	BMC 918	2.48 g

14	M. Aurelius Caes.	BMC 960	3.16 g
15	Faustina II	BMC 1088	2.52 g
16	Faustina II	BMC 1092	2.93 g

GROUP 10: Marcus Aurelius

C 249	Waddington (AD 161)		
16	A. Pius Posth.	RIC 441	3.45 g
C 257	Westgate (AD 170)		
8	Marcus Aurelius	BMC 459	2.03 g
9	Lucilla	BMC 317	2.72 g
C 001	Aldworth (AD 177)		
67	Marcus Aurelius	BMC 185	3.33 g
68	Marcus Aurelius	BMC 247	3.02 g
69	Marcus Aurelius	BMC 406	2.97 g
70	Marcus Aurelius	BMC 435	3.37 g
71	Marcus Aurelius	BMC 525	3.30 g
72	Marcus Aurelius	BMC 735	3.22 g
73	Lucius Verus	BMC 420	3.09 g
74	Faustina II	BMC 136	3.28 g
75	Lucilla	BMC 1705	3.33 g
C 010	Barway (AD 186)		
A 21	A. Pius Posth.	BMC 58	3.22 g
A 22	Lucilla	BMC 342	3.59 g
A 23	Lucius Verus	BMC 428	3.28 g
B 21	Marcus Aurelius	BMC 435	3.75 g
B 22	Faustina II	BMC 89	3.29 g
B 23	Commodus	BMC 649	3.13 g
B 24	Commodus	BMC 797	2.76 g
B 25	Commodus	BMC 803	3.16 g
C 120	Great Melton (AD 195)		
143	A. Pius Posth.	BMC 48	3.29 g
144	A. Pius Posth.	BMC 56	3.21 g
145	Marcus Aurelius	BMC 194	3.06 g
146	Marcus Aurelius	BMC 209	3.02 g
147	Marcus Aurelius	BMC 221	3.04 g
148	Marcus Aurelius	BMC 224	2.63 g
149	Marcus Aurelius	BMC 406	2.70 g
150	Marcus Aurelius	BMC 460	3.05 g
151	Marcus Aurelius	BMC 514	3.11 g
152	Marcus Aurelius	BMC 525	3.13 g
153	Marcus Aurelius	BMC 525	3.21 g
154	Marcus Aurelius	BMC 534	3.25 g
155	Marcus Aurelius	BMC 535	2.91 g
156	Marcus Aurelius	BMC 555	3.05 g
157	Marcus Aurelius	BMC 557	3.04 g
158	Marcus Aurelius	-	2.96 g
159	Marcus Aurelius	BMC 669	3.24 g
160	Marcus Aurelius	-	2.99 g
161	Lucius Verus	BMC 287	2.70 g
162	Lucius Verus	BMC 447	2.46 g
163	Faustina II	BMC 79	3.15 g
164	Faustina II	BMC 91	2.87 g
165	Faustina II	BMC 91	3.05 g
166	Faustina II	BMC 91	3.43 g
167	Faustina II	BMC 91	3.33 g
168	Faustina II	BMC 104	3.27 g
169	Faustina II	BMC 118	3.03 g
170	Faustina II	BMC 122	3.08 g
171	Faustina II	BMC 164	3.02 g
172	Faustina II	BMC 725	2.95 g
173	Lucilla	BMC 322	3.02 g
174	Lucilla	BMC 334	2.93 g
175	Lucilla	BMC 342	3.58 g
176	Commodus Caes	BMC 633	3.32 g
177	Commodus Caes	BMC 748	3.24 g
178	Commodus Caes	BMC 801	2.84 g
179	M.Aurelius Posth.	BMC 24	3.31 g
180	M.Aurelius Posth.	BMC 27	2.17 g
181	Commodus	BMC 63	2.86 g
182	Commodus	BMC 70	2.65 g
183	Commodus	BMC 157	2.62 g
184	Commodus	BMC 175	2.87 g
185	Commodus	BMC 182	2.32 g
186	Commodus	BMC 192	2.65 g
187	Commodus	BMC 202	2.65 g
188	Commodus	BMC 245	2.87 g
189	Commodus	BMC 281	2.11 g
190	Clodius Albinus	BMC 280	3.37 g
C 004	Akenham (AD 221)		
17	A.Pius Posth.	BMC 57	2.48 g
18	Commodus	BMC 81	3.19 g
19	Commodus	BMC 296	2.04 g
20	Commodus	BMC 322	2.72 g
21	Commodus	BMC 326	2.91 g
22	Commodus	BMC 339	2.13 g
24	Clodius Albinus	BMC 43	2.77 g

GROUP 11: Early Severan

C 004	Akenham (AD 221)		
23	Septimus Severus	BMC 2	2.91 g
25	Julia Domna	BMC 56	2.34 g
26	Septimus Severus	BMC 87	1.76 g
27	Septimus Severus	BMC 174	2.47 g
28	Septimus Severus	BMC 140	2.47 g
29	Caracalla Caesar	BMC 184	2.48 g
30	Septimus Severus	BMC 230	2.62 g
31	Septimus Severus	BMC 218	2.81 g
32	Septimus Severus	BMC 258	2.17 g
33	Septimus Severus	BMC 60	2.51 g
34	Septimus Severus	BMC 60	2.52 g
35	Caracalla Caesar	BMC 199	2.75 g
36	Caracalla Caesar	BMC 202	2.04 g
37	Caracalla Caesar	BMC 204	2.50 g
38	Caracalla Caesar	BMC 208	2.56 g
39	Julia Domna	BMC 15	2.23 g
40	Julia Domna	BMC 38	2.55 g
41	Julia Domna	BMC 54	2.64 g
42	Julia Domna	BMC 98	3.08 g
43	Geta	BMC 145	2.11 g
44	Geta	BMC 149	2.63 g
45	Geta	BMC 218	2.81 g
46	Geta	BMC 220	2.26 g
47	Geta	BMC 240	2.43 g
48	Septimus Severus	BMC 256	2.43 g
49	Caracalla	BMC 296	2.47 g
50	Septimus Severus	BMC 330	2.53 g
51	Septimus Severus	BMC 375	2.46 g
52	Caracalla	BMC 434	2.32 g
53	Geta	BMC 458	3.15 g
54	Septimus Severus	BMC 534	3.01 g
55	Septimus Severus	BMC 3	2.95 g
56	Caracalla	BMC 50	2.34 g
57	Caracalla	BMC 180	2.34 g
C 009	Barton-upon-Humber (AD 260)		
1	Septimus Severus	BMC 142	3.42 g
2	Septimus Severus	BMC 258	2.37 g
3	Septimus Severus	BMC 354	3.70 g
4	Julia Domna	BMC 87	2.83 g
5	Julia Domna	BMC 87	2.85 g
6	Julia Domna	BMC 31	2.83 g
7	Caracalla	BMC 73	2.89 g
8	Caracalla	BMC 94	3.19 g
9	Geta	BMC 223	3.28 g
10	Geta	BMC 446	2.61 g

GROUP 12: Macrinus and Later

C 004	Akenham (AD 221)		
58	Diadumenian	BMC 94	2.89 g
C 009	Barton-upon-Humber (AD 260)		

12	Elagabalus	BMC 96	2.83 g
13	Elagabalus	BMC 214	2.32 g
14	Elagabalus	BMC 222	2.58 g
15	Elagabalus	BMC 237	3.10 g
16	Elagabalus	BMC 237	2.84 g
17	Elagabalus	BMC 254	2.78 g
18	Elagabalus	BMC 230	2.28 g
19	Elagabalus	BMC 230	2.67 g
20	Elagabalus	BMC 225	2.97 g
21	Elagabalus	BMC 225	2.39 g
22	Elagabalus	BMC 232	2.09 g
23	Elagabalus	BMC 232	1.95 g
24	Elagabalus	BMC 256	2.75 g
25	Elagabalus	BMC 260	2.53 g
26	Elagabalus	BMC 281	3.71 g
28	Julia Maesa	BMC 79	2.92 g
29	Julia Soaemias	BMC 52	2.68 g
30	Severus Alexander	BMC 27	3.25 g
31	Severus Alexander	BMC 27	2.70 g
32	Severus Alexander	BMC 87	2.39 g
33	Severus Alexander	BMC 118	3.06 g
34	Severus Alexander	BMC 138	2.80 g
35	Severus Alexander	BMC 160	2.74 g
36	Severus Alexander	BMC 167	2.43 g
37	Severus Alexander	BMC 178	3.18 g
38	Severus Alexander	BMC 233	3.08 g
39	Severus Alexander	BMC 341	2.99 g
40	Severus Alexander	BMC 341	2.52 g
41	Severus Alexander	BMC 367	2.22 g
42	Severus Alexander	BMC 421	2.65 g
43	Severus Alexander	BMC 421	2.46 g
45	Severus Alexander	BMC 503	2.36 g
46	Severus Alexander	BMC 603	2.76 g
47	Severus Alexander	BMC 638	2.28 g
48	Severus Alexander	BMC 690	2.68 g
49	Severus Alexander	BMC 880	1.99 g
50	Severus Alexander	BMC 1018	3.09 g
51	Severus Alexander	BMC 1007	2.10 g
52	Julia Mamaea	BMC 43	3.15 g
53	Julia Mamaea	BMC 380	2.68 g
54	Julia Mamaea	BMC 440	2.61 g
55	Julia Mamaea	BMC 913	2.55 g
56	Maximinus	BMC 25	2.97 g

Appendix 2.32
Rates of wear of denarii

These figures are derived from the equations in Table 2.32
The individual group curves are displayed in Fig. 23.11
The average value is displayed in Fig. 23.12

This informationis used again in section 4.3 for the calculation of the silver content of the denarius circulation pool.

The values represent the average loss of weight every year of a denarius, on the basis of the sample of weighed coins found in hoards displayed in Appendix 2.31.

Group 1	Group 2	Group 3	Group 4	Groups 5-6	Group 7	Group 8	Group 9	Group 10	Date	Wear Rate
									40	0.00000
-0.0096									45	-0.00957
-0.0087									50	-0.00874
-0.0080									55	-0.00796
-0.0072	-0.0169								60	-0.01207
-0.0066	-0.0149								65	-0.01074
-0.0059	-0.0131								70	-0.00951
-0.0054	-0.0113								75	-0.00836
-0.0049	-0.0097	-0.0053	-0.0012	-0.0074					80	-0.00571
-0.0044	-0.0083	-0.0046	-0.0013	-0.0064					85	-0.00500
-0.0040	-0.0069	-0.0039	-0.0014	-0.0056					90	-0.00436
-0.0037	-0.0057	-0.0033	-0.0016	-0.0048					95	-0.00380
-0.0034	-0.0045	-0.0028	-0.0017	-0.0041					100	-0.00331
-0.0031	-0.0035	-0.0024	-0.0019	-0.0035					105	-0.00289
-0.0029	-0.0027	-0.0021	-0.0021	-0.0030					110	-0.00255
-0.0028	-0.0019	-0.0018	-0.0024	-0.0025					115	-0.00228
-0.0027	-0.0013	-0.0017	-0.0026	-0.0022					120	-0.00208
-0.0026	-0.0008	-0.0016	-0.0029	-0.0019					125	-0.00196
-0.0027	-0.0004	-0.0016	-0.0032	-0.0018					130	-0.00191
-0.0027	-0.0001	-0.0017	-0.0035	-0.0017					135	-0.00194
-0.0028	0.0000	-0.0019	-0.0038	-0.0017					140	-0.00204
-0.0030	0.0000	-0.0021	-0.0042	-0.0018					145	-0.00221
-0.0032	-0.0001	-0.0025	-0.0046	-0.0019					150	-0.00246
-0.0035	-0.0003	-0.0029	-0.0050	-0.0022	-0.0004	-0.0043	0.0036		155	-0.00187
-0.0039	-0.0007	-0.0034	-0.0054	-0.0025	-0.0009	-0.0043	0.0020		160	-0.00238
-0.0042	-0.0012	-0.0040	-0.0058	-0.0030	-0.0014	-0.0043	0.0003		165	-0.00295
-0.0047	-0.0018	-0.0047	-0.0063	-0.0035	-0.0018	-0.0043	-0.0014		170	-0.00355
-0.0052	-0.0025	-0.0054	-0.0068	-0.0041	-0.0023	-0.0043	-0.0031	-0.0014	175	-0.00390
-0.0057	-0.0033	-0.0063	-0.0073	-0.0048	-0.0028	-0.0043	-0.0047	-0.0036	180	-0.00477
-0.0063	-0.0043	-0.0072	-0.0079	-0.0056	-0.0033	-0.0043	-0.0064	-0.0058	185	-0.00568
-0.0069	-0.0054	-0.0082	-0.0084	-0.0064	-0.0038	-0.0043	-0.0081	-0.0081	190	-0.00663
-0.0077	-0.0066	-0.0093	-0.0090	-0.0074	-0.0043	-0.0043	-0.0098	-0.0103	195	-0.00763
-0.0084			-0.0096				-0.0114	-0.0125	200	-0.01050
-0.0092			-0.0102						205	-0.00973
-0.0101			-0.0109						210	-0.01048
-0.0110			-0.0116						215	-0.01128
-0.0119			-0.0123						220	-0.01211

Appendix 2.41
Cumulative composition of denarii in coin hoards, expressed as a percentage

Italics denote copies. The values in brackets indicates the figure is based on missing data.

Part 1; Groups D1 to D8

Ref.N°	Status	n	Date	D1	D2	D3	D4	D5	D6	D7	D8
C 060	Full	37	41	59.45	67.56	100.00	100.00	100.00	100.00	100.00	100.00
C 003q	Full	200	43	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
C 143f	Part	24	43	87.50	87.50	100.00	100.00	100.00	100.00	100.00	100.00
C 006n	Part	20	43	55.00	55.00	100.00	100.00	100.00	100.00	100.00	100.00
C 157	Full	*88*	47	*37.50*	*48.86*	*98.86*	*100.00*	*100.00*	*100.00*	*100.00*	*100.00*
C 188n	Full	4	48	75.00	75.00	100.00	100.00	100.00	100.00	100.00	100.00
C 241	Full	6	56	33.33	33.33	50.00	100.00	100.00	100.00	100.00	100.00
C 103	Full	72	60	51.38	62.50	97.22	98.61	100.00	100.00	100.00	100.00
C 221	Full	87	60	56.32	73.56	98.85	98.85	100.00	100.00	100.00	100.00
C 260n	Full	2	60	50.00	50.00	100.00	100.00	100.00	100.00	100.00	100.00
C 128q	Full	13	74	92.30	92.30	92.30	92.30	100.00	100.00	100.00	100.00
S 176	Full	35	74	8.57	8.57	37.14	37.14	45.71	48.57	62.85	62.85
S 014	Full	12	78	8.33	8.33	8.33	8.33	16.66	16.66	41.66	41.66
C 036	Part	74	78	33.78	50.00	68.91	70.27	72.97	72.97	75.67	75.67
C 179	Full	277	82	28.88	43.68	55.23	55.23	58.12	58.84	61.37	61.73
C 130	Full	74	87	40.54	45.94	64.86	64.86	67.56	68.91	68.91	70.27
C 151n	Full	32	87	34.37	53.12	75.00	75.00	78.12	78.12	81.25	81.25
C 064	Full	22	94	40.90	50.00	50.00	50.00	50.00	50.00	54.54	54.54
C 176	Part	12	98	50.00	58.33	66.66	66.66	66.66	75.00	75.00	75.00
S 058	Full	32	99	9.37	12.50	12.50	12.50	15.62	21.87	31.25	31.25
C 010n	Full	92	103	17.39	23.91	25.00	25.00	30.43	30.43	30.43	30.43
C 141q	Full	183	107	0.00	1.63	2.73	3.27	5.46	7.65	9.83	10.38
C 190q	Full	5	107	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C 246	Full	49	117	32.65	42.85	44.89	46.93	46.93	46.93	48.97	48.97
C 246	Full	*1*	117	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*
C 139	Full	19	118	21.05	26.31	26.31	26.31	26.31	31.57	31.57	31.57
C 262n	Part	41	118	43.90	46.34	51.21	51.21	51.21	53.65	56.09	56.09
S 106	Part	19	118	21.05	26.31	26.31	26.31	26.31	31.57	31.57	31.57
S 164	Full	14	188	35.71	42.85	42.85	42.85	42.85	42.85	42.85	42.85
C 141	Full	125	120	24.00	24.80	24.80	24.80	25.60	27.20	28.80	29.60
S 059	Full	6	120	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
S 155	Full	60	120	15.00	15.00	15.00	15.00	16.66	21.66	21.66	23.33
C 028n	Full	9	121	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
S 015	Full	30	122	36.66	56.66	60.00	60.00	63.33	63.33	63.33	63.33
S 016	Full	28	122	25.00	28.57	28.57	28.57	32.14	32.14	39.28	39.28
S 084	Part	9.	125	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C 084	Full	26	127	0.00	0.00	0.00	0.00	0.00	0.00	3.84	3.84
C 228	Full	15	127	73.33	86.66	93.33	93.33	93.33	93.33	100.00	100.00
C 228	Full	*2*	127	*50.00*	*50.00*	*50.00*	*50.00*	*50.00*	*50.00*	*100.00*	*100.00*
S 056	Full	7	128	0.00	0.00	0.00	0.00	0.00	14.28	14.28	14.28
C 261	Full	12	136	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
S 114	Full	138	136	0.00	0.00	0.00	0.00	0.00	0.72	1.44	2.17
C 236	Full	178	137	0.00	3.37	3.37	3.37	5.05	5.61	7.86	7.86
S 037	Full	62	138	0.00	0.00	0.00	0.00	1.61	3.22	6.45	8.06
S 116	Full	*17*	138	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*
C 258	Full	9.	140	0.00	0.00	0.00	0.00	0.00	0.00	11.11	11.11
S 112	Part	13	140	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C 127n	Full	24	142	16.66	16.66	25.00	25.00	25.00	29.16	29.16	29.16
S 127	Full	39	143	0.00	2.56	2.56	2.56	2.56	2.56	7.69	7.69
S 005	Full	2	144	0.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00
S 005	Full	*11*	144	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*
S 031	Part	50	144	0.00	0.00	0.00	0.00	2.00	4.00	6.00	6.00
S 098	Full	47	147	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C 154	Full	33	149	0.00	3.03	3.03	3.03	3.03	3.03	6.06	6.06
C 052	Full	40	150	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
S 180	Full	14	152	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
S 060	Full	12	153	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C 158	Full	420	154	0.00	1.66	1.66	1.66	2.61	3.33	4.04	5.00
S 129	Full	6	156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C 187n	Full	19	159	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Ref.N°	Status	n	Date	D1	D2	D3	D4	D5	D6	D7	D8
C 212	Full	82	159	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
S 135	Full	471	160	0.00	1.69	1.69	1.69	3.39	3.82	5.09	5.09
C 005	Full	296	162	0.00	3.71	3.71	3.71	5.74	6.08	7.43	8.44
C 249	Full	16	162	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C 215	Full	9	165	0.00	11.11	11.11	11.11	11.11	11.11	11.11	11.11
C 085	Full	27	166	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.70
C 198	Full	8	166	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
S 086	Full	9	169	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C 039n	Full	20	170	0.00	0.00	5.00	5.00	5.00	5.00	5.00	10.00
C 136	Full	78	170	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C 184q	Full	38	170	0.00	0.00	0.00	0.00	0,00	0.00	0.00	0.00
C 193q	Full	65	170	0.00	1.53	1.53	1.53	4.61	4.61	6.15	6.15
C 257	Part	9	170	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C 028	Full	61	171	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C 121	Full	*15*	172	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*
C 001	Full	76	176	0.00	1.31	1.31	1.31	1.31	1.31	1.31	1.31
C 048n	Full	181	177	0.00	2.76	2.76	2.76	2.76	2.76	2.76	2.76
C 048n	Full	*18*	177	*0.00*	*5.55*	*5.55*	*5.55*	*5.55*	*5.55*	*5.55*	*5.55*
C 206	Full	28	177	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C 097	Full	367	178	0.00	0.00	0.00	0.00	0.27	0.81	0.81	1.08
C 097	Full	*1*	178	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*
C 011n	Part	37	178	2.70	2.70	2.70	2.70	2.70	2.70	2.70	2.70
C 227n	Full	15	180	0.00	0.00	0.00	0.00	6.66	6.66	6.66	6.66
S 097	Full	167	181	0.00	0.00	0.00	0.00	1.19	1.79	2.99	3.59
C 022	Full	296	183	0.00	3.04	3.04	3.04	4.05	4.39	5.74	5.74
S 146	Full	120	185	0.00	0.00	0.00	0.00	2.50	6.66	6.66	6.66
C 010	Full	433	186	0.00	0.46	0.46	0.46	1.15	1.61	2.30	3.00
C 033	Full	25	186	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C 162n	Full	155	186	0.00	0.64	0.64	0.64	1.29	1.93	2.58	2.58
C 162	Full	38	187	2.63	2.63	2.63	2.63	2.63	2.63	2.63	2.63
S 022	Full	180	187	0.00	0.00	0.00	0.00	1.11	1.11	2.22	2.77
C 125	Full	571	194	0.00	3.50	3.50	3.50	4.02	4.37	4.90	5.60
C 223	Part	258	194	0.00	3.48	3.48	3.48	5.03	5.42	6.97	6.97
C 120	Full	190	195	0.00	3.15	3.15	3.15	4.21	4.21	4.73	5.26
C 193	Full	4	196	0.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00
S 132	Part	120	196	0.00	0.83	0.83	0.83	1.66	3.33	5.83	6.66
S 115	Full	8	203	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
S 117	Part	20	206	0.00	0.00	0.00	0.00	0.00	5.00	5.00	5.00
C 199	Full	6	207	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C 199	Full	*13*	207	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*
C 032	Full	1476	208	0.00	4.06	4.06	4.06	4.74	5.08	5.55	5.62
C 183	Full	653	209	0.00	1.53	1.53	1.53	1.83	1.99	2.14	2.45
S 039	Full	66	212	0.00	7.57	7.57	7.57	7.57	7.57	9.09	10.60
C 079	Full	500	213	0.00	1.00	1.00	1.00	3.20	3.20	4.00	4.40
C 019	Full	*142*	214	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*
C 051	Full	100	215	0.00	4.00	4.00	4.00	5.00	5.00	5.00	5.00
S 122	Full	33	217	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C 004	Full	59	222	0.00	1.69	1.69	1.69	1.69	1.69	1.69	1.69
C 068n	Full	32	223	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C 096	Full	23	225	0.00	8.69	8.69	8.69	8.69	8.69	8.69	8.69
C 220	Full	376	226	0.00	1.59	1.59	1.59	1.59	1.59	1.59	1.59
C 221f	Full	9	226	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C 149	Part	504	226	0.00	2.38	2.38	2.38	2.57	2.57	2.57	2.57
C 043	Full	13	228	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C 089n	Full	3062	228	0.00	0.00	0.00	0.00	0.06	0.09	0.22	0.22
C 188	Full	29	228	0.00	3.44	3.44	3.44	3.44	3.44	3.44	3.44
C 246f	Full	5	228	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
S 092	Full	5	229	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
S 071	Full	1923	230	0.05	0.93	0.93	0.93	2.34	3.06	3.84	4.21
C 284	Full	147	232	0.00	1.36	1.36	1.36	1.36	1.36	1.36	1.36
C 078q	Full	480	236	0.00	2.29	2.29	2.29	2.91	2.91	3.54	3.54
C 036s	Part	28	236	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C 135	Full	35	238	0.00	0.00	2.85	2.85	2.85	2.85	2.85	5.71
C 058	Full	19	241	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C 099	Full	964	248	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C 119	Full	35	248	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C 087	Full	16	257	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C 093	Full	436	259	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Ref.N°	Status	n	Date	D1	D2	D3	D4	D5	D6	D7	D8
C 173	Full	753	259	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C 009	Full	56	260	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C 041	Full	664	260	0.00	1.05	1.05	1.05	1.20	1.35	1.35	1.35
C 168	Full	1	260	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C 283	Full	29	260	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C 069	Full	14	269	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C 115	Full	7	270	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C 178	Full	1	270	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C 222	Full	9	270	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C 256	Full	5	270	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C 124	Full	1	271	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C 024	Part	1	271	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C 170	Full	11	272	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C 070	Full	3	273	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C 167	Full	1	273	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C 015	Full	28	274	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C 128	Full	2	279	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C 098	Full	7	280	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C 011	Full	1	295	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A 022	Full	1.	395	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Cumulative composition of the denarius hoards, expressed as a percentage
Part 2; Groups D9 to D18

The following hoards comprise 100% earlier coins
C 060 C 003q C 143f C 006n C 157 C 188n C 241 C 103 C 221 C 260n C 128q

Ref.N°	D9	D10	D11	D12	D13	D14	D15	D16	D17	D18
S 176	65.71	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
S 014	41.66	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
C 036	75.67	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
C 179	62.09	94.58	97.11	97.47	100.00	100.00	100.00	100.00	100.00	100.00
C 130	70.27	89.18	91.89	95.94	98.64	100.00	100.00	100.00	100.00	100.00
C 151n	81.25	90.62	90.62	93.75	96.87	100.00	100.00	100.00	100.00	100.00
C 064	54.54	86.36	90.90	90.90	90.90	100.00	100.00	100.00	100.00	100.00
C 176	75.00	75.00	75.00	75.00	83.33	83.33	100.00	100.00	100.00	100.00
S 058	31.25	68.75	71.87	81.25	87.50	100.00	100.00	100.00	100.00	100.00
C 010n	30.43	60.86	60.86	63.04	63.04	79.34	93.47	100.00	100.00	100.00
C 141q	10.38	45.90	45.90	58.46	58.46	81.42	84.69	100.00	100.00	100.00
C 190q	0.00	20.00	20.00	40.00	40.00	60.00	60.00	100.00	100.00	100.00
C 246	48.97	63.26	65.30	67.34	71.42	85.71	89.79	100.00	100.00	100.00
C 246	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*100.00*	*100.00*	*100.00*
C 139	31.57	73.68	73.68	89.47	89.47	89.47	89.47	94.73	94.73	100.00
C 262n	56.09	80.48	(80.48)	85.36	87.80	92.68	92.68	97.56	97.56	100.00
S 106	31.57	73.68	73.68	89.47	89.47	89.47	89.47	94.73	94.73	100.00
S 164	42.85	50.00	50.00	50.00	(50.00)	64.28	64.28	92.85	92.85	100.00
C 141	29.60	48.80	51.20	55.20	56.80	60.80	64.80	93.60	93.60	100.00
S 059	0.00	16.66	16.66	16.66	33.33	66.66	66.66	66.66	66.66	100.00
S 155	23.33	48.33	48.33	50.00	55.00	63.33	65.00	93.33	93.33	100.00
C 028n	0.00	22.22	33.33	33.33	33.33	33.33	44.44	77.77	77.77	100.00
S 015	63.33	76.66	(76.66)	80.00	80.00	83.33	83.33	93.33	93.33	100.00
S 016	42.85	53.57	(53.57)	60.71	67.85	71.42	75.00	96.42	96.42	100.00
S 084	0.00	11.11	11.11	22.22	22.22	22.22	22.22	77.77	77.77	100.00
C 084	3.84	19.23	19.23	19.23	(19.23)	30.76	30.76	61.53	61.53	96.15
C 228	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
C 228	*100.00*	*100.00*	*100.00*	*100.00*	*100.00*	*100.00*	*100.00*	*100.00*	*100.00*	*100.00*
S 056	14.28	28.57	28.57	42.85	42.85	57.14	57.14	85.71	85.71	100.00
C 261	0.00	0.00	0.00	0.00	0.00	8.33	8.33	66.66	66.66	100.00
S 114	2.17	5.79	6.52	10.14	13.04	20.28	28.98	76.08	76.08	100.00
C 236	7.86	23.03	(23.03)	29.21	(29.21)	47.19	50.00	76.96	76.96	96.06
S 037	8.06	20.96	20.96	20.96	(20.96)	40.32	45.16	75.80	75.80	95.16
S 116	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*17.64*	*58.82*	*58.82*	*64.70*
C 258	11.11	22.22	22.22	22.22	33.33	44.44	44.44	77.77	77.77	100.00
S 112	0.00	15.38	15.38	15.38	(15.38)	23.07	23.07	30.76	30.76	53.84
C 127n	29.16	50.00	(50.00)	54.16	54.16	66.66	70.83	79.16	79.16	95.83
S 127	7.69	20.51	20.51	23.07	23.07	35.89	38.46	64.10	64.10	89.74
S 005	50.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
S 005	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*9.09*	*9.09*	*81.81*	*81.81*	*90.90*
S 031	6.00	26.00	26.00	26.00	26.00	34.00	36.00	60.00	60.00	68.00

Ref.N°	D9	D10	D11	D12	D13	D14	D15	D16	D17	D18
S 098	0.00	4.25	(4.25)	6.38	(6.38)	17.02	21.27	55.31	55.31	97.87
C 154	6.06	9.09	12.12	12.12	15.15	18.18	21.21	54.54	54.54	87.87
C 052	0.00	2.50	(2.50)	7.50	(7.50)	10.00	10.00	57.50	57.50	87.50
S 180	0.00	0.00	0.00	0.00	(0.00)	14.28	14.28	50.00	50.00	64.28
S 060	0.00	16.66	16.66	16.66	16.66	16.66	16.66	50.00	50.00	75.00
C 158	5.00	14.76	16.19	20.71	22.61	33.57	37.38	66.42	66.42	90.23
S 129	0.00	33.33	33.33	33.33	33.33	50.00	50.00	50.00	50.00	50.00
C 187n	0.00	5.26	(5.26)	10.52	10.52	15.78	15.78	36.84	36.84	63.15
C 212	0.00	2.43	2.43	6.09	9.75	14.63	18.29	46.34	46.34	85.36
S 135	5.09	34.18	(34.18)	39.70	(39.70)	48.19	49.46	69.85	69.85	85.56
C 005	8.44	26.68	28.71	30.06	32.77	34.79	36.14	57.09	57.09	74.32
C 249	0.00	6.25	6.25	6.25	6.25	18.75	18.75	31.25	31.25	62.50
C 215	11.11	22.22	22.22	33.33	33.33	33.33	33.33	55.55	55.55	55.55
C 085	3.70	25.92	25.92	25.92	29.62	40.74	40.74	59.25	59.25	77.77
C 198	0.00	25.00	25.00	25.00	25.00	25.00	25.00	37.50	37.50	50.00
S 086	0.00	22.22	22.22	22.22	22.22	33.33	33.33	77.77	77.77	77.77
C 039n	10.00	30.00	30.00	30.00	30.00	30.00	35.00	45.00	45.00	60.00
C 136	0.00	8.97	10.25	11.53	12.82	17.94	21.79	35.89	35.89	57.69
C 184q	0.00	5.26	5.26	5.26	5.26	5.26	7.89	39.47	39.47	63.15
C 193q	6.15	13.84	13.84	13.84	(13.84)	21.53	33.84	56.92	56.92	80.00
C 257	0.00	11.11	11.11	11.11	11.11	11.11	11.11	33.33	33.33	55.55
C 028	0.00	18.03	19.67	19.67	19.67	22.95	22.95	54.09	54.09	80.32
C 121	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*
C 001	1.31	11.84	13.15	13.15	14.47	17.10	19.73	34.21	34.21	51.31
C 048n	2.76	14.36	16.02	16.02	16.02	19.88	21.54	39.22	39.22	63.53
C 048n	*5.55*	*16.66*	*16.66*	*16.66*	*16.66*	*16.66*	*16.66*	*27.77*	*27.77*	*50.00*
C 206	0.00	7.14	7.14	7.14	7.14	10.71	10.71	32.14	32.14	60.71
C 097	1.08	10.35	(10.35)	12.80	(12.80)	19.89	21.79	47.68	47.68	73.29
C 097	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*100.00*	*100.00*	*100.00*
C 011n	2.70	16.21	16.21	16.21	(16.21)	21.62	24.32	32.43	32.43	54.05
C 227n	6.66	20.00	20.00	20.00	(20.00)	26.66	26.66	46.66	46.66	60.00
S 097	3.59	10.17	10.17	12.57	12.57	14.97	15.56	31.73	31.73	52.69
C 022	5.74	15.87	17.56	19.25	20.60	25.33	28.71	43.91	43.91	63.51
S 146	6.66	15.83	17.50	19.16	19.16	23.33	25.00	43.33	43.33	61.66
C 010	3.00	9.69	9.93	10.85	11.77	14.54	18.47	40.41	40.41	55.88
C 033	0.00	4.00	4.00	8.00	8.00	12.00	16.00	36.00	36.00	44.00
C 162n	2.58	15.48	(15.48)	16.77	(16.77)	20.00	23.87	41.93	41.93	56.77
C 162	2.63	15.78	15.78	18.42	18.42	23.68	23.68	39.47	39.47	57.89
S 022	2.77	6.11	7.22	8.33	9.44	13.33	15.00	29.44	29.44	41.11
C 125	5.60	16.11	16.11	16.98	18.44	22.41	25.74	35.37	35.37	49.03
C 223	6.97	22.09	23.25	25.58	27.13	28.29	28.29	39.53	39.53	57.75
C 120	5.26	13.15	14.21	15.78	18.94	22.10	24.21	37.89	37.89	53.15
C 193	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00
S 132	6.66	11.66	12.50	15.00	15.83	18.33	20.00	30.83	30.83	45.83
S 115	0.00	12.50	12.50	12.50	12.50	12.50	12.50	12.50	12.50	12.50
S 117	5.00	10.00	15.00	15.00	15.00	15.00	15.00	25.00	25.00	40.00
C 199	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C 199	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*
C 032	5.62	16.32	17.14	18.42	19.57	20.18	20.79	27.71	27.71	36.51
C 183	2.45	7.65	(7.65)	9.03	(9.03)	13.78	14.39	21.89	21.89	25.26
S 039	10.60	15.15	15.15	15.15	15.15	15.15	15.15	15.15	15.15	15.15
C 079	4.40	19.40	19.40	21.20	21.20	24.60	25.60	36.20	36.20	47.00
C 019	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*
C 051	5.00	13.00	13.00	13.00	15.00	15.00	16.00	19.00	19.00	21.00
S 122	0.00	9.09	9.09	9.09	9.09	9.09	9.09	18.18	18.18	18.18
C 004	1.69	8.47	10.16	10.16	13.55	13.55	13.55	13.55	13.55	13.55
C 068n	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.12
C 096	8.69	8.69	8.69	8.69	8.69	8.69	8.69	13.04	13.04	13.04
C 220	1.59	5.31	5.31	5.31	6.64	6.64	6.64	7.44	7.44	7.71
C 221f	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C 149	2.57	6.74	7.14	7.14	7.34	7.73	7.73	8.53	8.53	8.92
C 043	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C 089n	0.22	1.50	1.56	1.66	1.73	2.25	2.44	5.78	5.78	9.76
C 188	3.44	3.44	3.44	3.44	3.44	3.44	3.44	3.44	3.44	3.44
C 246f	0.00	0.00	0.00	20.00	20.00	20.00	20.00	20.00	20.00	40.00
S 092	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
S 071	4.21	21.73	22.77	25.74	28.18	30.16	31.14	42.32	42.32	54.55
C 284	1.36	1.36	1.36	1.36	1.36	1.36	1.36	1.36	1.36	2.04

Ref.N°	D9	D10	D11	D12	D13	D14	D15	D16	D17	D18
C 078q	3.54	10.62	(10.62)	12.29	(12.29)	12.70	12.70	13.54	13.54	15.20
C 036s	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.57	3.57	3.57
C 135	5.71	14.28	14.28	14.28	14.28	17.14	22.85	25.71	25.71	31.42
C 058	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C 099	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C 119	0.00	2.85	2.85	2.85	2.85	2.85	2.85	2.85	2.85	2.85
C 087	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C 093	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C 173	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C 009	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C 041	1.35	1.95	1.95	2.10	2.10	2.25	2.71	3.4	3.46	4.21
C 168	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C 283	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C 069	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C 115	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C 178	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C 222	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C 256	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C 124	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	100.00	100.00
C 024	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C 170	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C 070	0.00	0.00	0.00	33.33	33.33	33.33	33.33	33.33	33.33	33.33
C 167	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C 015	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C 128	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C 098	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C 011	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A 022	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Cumulative composition of the denarius hoards, expressed as a percentage
Part 3; Groups D19 to D28

The following hoards comprise 100% earlier coins

C 060	C 003q	C 143f	C 006n	C 157	C 188n	C 241	C 103	C 221	C 260n	C 128q
S 176	S 014	C 036	C 179	C 130	C 151n	C 064	C 176	S 058	C 010n	C 141q
C 190q	C 246	C 139	C 262n	S 106	S 164	C 141	S 059	S 155	C 028n	S 015
S 016	S 084	C 084	C 228	S 056	C 261	S 114				

Ref.N°	D19	D20	D21	D22	D23	D24	D25	D26	D27	D28
C 236	98.87	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
S 037	96.77	98.38	98.38	100.00	(100.00)	(100.00)	100.00	100.00	100.00	100.00
S 116	*76.47*	*76.47*	*100.00*	*100.00*	*100.00*	*100.00*	*100.00*	*100.00*	*100.00*	*100.00*
C 258	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
S 112	53.84	53.84	69.23	84.61	(84.61)	(84.61)	(84.61)	100.00	100.00	100.00
C 127n	95.83	95.83	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
S 127	89.74	92.30	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
S 005	100.00	100.00	100.00	100.00	100.00	*100.00*	*100.00*	*100.00*	*100.00*	*100.00*
S 005	*90.90*	*90.90*	*90.90*	*90.90*	*90.90*	*90.90*	*100.00*	*100.00*	*100.00*	*100.00*
S 031	72.00	72.00	82.00	96.00	(96.00)	(96.00)	96.00	100.00	100.00	100.00
S 098	97.87	97.87	97.87	97.87	100.00	(100.00)	100.00	100.00	100.00	100.00
C 154	87.87	87.87	93.93	96.96	96.96	96.96	100.00	100.00	100.00	100.00
C 052	87.50	87.50	90.00	97.50	100.00	100.00	100.00	100.00	100.00	100.00
S 180	64.28	64.28	78.57	85.71	100.00	(100.00)	100.00	100.00	100.00	100.00
S 060	91.66	91.66	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
C 158	91.90	92.14	95.71	98.80	99.52	99.52	100.00	100.00	100.00	100.00
S 129	50.00	50.00	83.33	100.00	100.00	100.00	100.00	100.00	100.00	100.00
C 187n	63.15	63.15	73.68	89.47	89.47	89.47	100.00	100.00	100.00	100.00
C 212	86.58	87.80	93.90	97.56	97.56	97.56	100.00	100.00	100.00	100.00
S 135	86.62	86.62	93.41	97.02	(97.02)	97.87	(97.87)	100.00	100.00	100.00
C 005	76.68	77.02	87.16	93.58	95.60	96.62	98.98	99.32	99.32	99.66
C 249	62.50	68.75	93.75	93.75	93.75	93.75	93.75	93.75	100.00	100.00
C 215	55.55	55.55	88.88	88.88	88.88	88.88	88.88	100.00	100.00	100.00
C 085	77.77	77.77	88.88	88.88	88.88	88.88	88.88	100.00	100.00	100.00
C 198	50.00	50.00	50.00	50.00	62.50	62.50	87.50	87.50	87.50	87.50
S 086	77.77	77.77	88.88	88.88	88.88	88.88	100.00	100.00	100.00	100.00
C 039n	65.00	65.00	70.00	75.00	75.00	80.00	90.00	100.00	100.00	100.00
C 136	61.53	62.82	74.35	83.33	88.46	93.58	94.87	97.43	97.43	100.00

Ref.N°	D19	D20	D21	D22	D23	D24	D25	D26	D27	D28
C 184q	65.78	65.78	81.57	86.84	86.84	86.84	(86.84)	100.00	100.00	100.00
C 193q	81.53	81.53	89.23	95.38	(95.38)	(95.38)	(95.38)	98.46	98.46	98.46
C 257	55.55	55.55	66.66	77.77	77.77	77.77	77.77	88.88	88.88	88.88
C 028	80.32	80.32	88.52	88.52	90.16	91.80	91.80	95.08	98.36	100.00
C 121	*0.00*	*0.00*	*26.66*	*46.66*	*46.66*	*86.66*	*86.66*	*86.66*	*86.66*	*100.00*
C 001	55.26	55.26	72.36	82.89	84.21	85.52	89.47	97.36	97.36	98.68
C 048n	64.64	64.64	79.00	84.53	89.50	(89.50)	93.92	98.89	98.89	99.44
C 048n	*50.00*	*50.00*	*66.66*	*66.66*	*66.66*	*72.22*	*77.77*	*94.44*	*100.00*	*100.00*
C 206	64.28	64.28	82.14	85.71	85.71	85.71	89.28	96.42	100.00	100.00
C 097	74.65	75.20	83.92	87.73	90.19	(90.19)	(90.19)	96.18	97.27	97.82
C 097	*100.00*	*100.00*	*100.00*	*100.00*	*100.00*	*100.00*	*100.00*	*100.00*	*100.00*	*100.00*
C 011n	54.05	54.05	72.97	81.08	83.78	(83.78)	(83.78)	89.18	89.18	97.29
C 227n	60.00	60.00	73.33	73.33	86.66	(86.66)	(86.66)	100.00	100.00	100.00
S 097	56.28	56.28	73.65	81.43	84.43	(84.43)	87.42	94.01	94.01	97.60
C 022	64.18	64.18	76.68	82.09	84.12	85.81	89.52	94.59	95.27	96.95
S 146	62.50	62.50	75.00	80.00	80.00	80.83	84.16	90.83	90.83	90.83
C 010	56.81	56.81	72.97	82.67	84.52	86.14	89.83	95.15	95.38	97.45
C 033	44.00	44.00	60.00	72.00	72.00	72.00	72.00	92.00	92.00	96.00
C 162n	58.70	58.70	71.61	81.93	85.16	(85.16)	(85.16)	96.12	96.12	99.35
C 162	57.89	57.89	71.05	76.31	76.31	78.94	84.21	92.10	92.10	94.73
S 022	41.66	41.66	58.88	65.55	67.77	73.88	77.22	88.33	88.88	92.22
C 125	49.73	49.73	62.31	70.01	71.29	74.04	74.74	85.77	87.04	89.49
C 223	59.30	59.30	70.54	76.74	77.90	80.62	83.33	89.92	91.08	92.63
C 120	53.68	53.68	64.73	72.63	74.21	79.47	80.00	88.42	89.47	90.52
C 193	25.00	25.00	25.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00
S 132	46.66	46.66	62.50	73.33	73.33	78.33	82.50	88.33	93.33	95.83
S 115	12.50	12.50	12.50	12.50	12.50	12.50	12.50	25.00	25.00	25.00
S 117	40.00	40.00	55.00	65.00	65.00	65.00	70.00	80.00	80.00	80.00
C 199	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C 199	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*
C 032	37.19	37.53	45.66	50.13	52.03	53.99	56.09	60.16	60.97	62.26
C 183	25.88	25.88	31.85	35.06	37.21	(37.21)	(37.21)	41.96	41.96	43.03
S 039	15.15	15.15	16.66	16.66	19.69	19.69	19.69	19.69	19.69	19.69
C 079	47.80	47.80	56.80	64.20	65.60	68.40	71.80	77.00	77.00	77.80
C 019	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.70*	*0.70*	*0.70*
C 051	22.00	22.00	29.00	31.00	32.00	32.00	32.00	33.00	33.00	33.00
S 122	18.18	18.18	21.21	21.21	21.21	21.21	(21.21)	30.30	30.30	30.30
C 004	13.55	13.55	20.33	20.33	23.72	23.72	27.11	27.11	28.81	28.81
C 068n	3.12	3.12	12.50	15.62	15.62	15.62	15.62	18.75	18.75	28.12
C 096	13.04	13.04	26.08	30.43	30.43	30.43	30.43	30.43	30.43	30.43
C 220	7.71	7.71	8.51	9.04	9.04	9.57	9.57	10.10	10.10	10.10
C 221f	0.00	0.00	0.00	11.11	11.11	11.11	11.11	11.11	11.11	11.11
C 149	8.92	8.92	11.70	13.09	13.69	(13.69)	14.28	15.47	15.47	15.47
C 043	0.00	0.00	0.00	7.69	7.69	7.69	7.69	7.69	7.69	15.38
C 089n	9.96	9.99	17.01	19.30	21.12	(21.12)	21.16	24.88	(24.88)	25.73
C 188	3.44	3.44	3.44	3.44	3.44	3.44	3.44	3.44	3.44	3.44
C 246f	40.00	40.00	40.00	40.00	40.00	60.00	60.00	60.00	60.00	60.00
S 092	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
S 071	55.53	55.79	65.57	70.98	72.85	76.18	78.83	83.04	83.931	84.60
C 284	2.04	2.04	2.04	3.40	3.40	3.40	3.40	3.40	3.40	3.40
C 078q	15.41	15.41	21.04	22.91	24.37	(24.37)	(24.37)	26.04	26.04	26.66
C 036s	3.57	3.57	7.14	7.14	14.28	(14.28)	14.28	14.28	14.28	17.85
C 135	31.42	31.42	40.00	45.71	45.71	51.42	51.42	51.42	51.42	54.28
C 058	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C 099	0.00	0.00	0.20	0.20	0.20	0.20	0.20	0.31	0.31	0.31
C 119	2.85	2.85	5.71	5.71	5.71	5.71	5.71	11.42	11.42	11.42
C 087	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C 093	0.00	0.00	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22
C 173	0.00	0.00	0.26	0.39	0.39	0.39	0.39	0.39	0.39	0.39
C 009	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C 041	4.21	4.21	7.37	8.73	9.18	9.48	9.78	10.84	11.14	11.59
C 168	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C 283	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C 069	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C 115	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C 178	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C 222	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C 256	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C 124	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Ref.N°	D19	D20	D21	D22	D23	D24	D25	D26	D27	D28
C 024	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C 170	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C 070	33.33	33.33	33.33	33.33	33.33	33.33	33.33	33.33	33.33	33.33
C 167	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C 015	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C 128	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C 098	0.00	0.00	14.28	14.28	14.28	14.28	14.28	14.28	14.28	14.28
C 011	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A 022	0.00	0.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Cumulative composition of the denarius hoards, expressed as a percentage
Part 4; Groups D29 to D38

The following hoards comprise 100% earlier coins

C 060	C 003q	C 143f	C 006n	C 157	C 188n	C 241	C 103	C 221	C 260n	C 128q
S 176	S 014	C 036	C 179	C 130	C 151n	C 064	C 176	S 058	C 010n	C 141q
C 190q	C 246	C 139	C 262n	S 106	S 164	C 141	S 059	S 155	C 028n	S 015
S 016	S 084	C 084	C 228	S 056	C 261	S 114	C 236	S 037	S 116	C 258
S 112	C 127n	S 127	S 005	S 031	S 098	C 154	C 052	S 180	S 060	C 158
S 129	C 187n	C 212	S 135	C 005	C 249	C 215	C 085	C 198	S 086	C 039n
C 136	C 184q	C 193q	C 257	C 028	C 121	C 001				

Ref.N°	D29	D30	D31	D32	D33	D34	D35	D36	D37	D38
C 048n	99.44	99.44	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
C 048n	*100.00*	*100.00*	*100.00*	*100.00*	*100.00*	*100.00*	*100.00*	*100.00*	*100.00*	*100.00*
C 206	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
C 097	99.45	99.45	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
C 097	*100.00*	*100.00*	*100.00*	*100.00*	*100.00*	*100.00*	*100.00*	*100.00*	*100.00*	*100.00*
C 011n	97.29	97.29	(97.29)	100.00	100.00	100.00	100.00	100.00	100.00	100.00
C 227n	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
S 097	99.40	(99.40)	99.40	99.40	100.00	100.00	100.00	100.00	100.00	100.00
C 022	98.31	98.31	98.31	99.32	100.00	100.00	100.00	100.00	100.00	100.00
S 146	93.33	93.33	93.33	99.16	100.00	100.00	100.00	100.00	100.00	100.00
C 010	98.61	98.61	98.61	99.76	100.00	100.00	100.00	100.00	100.00	100.00
C 033	96.00	96.00	96.00	96.00	100.00	100.00	100.00	100.00	100.00	100.00
C 162n	99.35	99.3	99.35	100.00	100.00	100.00	100.00	100.00	100.00	100.00
C 162	94.73	94.73	94.73	100.00	100.00	100.00	100.00	100.00	100.00	100.00
S 022	94.44	94.44	95.00	99.44	100.00	100.00	100.00	100.00	100.00	100.00
C 125	91.76	91.76	91.76	98.42	99.29	99.29	99.47	99.47	99.47	99.82
C 223	93.79	93.79	93.79	98.83	99.22	99.61	99.61	99.61	99.61	100.00
C 120	92.10	92.10	93.68	99.47	99.47	100.00	100.00	100.00	100.00	100.00
C 193	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	100.00
S 132	99.16	99.16	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
S 115	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	50.00
S 117	80.00	80.00	80.00	85.00	90.00	95.00	95.00	95.00	95.00	100.00
C 199	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	16.66
C 199	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*23.07*
C 032	62.87	62.87	63.27	67.07	67.34	67.41	67.54	67.54	67.54	79.81
C 183	43.79	43.79	(43.79)	47.01	47.47	48.23	48.23	48.23	48.23	71.36
S 039	19.69	19.69	27.27	27.27	27.27	28.78	28.78	28.78	28.78	63.63
C 079	79.20	79.20	79.40	80.60	80.80	80.80	81.60	81.60	81.80	88.00
C 019	*0.70*	*0.70*	*0.70*	*0.70*	*0.70*	*0.70*	*0.70*	*0.70*	*0.70*	*67.60*
C 051	33.00	33.00	33.00	38.00	38.00	38.00	39.00	39.00	39.00	60.00
S 122	30.30	30.30	30.30	30.30	30.30	33.33	33.33	33.33	33.33	57.57
C 004	28.81	28.81	28.81	37.28	37.28	38.98	38.98	38.98	38.98	62.71
C 068n	28.12	28.12	28.12	34.37	34.37	34.37	34.37	34.37	34.37	50.00
C 096	30.43	30.43	30.43	34.78	34.78	34.78	34.78	34.78	34.78	47.82
C 220	10.10	10.10	10.10	13.82	14.09	15.15	15.15	15.19	15.15	43.35
C 221f	11.11	11.11	11.11	11.11	11.11	11.11	11.11	11.11	11.11	44.44
C 149	15.47	15.47	16.07	20.83	20.83	21.03	21.23	21.23	21.23	53.76
C 043	15.38	15.38	15.38	15.38	15.38	15.38	15.38	15.38	15.38	23.07
C 089n	26.19	26.19	(26.19)	34.25	34.51	34.78	34.87	34.91	34.91	55.19
C 188	3.44	3.44	3.44	3.44	3.44	3.44	3.44	3.44	3.44	34.48
C 246f	60.00	60.00	60.00	80.00	80.00	80.00	80.00	80.00	80.00	80.00
S 092	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
S 071	85.38	85.38	85.59	87.57	88.19	88.50	88.50	88.55	88.55	91.41
C 284	3.40	3.40	3.40	8.16	8.16	9.52	9.52	10.20	10.20	53.06
C 078q	26.87	(26.87)	(26.87)	31.25	31.45	32.50	32.91	32.91	32.91	56.87

Ref.N°	D29	D30	D31	D32	D33	D34	D35	D36	D37	D38
C 036s	17.85	17.85	17.85	21.42	21.42	21.42	21.42	21.42	25.00	32.14
C 135	54.28	54.28	54.28	60.00	60.00	60.00	60.00	60.00	60.00	77.14
C 058	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.52
C 099	0.31	0.31	0.41	1.24	1.24	1.34	1.34	1.34	1.34	11.82
C 119	11.42	11.42	11.42	14.28	14.28	14.28	14.28	14.28	14.28	34.28
C 087	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C 093	0.22	0.22	0.22	0.45	0.45	0.45	0.45	0.45	0.45	7.33
C 173	0.39	0.39	0.39	0.53	0.53	0.66	0.66	0.66	0.66	9.96
C 009	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.35
C 041	11.74	11.74	11.89	15.21	15.21	16.26	16.41	16.56	16.56	60.24
C 168	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C 283	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	20.68
C 069	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C 115	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C 178	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C 222	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C 256	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	40.00
C 124	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
C 024	0.00	0.00	0.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
C 170	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C 070	33.33	33.33	33.33	33.33	33.33	33.33	33.33	33.33	33.33	66.66
C 167	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C 015	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C 128	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C 098	14.28	14.28	14.28	14.28	14.28	14.28	14.28	14.28	14.28	71.42
C 011	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A 022	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Cumulative composition of the denarius hoards, expressed as a percentage

Part 5 Groups D39 to D48

The following hoards comprise 100% earlier coins

C 060	C 003q	C 143f	C 006n	C 157	C 188n	C 241	C 103	C 221	C 260n	C 128q
S 176	S 014	C 036	C 179	C 130	C 151n	C 064	C 176	S 058	C 010n	C 141q
C 190q	C 246	C 139	C 262n	S 106	S 164	C 141	S 059	S 155	C 028n	S 015
S 016	S 084	C 084	C 228	S 056	C 261	S 114	C 236	S 037	S 116	C 258
S 112	C 127n	S 127	S 005	S 031	S 098	C 154	C 052	S 180	S 060	C 158
S 129	C 187n	C 212	S 135	C 005	C 249	C 215	C 085	C 198	S 086	C 039n
C 136	C 184q	C 193q	C 257	C 028	C 121	C 001	C 048n	C 206	C 097	C 011n
C 227n	S 097	C 022	S 146	C 010	C 033	C 162n	C 162	S 022		

Ref.N°	D39	D40	D41	D42	D43	D44	D45	D46	D47	D48
C 125	99.82	99.82	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
C 223	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
C 120	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
C 193	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
S 132	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
S 115	50.00	75.00	75.00	75.00	75.00	75.00	100.00	100.00	100.00	100.00
S 117	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
C 199	16.66	16.66	66.66	66.66	66.66	66.66	100.00	100.00	100.00	100.00
C 199	*23.07*	*46.15*	*84.61*	*84.61*	*84.61*	*84.61*	*100.00*	*100.00*	*100.00*	*100.00*
C 032	79.81	85.23	90.85	90.85	92.88	92.88	100.00	100.00	100.00	100.00
C 183	76.11	76.11	86.52	86.52	90.35	100.00	100.00	100.00	100.00	100.00
S 039	63.63	71.21	83.33	83.33	90.90	90.90	100.00	100.00	100.00	100.00
C 079	88.00	90.20	94.20	94.20	94.80	94.80	100.00	100.00	100.00	100.00
C 019	69.01	69.01	96.47	96.47	96.47	96.47	100.00	100.00	100.00	100.00
C 051	68.00	68.00	85.00	85.00	86.00	99.00	100.00	100.00	100.00	100.00
S 122	57.57	72.72	87.87	(87.87)	90.90	90.90	96.96	100.00	100.00	100.00
C 004	72.88	72.88	81.35	(81.35)	81.35	93.22	96.61	96.61	98.30	100.00
C 068n	65.62	65.62	68.75	(68.75)	68.75	68.75	87.50	87.50	87.50	93.75
C 096	47.82	52.17	56.52	56.52	56.52	56.52	60.86	65.21	65.21	73.91
C 220	43.35	45.74	55.31	55.31	55.85	55.85	71.01	72.07	72.60	84.57
C 221f	44.44	44.44	44.44	44.44	44.44	44.44	44.44	44.44	44.44	77.77
C 149	53.76	59.12	72.22	72.22	72.61	82.73	88.29	89.48	89.68	95.63
C 043	23.07	23.07	38.46	38.46	38.46	38.46	46.15	46.15	46.15	61.53
C 089n	61.72	(61.72)	67.50	(67.50)	68.19	68.19	86.34	88.14	88.50	94.97
C 188	34.48	37.93	51.72	51.72	51.72	51.72	68.96	68.96	68.96	75.86
C 246f	80.00	80.00	80.00	80.00	80.00	80.00	80.00	80.00	80.00	80.00
S 092	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	20.00

Ref.N°	D39	D40	D41	D42	D43	D44	D45	D46	D47	D48
S 071	91.41	92.09	93.49	93.86	93.96	93.96	95.52	95.63	95.68	97.08
C 284	53.06	54.42	54.42	54.42	54.42	54.42	72.78	73 46	73.46	89.79
C 078q	56.87	61.87	70.41	70.41	70.83	70.83	83.12	83.54	83.54	91.45
C 036s	32.14	39.28	46.42	(46.42)	46.42	46.42	57.14	60.71	60.71	71.42
C 135	77.14	77.14	77.14	77.14	77.14	77.14	82.85	85.71	85.71	85.71
C 058	10.52	10.52	10.52	10.52	10.52	10.52	15.78	15.78	15.78	26.31
C 099	14.10	14.21	16.59	17.01	17.32	21.05	21.88	21.99	21.99	41.90
C 119	34.28	40.00	48.57	48.57	48.57	48.57	62.85	62.85	62.85	80.00
C 087	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C 093	7.33	8.25	9.63	9.63	9.63	9.63	14.90	15.13	15.13	38.76
C 173	11.55	12.88	15.67	15.93	16.06	19.78	20.71	21.38	21.38	43.29
C 009	8.92	8.92	12.50	14.28	14.28	16.07	17.85	17.85	17.85	48.21
C 041	60.24	62.80	75.60	77.56	78.91	78.91	90.66	90.81	90.81	93.67
C 168	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C 283	20.68	24.13	37.93	(37.93)	37.93	37.93	37.93	37.93	37.93	68.96
C 069	0.00	0.00	7.14	7.14	7.14	7.14	7.14	7.14	7.14	35.71
C 115	0.00	0.00	0.00	0.00	0.00	0.00	14.28	14.28	14.28	57.14
C 178	0.00	0.00	0.00	0.00	0.00	(0.00)	100.00	100.00	100.00	100.00
C 222	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	44.44
C 256	40.00	40.00	60.00	60.00	60.00	60.00	60.00	60.00	60.00	60.00
C 124	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
C 024	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
C 170	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	27.27
C 070	66.66	66.66	66.66	66.66	66.66	66.66	66.66	66.66	66.66	66.66
C 167	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C 015	0.00	0.00	0.00	0.00	0.00	0.00	3.57	3.57	3.57	42.85
C 128	0.00	0.00	0.00	0.00	0.00	0.00	50.00	50.00	50.00	50.00
C 098	71.42	71.42	71.42	71.42	71.42	71.42	71.42	71.42	71.42	71.42
C 011	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A 022	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Cumulative composition of the denarius hoards, expressed as a percentage

Part 6 Groups D49 to D57

The following hoards comprise 100% earlier coins

C 060	C 003q	C 143f	C 006n	C 157	C 188n	C 241	C 103	C 221	C 260n	C 128q
S 176	S 014	C 036	C 179	C 130	C 151n	C 064	C 176	S 058	C 010n	C 141q
C 190q	C 246	C 139	C 262n	S 106	S 164	C 141	S 059	S 155	C 028n	S 015
S 016	S 084	C 084	C 228	S 056	C 261	S 114	C 236	S 037	S 116	C 258
S 112	C 127n	S 127	S 005	S 031	S 098	C 154	C 052	S 180	S 060	C 158
S 129	C 187n	C 212	S 135	C 005	C 249	C 215	C 085	C 198	S 086	C 039n
C 136	C 184q	C 193q	C 257	C 028	C 121	C 001	C 048n	C 206	C 097	C 011n
C 227n	S 097	C 022	S 146	C 010	C 033	C 162n	C 162	S 022	S 164	C 125
C 223	C 120	C 193	S 132	S 115	S 117	C 199	C 199	C 032	C 183	S 039
C 079	C 019	C 051	S 122	C 004						

Ref.N°	D49	D50	D51	D52	D53	D54	D55	D56	D57
C 068n	93.75	93.75	93.75	100.00	100.00	100.00	100.00	100.00	100.00
C 096	78.26	78.26	78.26	91.30	100.00	100.00	100.00	100.00	100.00
C 220	86.70	87.23	90.42	98.40	100.00	100.00	100.00	100.00	100.00
C 221f	77.77	77.77	77.77	88.88	100.00	100.00	100.00	100.00	100.00
C 149	96.23	96.23	97.81	99.60	100.00	100.00	100.00	100.00	100.00
C 043	61.53	61.53	61.53	92.30	92.30	100.00	100.00	100.00	100.00
C 089n	95.29	95.29	95.65	99.73	100.00	100.00	100.00	100.00	100.00
C 188	75.86	75.86	75.86	86.20	100.00	100.00	100.00	100.00	100.00
C 246f	80.00	80.00	80.00	100.00	100.00	100.00	100.00	100.00	100.00
S 092	40.00	40.00	60.00	80.00	100.00	100.00	100.00	100.00	100.00
S 071	97.45	97.50	97.91	99.68	100.00	100.00	100.00	100.00	100.00
C 284	89.79	89.79	89.79	100.00	100.00	100.00	100.00	100.00	100.00
C 078q	91.45	91.45	92.91	98.75	99.37	100.00	100.00	100.00	100.00
C 036s	71.42	78.57	78.57	89.28	92.85	100.00	100.00	100.00	100.00
C 135	85.71	85.71	85.71	97.14	97.14	97.14	100.00	100.00	100.00
C 058	26.31	26.31	26.31	78.94	78.94	89.47	89.47	100.00	100.00
C 099	44.60	45.53	51.14	88.90	95.64	98.85	99.06	100.00	100.00
C 119	80.00	80.00	82.85	97.14	100.00	100.00	100.00	100.00	100.00
C 087	0.00	0.00	0.00	31.25	37.50	75.00	81.25	100.00	100.00
C 093	42.66	43.34	51.83	90.36	96.55	99.31	99.31	100.00	100.00
C 173	45.28	46.87	53.38	95.08	95.08	98.93	99.20	100.00	100.00

Ref.N°	D49	D50	D51	D52	D53	D54	D55	D56	D57
C 009	50.00	50.00	51.78	91.07	98.21	100.00	100.00	100.00	100.00
C 041	93.67	93.97	95.03	96.68	97.74	98.79	98.94	100.00	100.00
C 168	0.00	0.00	0.00	0.00	100.00	100.00	100.00	100.00	100.00
C 283	72.41	72.41	86.20	89.65	89.65	89.65	89.65	100.00	100.00
C 069	42.85	42.85	57.14	100.00	100.00	100.00	100.00	100.00	100.00
C 115	57.14	57.14	57.14	85.71	100.00	100.00	100.00	100.00	100.00
C 178	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
C 222	44.44	55.55	55.55	88.88	100.00	100.00	100.00	100.00	100.00
C 256	60.00	60.00	60.00	100.00	100.00	100.00	100.00	100.00	100.00
C 124	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
C 024	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
C 170	27.27	27.27	27.27	90.90	90.90	90.90	90.90	100.00	100.00
C 070	66.66	66.66	66.66	100.00	100.00	100.00	100.00	100.00	100.00
C 167	0.00	0.00	0.00	100.00	100.00	100.00	100.00	100.00	100.00
C 015	42.85	42.85	42.85	60.71	71.42	89.28	89.28	100.00	100.00
C 128	50.00	50.00	50.00	100.00	100.00	100.00	100.00	100.00	100.00
C 098	71.42	71.42	71.42	100.00	100.00	100.00	100.00	100.00	100.00
C 011	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00
A 022	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Appendix 2.42
The average proportion of denarii in British hoards

The table shows the percentage of each coin group (A-Q) in hoards on average at five year intervals from AD 40 to AD 280. The values are based on interpolation (and for the AD 40-45 points extrapolation) from all hoards in the database containing more than five coins, and only including real denarii, copies have been excluded from the statistics (as far as possible).

Date	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
AD 40:	75.56	7.41	17.03	0	0	0	0	0	0	0	0	0	0	0	0	0	0
AD 45	70.37	6.67	22.96	0	0	0	0	0	0	0	0	0	0	0	0	0	0
AD 50	65.18	6.67	20.74	7.41	0	0	0	0	0	0	0	0	0	0	0	0	0
AD 55	60.01	6.67	16.29	17.03	0	0	0	0	0	0	0	0	0	0	0	0	0
AD 60	53.34	6.67	14.07	25.92	0	0	0	0	0	0	0	0	0	0	0	0	0
AD 65	48.89	5.93	13.33	31.85	0	0	0	0	0	0	0	0	0	0	0	0	0
AD 70	45.92	4.45	12.59	31.85	4.45	0.74	0	0	0	0	0	0	0	0	0	0	0
AD 75	41.49	4.44	10.37	20.74	8.15	14.81	0	0	0	0	0	0	0	0	0	0	0
AD 80	38.53	4.44	8.15	15.55	5.19	28.14	0	0	0	0	0	0	0	0	0	0	0
AD 85	36.30	3.70	6.67	11.11	5.93	34.07	2.22	0	0	0	0	0	0	0	0	0	0
AD 90	34.07	2.96	5.19	8.89	5.19	37.03	6.67	0	0	0	0	0	0	0	0	0	0
AD 95	31.86	2.96	3.70	5.93	4.44	40.00	11.11	0	0	0	0	0	0	0	0	0	0
AD 100	29.64	2.96	2.96	2.96	3.70	40.0	13.33	4.45	0	0	0	0	0	0	0	0	0
AD 105	28.15	2.96	2.22	0.74	3.70	37.05	14.07	11.11	0	0	0	0	0	0	0	0	0
AD 110	25.93	3.70	1.48	0	2.22	33.34	12.59	20.74	0	0	0	0	0	0	0	0	0
AD 115	24.45	3.70	0.74	0	2.22	28.89	11.11	28.89	0	0	0	0	0	0	0	0	0
AD 120	22.96	4.44	0	0	2.22	24.45	11.11	28.15	6.67	0	0	0	0	0	0	0	0
AD 125	17.03	7.41	0	0	2.22	21.49	11.11	25.19	15.55	0	0	0	0	0	0	0	0
AD 130	7.41	8.15	0	0	2.22	24.45	10.37	25.18	22.22	0	0	0	0	0	0	0	0
AD 135	2.96	5.93	0	0	2.22	25.93	8.89	26.67	27.40	0	0	0	0	0	0	0	0
AD 140	0.74	5.19	0	0	2.22	25.19	7.41	27.40	29.63	2.22	0	0	0	0	0	0	0
AD 145	0	4.44	0	0	2.22	22.20	6.67	28.89	29.65	5.93	0	0	0	0	0	0	0
AD 150	0	2.96	0	0	2.22	20.00	6.67	28.15	29.63	10.37	0	0	0	0	0	0	0
AD 155	0	2.22	0	0	2.22	17.78	7.41	26.67	28.89	14.81	0	0	0	0	0	0	0
AD 160	0	1.48	0	0	2.22	16.29	7.41	25.93	28.90	17.03	0.74	0	0	0	0	0	0
AD 165	0	1.48	0	0	2.22	14.81	7.41	23.71	28.15	19.26	2.96	0	0	0	0	0	0
AD 170	0	1.48	0	0	1.48	14.07	7.41	20.74	27.41	21.48	5.93	0	0	0	0	0	0
AD 175	0	1.48	0	0	0.74	13.33	7.41	18.51	25.19	23.71	9.63	0	0	0	0	0	0
AD 180	0	1.48	0	0	0.74	12.59	7.41	15.55	22.23	25.93	12.59	1.48	0	0	0	0	0
AD 185	0	0.74	0	0	0	13.33	7.41	14.07	20.00	25.93	13.33	5.19	0	0	0	0	0
AD 190	0	0.74	0	0	0	13.33	6.67	11.85	17.78	26.67	11.85	11.11	0	0	0	0	0
AD 195	0	0.74	0	0	0	12.59	6.67	10.37	14.81	25.19	7.41	16.29	5.93	0	0	0	0
AD 200	0	0.74	0	0	0	12.59	5.19	8.89	13.33	22.22	5.93	5.19	25.92	0	0	0	0
AD 205	0	0.74	0	0	0	11.85	5.18	6.67	10.37	20.00	4.45	3.70	29.63	7.41	0	0	0
AD 210	0	0.74	0	0	0	11.85	3.70	5.19	7.41	17.78	3.70	3.70	29.64	16.29	0	0	0
AD 215	0	0.74	0	0	0	11.11	2.96	3.70	5.19	15.55	2.96	3.70	30.38	23.71	0	0	0
AD 220	0	0.74	0	0	0	9.63	2.22	2.96	3.70	12.59	2.96	3.70	30.38	18.52	12.60	0	0
AD 225	0	0.74	0	0	0	8.15	2.22	2.22	2.22	8.89	2.96	5.19	30.38	12.59	14.81	9.63	0
AD 230	0	0.74	0	0	0	5.93	2.22	1.48	1.48	7.41	2.96	4.44	30.39	8.15	17.77	17.03	0

Date

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
AD 235																
0	0	0	0	0	3.70	2.96	0.74	1.48	4.45	2.96	4.44	28.90	10.37	14.07	25.93	0
AD 240																
0	0	0	0	0	2.22	2.22	0.74	0.74	3.70	2.22	3.70	26.68	9.63	15.55	25.93	6.67
AD 245																
0	0	0	0	0	0.74	1.48	1.48	0.74	2.22	2.22	2.22	23.71	11.11	17.77	28.16	8.15
AD 250																
0	0	0	0	0	0	0.74	1.48	0.74	0.74	2.22	2.22	19.25	11.11	22.23	30.38	8.89
AD 255																
0	0	0	0	0	0	0	0.74	0.74	0.74	1.48	1.48	13.33	11.11	28.15	33.34	8.89
AD 260																
0	0	0	0	0	0	0	0	0	0.74	0.74	1.48	6.67	12.59	33.33	36.30	8.15
AD 265																
0	0	0	0	0	0	0	0	0	0	0	1.48	3.70	11.11	36.29	40.01	7.41
AD 270																
0	0	0	0	0	0	0	0	0	0	0	0	2.22	9.63	38.51	43.71	5.93
AD 275																
0	0	0	0	0	0	0	0	0	0	0	0	0	8.89	40.00	45.92	5.19
AD 280																
0	0	0	0	0	0	0	0	0	0	0	0	0	5.93	41.48	47.40	5.19

Appendix 2.43
An introduction to Contingency Tables

Much of the following is based on Iman & Conover (1983, 302-311), using an example from the thesis.

A contingency table is an array of numbers in matrix form, where the numbers represent frequencies. For example the number of denarii found in coin hoards of the AD130's:

	Coin Series:				
	B-F	G	H	I-J	Total
Hoard 1	0	1	7	4	12
Hoard 2	18	22	65	33	138
Hoard 3	52	37	48	41	178
Hoard 4	13	15	19	15	62
Total	83	75	139	93	390

The data is represented by frequency counts O_{ij} in an r x c contingency table (one with r rows and c columns), where O_{ij} equals the number of observations (coins) in cell (i,j) - that is the intersection of row i with column j.

	Col 1	Col 2	Col 3	Col 4	Total
Row 1	O_{11}	O_{12}	O_{13}	O_{14}	R_1
Row 2	O_{21}	O_{22}	O_{23}	O_{24}	R_2
Row 3	O_{31}	O_{32}	O_{33}	O_{34}	R_3
Row 4	O_{41}	O_{42}	O_{43}	O_{44}	R_4
Total	C_1	C_2	C_3	C_4	n

Null Hypothesis: The classification by rows is independent of the classification by columns. This hypothesis requires individual interpretation for each application. In this case it says that each hoard (row) is and independent random sample of the circulation pool; hence the ratios of coin series (columns) 1 : 2 : 3 : 4 should ideally be the same in all cases.

In symbols:

H_0: $p_{ij} = p_i \times p_j$ for all cells (i,j)

Test Statistic: Let

O_{ij} = the **observed** count in row i, column j,

$E_{ij} = \frac{R_i C_j}{n}$

= the **expected** count in row i, column j, if the null hypothesis is true.

Then one form of the test statistic is:

$$T = \sum_{\text{all cells}} (O_{ij} - E_{ij})^2 / E_{ij}$$

Decision Rule. Reject the null hypothesis at the level of significance a if T exceeds the 1-a quantile of the chi-squared distribution with $(r-1)(c-1)$ degrees of freedom.

The table of data above therefore represents the O_{ij} values.

The values can be calculated by the equation above to be:

	B-F	G	H	I-J	Total
Hoard 1	2.5	2.3	4.3	2.9	12
Hoard 2	29.4	26.5	49.2	32.9	138
Hoard 3	37.9	34.2	63.4	42.5	178
Hoard 4	13.2	11.9	22.1	14.8	62
Total	83	75	139	93	390

(figures only accurate to 1 dec. place)

The next figures which needs calculating are the values of $(O_{ij} - E_{ij})^2 / E_{ij}$:

For example: For coin series H (c =3) and Hoard 2 (r = 2)

O_{23} = 65

E_{23} = 49.18

So: $(O_{ij} - E_{ij})^2 / E_{ij}$ = $(65 - 49.18)^2 / 49.18$ = 5.09

	B-F	G	H	I-J	Total
Hoard 1	2.6	0.7	1.7	0.5	5.5
Hoard 2	4.4	0.8	5.1	0.0	10.3
Hoard 3	5.3	0.2	3.8	0.0	9.3
Hoard 4	0.0	0.8	0.4	0.0	1.2
Total	12.2	2.5	11.0	0.5	**26.3**

(figures rounded up to one decimal place)

Since T is the sum of all the $(O_{ij} - E_{ij})^2 / E_{ij}$ values, T = 26.3.

Cramer's Contingency Coefficient (Φ)

Sometimes a **measure of association** in a contingency table is a useful descriptive statistic to obtain. There are many different measures that are used with contingency tables. Cramer's is widely used.

Let q = the smaller of r and c .

$$F = \frac{T}{n(q-1)}$$

Properties

1. Φ (capital 'phi') is a measure of association between the row classification and column classification in a contingency table.
2. Φ will tend to be close to zero, its minimum value, if there is independence between the row and column variables.
3. If all of the observations in each row tend to collect in one column, but in a different column for each row, Φ will tend to be close to 1.0, its maximum value.
4. Φ is the r x c analog of the phi-coeficient for 2 x 2 contingency tables. In fact , f equals squared if r = 2 and c = 2.

In the example above:
T = 26.3
r = 4 and c = 4, so q = 4
n = 390

So: $$\Phi = \frac{T}{n(q-1)} = \frac{26.3}{390(4-1)} = 0.0224$$

Since this value is very close to zero, it suggests that there is independence between the number of coins of a particular series and which hoard they are found in. That is to say, all the hoards are very similar in composition.

Appendix 2.44
Denarius Hoards: Contingency Tables

The tables are ordered in ten year time brackets starting from the AD 40's:

Index No.	Date	A	B	C	-
C 060	41	22	3	12	-
C 143f	43	21		3	-
C 003q	43	200			-
C 006n	43	11		9	-
C 188n	48	3		1	-

Q = 3
T = 101.64
Φ = 0.1703
Date = 43.6 ± 2

Index No.	Date	A	B	C	D
C 241	56	2		1	3

No Calculations on the basis of only one hoard

Index No.	Date	A	B	C	D
C 103	60	37	8	25	2
C 221	60	49	15	22	1
C 260n	60	1		1	

Q = 3
T = 3.56
Φ = 0.0110
Date = 60.0 ± 0.0

Index No.	Date	A-B	C-D	E	F
C 128q	74	12	1		
S 176	74	3	13	7	12
C 036	78	37	16		
S 014	78	1	1	3	7

Q = 4
T = 75.25
Φ = 0.2219
Date = 76.0 ± 2.3

Index No.	Date	A-B	C-D	E	F-G
C 179	82	121	40	11	105
C 130	87	34	16	2	22
C 151n	87	17	8	1	6

Q = 3
T = 7.80
Φ = 0.0101
Date = 85.3 ± 2.9

Index No.	Date	A-B	C-E	F	G
C 064	94	11	1	8	2
C 176	98	7	1	1	2
S 058	99	4	6	18	4

Q = 3
T = 16.22
Φ = 0.1248
Date = 97.0 ± 2.6

Index No.	Date	B-E	F	G	H
C 141q	107	19	88	48	28
C 190q	107		2	1	2

Q = 2
T = 2.51
Φ = 0.0133
Date = 107.0 ± 0.0

Index No.	Date	A	B-E	F	G-I
C 246	117	16	8	11	14
C 139	118	4	2	11	2
C 262n	118	18	3	1	
S 106	118	4	1		
S 164	118	5	1	1	7

Q = 4
T = 43.96
Φ = 0.1344
Date = 117.8 ± 0.4

Index No.	Date	A-E	F	G	H-I
C 141	120	37	34	10	44
S 059	120		2	2	2
S 155	120	14	19	6	21
C 028n	121		3	1	5
S 015	122	19	5	1	5
S 016	122	12	7	2	7
C 084	127	1	4	3	18
C 228	127	15			
S 056	128	1	2	1	3

Q = 4
T = 78.95
Φ = 0.0860
Date = 123.0 ± 3.3

Index No.	Date	B-F	G	H	I-J
C 261	136		1	7	4
S 114	136	18	22	65	33
C 236	137	52	37	48	41
S 037	138	13	15	19	15

Q = 4
T = 26.27
Φ = 0.0224
Date = 136.7 ± 0.9

Index No.	Date	A-F	G	H	I-J
C 258	140	3	1	3	2
C 127n	142	13	4	2	5
S 127	143	9	6	10	14
S 005	144	2			
S 031	144	1	1		
S 098	147	3	7	16	21
C 154	149	5	2	11	15

Q = 4
T = 37.65
Φ = 0.0804
Date = 144.1 ± 3.0

Index No.	Date	A-F	G	H	I-J
C 052	150	3	1	19	17
S 180	152		2	5	7
S 060	153	2		4	6
C 158	154	95	62	122	141
S 129	156	2	1		3
C 187n	159	2	1	4	12
C 212	159	8	7	23	44

Q = 4
T = 40.44
Φ = 0.0227
Date = 154.7 ± 3.4

Index No.	Date	A-F	G-H	I	J-K
S 135	160	187	142	79	63
C 005	162	97	72	59	68
C 249	162	1	4	6	5
C 215	165	3	2		4
C 198	166	2	1	1	4
S 086	169	2	5		2

Q = 4
T = 39.92
Φ = 0.0164
Date = 164.0 ± 3.3

Index No.	Date	A-F	G-H	I	J-K
C 039n	170	6	3	4	7
C 136	170	10	18	21	29
C 184q	170	2	13	10	13
C 193q	170	9	28	16	12
C 028	171	12	21	16	12
C 121	172				15
C 001	176	11	15	16	34
C 048n	177	29	42	46	64
C 206	177	2	7	9	10
C 097	178	47	128	101	91

Q = 4
T = 78.14
Φ = 0.0280
Date = 173.1 ± 3.4

Index No.	Date	A-F	G-H	I-J	K-L
C 227n	180	3	4	6	2
S 097	181	21	32	93	21
C 022	183	61	69	135	31
S 146	185	23	29	49	19
C 010	186	51	124	214	44
C 033	186	2	7	9	7
C 162n	186	26	39	67	23
C 162	187	7	8	17	6
S 022	187	17	36	86	41

Q = 4
T = 51.23
Φ = 0.0119
Date = 184.5 ± 2.6

Index No.	Date	B-F	G-H	I-J	K-M
C 223	194	17		7	
C 125	194	105	96	224	144
C 120	195	36	36	80	38
C 193	196	1		1	2
S 132	196	3	2	5	1

Q = 4
T = 47.82
Φ = 0.0199
Date = 195.0 ± 1.0

Index No.	Date	B-F	G-J	K-L	M-N
S 115	203	1		1	6
C 199	207				6
C 032	208	289	539	169	479
C 183	209	59	184	72	338

Q = 4
T = 99.05
Φ = 0.0154
Date = 206.7 ± 2.6

Index No.	Date	B-F	G-J	K-M	N-O
S 039	212	10	3	42	11
C 079	213	106	253	112	29
C 051	215	15	17	53	15
S 122	217	3	4	22	4

Q = 4
T = 133.91
Φ = 0.0638
Date = 214.2 ± 2.2

Index No.	Date	B-J	K-M	N-O	P-Q
C 004	222	16	32	11	
C 068n	223	5	17	8	2
C 096	225	7	6	5	5
C 149	226	17	69	36	2
C 220	226	36	172	132	36
C 221f	226	1	3	3	2
C 043	228	1	4	3	5
C 089n	228	648	1419	862	133
C 188	228	1	14	7	7
C 246f	228	3	1		1
S 092	229			3	2

Q = 4
T = 146.12
Φ = 0.0130
Date = 226.3 ± 2.2

Index No.	Date	A-J	K-M	N-O	P-Q
S 071	230	1516	282	85	40
C 284	232	5	75	52	15
C 036s	236		3	3	1
C 135	238	18	9	3	5

Q = 4
T = 478.79
Φ = 0.0755
Date = 234.0 ± 3.6

Index No.	Date	A-J	K-M	N-O	P+
C 058	241		2	3	14
C 099	248	2	158	333	471
C 119	248	2	15	12	6

Q = 3
T = 51.96
Φ = 0.0255
Date = 245.7 ± 4.0

Index No.	Date	J	L-M	N-O	P+
C 087	257				16
C 093	259	1	41	184	210
C 173	259	3	115	284	351

Q = 3
T = 26.80
Φ = 0.0111
Date = 258.3 ± 1.1

Index No.	Date	L	M	N-O	P+
C 009	260		7	22	27
C 041	260	110	392	129	33
C 168	260				1
C 283	260		11	14	4
C 069	269		1	7	6

Q = 4
T = 199.64
Φ = 0.0871
Date = 261.8 ± 4.0

Index No.	Date	A-M	N	O	P+
C 115	270		1	3	3
C 178	270		1		
C 222	270			5	4
C 256	270	3			2
C 124	271	1			
C 170	272			3	8
C 070	273	2			1
C 167	273				1
C 015	274		1	11	16
C 128	279		1		1

Q = 4
T = 67.40
Φ = 0.3304
Date = 272.1 ± 2.7

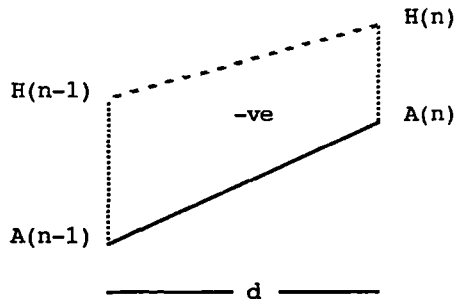
Index No.	Date	A-I	J-P	Q+
C 098	280		5	
C 010n	295	92		
C 011	295			1

Q = 3
T = 196.00
Φ = 1.0000
Date = 290.0 ± 8.6

Appendix 2.51
Hoard structure analysis: the mathematical background

A(n) = the percentage of coins of up to emperor n in an Average hoard.
A(n-1) = the percentage of coins of up to emperor n-1 in an Average hoard.
H(n) = the percentage of coins of up to emperor n in the specific Hoard under analysis.
H(n-1) = the percentage of coins of up to emperor n-1 in the specific Hoard under analysis.
d = the number of years between the issues of n-1 and n

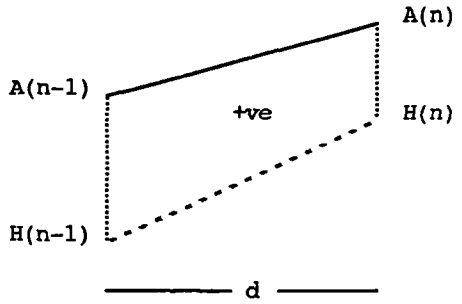
Case 1: An archaic segment



In this case the hoard has more older coins in it than would be expected on average. Therefore we want the computation to deliver a negative value to the area between these two dates. This is given by the following equation:

$$\text{Area} = \frac{([A(n-1)-H(n-1)] + [A(n)-H(n)])}{2} \times d$$

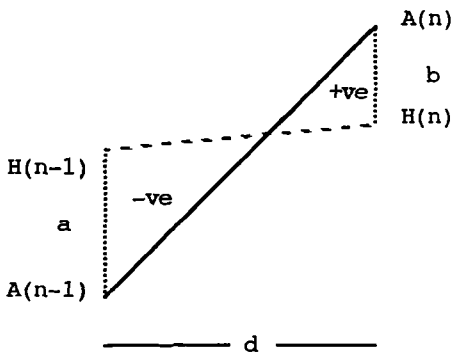
Case 2: An modern segment



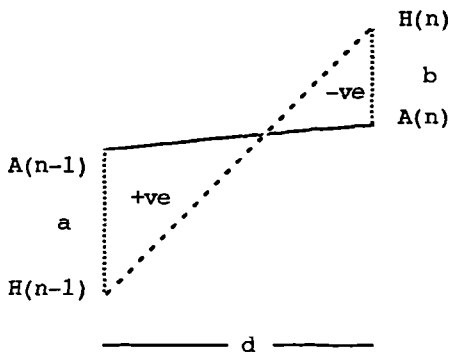
In this case the hoard has less older coins in it than would be expected on average. Therefore we want the computation to deliver a positive value to the area between these two dates. This is given by the following equation:

$$\text{Area} = \frac{([A(n-1)-H(n-1)] + [A(n)-H(n)])}{2} \times d$$

Case 3: A crossing segment



Case 4: Another crossing segment



Here there are both positive and negative areas which need to be calculated. The simple formulae used above will not suffice here, and a little bit of geometry is required.

Let us define the lengths *a* and *b*.

a = ABS(A(n-1) - H(n-1))
b = ABS(A(n) - H(n))

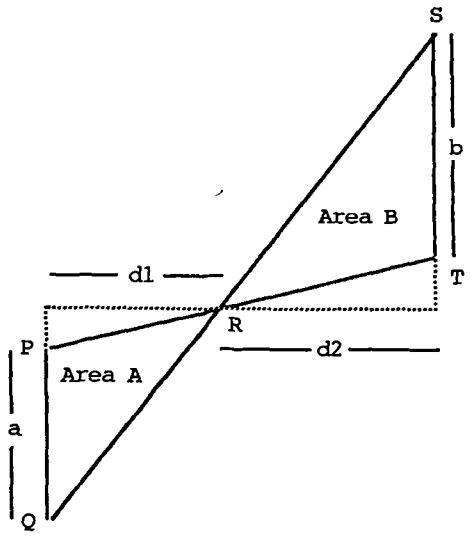
ABS is the absolute value; for example:
ABS(1.23) = 1.23
ABS(-1.23) = 1.23

Equation 1: $d = d1 + d2$

The triangles PQR and TSR are similar, therefore:

Equation 2: $\frac{a}{b} = \frac{d1}{d2}$

We need to find out the areas of PQR (Area A) and TSR (Area B)



Area A = $\frac{a \times d1}{2}$

$d2 = \frac{b \times d1}{a} = d - d1$ (from eq 1&2)

therefore: $\frac{b}{a} = \frac{d}{d1} - 1$

therefore: $1 + \frac{b}{a} = \frac{d}{d1}$

therfore: $d1 = \frac{d}{(1 + b/a)}$

So Area A $= \frac{a}{2} \times \frac{d}{(1 + b/a)}$

Area B = $\frac{b \times d2}{2}$

$d1 = \frac{a \times d2}{b} = d - d2$ (from eq 1&2)

therefore: $\frac{a}{b} = \frac{d}{d2} - 1$

therefore: $1 + \frac{a}{b} = \frac{d}{d2}$

therfore: $d2 = \frac{d}{(1 + a/b)}$

So Area B $= \frac{b}{2} \times \frac{d}{(1 + a/b)}$

Whether the value of Area A and Area B is positive or negative can be told from which is the larger, S(n) or A(n).

If S(n-1) > A(n-1) then Area A is -ve and Area B is +ve
If S(n-1) < A(n-1) then Area A is +ve and Area B is -ve

This being the case, it is now possible to find equations to calculate the area in all three cases above.

Computatons to calculate the net and gross area values

Based on the preceeding equations the following three routines together calculate the gross and net area values. The routines are written here as a simplified version of the actual version used, all unnessecary lines having been stripped in order to permit some clarity.

```
"Computations"
GrossArea = 0
NetArea = 0
FOR E = 2 TO 17
    A = Data(D,E-1) - Hoard(E-1)
    B = Data(D,E) - Hoard(E)
    C = A * B
    IF C>=0 THEN GOSUB "Normal Situation" ELSE GOSUB "Crossing Situation"
NEXT E
PRINT Index$, D, GrossArea, NetArea
RETURN
```

Notes: This routine decides which kind of case is being studied. If it is one such as case 1 or 2, where the specific hoard line and the average hoard line do not cross, then the routine "Normal Situation" is called. If the lines cross as in Cases 3&4, then the "Crossing Situation" routine is called. The ***FOR-NEXT*** *loop takes the calculations through all the issue series, from the Republican issues until the end; at each stage calculating the area between the two lines. At the end it prints the area value.*

```
"Normal Situation"
Area = (A+B) * (Dates(E)-Dates(E-1))/2
GrossArea = GrossArea + ABS(Area)
NetArea = NetArea + Area
RETURN
```

Notes: This routine calculates the area between the two lines between issue E and that immediately preceding it (E-1). The equation is the same as that above in cases 1&2.

```
"Crossing Situation"
AbsA = ABS(A)
AbsB = ABS(B)
AreaA = (AbsA*(Dates(E)-Dates(E-1)))/(2*((AbsB/AbsA)+1))
AreaB = (AbsB*(Dates(E)-Dates(E-1)))/(2*((AbsA/AbsB)+1))
GrossArea = GrossArea + AreaA + AreaB
NetArea = NetArea + (SGN(A)*AreaA) + (SGN(B)*AreaB)
RETURN
```

Notes: This routine calculates the area between the two lines between issue E and that immediately preceding it (E-1). The equation is the same as that above in case 3 & 4.

KEY

GrossArea	= The variable which represents the value of the gross area being calculated.
NetArea	= The variable which represents the value of the net area being calculated.
Area	= A variable representing the area between the line in cases such as 1 & 2 above.
AreaA	= A variable representing the area A in cases such as 3 above.
AreaB	= A variable representing the area B in cases such as 3 above.
Data(D,E)	= The average hoard composition: percentage of coins up to series E at date D.
Hoard(E)	= The specific hoard composition: percentage of coins up to series E present.
Index$	= The reference number of the specific hoard under analysis.
D	= The T.P.Q. of the specific hoard under analysis.
Dates(E)	= The date in calendar years at which coins of series E were issued.

Full Archaic & Modern Structure Analysis Program

The following is written in a version of Basic on an Apple Mac+
This software was created using the ZBasic™ Compiler.
Portions of the code are © Copyrighted, 1985 by Zedcore Inc.

```
GOSUB "Define Arrays & Variables"
GOSUB "Introduction Page"
GOSUB "Set up Data (T,E)"
GOSUB "Set up Dates (E)"
OPEN "A",1,"Data Output File"
ROUTE 1
DO
    GOSUB "Read Hoard Data"
    GOSUB "Process Hoard Data"
UNTIL Index$ = "Final Marker"
CLOSE 1
ROUTE 0
END

"Define Arrays & Variables"
    DIM Data#(280,17)
    DIM Hoard#(17)
    DIM Dates%(17)
    Date1% = 0
    Date2% = 0
    AvDate% = 0
    Date% = 0
    Index$ = "Index Name"
    Name$ = "Hoard Name"
    Denarii% = 0
    Status$ = "Sample of Hoard"
    ActualArea# = 0
    NetArea# = 0
    Area# = 0
    AreaA# = 0
    AreaB# = 0
RETURN

"Introduction Page"
    CLS
    WINDOW 1,"Introduction Page",(30,38)-(460,320),257
    WINDOW OUTPUT 1
    TEXT 2,12,4
    PRINT "Hoard Structure Analysis (Ancient or Modern)"
    TEXT 2,10,0
    PRINT "Version 1.0"
    PRINT "By John Creighton"
    DELAY 2000
    WINDOW CLOSE 1
RETURN

"Set up Data (T,E)"
    REM Data for AD40
    DATA 75.56,7.41,17.03,0,0,0,0,0,0,0
    DATA 0,0,0,0,0,0,0
    REM Data for AD45
    DATA 70.37,6.67,22.96,0,0,0,0,0,0,0
    DATA 0,0,0,0,0,0,0
    REM Data for AD50
    DATA 65.18,6.67,20.74,7.41,0,0,0,0,0,0
    DATA 0,0,0,0,0,0,0
    REM Data for AD55
    DATA 60.01,6.67,16.29,17.03,0,0,0,0,0,0
    DATA 0,0,0,0,0,0,0
    REM Data for AD60
    DATA 53.34,6.67,14.07,25.92,0,0,0,0,0,0
    DATA 0,0,0,0,0,0,0
    ...
    This setion of data continues at five year intervals.
```

```
    The data is the same as Appendix 2.42
    ...
    REM Data for AD265
    DATA 0,0,0,0,0,0,0,0,0,0
    DATA 0,1.48,3.70,11.11,36.29,40.01,7.41
    REM Data for AD270
    DATA 0,0,0,0,0,0,0,0,0,0
    DATA 0,0,2.22,9.63,38.51,43.71,5.93
    REM Data for AD275
    DATA 0,0,0,0,0,0,0,0,0,0
    DATA 0,0,0,8.89,40.00,45.92,5.19
    REM Data for AD280
    DATA 0,0,0,0,0,0,0,0,0,0
    DATA 0,0,0,5.93,41.48,47.40,5.19
    RESTORE
    REM This sets data pointer to the start
    FOR T% = 40 TO 280 STEP 5
        FOR E% = 1 TO 17
            READ Data#(T%,E%)
        NEXT E%
    NEXT T%
    REM Now to convert these into cumulative percentages...
    WINDOW 1,"Output",(30,38)-(460,320),257
    WINDOW OUTPUT 1
    PRINT "Now to convert the data into Cumulative Percentages"
    FOR T% = 40 TO 280 STEP 5
        FOR E% = 2 TO 17
            Data#(T%,E%) = Data#(T%,E%) + Data#(T%,(E%-1))
        NEXT E%
    NEXT T%
    REM Now to fill in the rest of the array
    FOR T% = 45 TO 280 STEP 5
        FOR F% = 1 TO 4
            FOR E% = 1 TO 17
                Data#((T%-5+F%),E%) = (((5-F%)*Data#((T%-5),E%))+(F%*Data#(T%,E%)))/5
            NEXT E%
        NEXT F%
        PRINT "Calcuating around the year ";T%;"  now"
    NEXT T%
    WINDOW CLOSE 1
RETURN

"Set up Dates (E)"
    DATA -40, -31, 41, 68, 69, 81, 98, 117, 138, 161, 177, 193, 212
    DATA 217, 222, 235, 238
    FOR E% = 1 TO 17
    READ Dates%(E%)
    NEXT E%
RETURN

"Read Hoard Data"
    READ Index$
    IF Index$ = "Final Marker" THEN RETURN
    READ Name$, Date1%, Date2%, AvDate%, Denarii%, Status$
    FOR E% = 1 TO 17
    READ Hoard#(E%)
    NEXT E%
RETURN
```

```
"Process Hoard Data"
    TEXT 2,12,4
    PRINT "(";Index$;") ";Name$
    TEXT 2,9,0
    Difference% = Date2%-Date1%
    Text1$="which comprise all (if not nearly all) the denarii in the hoard."
    Text2$="which comprise only a partial sample of the hoards original contents."
    Text3$="The TPQ date provided for the hoard is: "
    IF SGN(Denarii%)=1 THEN PRINT "This analysis is based on ";ABS(Denarii%);" denarii,"
    IF SGN(Denarii%)=-1 THEN PRINT "This analysis is based on ";ABS(Denarii%);" irregular     denarii,"
    IF Status$="Full" THEN PRINT Text1$
    IF Status$="Part" THEN PRINT Text2$
    IF Difference% = 0 THEN PRINT Text3$;Date1%;"AD"
    IF Difference% <>0 THEN PRINT Text3$;Date1%;"-";Date2%;"AD"
    PRINT
    TEXT 2,9,0
    PRINT "Reference";CHR$(9);"Date";CHR$(9);"Total Area";CHR$(9);"Net Area"
    D% = (Date1%-2)
    DO
        ActualArea# = 0
        NetArea# = 0
        FOR E% = 2 TO 17
        A# = Data#(D%,E%-1) - Hoard#(E%-1)
        B# = Data#(D%,E%) - Hoard#(E%)
        C# = A# * B#
        F C#>=0 THEN GOSUB "Normal Situation" ELSE GOSUB "Crossing Situation"
        NEXT E%
        PRINT Index$;CHR$(9);D%;CHR$(9);ActualArea#;CHR$(9);NetArea#
        D% =D%+1
    UNTIL D%>(Date2%+2)
    PRINT
RETURN

"Normal Situation"
    Area# = (A#+B#) * (Dates%(E%)-Dates%(E%-1))/2
    ActualArea# = ActualArea# + ABS(Area#)
    NetArea# = NetArea# + Area#
RETURN

"Crossing Situation"
    AbsA# = ABS(A#)
    AbsB# = ABS(B#)
    AreaA# = (AbsA#*(Dates%(E%)-Dates%(E%-1)))/(2*((AbsB#/AbsA#)+1))
    AreaB# = (AbsB#*(Dates%(E%)-Dates%(E%-1)))/(2*((AbsA#/AbsB#)+1))
    ActualArea# = ActualArea# + AreaA# + AreaB#
    NetArea# = NetArea# + (SGN(A#)*AreaA#) + (SGN(B#)*AreaB#)
RETURN

Example of hoard data:
DATA "J 060","Chippenham",41,41,41,37,"Full"
DATA 59.459,67.567,100,100,100,100,100,100,100
DATA 100,100,100,100,100,100,100,100
REM ------------------------------------------------------
DATA "J 003q","Almondbury",43,43,43,200,"Full"
DATA 100,100,100,100,100,100,100,100,100
DATA 100,100,100,100,100,100,100,100
REM ------------------------------------------------------
DATA "J 143f","Lightcliffe",43,43,43,24,"Part"
DATA 87.5,87.5,100,100,100,100,100,100,100
DATA 100,100,100,100,100,100,100,100
REM ------------------------------------------------------
DATA "J 246","Verulamium",117,117,117,49,"Full"
DATA 32.653,42.857,44.897,46.938,48.979,71.428,89.795,100.00,100.00
DATA 100.00,100.00,100.00,100.00,100.00,100.00,100.00,100.00
REM ------------------------------------------------------
DATA "Final Marker"
```

Appendix 2.52

Hoard structure analysis: worked examples

Examples of hoards with an archaic, modern and normal structure; & the Falkirk hoard

Notes

The **T.P.Q. range** is indicated by the latest coin from the hoard is marked by the date range between the two black lines.

The **'best fit date'** is indicated by a bold type-face.

The **best date within the T.P.Q. range** is indicated by the line being in italics.

A. An example of a normal structure

(with its 'best fit' date within its T.P.Q. range)

(C 179) Mildenhall(BeckRow)

This analysis is based on 277 denarii, which comprise all (if not nearly all) the denarii in the hoard. The TPQ date provided for the hoard is: 80-85AD

Date	TotalArea	NetArea
70	1459	1459
71	1230	1230
72	1059	1059
73	858	858
74	688	688
75	586	586
76	447	445
77	394	304
78	379	225
79	372	136
80	***383***	***59***
81	433	-87
82	492	-276
83	521	-373
84	589	-487
85	612	-538
86	762	-708
87	890	-836
88	986	-964
89	1103	-1081
90	1123	-1101
91	1281	-1263
92	1365	-1347
93	1493	-1485
94	1541	-1533
95	1598	-1590

B. An example of a 'modern' structure

(with its 'best' date outside its T.P.Q. range)

(C 084) Dewsbury

This analysis is based on 26 denarii, which comprise all (if not nearly all) the denarii in the hoard. The TPQ date provided for the hoard is: 117-138AD

Date	TotalArea	NetArea
110	5753	5753
111	5623	5623
112	5531	5531
113	5410	5410
114	5359	5359
115	5319	5319
116	5107	5107
117	5054	5054
118	4917	4917
119	4859	4859
120	4822	4822
121	4581	4581
122	4505	4505
123	4317	4317
124	4156	4156
125	4088	4088
126	3738	3738
127	3455	3455
128	3179	3179
129	2983	2983
130	2766	2766
131	2514	2514
132	2222	2222
133	2049	2049
134	1881	1881
135	1682	1682
136	1551	1527
137	1383	1359
138	*1242*	*1186*
139	1193	1137
140	1139	1079
141	1018	920
142	983	849
143	851	633
144	836	572
145	803	565
146	668	362
147	640	288
148	649	253
149	656	168
150	608	120
151	**583**	**-35**
152	614	-98
153	656	-140
154	678	-192
155	682	-180
156	641	-393
157	701	-469
158	696	-484
159	756	-544
160	709	-493

C. An example of a 'archaic' structure

(with its 'best' date outside its T.P.Q. range)

(C 193q) *ParwichHill*

This analysis is based on 80 denarii, which comprise all (if not nearly all) the denarii in the hoard. The TPQ date provided for the hoard is: 161-180AD

Date	TotalArea	NetArea
140	1441	1441
141	1244	1244
142	1169	1169
143	1013	1011
144	953	951
145	976	976
146	760	718
147	706	660
148	650	604
149	602	538
150	597	529
151	470	326
152	429	259
153	394	224
154	379	167
155	413	229
156	402	38

157	**415**	**-35**
158	408	-56
159	428	-164
160	365	-99
161	*432*	*-238*
162	469	-275
163	482	-366
164	501	-391
165	476	-356
166	583	-513
167	611	-559
168	668	-620
169	735	-705
170	691	-655
171	831	-813
172	893	-875
173	976	-958
174	990	-988
175	983	-973
176	1147	-1145
177	1230	-1228
178	1271	-1269
179	1348	-1348
180	1303	-1301
181	1493	-1493
182	1570	-1570
183	1695	-1695
184	1780	-1780
185	1677	-1677

D. An example of a very archaic structure
(with its 'best' date outside its T.P.Q. range)

(S 071) Falkirk
This analysis is based on 931 denarii, which comprise all (if not nearly all) the denarii in the hoard. The TPQ date provided for the hoard is: 230AD

Date	Total Area	Net Area
160	1911	1585
161	1854	1410
162	1812	1368
163	1764	1292
164	1742	1270
165	1758	1330
166	1654	1096
167	1612	1026
168	1593	971
169	1538	904
170	1554	972
171	1492	792
172	1437	737
173	1375	677
174	1366	640
175	1373	671
176	1310	498
177	1262	420
178	1227	373
179	1197	287
180	1214	296
181	1149	103
182	**1114**	**26**
183	1155	-49
184	1132	-124
185	1029	-45
186	1115	-259
187	1107	-311
188	1156	-386
189	1165	-459
190	1107	-403
191	1203	-669
192	1263	-757
193	1310	-840
194	1414	-1030
195	1390	-1012
196	1546	-1306
197	1626	-1398
198	1794	-1628
199	1976	-1810
200	1971	-1825
201	2259	-2143
202	2393	-2293
203	2532	-2452
204	2682	-2606
205	2671	-2593
206	2977	-2899
207	3126	-3060
208	3305	-3239
209	3464	-3398
210	3448	-3386
211	3755	-3693
212	3890	-3830
213	4013	-3953
214	4179	-4119
215	4151	-4091
216	4466	-4426
217	4591	-4555
218	4771	-4741
219	4884	-4856
220	4882	-4854
221	5152	-5152
222	5331	-5331
223	5464	-5464
224	5629	-5629
225	5610	-5610
226	5912	-5912
227	6054	-6054
228	6181	-6181
229	6323	-6323
230	*6283*	*-6283*
231	6598	-6598
232	6744	-6744
233	6901	-6901
234	7044	-7044
235	7068	-7068
236	7300	-7300
237	7444	-7444
238	7596	-7596
239	7707	-7707
240	7731	-7731
241	7956	-7956
242	8016	-8016
243	8139	-8139
244	8220	-8220
245	8195	-8195
246	8406	-8406
247	8474	-8474
248	8554	-8554
249	8623	-8623
250	8607	-8607

Appendix 2.53
Hoard structure analysis
Coin hoards with T.P.Q. ranges

Note:
The following tables show hoards which have not been given a precise T.P.Q.; because of this the 'best fit date' has been found calculated, and is highlited here. The definition is that point within the T.P.Q. band that the 'net area' tends most towards zero, i.e. it is neither archaich not modern in structure. In all subsequent analyses this has been used as the nominal date of the hoard.

(C 157) London (St Swithin's Lane)
This analysis is based on 89 irregular denarii, which comprise all (if not nearly all) the denarii in the hoard. The TPQ date provided for the hoard is: 41 - 54 AD

Reference	Date	Total Area	Net Area
C 157	41	1507	1507
C 157	42	1462	1462
C 157	43	1417	1417
C 157	44	1372	1372
C 157	45	1331	1331
C 157	46	1197	1195
C 157	47	1168	1134
C 157	48	1165	1047
C 157	49	1150	972
C 157	50	1189	915
C 157	51	1185	757
C 157	52	1256	596
C 157	53	1274	488
C 157	**54**	**1292**	**380**

(C 188n) Nunney
This analysis is based on 4 denarii, which comprise all (if not nearly all) the denarii in the hoard. The TPQ date provided for the hoard is: 43 - 54 AD

Reference	Date	Total Area	Net Area
C 188n	43	168	156
C 188n	44	132	96
C 188n	**45**	**95**	**55**
C 188n	46	126	-126
C 188n	47	220	-220
C 188n	48	364	-364
C 188n	49	459	-459
C 188n	50	508	-508
C 188n	51	747	-747
C 188n	52	891	-891
C 188n	53	1035	-1035
C 188n	54	1179	-1179

(C 241) Usk (Hoard 1)
This analysis is based on 6 denarii, which comprise all (if not nearly all) the denarii in the hoard. The TPQ date provided for the hoard is: 55 - 57 AD

Reference	Date	Total Area	Net Area
C 241	55	3078	3078
C 241	56	2902	2902
C 241	**57**	**2758**	**2758**

(C 103) Eriswell
This analysis is based on 72 denarii, which comprise all (if not nearly all) the denarii in the hoard. The TPQ date provided for the hoard is: 60 - 61 AD

Reference	Date	Total Area	Net Area
C 103	**60**	**1225**	**-1217**
C 103	61	1401	-1401

(C 221) Scole
This analysis is based on 87 denarii, which comprise all (if not nearly all) the denarii in the hoard. The TPQ date provided for the hoard is: 60 - 61 AD

Reference	Date	Total Area	Net Area
C 221	**60**	**1764**	**-1764**
C 221	61	1948	-1948

(C 260n) Weston Longville
This analysis is based on 2 denarii, which comprise all (if not nearly all) the denarii in the hoard. The TPQ date provided for the hoard is: 60 - 61 AD

Reference	Date	Total Area	Net Area
C 260n	**60**	**1448**	**-1092**
C 260n	61	1503	-1269

(C 128q) Honley (Northgate Mount)
This analysis is based on 13 denarii, which comprise all (if not nearly all) the denarii in the hoard. The TPQ date provided for the hoard is: 69 - 79 AD

Reference	Date	Total Area	Net Area
C 128q	**69**	**3379**	**-3379**
C 128q	70	3413	-3413
C 128q	71	3643	-3643
C 128q	72	3813	-3813
C 128q	73	4015	-4015
C 128q	74	4184	-4184
C 128q	75	4273	-4273
C 128q	76	4449	-4449
C 128q	77	4587	-4587
C 128q	78	4722	-4722
C 128q	79	4820	-4820

(C 036) Budge Row
This analysis is based on 74 denarii, which comprise only a partial sample of the hoards original contents. The TPQ date provided for the hoard is: 78 - 79 AD

Reference	Date	Total Area	Net Area
C 036	**78**	**1084**	**-1050**
C 036	79	1162	-1140

(C 179) Mildenhall (Beck Row)
This analysis is based on 277 denarii, which comprise all (if not nearly all) the denarii in the hoard. The TPQ date provided for the hoard is: 80 - 85 AD

Reference	Date	Total Area	Net Area
C 179	**80**	**383**	**59**
C 179	81	433	-87
C 179	82	492	-276
C 179	83	521	-373
C 179	84	589	-487
C 179	85	612	-538

(C 010n) Bath .
This analysis is based on 92 denarii, which comprise all (if not nearly all) the denarii in the hoard. The TPQ date provided for the hoard is: 98 - 117 AD

Reference	Date	Total Area	Net Area
C 010n	98	1531	1531
C 010n	99	1433	1433
C 010n	100	1403	1403
C 010n	101	1263	1263
C 010n	102	1143	1123
C 010n	103	1105	1061
C 010n	104	1034	964
C 010n	105	1033	933
C 010n	106	931	737
C 010n	107	916	586
C 010n	108	871	469
C 010n	109	819	379
C 010n	110	837	331
C 010n	111	792	208
C 010n	112	780	124
C 010n	113	750	26
C 010n	**114**	**799**	**-25**
C 010n	115	834	-56
C 010n	116	853	-269
C 010n	117	905	-321

(C 141q) Lavenham
This analysis is based on 183 denarii, which comprise only a partial sample of the hoards original contents. The TPQ date provided for the hoard is: 98 - 117 AD

Reference	Date	Total Area	Net Area
C 141q	98	4298	4298
C 141q	99	4200	4200
C 141q	100	4161	4161
C 141q	101	4030	4030
C 141q	102	3864	3864
C 141q	103	3798	3798
C 141q	104	3695	3695
C 141q	105	3705	3705
C 141q	106	3457	3457
C 141q	107	3394	3394
C 141q	108	3330	3282
C 141q	109	3274	3198
C 141q	110	3332	3192
C 141q	111	3215	2953
C 141q	112	3200	2866
C 141q	113	3116	2746
C 141q	114	3142	2700
C 141q	115	3151	2675
C 141q	116	3106	2470
C 141q	**117**	**3152**	**2424**

(C 190q) Oughtibridge (Middlewood)
This analysis is based on 5 denarii, which comprise all (if not nearly all) the denarii in the hoard. The TPQ date provided for the hoard is: 103 - 111 AD

Reference	Date	Total Area	Net Area
C 190q	103	4901	4901
C 190q	104	4799	4799
C 190q	105	4741	4741
C 190q	106	4561	4561
C 190q	107	4476	4476
C 190q	108	4351	4351
C 190q	109	4263	4263
C 190q	110	4198	4198
C 190q	**111**	**4068**	**4068**

(S 059) Corbridge 1965
This analysis is based on 6 denarii, which comprise all (if not nearly all) the denarii in the hoard. The TPQ date provided for the hoard is: 119 - 122 AD

Reference	Date	Total Area	Net Area
S 059	119	3952	3952
S 059	120	3928	3928
S 059	121	3738	3720
S 059	**122**	**3688**	**3654**

(S 155) Thorngrafton
This analysis is based on 60 denarii, which comprise all (if not nearly all) the denarii in the hoard. The TPQ date provided for the hoard is: 119 - 122 AD

Reference	Date	Total Area	Net Area
S 155	119	1306	1306
S 155	120	1317	1303
S 155	121	1283	1063
S 155	**122**	**1348**	**990**

(C 084) Dewsbury
This analysis is based on 26 denarii, which comprise all (if not nearly all) the denarii in the hoard. The TPQ date provided for the hoard is: 117 - 138 AD

Reference	Date	Total Area	Net Area
C 084	117	5054	5054
C 084	118	4917	4917
C 084	119	4859	4859
C 084	120	4822	4822
C 084	121	4581	4581
C 084	122	4505	4505
C 084	123	4317	4317
C 084	124	4156	4156
C 084	125	4088	4088
C 084	126	3738	3738
C 084	127	3455	3455
C 084	128	3179	3179
C 084	129	2983	2983
C 084	130	2766	2766
C 084	131	2514	2514
C 084	132	2222	2222
C 084	133	2049	2049
C 084	134	1881	1881
C 084	135	1682	1682
C 084	136	1551	1527
C 084	137	1383	1359
C 084	**138**	**1242**	**1186**

(C 228) Southampshire
This analysis is based on 15 denarii, which comprise all (if not nearly all) the denarii in the hoard. The TPQ date provided for the hoard is: 117 - 138 AD

Reference	Date	Total Area	Net Area
C 228	**117**	**8454**	**-8454**
C 228	118	8591	-8591
C 228	119	8650	-8650
C 228	120	8654	-8654
C 228	121	8927	-8927
C 228	122	9003	-9003
C 228	123	9191	-9191
C 228	124	9353	-9353
C 228	125	9388	-9388
C 228	126	9771	-9771
C 228	127	10053	-10053
C 228	128	10330	-10330
C 228	129	10526	-10526

C 228	130	10727	-10727
C 228	131	10996	-10996
C 228	132	11286	-11286
C 228	133	11460	-11460
C 228	134	11627	-11627
C 228	135	11804	-11804
C 228	136	11997	-11997
C 228	137	12164	-12164
C 228	138	12344	-12344

(C 228) Southampshire

This analysis is based on 2 irregular denarii, which comprise all (if not nearly all) the denarii in the hoard. The TPQ date provided for the hoard is: 117 - 138 AD

Reference	Date	Total Area	Net Area
C 228	**117**	**4163**	**-4163**
C 228	118	4299	-4299
C 228	119	4359	-4359
C 228	120	4321	-4321
C 228	121	4635	-4635
C 228	122	4712	-4712
C 228	123	4900	-4900
C 228	124	5061	-5061
C 228	125	5055	-5055
C 228	126	5479	-5479
C 228	127	5761	-5761
C 228	128	6037	-6037
C 228	129	6235	-6235
C 228	130	6382	-6382
C 228	131	6705	-6705
C 228	132	6993	-6993
C 228	133	7168	-7168
C 228	134	7335	-7335
C 228	135	7472	-7472
C 228	136	7706	-7706
C 228	137	7873	-7873
C 228	138	8051	-8051

(C 261) Weston (Green Farm)

This analysis is based on 12 denarii, which comprise all (if not nearly all) the denarii in the hoard. The TPQ date provided for the hoard is: 134 - 138 AD

Reference	Date	Total Area	Net Area
C 261	134	2495	2495
C 261	135	2277	2277
C 261	136	2163	2137
C 261	137	1996	1970
C 261	**138**	**1858**	**1792**

(S 114) Mallerstang

This analysis is based on 138 denarii, which comprise all (if not nearly all) the denarii in the hoard. The TPQ date provided for the hoard is: 134 - 138 AD

Reference	Date	Total Area	Net Area
S 114	134	1824	1754
S 114	135	1627	1553
S 114	136	1570	1390
S 114	137	1436	1230
S 114	**138**	**1346**	**1046**

(C 236) Swaby

This analysis is based on 178 denarii, which comprise all (if not nearly all) the denarii in the hoard. The TPQ date provided for the hoard is: 137 - 138 AD

Reference	Date	Total Area	Net Area
C 236	137	664	132
C 236	**138**	**611**	**-43**

(S 116) Maryport

This analysis is based on 155 irregular denarii, which comprise all (if not nearly all) the denarii in the hoard. The TPQ date provided for the hoard is: 180 - 192 AD

Reference	Date	Total Area	Net Area
S 116	**180**	**1436**	**-686**
S 116	181	1513	-829
S 116	182	1590	-906
S 116	183	1509	-1033
S 116	184	1580	-1118
S 116	185	1637	-1073
S 116	186	1714	-1252
S 116	187	1772	-1310
S 116	188	1841	-1397
S 116	189	1914	-1470
S 116	190	1998	-1438
S 116	191	2084	-1672
S 116	192	2195	-1783

(C 127n) Hengistbury Head (Site 33)

This analysis is based on 24 denarii, which comprise all (if not nearly all) the denarii in the hoard. The TPQ date provided for the hoard is: 140 - 144 AD

Reference	Date	Total Area	Net Area
C 127n	**140**	**2883**	**-2855**
C 127n	141	3064	-3040
C 127n	142	3105	-3105
C 127n	143	3259	-3259
C 127n	144	3320	-3320

(S 127) Norton (Malton)

This analysis is based on 39 denarii, which comprise all (if not nearly all) the denarii in the hoard. The TPQ date provided for the hoard is: 143 - 144 AD

Reference	Date	Total Area	Net Area
S 127	143	275	245
S 127	**144**	**253**	**191**

(S 060) Corbridge 1969

This analysis is based on 12 denarii, which comprise all (if not nearly all) the denarii in the hoard. The TPQ date provided for the hoard is: 145 - 161 AD

Reference	Date	Total Area	Net Area
S 060	145	1294	1294
S 060	146	1097	1097
S 060	147	1017	1017
S 060	148	981	981
S 060	149	942	916
S 060	150	902	848
S 060	151	812	720
S 060	152	784	644
S 060	153	780	608
S 060	154	764	558
S 060	155	766	494
S 060	156	656	296
S 060	157	637	235
S 060	158	617	215
S 060	159	605	157
S 060	160	624	196
S 060	**161**	**600**	**70**

(S 129) Piercebridge

This analysis is based on 6 denarii, which comprise all (if not nearly all) the denarii in the hoard. The TPQ date provided for the hoard is: 156 - 157 AD

Reference	Date	Total Area	Net Area
S 129	156	1480	360
S 129	**157**	**1463**	**305**

(C 187n) Nottingham

This analysis is based on 19 denarii, which comprise all (if not nearly all) the denarii in the hoard. The TPQ date provided for the hoard is: 157 - 161 AD

Reference	Date	Total Area	Net Area
C 187n	157	1275	1259
C 187n	158	1254	1238
C 187n	159	1194	1178
C 187n	160	1213	1213
C 187n	**161**	**1130**	**1094**

(C 212) Pyrford (Bolton's Lane)

This analysis is based on 82 denarii, which comprise all (if not nearly all) the denarii in the hoard. The TPQ date provided for the hoard is: 159 - 160 AD

Reference	Date	Total Area	Net Area
C 212	**159**	**654**	**440**
C 212	160	667	471

(C 198) Piercebridge

This analysis is based on 8 denarii, which comprise all (if not nearly all) the denarii in the hoard. The TPQ date provided for the hoard is: 164 - 169 AD

Reference	Date	Total Area	Net Area
C 198	164	1253	1051
C 198	165	1238	1052
C 198	166	1140	938
C 198	167	1093	861
C 198	168	1064	814
C 198	**169**	**998**	**748**

(C 039n) Caistor St Edmund

This analysis is based on 20 denarii, which comprise all (if not nearly all) the denarii in the hoard. The TPQ date provided for the hoard is: 161 - 180 AD

Reference	Date	Total Area	Net Area
C 039n	**161**	**1245**	**5**
C 039n	162	1207	-33
C 039n	163	1164	-104
C 039n	164	1143	-125
C 039n	165	1076	-88
C 039n	166	1061	-245
C 039n	167	1019	-315
C 039n	168	1002	-368
C 039n	169	957	-427
C 039n	170	892	-388
C 039n	171	936	-534
C 039n	172	910	-592
C 039n	173	848	-688
C 039n	174	861	-735
C 039n	175	806	-708
C 039n	176	903	-881
C 039n	177	987	-965
C 039n	178	1028	-1006
C 039n	179	1120	-1098
C 039n	180	1074	-1032

(C 184q) Naseby

This analysis is based on 38 denarii, which comprise all (if not nearly all) the denarii in the hoard. The TPQ date provided for the hoard is: 161 - 180 AD

Reference	Date	Total Area	Net Area
C 184q	161	1419	1419
C 184q	162	1376	1376
C 184q	163	1301	1301
C 184q	164	1280	1280
C 184q	165	1294	1294
C 184q	166	1157	1157
C 184q	167	1082	1082
C 184q	168	1022	1022
C 184q	169	953	953
C 184q	170	979	979
C 184q	171	836	836
C 184q	172	775	775
C 184q	173	692	692
C 184q	174	655	655
C 184q	175	640	640
C 184q	176	562	520
C 184q	177	587	437
C 184q	178	600	398
C 184q	179	638	332
C 184q	**180**	**668**	**334**

(C 193q) Parwich Hill

This analysis is based on 80 denarii, which comprise all (if not nearly all) the denarii in the hoard. The TPQ date provided for the hoard is: 161 - 180 AD

Reference	Date	Total Area	Net Area
C 193q	**161**	**432**	**-238**
C 193q	162	469	-275
C 193q	163	482	-366
C 193q	164	501	-391
C 193q	165	476	-356
C 193q	166	583	-513
C 193q	167	611	-559
C 193q	168	668	-620
C 193q	169	735	-705
C 193q	170	691	-655
C 193q	171	831	-813
C 193q	172	893	-875
C 193q	173	976	-958
C 193q	174	990	-988
C 193q	175	983	-973
C 193q	176	1147	-1145
C 193q	177	1230	-1228
C 193q	178	1271	-1269
C 193q	179	1348	-1348
C 193q	180	1303	-1301

(C 121) Gurnard

This analysis is based on 15 irregular denarii, which comprise all (if not nearly all) the denarii in the hoard. The TPQ date provided for the hoard is: 170 - 174 AD

Reference	Date	Total Area	Net Area
C 121	170	3414	3414
C 121	171	3319	3319
C 121	172	3258	3258
C 121	173	3175	3175
C 121	**174**	**3138**	**3138**

(C 001) Aldworth

This analysis is based on 75 denarii, which comprise all (if not nearly all) the denarii in the hoard. The TPQ date provided for the hoard is: 176 - 177 AD

Reference	Date	Total Area	Net Area
C 001	176	383	351
C 001	**177**	**329**	**277**

(C 097) Edwinstone

This analysis is based on 368 denarii, which comprise all (if not nearly all) the denarii in the hoard. The TPQ date provided for the hoard is: 177 - 180 AD

Reference	Date	Total Area	Net Area
C 097	**177**	**609**	**-361**
C 097	178	650	-402
C 097	179	712	-494
C 097	180	761	-483

(C 097) Edwinstone

This analysis is based on 1 irregular denarii, which comprise all (if not nearly all) the denarii in the hoard. The TPQ date provided for the hoard is: 177 - 180 AD

Reference	Date	Total Area	Net Area
C 097	**177**	**2872**	**-1694**
C 097	178	2913	-1735
C 097	179	2977	-1827
C 097	180	3001	-1821

(C 011n) Beachamwell

This analysis is based on 37 denarii, which comprise only a partial sample of the hoards original contents. The TPQ date provided for the hoard is: 177 - 180 AD

Reference	Date	Total Area	Net Area
C 011n	177	621	211
C 011n	178	580	170
C 011n	179	517	77
C 011n	**180**	**438**	**140**

(S 097) Kirkby Thore

This analysis is based on 234 denarii, which comprise all (if not nearly all) the denarii in the hoard. The TPQ date provided for the hoard is: 180 - 183 AD

Reference	Date	Total Area	Net Area
S 097	180	445	395
S 097	181	438	216
S 097	182	433	141
S 097	**183**	**342**	**24**

(C 010) Barway

This analysis is based on 433 denarii, which comprise all (if not nearly all) the denarii in the hoard. The TPQ date provided for the hoard is: 180 - 192 AD

Reference	Date	Total Area	Net Area
C 010	180	346	142
C 010	**181**	**325**	**-85**
C 010	182	366	-154
C 010	183	331	-215
C 010	184	398	-304
C 010	185	414	-274
C 010	186	532	-438
C 010	187	590	-496
C 010	188	654	-588
C 010	189	727	-661
C 010	190	752	-646
C 010	191	901	-859
C 010	192	1012	-970

(C 033) Brixworth

This analysis is based on 25 denarii, which comprise all (if not nearly all) the denarii in the hoard. The TPQ date provided for the hoard is: 180 - 192 AD

Reference	Date	Total Area	Net Area
C 033	180	989	989
C 033	181	886	886
C 033	182	808	808
C 033	183	682	682
C 033	184	644	626
C 033	185	676	658
C 033	186	593	511
C 033	187	568	452
C 033	188	536	368
C 033	189	526	254
C 033	190	572	282
C 033	**191**	**510**	**40**
C 033	192	560	-126

(C 162n) Lydney

This analysis is based on 32 denarii, which comprise all (if not nearly all) the denarii in the hoard. The TPQ date provided for the hoard is: 180 - 192 AD

Reference	Date	Total Area	Net Area
C 162n	**180**	**211**	**-55**
C 162n	181	241	-233
C 162n	182	297	-289
C 162n	183	363	-363
C 162n	184	446	-446
C 162n	185	409	-409
C 162n	186	582	-582
C 162n	187	639	-639
C 162n	188	735	-735
C 162n	189	809	-809
C 162n	190	774	-774
C 162n	191	1008	-1008
C 162n	192	1119	-1119

(C 162) Lowestoft

This analysis is based on 38 denarii, which comprise all (if not nearly all) the denarii in the hoard. The TPQ date provided for the hoard is: 186 - 189 AD

Reference	Date	Total Area	Net Area
C 162	**186**	**682**	**-682**
C 162	187	740	-740
C 162	188	836	-836
C 162	189	909	-909

(C 125) Handley Upwood Farm

This analysis is based on 639 denarii, which comprise all (if not nearly all) the denarii in the hoard. The TPQ date provided for the hoard is: 194 - 195 AD

Reference	Date	Total Area	Net Area
C 125	194	1102	-1102
C 125	**195**	**1037**	**-1037**

(C 223) Silchester Hoard 1

This analysis is based on 258 denarii, which comprise only a partial sample of the hoards original contents. The TPQ date provided for the hoard is: 194 - 195 AD

Reference	Date	Total Area	Net Area
C 223	**194**	**1741**	**-1741**
C 223	195	1746	-1746

(S 132) Portmoak

This analysis is based on 129 denarii, which comprise only a partial sample of the hoards original contents. The TPQ date provided for the hoard is: 196 - 197 AD

Reference	Date	Total Area	Net Area
S 132	**196**	**1089**	**-1089**
S 132	197	1216	-1216

(S 115) Malton

This analysis is based on 8 denarii, which comprise all (if not nearly all) the denarii in the hoard. The TPQ date provided for the hoard is: 201 - 206 AD

Reference	Date	Total Area	Net Area
S 115	201	3633	3633
S 115	202	3489	3489
S 115	203	3317	3317
S 115	204	3153	3153
S 115	205	3093	3093
S 115	**206**	**2847**	**2847**

(S 117) Hill of Megray

This analysis is based on 20 denarii, which comprise only a partial sample of the hoards original contents. The TPQ date provided for the hoard is: 202 - 210 AD

Reference	Date	Total Area	Net Area
S 117	**202**	**1119**	**-1013**
S 117	203	1258	-1178
S 117	204	1399	-1345
S 117	205	1512	-1316
S 117	206	1690	-1656
S 117	207	1842	-1808
S 117	208	1998	-1990
S 117	209	2155	-2149
S 117	210	2244	-2128

(C 199) Piercebridge

This analysis is based on 6 denarii, which comprise all (if not nearly all) the denarii in the hoard. The TPQ date provided for the hoard is: 203 - 211 AD

Reference	Date	Total Area	Net Area
C 199	203	5423	5423
C 199	204	5257	5257
C 199	205	5209	5209
C 199	206	4954	4954
C 199	207	4801	4801
C 199	208	4624	4624
C 199	209	4465	4465
C 199	210	4427	4427
C 199	**211**	**4171**	**4171**

(C 199) Piercebridge

This analysis is based on 15 irregular denarii, which comprise all (if not nearly all) the denarii in the hoard. The TPQ date provided for the hoard is: 203 - 211 AD

Reference	Date	Total Area	Net Area
C 199	203	5207	5207
C 199	204	5041	5041
C 199	205	4993	4993
C 199	206	4738	4738
C 199	207	4585	4585
C 199	208	4408	4408
C 199	209	4249	4249
C 199	210	4224	4224
C 199	**211**	**3998**	**3986**

(C 019) Billingsgate

This analysis is based on 142 irregular denarii, which comprise all (if not nearly all) the denarii in the hoard. The TPQ date provided for the hoard is: 212 - 217 AD

Reference	Date	Total Area	Net Area
C 019	212	3941	3757
C 019	213	3835	3641
C 019	214	3704	3488
C 019	215	3679	3453
C 019	216	3509	3159
C 019	**217**	**3423**	**3027**

(C 051) Chadwell St Mary

This analysis is based on 100 denarii, which comprise all (if not nearly all) the denarii in the hoard. The TPQ date provided for the hoard is: 213 - 217 AD

Reference	Date	Total Area	Net Area
C 051	**213**	**1193**	**61**
C 051	214	1057	-133
C 051	215	912	-118
C 051	216	1006	-478
C 051	217	1002	-596

(S 122) Nawton

This analysis is based on 33 denarii, which comprise all (if not nearly all) the denarii in the hoard. The TPQ date provided for the hoard is: 217 - 218 AD

Reference	Date	Total Area	Net Area
S 122	217	864	476
S 122	**218**	**783**	**275**

(C 043) Camborne Roman Villa

This analysis is based on 13 denarii, which comprise all (if not nearly all) the denarii in the hoard. The TPQ date provided for the hoard is: 222 - 235 AD

Reference	Date	Total Area	Net Area
C 043	222	2850	2850
C 043	223	2718	2718
C 043	224	2552	2552
C 043	225	2529	2529
C 043	226	2270	2270
C 043	227	2129	2129
C 043	228	2001	2001
C 043	229	1860	1860
C 043	230	1846	1846
C 043	231	1585	1585
C 043	232	1439	1439
C 043	233	1280	1280
C 043	234	1138	1138
C 043	**235**	**1080**	**1080**

(C 089n) East Anglia

This analysis is based on 3062 denarii, which comprise all (if not nearly all) the denarii in the hoard. The TPQ date provided for the hoard is: 222 - 235 AD

Reference	Date	Total Area	Net Area
C 089n	222	797	725
C 089n	223	772	622
C 089n	224	753	443
C 089n	225	818	450
C 089n	226	717	175
C 089n	**227**	**706**	**30**
C 089n	228	773	-81
C 089n	229	796	-214
C 089n	230	914	-216

C 089n	231	920	-506
C 089n	232	996	-646
C 089n	233	1076	-788
C 089n	234	1146	-936
C 089n	235	1218	-966

(C 188) Nuneaton

This analysis is based on 29 denarii, which comprise all (if not nearly all) the denarii in the hoard. The TPQ date provided for the hoard is: 222 - 235 AD

Reference	Date	Total Area	Net Area
C 188	222	2938	2292
C 188	223	2805	2159
C 188	224	2640	1994
C 188	225	2506	1980
C 188	226	2357	1711
C 188	227	2217	1571
C 188	228	2086	1440
C 188	229	1961	1293
C 188	230	1849	1301
C 188	231	1717	1015
C 188	232	1579	857
C 188	233	1443	709
C 188	234	1339	593
C 188	**235**	**1330**	**544**

(C 246f) Verulamium

This analysis is based on 5 denarii, which comprise all (if not nearly all) the denarii in the hoard. The TPQ date provided for the hoard is: 227 - 229 AD

Reference	Date	Total Area	Net Area
C 246f	**227**	**3654**	**-3548**
C 246f	228	3749	-3677
C 246f	229	3871	-3815

(C 284) ? Britain

This analysis is based on 147 denarii, which comprise all (if not nearly all) the denarii in the hoard. The TPQ date provided for the hoard is: 230 - 235 AD

Reference	Date	Total Area	Net Area
C 284	230	1636	1354
C 284	231	1530	1088
C 284	232	1440	948
C 284	233	1363	807
C 284	234	1285	667
C 284	**235**	**1278**	**614**

(C 078q) Darfield 1

This analysis is based on 480 denarii, which comprise all (if not nearly all) the denarii in the hoard. The TPQ date provided for the hoard is: 235 - 238 AD

Reference	Date	Total Area	Net Area
C 078q	**235**	**1828**	**-1828**
C 078q	236	2030	-2030
C 078q	237	2173	-2173
C 078q	238	2324	-2324

(C 036s) Cadeby

This analysis is based on 28 denarii, which comprise only a partial sample of the hoards original contents. The TPQ date provided for the hoard is: 235 - 238 AD

Reference	Date	Total Area	Net Area
C 036s	235	564	320
C 036s	236	546	82
C 036s	**237**	**553**	**-29**
C 036s	238	567	-211

(C 058) Chesterfield

This analysis is based on 19 denarii, which comprise all (if not nearly all) the denarii in the hoard. The TPQ date provided for the hoard is: 238 - 244 AD

Reference	Date	Total Area	Net Area
C 058	238	2167	2167
C 058	239	2056	2056
C 058	240	2002	2002
C 058	241	1805	1805
C 058	242	1745	1745
C 058	243	1625	1625
C 058	**244**	**1541**	**1541**

(C 119) Great Chesterford

This analysis is based on 35 denarii, which comprise all (if not nearly all) the denarii in the hoard. The TPQ date provided for the hoard is: 247 - 249 AD

Reference	Date	Total Area	Net Area
C 119	**247**	**790**	**-790**
C 119	248	861	-861
C 119	249	930	-930

(C 124) Ham Hill (Montacute)

This analysis is based on 1 denarius, which comprise all (if not nearly all) the denarii in the hoard. The TPQ date provided for the hoard is: 270 - 273 AD

Reference	Date	Total Area	Net Area
C 124	**270**	**11589**	**-11589**
C 124	271	11639	-11639
C 124	272	11643	-11643
C 124	273	11661	-11661

(C 024) Bonnington

This analysis is based on 1 denarius, which comprise only a partial sample of the hoards original contents. The TPQ date provided for the hoard is: 270 - 273 AD

Reference	Date	Total Area	Net Area
C 024	**270**	**3839**	**-3839**
C 024	271	3889	-3889
C 024	272	3893	-3893
C 024	273	3911	-3911

(C 170) Market Deeping

This analysis is based on 11 denarii, which comprise all (if not nearly all) the denarii in the hoard. The TPQ date provided for the hoard is: 272 - 273 AD

Reference	Date	Total Area	Net Area
C 170	272	273	273
C 170	**273**	**257**	**257**

(C 128) Hollingbourne

This analysis is based on 2 denarii, which comprise all (if not nearly all) the denarii in the hoard. The TPQ date provided for the hoard is: 276 - 282 AD

Reference	Date	Total Area	Net Area
C 128	**276**	**276**	**-276**
C 128	277	280	-280
C 128	278	294	-294
C 128	279	294	-294

Appendix 2.54
Hoard structure analysis: basic results

Key:
1. The name of the hoard
2. The number of denarii studied
3. Full: the data comprise nearly all the denarii in the hoard, or Part: the data comprise only a sample of the hoard
4. The reference number of the hoard
5. The date or 'best fit within the TPQ range' date of the hoard
6. The gross area difference
7. The net area difference (positive is a modern structure, negative is an archaic structure). This is the **METHOD 1** result.
8. The 'best fit date' of the hoard against the AD40-280 'normal structure' benchmark devised
9. The gross area difference at the 'best fit date'
10. (Column 8)-(Column 5), the difference in date between the 'best fit' and actual date of the hoard (positive is a modern structure, negative is an archaic structure). This is the **METHOD 2** result.

1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
C 060	Chippenham	37	Full	41	589	589	48	92	7
C 003q	Almondbury	200	Full	43	976	-976	<40	-796	-3
C 143f	Lightcliffe	24	Part	43	396	-396	<40	-216	-3
C 006n	Ayott Saint Lawrence	20	Part	43	1048	1048	52	225	9
C 157	London (St Swithin's Lane)	-89	Full	54	1292	380	55	333	1
C 188n	Nunney	4	Full	45	95	55	45	55	0
C 241	Usk (Hoard1)	6	Full	57	2758	2758	77	58	20
C 103	Eriswell	72	Full	60	1225	-1217	51	137	-9
C 221	Scole	87	Full	60	1764	-1764	47	-22	-13
C 260n	Weston Longville	2	Full	60	1448	-1092	54	234	-6
C 128q	Honley (Northgate Mount)	13	Full	69	3379	-3379	40	-221	-29
S 176	York (Blake Street)	35	Full	74	3249	3249	105	29	31
S 014	Binnington Carr	12	Full	78	4713	4713	122	59	44
C 036	Budge Row	74	Part	78	1084	-1050	72	-74	-6
C 179	Mildenhall (Beck Row)	277	Full	80	383	59	80	59	0
C 130	The Howe	75	Full	87	1625	-1625	74	-35	-13
C 151n	Llanfaethlu	32	Full	87	2621	-2621	67	10	-20
C 064	Cirencester	22	Full	94	1303	-1303	82	-32	-12
C 176	Mereclough	12	Part	98	3219	-3217	72	-41	-26
S 058	Corbridge1914	32	Full	99	2546	2316	121	28	22
C 010n	Bath	92	Full	114	799	-25	114	-25	0
C 141q	Lavenham	183	Part	117	3152	2424	130	100	13
C 190q	Oughtibridge (Middlewood)	5	Full	111	4068	4068	136	-25	25
C 246	Verulamium	49	Full	117	2517	-2517	92	-9	-25
C 246	Verulamium	-1	Full	117	5252	5188	150	55	33
C 262n	Wheathampstead	41	Part	118	3514	-3514	85	-1	-33
S 106	Lancaster (Bridge Lane)	19	Part	118	948	-832	110	12	-8
S 164	Wallsend	14	Full	118	1890	-1612	103	-30	-15
C 141	Lathom (Ormskirk)	125	Full	120	289	207	121	-73	1
S 059	Corbridge1965	6	Full	122	3688	3654	141	-1	19
S 155	Thorngrafton	60	Full	122	1348	990	127	-64	5
C 028n	Brecon (Y Gaer)	9	Full	121	3832	3832	143	-55	22
S 015	Birdoswald	30	Full	122	4597	-4597	78	-34	-44
S 016	Birdoswald	28	Full	122	1024	-1024	111	-5	-11
S 084	Great Chesters	9	Part	125	3895	3895	148	8	23
C 084	Dewsbury	26	Full	138	1242	1186	151	-35	13
C 228	Southampshire	15	Full	117	8454	-8454	43	-13	-74
C 228	Southampshire	-2	Full	117	4163	-4163	77	15	-40
S 056	Corbridge1911c	7	Full	128	2106	1834	137	21	9
C 261	Weston (Green Farm)	12	Full	138	1858	1792	162	0	24
S 114	Mallerstang	138	Full	138	1346	1046	149	-21	11
C 236	Swaby	178	Full	138	611	-43	138	-43	0
S 037	Carlisle (east of the city)	62	Full	138	951	625	145	-3	7
S 116	Maryport	-155	Full	180	1436	-686	170	-15	-10

1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
C 258	Westmeston	9	Full	140	882	264	142	40	2
S 112	Linlithgow	13	Part	140	3201	3201	185	-1	45
C 127n	Hengistbury Head (Site33)	24	Full	140	2883	-2855	125	155	-15
S 127	Norton (Malton)	39	Full	144	253	191	146	-6	2
S 005	Bar Hill (Kirkintilloch)	2	Full	144	8082	-8082	83	-3	-61
S 005	Bar Hill (Kirkintilloch)	-11	Full	144	1645	1135	156	1	12
S 031	Carlisle	62	Part	144	1092	1092	159	-17	15
S 098	Kirkintilloch	47	Full	147	1064	890	159	28	12
C 154	Llanynynech Hill	33	Full	149	477	477	156	-86	7
C 052	Chalfont St. Giles	40	Full	150	1016	1016	167	-2	17
S 180	York (Post Office)	14	Full	152	1481	1481	176	-1	24
S 060	Corbridge1969	12	Full	161	600	70	163	-23	2
C 158	Londonthorpe (Alma Wood)	420	Full	154	493	-489	147	14	-7
S 129	Piercebridge	6	Full	157	1463	305	166	-46	9
C 187n	Nottingham	19	Full	161	1130	1094	178	36	17
C 212	Pyrford (Bolton's Lane)	82	Full	159	654	440	167	-28	8
S 135	Rudchester	471	Full	160	1134	-1112	143	-31	-17
C 005	Allerton Bywater	296	Full	162	858	-770	149	50	-13
C 249	Waddington	16	Full	162	1150	1150	180	30	18
C 215	Ribchester	9	Full	165	2087	-803	150	47	-15
C 085	Dewsbury (Thornhill)	27	Full	166	928	-448	156	47	-10
C 198	Piercebridge	8	Full	169	998	748	181	-15	12
S 086	Hampsthwaite	9	Full	169	1208	-992	151	0	-18
C 039n	Caistor St Edmund	20	Full	161	1245	5	161	5	0
C 136	Knapwell	78	Full	170	613	613	178	39	8
C 184q	Naseby	38	Full	180	668	334	183	-4	3
C 193q	Parwich Hill	80	Full	161	432	-238	157	-35	-4
C 257	Westgate	9	Part	170	1352	1352	190	-25	20
C 028	Braughing	61	Full	171	573	-335	166	-21	-5
C 121	Gurnard	-15	Full	174	3138	3138	204	4	30
C 001	Aldworth	75	Full	177	329	277	181	-19	4
C 048n	Castle Bromwich	181	Full	177	318	-308	173	-34	-4
C 048n	Castle Bromwich	-18	Full	177	1302	286	181	17	4
C 206	Poughill	28	Full	177	611	513	183	2	6
C 097	Edwinstone	368	Full	177	609	-361	171	26	-6
C 097	Edwinstone	-1	Full	177	2872	-1694	150	55	-27
C 011n	Beachamwell	37	Part	180	438	140	181	-30	1
C 227n	Slay Hills Saltings	15	Full	180	515	-355	175	-5	-5
S 097	Kirkby Thore	234	Full	183	342	24	183	24	0
C 022	Blerchley (Bow Brickhill)	296	Full	183	1040	-1040	168	-13	-15
S 146	South Shields Hoard1	120	Full	185	587	-483	177	-1	-8
C 010	Barway	433	Full	181	325	-85	181	-85	0
C 033	Brixworth	25	Full	191	510	40	191	40	0
C 162n	Lydney	32	Full	180	211	-55	178	18	-2
C 162	Lowestoft	38	Full	186	682	-682	174	221	-12
S 022	Briglands (Rumbling Bridge)	180	Full	187	590	450	192	-1	5
C 125	Handley Upwood Farm	639	Full	195	1037	-1037	181	35	-14
C 223	Silchester Hoard1	258	Part	194	1741	-1741	172	21	-22
C 120	Great Melton	190	Full	195	1253	-1253	179	-16	-16
C 193	Owston Ferry	4	Full	196	4973	-1115	186	-2	-10
S 132	Portmoak	129	Part	196	1089	-1089	186	-36	-10
S 115	Malton	8	Full	206	2847	2847	225	41	19
S 117	Hill of Megray	20	Part	210	2244	-2128	196	1	-14
C 199	Piercebridge	6	Full	211	4171	4171	240	18	29
C 199	Piercebridge	-15	Full	211	3998	3986	238	-65	27
C 032	Bristol (Rochester Road)	1476	Full	208	1405	-1405	199	16	9
C 183	Muswell Hill (Cranley Garde	153	Full	209	738	396	211	51	2
S 039	Carrawburgh	66	Full	212	2355	563	216	-17	-4
C 079	Darfield2	500	Full	213	3187	-3187	192	-30	21
C 019	Billingsgate	-142	Full	217	3423	3027	236	48	19
C 051	Chadwell St Mary	100	Full	213	1193	61	213	61	0
S 122	Nawton	33	Full	218	783	275	221	-110	3
C 004	Akenham	59	Full	222	718	-500	219	-4	3
C 068n	Colchester	32	Full	223	1212	1046	231	-91	8
C 096	Edlington Wood5(Doncaster	23	Full	225	1335	-691	219	9	-6

1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
C 220	Saint Mary Cray	376	Full	226	1306	944	233	-1	7
C 221f	Segontium	9	Full	226	2064	2064	242	-5	16
C 149	Llanarmon Dyffryn Ceiriog	504	Part	226	1154	124	227	7	1
C 043	Camborne Roman Villa	13	Full	235	1080	1080	244	6	9
C 089n	East Anglia	3062	Full	227	706	30	227	30	0
C 188	Nuneaton	29	Full	235	1330	544	239	-28	4
C 246f	Verulamium	5	Full	227	3654	-3548	205	-153	-22
S 092	Housteads	5	Full	229	3188	3188	266	13	37
S 071	Falkirk	1931	Full	230	6283	-6283	182	26	-48
C 284	? Britain	147	Full	235	1278	614	239	-53	4
C 078q	Darfield1	480	Full	235	1828	-1828	221	87	-14
C 036s	Cadeby	28	Part	237	553	-29	237	-29	0
C 135	Kirkham	35	Full	238	4510	-4510	207	9	-31
C 058	Chesterfield	19	Full	244	1541	1541	278	147	34
C 099	Elveden	964	Full	248	762	730	258	33	10
C 119	Great Chesterford	35	Full	247	790	-790	238	43	-9
C 087	Dorchester	16	Full	257	1346	1346	278	900	21
C 093	Edlington Wood (1&2)	436	Full	259	160	74	261	3	2
C 173	Mattishall	753	Full	259	130	-46	258	24	-1
C 009	Barton upon Humber	56	Full	260	184	52	259	46	-1
C 041	Caistor-by-Yarmouth	664	Full	260	2430	-2430	232	1	-28
C 168	March (Flaggrass)	1	Full	260	811	773	278	439	18
C 283	? Britain	29	Full	260	746	-638	250	9	-10
C 069	Colchester (Oliver's Orchard)	14	Full	269	189	-165	262	9	-7
C 115	Gare (Sett Bridge)	7	Full	270	134	-92	263	0	-7
C 178	Mildenhall	1	Full	270	945	-907	249	-19	-21
C 222	Selsey	9	Full	270	165	1	270	1	0
C 256	Welwyn (Glebe Road)	5	Full	270	1049	-1049	246	8	-24
C 124	Ham Hill (Montacute)	1	Full	270	11589	-11589	150	55	-120
C 024	Bonnington	1	Part	270	3839	-3839	223	78	-47
C 170	Market Deeping	11	Full	273	257	257	278	224	5
C 070	Colchester (Oliver's Orchard)	3	Full	273	5489	-5489	214	-60	-59
C 167	March (Flaggrass)	1	Full	273	498	472	278	439	5
C 015	Beachy Head	28	Full	274	254	254	278	222	4
C 128	Hollingbourne	2	Full	276	276	-276	259	-5	-17
C 098	Ellesmere	7	Full	280	2173	-2173	237	3	-43

Appendix 2.55
Hoard structure analysis: summary data

Two methods were used for this analysis. The first was based on the area of deviation on the cumulative composition graphs between the actual hoard and the 'normal' compositon of a hoard *at that date*. The second method was based on assessing what the 'best fit date' was for each hoard by seeing at which date 'normal' hoards had a most similar composition. The data from the two methods were then combined using the equation derived from Fig. 45.05. All three summary data sets are presented here.

METHOD 1: DATA

Date Range Range	Average net deviation from the 'normal' hoard	Standard deviation from this value	
41-78:	462	±2512	n=10
78-117:	163	±2361	n=10
117-122:	-37	±2851	n=10
125-140:	1094	±1859	n=10
144-160:	429	±774	n=10
161-169:	-18	±785	n=10
170-180:	187	±556	n=10
180-195:	-460	±664	n=10
195-213:	-102	±2243	n=10
218-229:	293	±1793	n=10
230-248:	-893	±2593	n=10
257-280:	-354	±1020	n=13

Data:

The values are in order of the dates of the hoards (cf. Appendix 2.54).
Hoards of irregular coins, hoards with less than five coins, and the Southants. hoard have been excluded. The hoards have been grouped in blocks of ten, except the last group which includes three extra.

41-78:	589	-976	-396	1048	2758	-1217	-1764	-3379	3249	4713
78-117:	-1050	59	-1625	-2621	1303	-3217	2316	4068	-25	2424
117-122:	2517	-3514	-832	-1612	207	3832	3654	990	-4597	-1024
122-140:	3895	1834	1792	1186	1046	-43	625	264	3201	-2855
144-160:	191	1092	890	477	1016	1481	-489	305	440	-1112
161-169:	70	1094	5	-238	-770	1150	-803	-448	748	-992
170-180:	613	1352	-335	277	-308	513	-361	334	140	-355
180-195:	-55	-85	24	-1040	-483	-682	450	40	-1741	-1037
195-213:	-1253	-1089	2847	-2128	4171	-1405	396	563	-3187	61
218-229:	275	-500	1046	-691	944	2064	124	30	-3548	3188
230-248:	-6283	1080	544	614	-1828	-29	-4510	1541	-790	730
257-280:	1346	74	-46	52	-2430	-638	-165	-92	1	-1049
	257	254	-2173							

METHOD 2: DATA

Date Range	Average deviation from the actual hoard date	Standard deviation from this value	
*41-87	7.0	±19.4 years	n=10 (excluding the 3 hoards)
41-87:	2.6	±19.6 years	n=13 (including the 3 hoards)
87-118:	-6.4	±20.7 years	n=10
118-138:	3.3	±21.6 years	n=10
138-147:	9.2	±15.3 years	n=10
149-161:	6.0	±12.1 years	n=10
161-171:	-0.7	±3.0 years	n=10
177-183:	-0.3	±3.9 years	n=10
183-196:	-7.3	±12.1 years	n=10
206-222:	-0.1	±13.5 years	n=10
223-235:	-0.2	±22.5 years	n=10
235-259:	1.6	±18.0 years	n=10
259-280:	-11.1	±15.6 years	n=10

Data:

The values are in order of the dates of the hoards (cf. Appendix 2.54).
Hoards of irregular coins, hoards with less than five coins, and the Southants. hoard have been excluded. The hoards have been taken in groups of ten.

*Note

Three early hoards have been excluded: Lightcliffe, Almondbury and Honley. In all three cases the 'best fit date' for the hoards was judged to be prior to 40AD. This being the case no data existed with which to compare its structure against. This means that the *differential* date between the actual and 'best fit' date can not be established; except to say that Lightcliffe is at least 3 years or more archaic, Almondbury is likewise, and Honley has a structure that is more than 29 years out of date. Because of this it should be remembered that the average value of the differential including or excluding these three hoards will be too high, and the standard deviation will be too small.

41-87:	7	9	20	-9	-13	31	-44	-6	0	-13
41-87:	additional hoards:			-3 (or less)	-3 (or less)		-29 (or less)			
87-118:	-20	-12	-26	22	25	0	13	-25	-33	-8
118-138:	-15	1	22	19	5	-44	-11	23	9	24
138-147:	13	11	0	7	2	-45	-15	2	15	12
149-161:	7	17	24	-7	9	8	-17	2	17	0
161-171:	-4	-13	18	-15	-10	12	-18	8	20	-5
177-183:	4	-1	6	-6	3	1	-5	-2	0	0
183-196:	-15	-8	-12	5	0	-22	-14	-16	-10	19
206-222:	-9	2	-14	29	4	-21	0	3	-3	8
223-235:	-6	7	16	1	0	-22	37	-48	9	4
235-259:	4	-14	0	-31	34	-9	10	21	2	-1
259-280:	-1	-28	-10	-7	-7	0	-24	5	4	-13

METHODS 1 & 2 COMBINED: DATA

Date Range	Average deviation from the actual hoard date	Standard deviation from this value
41-60:	0.92	±11.74 years n=14
69-87:	0.00	±25.23 years n=14
94-117:	0.78	±21.34 years n=14
118-122:	0.92	±20.39 years n=14
122-138:	4.21	±22.48 years n=14
138-144:	5.42	±16.49 years n=14
147-159:	7.21	±7.93 years n=14
160-162:	0.28	±10.28 years n=14
165-171:	-0.50	±11.06 years n=14
177-180:	0.00	±3.78 years n=14
180-187:	-3.36	±5.78 years n=14
191-208:	-5.93	±12.99 years n=14
209-218:	0.14	±17.12 years n=14
222-227:	3.21	±7.46 years n=14
227-235:	-6.00	±26.09 years n=14
237-259:	-2.50	±15.53 years n=14
260-280:	-8.05	±12.63 years n=20

Data:

The values are in order of the dates of the hoards (cf. Appendix 2.54)
Hoards of irregular coins, hoards with less than five coins, and the Southants. hoard have been excluded. The hoards have been taken in groups of fourteen representing seven hoards, except for the last group which contains twenty, representing ten hoards.

41-60:	4	7	-8	-3	3	-3	8	9	23	20	-10	-9	-15	-13
69-87:	-29	-29	27	31	40	44	-9	-6	0	0	-14	-13	-22	-20
94-117:	-11	-12	27	-26	19	22	34	25	0	0	20	13	-21	-25
118-122:	-30	-33	-7	-8	-13	-15	1	1	32	22	31	19	8	5
122-138:	-39	-44	-8	-11	33	23	15	9	10	13	15	24	8	11
138-144:	0	0	5	7	2	2	27	45	-24	-15	1	2	9	15
147-159:	7	12	3	7	8	17	12	24	-4	-7	2	9	3	8
160-162:	-9	-17	0	2	9	17	0	0	-2	-4	-6	-13	9	18
165-171:	-7	-15	-3	-10	6	12	-8	-18	5	8	11	20	-3	-5
177-180:	2	4	-2	-4	4	6	-3	-6	2	3	1	1	-3	-5
180-187:	0	-2	0	0	0	0	-9	-15	-4	-8	-5	-12	3	5
191-208:	0	0	-15	-22	-9	-14	-10	-16	-9	-10	24	19	-12	-9
209-218:	3	2	-18	-14	35	29	4	4	-27	-21	0	0	2	3
222-227:	-4	-3	8	8	-6	-6	7	7	17	16	0	1	0	0
227-235:	-30	-22	27	37	-54	-48	9	9	4	4	5	4	-15	-14
237-259:	0	0	-38	-31	-6	-9	6	10	11	21	0	2	0	-1
260-280:	0	-1	-21	-28	-5	-10	-1	-7	0	-7	0	0	-9	-24
	2	5	2	4	-18	-43								

Appendix 2.61
Number of denarii in hoards: summary statistics

AD 41-60
Population: 37, 200, 200, 4, 6, 72, 87, 2
Mean = 76.0; $x\ s_{n-1}$ = 82.7; n = 8; Median = 54.5

AD 61-80
Population: 13, 35, 12, 14
Mean = 18.5; $x\ s_{n-1}$ = 11.0; n = 4; Median = 13.5

AD 81-100
Population: 277, 75, 32, 22, 20, 580, 32
Mean = 148.2; $x\ s_{n-1}$ = 211.2; n = 7; Median = 32.0

AD 101-120
Population: 197, 5, 49, 100, 100, 30, 40, 100, 125, 6, 60
Mean = 73.8; $x\ s_{n-1}$ = 57.5; n = 11; Median = 60.0

AD 121-140
Population: 9, 30, 28, 20, 26, 15, 7, 16, 12, 138, 178, 420, 5, 62, 280, 9, 300
Mean = 91.5; $x\ s_{n-1}$ = 127.7; n = 17; Median = 26.0

AD 141-160
Population: 600, 24, 39, 2, 100, 47, 33, 75, 40, 1000, 14, 12, 420, 6, 19, 82, 471
Mean = 175.5; $x\ s_{n-1}$ = 281.1; n = 17; Median = 40.0

AD 161-180
Population: 296, 16, 9, 27, 8, 9, 29, 920, 20, 20, 200, 70, 78, 38, 80, 35, 83, 61, 200, 75, 81, 28, 50, 368, 15, 13, 400
Mean = 119.6; $x\ s_{n-1}$ = 193.0; n = 27; Median = 50.0

AD 181-200
Population: 234, 296, 120, 433, 25, 155, 38, 180, 14, 100, 639, 190, 4, 600
Mean = 216.3; $x\ s_{n-1}$ = 208.0; n = 14; Median = 167.5

AD 201-220
Population: 2500, 8, 200, 6, 1476, 153, 350, 66, 500, 100, 33
Mean = 490.2; $x\ s_{n-1}$ = 789.7; n = 11; Median = 153.0

AD 221-240
Population: 59, 131, 32, 23, 548, 376, 9, 13, 3062, 29, 5, 5, 1931, 147, 480, 35
Mean = 430.3; $x\ s_{n-1}$ = 850.9; n = 16; Median = 47.0

AD 241-260
Population: 19, 224, 964, 35, 524, 16, 436, 753, 56, 664, 1, 29
Mean = 310.1; $x\ s_{n-1}$ = 344.3; n = 12; Median = 140.0

AD 261-280
Population: 14, 7, 1, 9, 5, 1, 11, 3, 1, 28, 2, 7
Mean = 7.4; $x\ s_{n-1}$ = 7.7; n = 12; Median = 6.0

Appendix 2.62
Size of Later Third Century Hoards

Here denarii have been included as half the value of antoniniani, and copies have been counted as of equal value. The reason for the latter decision being the frequent difficulty in distinguishing between the two in many reports.

Hoards from AD 230-265

Ref	Name	Date	Den	Ant	Total
J 058	Chesterfield	238-244	19	0	9.5
J 205	Portsdown Hill	260	0	10	10
J 168	March	260	1	14	14.5
J 135	Kirkham	238	35	0	17.5
J 204	Poole Harbour	253-260	0	34	34
J 009	Barton upon Humber	260	56	23	51
J 119	Great Chesterford	247-249	35	60	77.5
J 003	Alcester	259-260	0	95	95
S 128	Piercebridge	263	0	130	130
J 078q	Darfield I	235-238	480	1	241
S 162	Upper Holker	253	524	0	262
J 283	? Britain	260	29	290	304.5
J 093	Edlington Wood	259	436	173	391
J 030n	Brighton (near...)	244-249	1000	0	500
J 041	Caistor-by-Yarmouth	260	664	183	515
J 099	Elveden	248	964	182	664

Hoards from AD 266-275

Ref	Name	Date	Den	Ant	Total
J 026	Bourne End	270	0	5	5
J 095	Edlington Wood	269	0	8	8
S 001	Adderstone	270	0	13	13
S 013	Bewcastle	273	0	13	13
J 167	March	273	1	14	14.5
J 273	Wookey Hole	274	0	15	15
J 202	Polegate	273	0	17	17
J 233	Stiffkey (?)	268-270	0	18	18
J 086	Dolydd	273	0	18	18
J 197	Piercebridge	270-273	0	21	21
S 139	Seamer	273	0	21	21
S 028	Ninekirks	273	0	23	23
J 234	Stonea Camp	273	0	25	25
J 163	Magdalen	268	0	27	27
S 081	Glaisdale Moor	270	0	30	30
J 109	Farley Hill	273	0	30	30
J 201	Pitstone	270-280	0	30	30
J 156	London	273	0	32	32
J 260	Westmoor	273	0	34	34
J 115	Gare	270	7	40	43.5
J 186	Northampton	273	0	45	45
S 150	South Shields 5	273	0	45	45
J 021	Blackmoor	270-273	0	46	46
J 246s	Verulamium	273	0	52	52
J 102	Epping Forrest	275	0	53	53
J 247	Vinters Park	272	0	58	58
J 259	Westmeston	273-274	0	61	61
J 172	Marr Thick (?)	273	0	62	62
S 038	Carrawburgh	270-270	0	82	82
J 161	Lostwithiel	274	0	103	103
S 045	Chesterholme	270	0	111	111
S 068	Docker	273	0	123	123
J 118	Great Chesells	273	0	133	133
J 266	Willingdon	273	0	140	140
J 256	Welwyn	270	5	145	147.5
J 078	Croydon	270	0	170	170
J 024	Bonnington	270-273	1	180	180.5
J 071	Colchester	274	0	194	194
S 006	Barton	273	0	203	203
J 082	Darlington	274	0	203	203
J 210	Purbrook Heath	272	0	207	207
J 045	Campsmount	273	0	300	300
J 282	? England	270-273	0	323	323
J 127	Heckensall Hall	273	0	343	343
J 122	Hackensall	273	0	450	450
J 124	Ham Hill	270-273	1	491	491.5
S 027	Brougham Castle	273	0	500	500
J 083	Deeping St. James	274	0	515	515
J 025	Boothstown	273-275	0	540	540
J 184	Mytholmroyd	274	0	597	597
J 092	East Mersea	273	0	635	635
J 048	Cardiff	275	0	800	800
J 169	March	270-273	0	816	816
J 031	Brighton	275	0	928	928
J 203	Poole	273-274	0	964	964
J 222	Selsey	270	9	966	970.5
J 285	? England	273	0	988	988
S 017	Bolton Castle	270	0	1100	1100
J 112	Folds Farm	273	0	1220	1220
J 178	Mildenhall	270	1	1285	1285.5
J 069	Colchester	269	14	1543	1550
J 264	Wickham Market	273	0	1588	1588
J 037	Cadeby	273	0	1596	1596
J 267	Wimblingdon	273	0	2000	2000
J 100	Emneth	274	0	2000	2000
J 170	Market Deeping	272-273	11	2858	2863.5
J 070	Colchester	273	3	4068	4069.5
S 157	Walbottle	272	0	5024	5024
J 015	Beachy Head	274	28	13959	13973

Hoards from AD 276-285

Ref	Name	Date	Den	Ant	Total
J 211	Pyle	280	0	10	10
J 187	Northamptonshire (?)	276	0	27	27
J 094	Edlington Wood	276-282	0	59	59
S 085	Great Chesters	276	0	119	119
J 276	Worden	276-282	0	126	126
J 098	Ellesmere	280	7	355	358.5
J 080	Darfield 3	276-282	0	541	541
J 194	Paternoster Row	276	0	543	543
J 012	Beachy Head	276-282	0	550	550
J 013	Beachy Head	276-282	0	682	682
J 174	Mear Heath	280-283	0	1254	1254
J 116	Goadby Marwood	280	0	1917	1917
J 014	Beachy Head	276-282	0	2073	2073
J 002	Agden near Altrincham	276-82	0	2435	2435
J 182	Much Wenlock	284	0	2591	2591
J 059	Child's Ercall	281	0	2893	2893
J 165	Maltby	282	0	3496	3496
S 020	Hawkhurst	276	1	5000	5000.5
J 237	Tattershall Thorpe	281	0	5074	5074
J 128	Hollingbourne	276-82	2	5355	5356
J 073	Coleby	281	0	9999	9999
J 216	Riby	276	0	17000	17000

Hoards from AD 286-299

Ref	Name	Date	Den	Ant	Total
J 195n	Peterborough	287-96	0	5	5
J 045f	Canterbury	287-93	0	6	6
J 085n	Dinorben	287-93	0	6	6
J 216q	Richborough	293	0	6	6
J 124n	Hammersmith	287-90	0	7	7
J 045n	Canterbury	293-95	0	8	8
J 235	Surrey (?)	293	0	9	9
J 271	Wisbeach	293	0	9	9
J 216n	Richborough	287-93	0	11	11
J 277n	Wroxeter	287-93	0	12	12
J 089	Droitwich	293-95	0	14	14
J 138	Lancaster	286	0	15	15
J 234n	Strata Florida	290	0	15	15
J 017q	Bicester (near...)	287-93	0	17	17
J 120n	Great Orme's Head	291	0	17	17
S 107	Lancaster	286	0	19	19
S 108	Lancaster	286	0	19	19
J 246p	Verulamium	289	0	19	19
J 038n	Caerwent	293-96	0	20	20
J 224	Silchester Hoard 2	293	0	22	22
J 153n	Llangeinwen	291	0	23	23
J 252n	Watchfield	293-97	0	23	23
J 082n	Deal	287-93	0	25	25
J 270	Wint Hill	286	0	30	30
J 152	Llanfairfrechan	293	0	30	30
J 142n	Leigh Church	293-96	0	30	30
J 169n	Margaretting	287-90	0	32	32
S 163	Upsall Castle	286	0	35	35
J 025n	Borden	293-96	0	35	35
J 246n	Verulamium	287-93	0	36	36
J 225	Silchester Hoard 3	293	0	40	40
J 045j	Canterbury	287-93	0	41	41
J 067	Claydon Pike	296	0	42	42
J 075n	Conway	287-93	0	50	50
J 255f	Wedmore	293-96	0	54	54
J 228n	South Norwood	287-90	0	55	55
J 221n	Segontium	287	0	56	56
J 153u	Llanyihangel...	289-91	0	61	61
J 044n	Camerton	293-96	0	67	67
J 220n	Sapperton Tunnel	293-96	0	70	70
J 054n	Cheddar	287-96	0	100	100
S 104	Lancaster	294	0	100	100
J 036q	Burton Latimer	293-96	0	108	108
J 044f	Camerton	287-93	0	114	114
J 045l	Canterbury	289	0	117	117
J 078n	Croydon	287-93	0	120	120
J 195	Pen-y-Corddyn	296	0	128	128
J 029n	Bredicot	287-93	0	140	140
J 246q	Verulamium	290-93	0	144	144
J 045h	Canterbury	287-93	0	150	150
J 185	Neath	293-96	0	175	175
J 153t	Llanlechid	287-93	0	200	200
J 077n	Crondall	293-96	0	250	250
J 129	Hoveringham	287-93	0	289	289
J 072	Colchester (near...)	293-96	0	298	298
J 008	Crondall	293-96	0	300	300
J 229	Sparkford (near...)	294	0	400	400
J 222n	Shotover	287-93	0	560	560
J 251n	Walmersley	287-93	0	600	600
J 104n	Everton	292	0	600	600
J 017	Bawtree (?)	296	0	600	600
J 237n	Thurstonland	287-93	1	600	600.5
J 255n	Well	287-93	0	650	650
J 104	Erw-hen	291	0	684	684
J 148	Little Orm's Head	293-93	0	700	700
J 144	Linchmere	287-93	0	812	812
J 101n	Epperstone	287-93	0	1000	1000
J 193n	Park End	293-96	0	1000	1000
J 128n	Holt	293-95	0	1063	1063
J 192n	Oundle	293-96	0	1205	1205
J 143n	Lilly Horn	293-95	0	1223	1223
J 256n	Wentwood Mill	290-93	0	1250	1250
J 011	Bath (near...)	295-96	1	1805	1805.5
J 194n	Penard Gower	287-93	0	2583	2583
J 104f	Evenley	287-96	0	3153	3153
J 066	Clapton-in-Gordano	286	0	3437	3437
J 181	Monkton Farleigh	286	0	3466	3466
J 115n	Gloucester	293-96	0	15544	15544
J 184n	Narberth	287-93	0	18000	18000
J 020	Blackmoor	296	0	29802	29802

Appendix 2.63
Denarius hoard size and location

Below are given all the hoards for which there is a reasonablly accurate idea of their original size. They have been divided up into period blocks, and within each of these into quartiles on the basis of hoard size. Their location has been given, together with a categorisaton into one of three regional zones. The three zones are defined as follows:

Zone 1:
Bedfordshire, Berkshire, Buckinghamshire, East Sussex, Essex, Greater London, Hampshire, Hertfod, Isle of White, Kent, Northamptonshire, Oxfordshire, Surrey and West Sussex
Zone 2:
Avon, Cambridgeshire, Dorset, Gloucestershire, Hereford and Worcester, South Humberside, Leicestershire, Lincolnshire, Norfolk, Nottingham, Somerset, Suffolk, Warwick and Wiltshire
Zone 3:
All other counties

Hoards in AD 43-99

Ref	Name	County	Zone	NGR	T.P.Q.	Den	Copies	Total
FIRST QUARTILE								
J 260n	Weston Longville	Norfolk	2	TG 11 15	60-61	2	0	2
J 188n	Nunney	Somerset	2	ST 73 45	43-54	4	0	4
J 241	Usk, Hoard 1	Gwent	3	SO 37 00	55-57	6	0	6
S 014	Binnington Carr	Yorkshire	3	SE 98 79	78	12	0	12
J 128q	Honley	Yorkshire	3	SE 13 11	69-79	13	0	13
SECOND QUARTILE								
S 080	Gillingwood Hall	North Yorkshire	3	NZ 17 04	79	14	0	14
J 240n	Upton	Nottinghamshire	2	SK 73 54 ?	96	20	0	20
J 064	Cirencester	Gloucestershire	2	SP 02 01	94	22	0	22
J 151n	Llanfaethlu	Anglesey	3	SH 31 86	87	32	0	32
S 058	Corbridge 1914	Northumberland	3	NY 98 64	99	32	0	32
THIRD QUARTILE								
S 176	York, Blake Street	Yorkshire	3	SE 60 52	74	35	0	35
J 060	Chippenham	Cambridgeshire	2	TL 66 69	41	37	0	37
J 103	Eriswell	Suffolk	2	TL 72 78	60-61	72	0	72
J 130	The Howe	Norfolk	2	TM 28 99	87	75	0	75
J 221	Scole	Norfolk	2	TM 15 79	60-61	87	0	87
FOURTH QUARTILE								
J 157	St Swithin's Lane	London	1	TQ 32 80	41-54	0	89	89
J 003q	Almondbury	Yorkshire	3	SE 15 15	43	200	0	200
J 006n	Ayott Saint Lawrence	Hertfordshire	1	TL 19 16	43	200	0	200
J 179	Mildenhall, Beck Row	Suffolk	2	TL 71 74	80-85	277	0	277
S 142	Shap	Cumbria	3	NY 56 15	98	580	0	580

Hoards in AD 100-149

Ref	Name	County	Zone	NGR	T.P.Q.	Den	Copies	Total
FIRST QUARTILE								
J 190q	Oughtibridge	Yorkshire	3	SK 30 93	103-111	5	0	5
J 251	Waddington	Lincolnshire	2	SK 98 64	138	5	0	5
S 059	Corbridge 1965	Northumberland	3	NY 98 64	119-122	6	0	6
S 056	Corbridge 1911c	Northumberland	3	NY 98 64	128	7	0	7
J 028n	Brecon, Y Gaer	Powys	3	SO 04 28	121	9	0	9
J 258	Westmeston	Sussex East	1	TQ 34 13	140	9	0	9
J 261	Weston, Green Farm	Cheshire	3	SJ 69 52	134-138	12	0	12
S 005	Bar Hill	Dumbartonshire	3	NS 70 75	144	13	0	13
J 228	Southampshire (?)	Hampshire	1	N.A.	117-138	15	2	17
SECOND QUARTILE								
S 116	Maryport	Cumberland	3	NY 03 37	138	17	0	17
S 084	Great Chesters	Northumberland	3	NY 70 66	125	20	0	20
J 127n	Hengistbury Head	Hampshire	1	SZ 17 90	140-144	24	0	24
J 084	Dewsbury	Yorkshire	3	SE 24 22	117-138	26	0	26
S 016	Birdoswald	Cumberland	3	NY 61 66	122	28	0	28
S 011	Bewcastle	Cumberland	3	NY 56 74	118	30	0	30
S 015	Birdoswald	Cumberland	3	NY 61 66	122	30	0	30
J 154	Llanymynech Hill	Montgomeryshire	3	SJ 26 22	149	33	0	33
S 127	Norton	Yorkshire	3	SE 78 71	143-144	39	0	39
THIRD QUARTILE								
S 093	Nidderdale	Yorkshire	3	SE 09 73	118	40	0	40
S 098	Kirkintilloch	Dumbartonshire	3	NS 65 73	147	47	0	47
J 246	Verulamium	Hertfordshire	1	TL 15 07	117	49	1	50
S 155	Thorngrafton	Northumberland	3	NY 78 66	119-122	60	0	60
S 037	Carlisle (E. of city)	Cumberland	3	NY --	138	62	0	62
J 255p	Well St./Jewin Str.	London	1	TQ 29 79	138-161	75	0	75
J 262n	Wheathampstead	Hertfordshire	1	TL 17 14	118	100	0	100
S 106	Lancaster	Lancashire	3	SD 47 61	118	100	0	100
FOURTH QUARTILE								
S 031	Carlisle	Cumberland	3	NY 38 56	144	100	0	100
J 141	Lathom, Ormskirk	Lancashire	3	SD 46 09	120	125	0	125
S 114	Mallerstang	Westmoreland	3	NY 79 01	134-138	138	0	138
J 236	Swaby	Lincolnshire	2	TF 38 77	137-138	178	0	178
J 141q	Lavenham	Suffolk	2	TL 91 49	98-117	197	0	197
S 003	Backworth	Northumberland	3	NZ 30 72	139	280	0	280
S 112	Linlithgow	West Lothian	3	NT 02 78	140	300	0	300
J 159	Londonthorpe	Lincolnshire	2	SK 95 37	138	420	0	420
S 119	Mindrum	Northumberland	3	NT 32 82	141	600	0	600

Hoards in AD 150-196

Ref	Name	County	Zone	NGR	T.P.Q.	Den	Copies	Total
FIRST QUARTILE								
J 193	Owston Ferry	Lincolnshire	2	SE 79 01	196	4	0	4
S 129	Piercebridge	Durham	3	NZ 21 15	156-157	6	0	6
J 198	Piercebridge	Durham	3	NZ 21 15	164-169	8	0	8
J 215	Ribchester	Lancashire	3	SD 64 35	165	9	0	9
S 086	Hampsthwaite	Yorkshire	3	SE 25 58	169	9	0	9
S 060	Corbridge 1969	Northumberland	3	NY 98 64	145-161	12	0	12
S 154	Taymouth	Perthshire	3	NN 80 42	180	13	0	13
S 180	York, Post Office	Yorkshire	3	SE 59 51	152	14	0	14
S 164	Wallsend	Northumberland	3	NZ 30 66	188	14	0	14
J 121	Gurnard	Isle of White	1	SZ 47 95	170-174	0	15	15
J 227n	Slay Hills Saltings	Kent	1	TQ 86 70	180	15	0	15
J 249	Waddington	Lincolnshire	2	SK 98 64	162	16	0	16
J 187n	Nottingham	Nottinghamshire	2	SK 56 41	157-161	19	0	19
SECOND QUARTILE								
J 039n	Caistor St Edmund	Norfolk	2	TG 23 03	161-180	20	0	20
J 048q	Castle Thorpe	Buckinghamshire	1	SP 79 44	170	20	0	20
J 033	Brixworth	Northamptonshire	1	SP 74 70	180-192	25	0	25
J 085	Dewsbury	Yorkshire	3	SE 24 22	166	27	0	27
J 206	Poughill	Devon	3	SS 85 08	177	28	0	28
J 006q	Babworth	Nottinghamshire	2	SK 68 80	161-180	29	0	29
J 222h	Sheffield	South Yorkshire	3	SK 35 87	161-180	35	0	35
J 184q	Naseby	Northamptonshire	1	SP 68 77	161-180	38	0	38
J 162	Lowestoft	Suffolk	2	TM 53 92	186-189	38	0	38
J 052	Chalfont St. Giles	Buckinghamshire	1	SU 98 93	150	40	0	40
J 011n	Beachamwell	Norfolk	2	TF 74 03	177-180	50	0	50
J 028	Braughing	Hertfordshire	1	TL 39 24	171-171	61	0	61
THIRD QUARTILE								
J 125n	Hanwell	Oxfordshire	1	SP 43 43	161-180	70	0	70
J 001	Aldworth	Berkshire	1	SU 55 79	176-177	75	0	75
J 136	Knapwell	Cambridgeshire	2	TL 33 62	170	78	0	78
J 193q	Parwich Hill	Derbyshire	3	SK 18 55	161-180	80	0	80
J 212	Pyrford	Surrey	1	TQ 03 59	159-160	82	0	82
J 270a	Wirksworth (near...)	Derbyshire	3	SK 30 54	161-180	83	0	83
S 110	Leuchars	Fifeshire	3	NO 44 24	193-193	100	0	100
S 146	South Shields 1	Durham	3	NY 36 67	185-185	120	0	120
J 162n	Lydney (near...)	Gloucestershire	2	SO 63 03	180-192	155	0	155
S 022	Briglands	Kinrosshire	3	NT 01 99	187	180	0	180
J 120	Great Melton	Norfolk	2	TG 13 06	195	190	0	190
J 048n	Castle Bromwich	West Midlands	3	SP 15 89	177	181	18	199
J 062n	Cilhaul	Powys	3	SN 95 90	161-180	200	0	200
FOURTH QUARTILE								
S 181	York, Railway Street	Yorkshire	3	SE 60 52	172	200	0	200
S 097	Kirkby Thore	Westmoreland	3	NY 63 25	180-183	234	0	234
J 005	Allerton Bywater	Yorkshire West Riding	3	SE 42 27	162	296	0	296
J 022	Blerchley	Buckinghamshire	1	SP 86 34	183	296	0	296
J 097	Edwinstone	Nottinghamshire	2	SK 62 66	177-180	368	1	369
S 158	Torfoot	Lanarkshire	3	NS 64 38	180	400	0	400
J 158	Londonthorpe	Lincolnshire	2	SK 95 37	154	420	0	420
J 010	Barway	Cambridgeshire	2	TL 54 75	180-192	433	0	433
S 135	Rudchester	Northumberland	3	NZ 11 64	160	471	0	471
S 132	Portmoak	Kinrosshire	3	NO 10 20	196-197	600	0	600
J 125	Handley	Dorset	2	SU 01 16	194-195	639	0	639
J 017n	Benacre	Suffolk	2	TM 51 84	161-180	920	0	920
J 053	Chatburn	Lancashire	3	SD 76 43	150	1000	0	1000

Hoards in AD 197-238

Ref	Name	County	Zone	NGR	T.P.Q.	Den	Copies	Total
FIRST QUARTILE								
J 246f	Verulamium	Hertfordshire	1	TL 15 07	227-229	5	0	5
S 092	Housteads	Northumberland	3	NY 79 68	229	5	0	5
S 115	Malton	Yorkshire	3	SE 79 71	201-206	8	0	8
J 221f	Segontium	Caernarvonshire	3	SH 48 62	226-226	9	0	9
J 043	Camborne Villa	Cornwall	3	SW 64 40	222-235	13	0	13
S 117	Hill of Megray	Kincardineshire	3	NO 87 87	202-210	20	0	20
J 199	Piercebridge	Durham	3	NZ 21 15	203-211	6	15	21
SECOND QUARTILE								
J 096	Edlington Wood	Yorkshire West Riding	3	SK 62 66	225	23	0	23
J 188	Nuneaton	Warwickshire	2	SP 36 91	222-235	29	0	29
J 068n	Colchester	Essex	1	TL 96 21	223	32	0	32
S 122	Nawton	Yorkshire	3	SE 65 84	217-218	33	0	33
J 004	Akenham	Suffolk	2	TM 14 48	222	59	0	59
S 039	Carrawburgh	Northumberland	3	NY 85 71	212	66	0	66
J 051	Chadwell St Mary	Essex	1	TQ 64 78	213-217	100	0	100
THIRD QUARTILE								
J 265	Wigan	Lancashire	3	SD 58 05	222	131	0	131
J 019	Billingsgate	London	1	TQ 32 80	212-217	0	142	142
J 284	? Britain	Britain	-	N.A.	230-235	147	0	147
J 183	Muswell Hill	London	1	TQ 28 90	209	153	0	153
J 165n	Mansfield	Nottinghamshire	2	SK 53 61	209-212	350	0	350
J 220	Saint Mary Cray	Kent	1	TQ 46 67	226	376	0	376
FOURTH QUARTILE								
J 078q	Darfield 1	Yorkshire West Riding	3	SE 41 04	235-238	480	0	480
J 079	Darfield 2	Yorkshire West Riding	3	SE 41 04	213	500	0	500
J 149	Llanarmon Dyffryn...	Denbighshire (Clwyd)	3	SJ 15 32	226	548	0	548
J 032	Bristol	Avon	2	ST 59 72	208	1476	0	1476
S 071	Falkirk	Stirlingshire	3	NS 89 79	230	1931	0	1931
J 003n	Alfreton	Derbyshire	3	SK 41 55	193-211	2500	0	2500
J 089n	East Anglia	East Anglia	2	N.A.	222-235	3062	0	3062

Summary Data:

Hoards in AD 43-99:

	Zone 1	Zone 2	Zone 3
First quartile	0	2	3
Second quartile	0	2	3
Third quartile	0	4	1
Fourth quartile	2	1	2

Hoards in AD 100-149:

	Zone 1	Zone 2	Zone 3
First quartile	2	1	6
Second quartile	1	0	8
Third quartile	3	0	5
Fourth quartile	0	3	6

Hoards in AD 150-196:

	Zone 1	Zone 2	Zone 3
First quartile	2	3	8
Second quartile	5	4	3
Third quartile	3	3	7
Fourth quartile	1	5	7

Hoards in AD 196-238:

	Zone 1	Zone 2	Zone 3
First quartile	1	0	6
Second quartile	2	2	3
Third quartile	3	1	1
Fourth quartile	0	2	5

Appendix 3.21
Site Finds: Summary Tables

All the sites within each category have been added together. The original database includes RIC references, where these were provided. They are not recorded here for reasons of economy of space.

The site categories are:

1.	Cemeteries	5.	Small Towns
2.	Military sites	6.	Temples
3.	Rural sites	7.	Urban sites
4.	Small towns with forts	8.	Villas

1. The Cemetery data

The sites:

501	Bloxham	OXON	8
536	Chichester: St Pancras	SUSW	3
834	Frilford Cemetery	BERK	2
833	Hassocks	SUSE	25
015	Lankhills: Winchester	HANT	6

TOTAL = 44

Coins from cemeteries:

		Den	Ant	Sest	Dup/As	AE	?	Quin	Total
510	GAIUS	.	.	.	1	.	.	.	1
538	VESPASIAN	.	.	.	1	.	.	.	1
540	DOMITIAN (VESP)	.	.	.	1	.	.	.	1
556	DOMITIAN	.	.	.	2	.	.	.	2
570	TRAJAN	.	.	1	3	.	.	.	4
585	HADRIAN	.	.	.	1	.	.	.	1
594	ANTONINUS PIUS	.	.	2	1	3	.	.	6
595	FAUSTINA I (A.P.)	.	.	.	2	.	.	.	2
599	MARCUS AURELIUS	.	.	2	.	.	.	.	2
608	CRISPINA (COMM)	.	.	1	.	.	.	.	1
678	VALERIAN	.	.	.	.	.	1	.	1
684	GALLIENUS (SOLE REIGN)	.	2	.	.	.	.	.	2
687	CLAUDIUS II	.	4	.	.	.	.	.	4
695	PROBUS	.	1	.	.	.	.	.	1
703	POSTUMUS	.	1	.	.	.	.	.	1
707	TETRICUS I	.	2	.	.	.	.	.	2
709	CARAUSIUS	.	1	.	.	.	.	.	1
726	BARBAROUS RADIATE	.	10	.	.	.	.	.	10
728	DIOCLETIAN	.	1	.	.	.	.	.	1
	Total	0	22	6	12	3	1	0	44

2. Military Sites

The sites:

-	Bewcastle	CUMB	44	072	Portchester	HANT	110
-	Carrawburgh Fort	NTHM	10	-	Sewingshields	NTHM	8
-	Castle Nick (MC 39)	NTHM	19	-	South Shields	NTHM	62
-	Catterick (Fort)	YORK	1	451	Topsham	DEVN	3
-	Ebchester Fort	DURH	10	-	Turret 33b	NTHM	2
-	High Rochester	NTHM	130	-	Usk	GWEN	348
042	Lympne	KENT	8	-	Vindolanda Fort	NTHM	105
-	Old Penrith (Vicus)	CUMB	77	-	Wallsend	NTHM	170

TOTAL = 1107, of which only 1076 could be fully identified.

Coins from military sites:

		Den	Ant	Sest	Dup/As	AE	?	Quin	Total	
1	REPUBLICAN	17	.	.	1	.	.	1	19	
1	MARK ANTONY	6	.	.	.	.	.	.	6	
501	AUGUSTUS	3	.	.	1	.	.	.	4	
504	TIBERIUS	5	.	.	2	.	.	.	7	
508	GAIUS (TIB)	1	.	.	.	.	.	.	1	
515	CLAUDIUS I	.	.	1	203	.	.	.	204	
519	ANTONIA (CL)	.	.	1	.	.	.	.	1	
525	NERO	.	.	5	28	.	.	.	33	
535	GALBA	1	.	.	.	.	.	.	1	
536	OTHO	1	.	.	.	.	.	.	1	
538	VESPASIAN	15	.	2	28	.	.	.	45	
539	TITUS (VESP)	1	.	.	1	.	.	.	2	
540	DOMITIAN (VESPASIAN)	1	.	.	2	.	.	.	3	
541	TITUS	.	.	1	1	.	.	.	2	
544	VESPASIAN POSTH (TITUS)		1	.	1	.	.	.	.	2
555	FLAVIAN	1	.	1	5	.	.	.	7	
556	DOMITIAN	5	.	7	17	.	.	.	29	
567	NERVA	2	.	1	5	.	.	.	8	
570	TRAJAN	7	.	39	30	.	.	.	76	
585	HADRIAN	9	.	29	16	.	1	.	55	
589	SABINA (HAD)	.	.	2	.	.	.	.	2	
594	ANTONINUS PIUS	16	.	21	24	.	.	.	61	
595	FAUSTINA I (A.P.)	1	.	8	5	.	.	.	14	
596	FAUSTINA II (A.P.)	.	.	.	2	.	.	.	2	
604	FAUSTINA II (M.A.)	.	.	5	2	.	.	.	7	
598	FAUSTINA (?)	.	.	1	1	.	.	.	2	
597	MARCUS AURELIUS (A.P.)	.	.	.	1	.	.	.	1	
599	MARCUS AURELIUS	5	.	8	5	.	.	.	18	
601	LUCIUS VERUS (M.A.)	1	.	1	.	.	.	.	2	
605	LUCILLA (M.A.)	.	.	5	.	.	.	.	5	
605	LUCILLA (?)	.	.	1	.	.	.	.	1	
606	COMMODUS	5	.	6	1	.	.	.	12	
607	M. AURELIUS POST.	.	.	1	.	.	.	.	1	
608	CRISPINA (COMM)	1	.	1	1	.	.	.	3	
610	LUCILLA (COMM)	1	.	.	.	.	.	.	1	
615	SEPTIMUS SEVERUS	24	.	1	.	.	.	.	25	
623	GETA	5	.	.	.	.	.	.	5	
618	JULIA DOMNA (SEV)	8	.	1	.	.	.	.	9	
619	CARACALLA	10	.	.	.	.	.	.	10	
620	CARACALLA/GETA	1	.	.	.	.	.	.	1	
622	JULIA DOMNA (CAR)	2	.	.	.	.	.	.	2	
624	MACRINUS	1	.	.	.	.	.	.	1	
625	DIADUMENIAN CAES.	1	.	.	.	.	.	.	1	
627	ELAGABULUS	9	.	.	.	.	.	.	9	
630	JULIA SOEMIAS (ELAG)	1	.	.	.	.	.	.	1	
631	JULIA MAESA (ELAG)	1	.	.	.	.	.	.	1	
632	JULIA PAULA (ELAG)	1	.	.	.	.	.	.	1	
633	SEVERUS ALEXANDER	16	.	2	1	.	.	.	19	
635	JULIA MAMAEA (S.A.)	3	.	.	.	.	.	.	3	
641	MAXIMUS (MAX I)	.	.	1	.	.	.	.	1	
645	GORDIAN III	1	.	.	.	.	.	.	1	
649	PHILIP I	.	1	.	.	.	.	.	1	
655	TRAJAN DECIUS	.	1	.	.	.	.	.	1	
656	HERINNIA ETRUSCILLA	.	1	.	.	.	.	.	1	
678	VALERIAN	.	2	.	.	.	.	.	2	
679	VALERIAN II	.	1	.	.	.	.	.	1	
681	GALLIENUS (JOINT REIGN)		.	1	.	.	.	.	.	1
683	SALONINUS	.	1	.	.	.	.	.	1	
684	GALLIENUS (SOLE REIGN)	.	32	.	.	.	.	.	32	
685	GALLIENUS & SAL. (?)	.	2	.	.	.	.	.	2	
687	CLAUDIUS II	.	27	.	.	.	.	.	27	
690	CLAUDIUS II POSTH	.	5	.	.	.	.	.	5	
688	QUINTILLUS	.	1	.	.	.	.	.	1	
689	AURELIAN	.	1	.	.	.	.	.	1	

Coins from military sites (cont.):

		Den	Ant	Sest	Dup/As	AE	?	Quin	Total
702	GALLIC EMPIRE	.	18	.	.	.	.	.	18
703	POSTUMUS	.	11	.	.	.	.	.	11
706	VICTORINUS	.	25	.	.	.	.	.	25
707	TETRICUS I	.	52	.	.	.	.	.	52
708	TETRICUS II	.	29	.	.	.	.	.	29
708	TETRICUS (?)	.	1	.	.	.	.	.	1
709	CARAUSIUS	.	64	.	.	.	.	.	64
712	MAXIMIANUS H. (CAR...	.	1	.	.	.	.	.	1
713	ALLECTUS	.	2	.	.	.	.	2	4
726	BARBAROUS RADIATE	.	65	.	.	.	.	.	65
728	DIOCLETIAN	.	2	.	.	.	.	.	2
	Total	190	346	153	383	0	1	3	1076

3. Rural sites

The sites:

069	Marnhull	DORS	4	005	Kingscote	GLOS	507
504	Ashley	HANT	1	312	Lansdown 12 Acres	AVON	4
073	Asthall	OXON	8	521	Limbury	BEDS	4
-	Baldock	HERT	56	070	Lincoln Road: Enfield	MSEX	98
546	Bishopstone	SUSX	3	025	Lodge Farm: Alveston	AVON	1
870	Bletchley	BUCK	17	520	Lyons Court Farm	AVON	21
126	Bradley Hill	SOMS	16	060	Old Ford 1: Lefevre Rd	MSEX	41
502	Brockworth	GLOS	3	061	Old Ford 2: Parnell Rd	MSEX	45
066	Butcombe	AVON	13	062	Old Ford 3: Usher Rd	MSEX	43
153	Catsgore	SOMS	155	512	Overstone	NNTS	6
155	Chalk	KENT	15	513	Ringstead	NNTS	2
771	Cobham	SURR	3	171	Rotherley	DORS	8
002	Coln St Aldwyns	GLOS	312	875	Stone by Faversham	KENT	2
185	Cwmbrwyn	DYFD	1	529	Stretton Bridge	STAF	6
838	Eastington	GLOS	2	432	Studland	DORS	9
056	Farmoor	OXON	3	514	Thorplands	NNTS	8
506	Grandford	CAMB	23	457	Ufton Nervet	BEDS	4
281	Highdown	SUSW	1	028	Verlucio: Bowood House	WILT	71
293	Hucclecote 2	GLOS	4	078	West Blatchington	SUSE	20
297	Huntsham	HERE	4	068	Wiggonholt	SUSW	74
304	Iwerne Minster	DORS	17	489	Wooscutts Common	DORS	175

TOTAL = 1810, of which only 1802 could be fully identified

Coins from rural sites:

		Den	Ant	Sest	Dup/As/Quad	AE	?	Quin	Total
1	REPUBLIC	1	.	.	.	.	.	.	1
501	AUGUSTUS	3	.	.	1	.	.	.	4
510	GAIUS	.	.	.	.	.	1	.	1
515	CLAUDIUS I	1	.	1	17	.	4	.	23
519	ANTONIA (CL)	.	.	2	.	.	.	.	2
525	NERO	3	.	.	11	.	2	.	16
536	OTHO	1	.	.	.	.	.	.	1
538	VESPASIAN	2	.	.	15	.	6	.	23
540	DOMITIAN (VESP)	.	.	.	3	.	.	.	3
542	DOMITIAN (TITUS)	.	.	.	1	.	.	.	1
556	DOMITIAN	2	.	2	11	.	2	.	17
567	NERVA	.	.	.	1	.	2	.	3
570	TRAJAN	4	.	6	6	3	8	.	27
585	HADRIAN	2	.	19	12	3	16	.	52
589	SABINA (HAD)	1	.	.	.	.	.	.	1
592	L. AELIUS CAESAR (HAD)	.	.	1	.	.	.	.	1
594	ANTONINUS PIUS	.	.	23	12	1	8	.	44
595	FAUSTINA I (A.P.)	.	.	5	2	.	7	.	14
596	FAUSTINA II (A.P.)	.	.	2	2	.	.	.	4
604	FAUSTINA II (M.A.)	.	.	7	2	.	2	.	11
598	FAUSTINA (?)	.	.	.	1	.	.	.	1

Coins from rural sites (cont.):

		Den	Ant	Sest	Dup/As/Quad	AE	?	Quin	Total	
597	MARCUS AURELIUS (A.P.)	1	.	1	2	.	.	.	4	
599	MARCUS AURELIUS	2	.	12	1	.	8	.	23	
601	LUCIUS VERUS (M.A.)	1	.	2	1	.	.	.	4	
602	COMMODUS (M.A.)	1	.	1	.	.	.	.	2	
605	LUCILLA (M.A.)	.	.	4	1	.	1	.	6	
606	COMMODUS	2	.	17	3	.	1	.	23	
608	CRISPINA (COMM)	.	.	2	2	.	.	.	4	
614	CLODIUS ALBINUS	.	.	.	.	.	1	.	1	
615	SEPTIMIUS SEVERUS	14	.	3	.	.	1	.	18	
623	GETA	1	.	.	.	.	.	.	1	
618	JULIA DOMNA (SEV)	1	.	1	.	.	.	.	2	
619	CARACALLA	8	.	1	.	.	.	.	9	
622	JULIA DOMNA (CAR)	1	.	1	.	.	1	.	3	
627	ELAGABULUS	3	.	.	.	.	.	.	3	
631	JULIA MAESA (ELAG)	2	.	.	.	.	.	.	2	
633	SEVERUS ALEXANDER	5	.	.	2	.	.	.	7	
635	JULIA MAMAEA (S.A.)	.	.	.	.	.	1	.	1	
639	MAXIMINUS I	1	.	.	.	.	.	.	1	
647	GORDIAN III AUG.	.	4	.	1	.	1	.	6	
655	TRAJAN DECIUS	.	1	.	.	.	.	.	1	
672	TREBONIANUS GALLUS	.	.	.	.	.	1	.	1	
678	VALERIAN	.	.	.	.	.	2	.	2	
679	VALERIAN II	.	1	.	.	.	.	.	1	
681	GALLIENUS (JOINT REIGN)		.	9	.	.	.	.	.	9
684	GALLIENUS (SOLE REIGN)	.	86	.	.	.	.	.	86	
685	GALLIENUS & SAL. (?)	.	4	.	.	.	.	.	4	
686	SALONINA	.	3	.	.	.	.	.	3	
686	SALONINA (SOLE REIGN)	.	3	.	.	.	.	.	3	
687	CLAUDIUS II	.	157	.	.	.	.	.	157	
688	QUINTILLUS	.	5	.	.	.	.	.	5	
689	AURELIAN	.	5	.	.	.	.	.	5	
691	SEVERINA	.	1	.	.	.	.	.	1	
692	TACITUS	.	5	.	.	.	.	.	5	
695	PROBUS	.	8	.	.	.	.	.	8	
696	CARUS	.	1	.	.	.	.	.	1	
698	CARINUS AUG. (CARUS)	.	1	.	.	.	.	.	1	
727	GALERIUS	.	.	.	.	.	.	1	1	
729	MAXIMIANUS HERCULEUS		.	.	.	.	.	.	2	2
703	POSTUMUS	.	27	2	.	.	.	.	29	
705	MARIUS	.	1	.	.	.	.	.	1	
706	VICTORINUS	.	86	.	.	.	.	.	86	
707	TETRICUS I	.	229	.	.	.	.	.	229	
708	TETRICUS II	.	74	.	.	.	.	.	74	
709	CARAUSIUS	.	92	.	.	.	.	.	92	
711	DIOCLETIAN (CARAUSIUS)		.	1	.	.	.	.	.	1
713	ALLECTUS	.	17	.	.	.	.	11	28	
726	BARBAROUS RADIATE	.	596	.	.	.	.	.	596	
	TOTAL	63	1417	115	110	7	76	14	1802	

4. Small Towns with forts

The sites:

Alchester	Alauna	14	Scole	Villa Faustini	34
Catterick	Cataractonium	325	Sea Mills	Abona	259
Clausentum (Bitterne)	Clausentium	42	Wall	Letocetum	3
Corbridge	Coriosopitum	4253	Bath	Aquae Sulis	27
High Cross	Venonis	11	Godmanchester	Durovigutum	2
Malton	? Derventio	136	Dorchester on Thames	-	28
Old Winteringham	-	113	Cambridge	Duroliponte	5
Piercebridge	-	1544			

TOTAL = 6796, of which only 6787 could be fully identified

Coins from small towns with forts:

		Den	Ant	Sest	Dup/As/Quad	AE	?	Quin	Total
1	REPUBLIC	17	.	.	.	.	.	.	17
1	MARK ANTONY	48	.	.	.	.	.	.	48
501	AUGUSTUS	.	.	.	3	.	.	.	3
504	TIBERIUS	2	.	.	.	.	.	.	2
506	DRUSUS (TIB)	.	.	.	1	.	.	.	1
509	AGRIPPA (TIB)	.	.	.	4	.	.	.	4
510	GAIUS	.	.	.	2	.	.	.	2
515	CLAUDIUS I	1	.	2	98	3	.	.	104
519	ANTONIA (CL)	.	.	1	1	.	.	.	2
525	NERO	3	.	1	35	6	.	.	45
535	GALBA	2	.	.	1	.	.	.	3
537	VITELLIUS	5	.	.	.	.	.	.	5
538	VESPASIAN	62	.	7	100	10	.	.	179
539	TITUS (VESP)	2	.	3	3	.	.	.	8
540	DOMITIAN (VESPIAN)	7	.	.	4	.	.	.	11
541	TITUS	11	.	5	8	.	.	.	24
542	DOMITIAN (TITUS)	3	.	.	1	.	.	.	4
543	JULIA (TITUS)	1	.	.	.	.	.	.	1
544	VESPIAN POSTH (TITUS)	1	.	1	.	.	.	.	2
555	FLAVIAN	4	.	.	17	.	.	.	21
556	DOMITIAN	24	.	30	107	3	1	.	165
567	NERVA	14	.	13	18	.	.	.	45
570	TRAJAN	76	.	115	134	1	3	.	329
585	HADRIAN	72	.	105	91	1	3	.	272
589	SABINA (HAD)	4	.	6	4	.	.	.	14
592	L. AELIUS CAES. (HAD)	.	.	2	1	.	.	.	3
594	ANTONINUS PIUS	50	.	45	88	.	1	.	184
595	FAUSTINA I (A.P.)	24	.	22	32	.	.	.	78
596	FAUSTINA II (A.P.)	4	.	5	11	.	.	.	20
604	FAUSTINA II (M.A.)	9	.	12	7	.	1	.	29
597	M. AURELIUS (A.P.)	11	.	5	16	.	.	.	32
599	M.S AURELIUS	28	.	21	6	.	.	.	55
600	A.PIUS POSTH (M.A.)	1	.	.	.	.	.	.	1
601	LUCIUS VERUS (M.A.)	10	.	2	3	.	.	.	15
602	COMMODUS (M.A.)	3	.	1	1	.	.	.	5
605	LUCILLA (M.A.)	5	.	5	1	.	.	.	11
606	COMMODUS	17	.	13	4	.	.	.	34
607	MARCUS AURELIUS P...	2	.	.	.	.	.	.	2
608	CRISPINA (COMM)	1	.	2	.	.	.	.	3
613	MANLIA SCANTILLA	.	.	.	1	.	.	.	1
614	CLODIUS ALBINUS	3	.	1	.	.	.	.	4
615	SEPTIMIUS SEVERUS	85	.	2	1	.	.	.	88
623	GETA	22	.	.	1	.	1	.	24
617	JULIA DOMNA (?)	35	.	.	.	.	.	.	35
618	JULIA DOMNA (SEV)	2	.	1	.	.	.	.	3
619	CARACALLA	49	1	.	1	2	.	.	53
620	CARACALLA/GETA	1	.	.	.	.	.	.	1
621	PLAUTILLA (CAR)	3	.	.	.	.	.	.	3
624	MACRINUS	3	.	.	.	.	.	.	3
627	ELAGABULUS	30	.	.	.	.	.	.	30
628	ELAGABULUS'SEV.ALEX	1	.	.	.	.	.	.	1
629	AQUILIA SEVERA (ELAG)	2	.	.	.	.	.	.	2
630	JULIA SOAEMI (ELAG)	3	.	.	.	.	.	.	3
631	JULIA MAESA (ELAG)	10	.	.	.	.	.	.	10
632	JULIA PAULA (ELAG)	1	.	.	.	.	1	.	2
633	SEVERUS ALEXANDER	56	.	.	.	.	.	.	56
634	ORBIANA	2	.	.	.	.	.	.	2
635	JULIA MAMAEA (S.A.)	15	.	1	1	.	1	.	18
639	MAXIMINUS I	4	1	.	.	.	.	.	5
641	MAXIMUS (MAX I)	1	.	.	.	.	.	.	1
645	GORDIAN III	1	10	.	1	.	.	.	12
647	GORDIAN III AUG.	.	2	.	.	.	.	.	2
649	PHILIP I	1	9	.	.	.	.	.	10
650	OTACILIA SEVERA (PH I)	.	1	.	.	.	.	.	1
651	PHILIP II CAES. (PH I)	.	1	.	.	.	.	.	1

Coins from small towns with forts (cont.):

		Den	Ant	Sest	Dup/As/Quad	AE	?	Quin	Total
655	TRAJAN DECIUS	.	3	.	.	.	.	.	3
656	HERENNIA ETRUSCILLA	.	1	.	.	.	.	.	1
672	TREBONIANUS GALLUS	.	1	.	.	.	.	.	1
674	VOLUSIAN AUG. (TREB.G)	.	2	.	.	.	.	.	2
678	VALERIAN	.	13	.	.	.	2	.	15
679	VALERIAN II	.	1	.	.	.	.	.	1
681	GALLIENUS (JR)	.	7	.	.	.	.	.	7
682	SALONINA (JR)	.	5	.	.	.	.	.	5
683	SALONINUS	.	1	.	.	.	.	.	1
684	GALLIENUS (SOLE REIGN)	.	441	.	.	.	.	.	441
686	SALONINA (SOLE REIGN)	.	34	.	.	.	.	.	34
687	CLAUDIUS II	.	546	.	.	.	.	.	546
690	CLAUDIUS II POSTH	.	346	.	.	.	.	.	346
688	QUINTILLUS	.	13	.	.	.	.	.	13
689	AURELIAN	.	7	.	.	.	.	.	7
689	SEVERINA	.	1	.	.	.	.	.	1
692	TACITUS	.	4	.	.	.	.	.	4
693	FLORIAN	.	1	.	.	.	.	.	1
695	PROBUS	.	24	.	.	.	.	.	24
701	NUMERIAN AUG. (CARUS)	.	1	.	.	.	.	.	1
728	DIOCLETIAN	.	2	.	.	.	.	.	2
730	CONSTANTIUS I	.	1	.	.	.	.	.	1
702	GALLIC EMPIRE	.	121	.	.	.	.	.	121
703	POSTUMUS	.	82	.	1	.	.	.	83
705	MARIUS	.	2	.	.	.	.	.	2
706	VICTORINUS	.	373	.	.	.	.	.	373
707	TETRICUS I	.	994	.	.	.	.	.	994
708	TETRICUS II	.	469	.	.	.	.	.	469
708	TETRICUS (?)	.	1	.	.	.	.	.	1
709	CARAUSIUS	1	373	.	.	.	.	.	374
711	DIOCLETIAN (CAR)	.	3	.	.	.	.	.	3
712	MAXIMIANUS H. (CAR...	.	2	.	.	.	.	.	2
713	ALLECTUS	.	53	.	.	.	2	5	60
714	BRITISH EMPIRE	.	3	.	.	.	.	.	3
726	BARBAROUS RADIATE	.	691	.	.	.	.	.	691
	TOTAL	855	4647	429	809	26	16	5	6787

5. Small Towns

The sites:

Bourton Bridge	-	42	Skeleton Green/Braughing	-	17
Dorn	-	15	Hibaldstow	-	41
Old Sarum	Sorviodunum	17	Towcester	Lactodurum	12
Camerton	-	365	Tripontium (Cave's Inn)	Tripontium	27
Brampton	-	8	Great Casterton	?	28

TOTAL = 572

Coins from small towns:

		Den	Ant	Sest	Dup/As	AE	?	Quin	Total
1	REPUBLIC	2	.	.	.	.	.	.	2
502	TIBERIUS CAESAR (AUG)	.	.	.	1	.	.	.	1
510	GAIUS	.	.	.	2	.	.	.	2
515	CLAUDIUS I	.	.	1	5	.	.	.	6
525	NERO	.	.	.	1	.	.	.	1
538	VESPASIAN	2	.	1	12	.	.	.	15
539	TITUS (VESP)	.	.	.	3	.	.	.	3
556	DOMITIAN	1	.	1	6	.	1	.	9
570	TRAJAN	2	.	3	7	.	2	.	14
585	HADRIAN	.	.	4	4	.	.	.	8
589	SABINA (HAD)	.	.	1	1	.	.	.	2

Coins from small towns (cont.):

		Den	Ant	Sest	Dup/As	AE	?	Quin	Total
594	ANTONINUS PIUS	1	.	5	6	.	.	.	12
595	FAUSTINA I (A.P.)	.	.	2	2	.	.	.	4
596	FAUSTINA II (A.P.)	.	.	2	.	.	2	.	4
604	FAUSTINA II (M.A.)	.	.	.	2	.	.	.	2
597	MARCUS AURELIUS (A.P.)	.	.	.	2	.	.	.	2
599	MARCUS AURELIUS	.	.	1	.	.	.	.	1
602	COMMODUS (M.A.)	.	.	1	.	.	1	.	2
606	COMMODUS	.	.	3	1	.	.	.	4
608	CRISPINA (COMM)	.	.	.	1	.	.	.	1
609	PERTINAX	1	.	.	.	.	.	.	1
615	SEPTIMIUS SEVERUS	5	.	.	.	.	.	.	5
623	GETA	1	.	1	.	.	.	.	2
618	JULIA DOMNA (SEV)	2	.	.	.	.	.	.	2
619	CARACALLA	2	.	.	.	.	1	.	3
627	ELAGABULUS	1	.	.	.	.	.	.	1
631	JULIA MAESA (ELAG)	2	.	.	.	.	.	.	2
633	SEVERUS ALEXANDER	8	.	.	.	.	.	.	8
634	ORBIANA	1	.	.	.	.	.	.	1
635	JULIA MAMAEA (S.A.)	3	.	.	1	.	.	.	4
674	VOLUSIAN AUG. (TREB.G)	.	1	.	.	.	.	.	1
678	VALERIAN	.	2	.	.	.	.	.	2
679	VALERIAN II	.	1	.	.	.	.	.	1
681	GALLIENUS (JR)	.	1	.	.	.	.	.	1
684	GALLIENUS (SR)	.	44	.	.	.	.	.	44
686	SALONINA	.	1	.	.	.	.	.	1
686	SALONINA (SOLE REIGN)	.	1	.	.	.	.	.	1
687	CLAUDIUS II	.	66	.	.	.	.	.	66
690	CLAUDIUS II POSTH	.	3	.	.	.	.	.	3
689	AURELIAN	.	3	.	.	.	.	.	3
692	TACITUS	.	1	.	.	.	.	.	1
695	PROBUS	.	7	.	.	.	.	.	7
729	MAXIMIANUS HERC.	.	1	.	.	.	.	.	1
702	GALLIC EMPIRE	.	2	.	.	.	.	.	2
703	POSTUMUS	.	8	2	.	.	.	.	10
705	MARIUS	.	1	.	.	.	.	.	1
706	VICTORINUS	.	33	.	.	.	.	.	33
707	TETRICUS I	.	106	.	.	.	.	.	106
708	TETRICUS II	.	35	.	.	.	.	.	35
709	CARAUSIUS	1	24	.	.	.	.	.	25
713	ALLECTUS	.	6	.	.	.	.	8	14
726	BARBAROUS RADIATE	.	90	.	.	.	.	.	90
	TOTAL	35	437	28	57	0	7	8	572

6. Temples

The sites:

849	Blaise Castle	AVON	11	059	Slonk Hill	SUSW	12
805	Bourton Grounds	BUCK	31	422	Springhead Site A	KENT	27
036	Brean Down	SOMS	21	862	Springhead: B10	KENT	9
077	Brigstock	NNTS	73	863	Springhead: B8 & kiln	KENT	6
821	Chanctonbury Ring	SUSW	9	860	Springhead: ditch	KENT	6
-	Cosgrove	NNTS	52	856	Springhead: Temple 1	KENT	24
819	Farley Heath	SURR	16	858	Springhead: Temple 2	KENT	23
080	Frilford Temple	BERK	14	857	Springhead: T 3&4	KENT	9
815	Harlow	ESSX	4	861	Springhead: Temple 6	KENT	43
510	Jordan Hill	DORS	5	859	Springhead: Timple 5	KENT	25
004	Lamyatt Beacon	SOMS	74	007	West Hill: Uley	GLOS	300
803	Lydney Park	GLOS	1325	508	Weycock Hill	BERK	2
003	Nettleton	WILT	364	075	Woodeaton	OXON	328
019	Pagans Hill: Chewstoke	AVON	39	045	Wycombe: Andoversford	GLOS	16

TOTAL = 2868, of which only 2865 could be fully identified

Coins from temple sites:

		Den	Ant	Sest	Dup/As	AE	?	Quin	Total
1	REPUBLIC	12	.	.	.	.	.	.	12
501	AUGUSTUS	1	.	1	2	3	.	.	7
503	DIVUS AUGUSTUS	.	.	.	1	.	.	.	1
504	TIBERIUS	.	.	.	2	.	.	.	2
505	DIVUS AUGUSTUS (TIB)	.	.	.	1	.	.	.	1
509	AGRIPPA (TIB)	.	.	.	3	.	.	.	3
510	GAIUS	.	.	.	1	.	.	.	1
515	CLAUDIUS I	.	.	3	20	10	.	.	33
519	ANTONIA (CL)	.	.	2	.	.	.	.	2
525	NERO	2	.	.	7	3	3	.	15
535	GALBA	1	.	.	.	.	.	.	1
537	VITELLIUS	.	.	.	.	1	1	.	2
538	VESPASIAN	11	.	4	17	2	6	.	40
539	TITUS (VESP)	.	.	1	1	.	.	.	2
540	DOMITIAN (VESP)	.	.	.	2	.	.	.	2
541	TITUS	.	.	.	.	1	1	.	2
556	DOMITIAN	5	.	2	22	4	1	.	34
567	NERVA	1	.	1	.	.	.	.	2
570	TRAJAN	14	.	9	11	7	7	.	48
585	HADRIAN	15	.	17	17	9	14	.	72
589	SABINA (HAD)	.	.	1	1	.	.	.	2
594	ANTONINUS PIUS	7	.	26	12	20	5	.	70
595	FAUSTINA I (A.P.)	3	.	10	9	.	1	.	23
596	FAUSTINA II (A.P.)	.	.	2	2	.	.	.	4
604	FAUSTINA II (M.A.)	1	.	10	4	.	5	.	20
597	M. AURELIUS (A.P.)	.	.	2	5	.	2	.	9
599	MARCUS AURELIUS	5	.	16	6	16	2	.	45
601	LUCIUS VERUS (M.A.)	2	.	1	1	.	.	.	4
602	COMMODUS (M.A.)	.	.	1	.	.	.	.	1
605	LUCILLA (M.A.)	.	.	6	.	.	5	.	11
606	COMMODUS	5	.	21	.	2	.	.	28
608	CRISPINA (COMM)	1	.	5	2	.	.	.	8
614	CLODIUS ALBINUS	.	.	1	.	.	.	.	1
615	SEPTIMIUS SEVERUS	30	.	3	.	.	3	.	36
623	GETA	2	.	.	2	.	.	.	4
618	JULIA DOMNA (SEV)	6	.	2	.	.	.	.	8
619	CARACALLA	10	4	1	.	1	.	.	16
621	PLAUTILLA (CAR)	2	.	.	.	.	.	.	2
625	DIADUMENIAN CAES.	.	.	.	.	.	1	.	1
627	ELAGABULUS	7	.	1	.	2	.	.	10
630	JULIA SOAEMIAS (ELAG)	1	.	.	.	.	.	.	1
631	JULIA MAESA (ELAG)	1	.	.	1	.	.	.	2
633	SEVERUS ALEXANDER	22	.	2	2	4	1	.	31
634	ORBIANA	1	.	.	.	.	.	.	1
635	JULIA MAMAEA (S.A.)	4	.	.	.	.	.	.	4
639	MAXIMINUS I	.	.	.	.	1	.	.	1
641	MAXIMUS (MAX I)	1	.	.	.	.	.	.	1
646	GORDIAN III CAES.	.	1	.	.	.	.	.	1
647	GORDIAN III AUG.	.	5	1	1	.	1	.	8
649	PHILIP I	.	2	.	1	.	.	.	3
650	OTACILIA SEVERA (PH I)	.	.	1	.	.	.	.	1
655	TRAJAN DECIUS	.	2	.	.	.	.	.	2
672	TREBONIANUS GALLUS	.	2	.	.	.	.	.	2
674	VOLUSIAN AUG. (TREB.G)	.	1	.	.	.	.	.	1
678	VALERIAN	.	14	.	.	.	1	.	15
679	VALERIAN II	.	1	.	.	.	.	.	1
680	MARINIANA	.	1	.	.	.	.	.	1
681	GALLIENUS (JR)	.	4	.	.	.	.	.	4
—	SALONINA (JOINT REIGN)	.	1	.	.	.	.	.	1
684	GALLIENUS (SOLE REIGN)	.	215	.	1	.	.	.	216
685	GALLIENUS & SALONINA	.	1	.	.	.	.	.	1
686	SALONINA	.	23	.	.	.	.	.	23
687	CLAUDIUS II	.	455	.	.	.	.	.	455
690	CLAUDIUS II POSTH	.	10	.	.	.	.	.	10

Coins from temple sites (cont.):

		Den	Ant	Sest	Dup As	AE	?	Quin	Total
688	QUINTILLUS	.	12	.	.	.	.	.	12
689	AURELIAN	.	10	.	.	.	.	.	10
691	SEVERINA	.	1	.	.	.	.	.	1
692	TACITUS	.	12	.	.	.	.	.	12
693	FLORIAN	.	1	.	.	.	.	.	1
695	PROBUS	.	40	.	.	.	.	.	40
696	CARUS	.	3	.	.	.	.	.	3
701	NUMERIAN AUG. (CARUS)	.	2	.	.	.	.	.	2
703	POSTUMUS	.	50	1	.	.	.	.	51
704	LAELIAN	.	1	.	.	.	.	.	1
705	MARIUS	.	1	.	.	.	.	.	1
706	VICTORINUS	.	99	.	.	.	.	.	99
707	TETRICUS I	.	595	.	.	.	.	.	595
708	TETRICUS II	.	108	.	.	.	.	.	108
709	CARAUSIUS	.	134	.	.	.	.	.	134
710	CARAUASIUS (&'COL...	.	1	.	.	.	.	.	1
712	MAXIMIANUS H. (CAR...	.	1	.	.	.	.	.	1
713	ALLECTUS	.	50	.	.	.	.	6	56
726	BARBAROUS RADIATE	.	310	.	.	.	.	.	310
728	DIOCLETIAN	.	12	.	.	.	17	.	29
729	MAXIMIANUS HERCULEUS		.	1	.	.	.	26	.
	27								
	TOTAL	173	2186	154	157	86	103	6	2865

7. Urban sites

The sites:

York	Colonia	Eburacum	430
Gloucester	Colonia	Glevum	41
Verulamium	Municipium	Verulamium	78
Aldborough	Civitas Capital	Isurium Brigantum	14
Exeter	Civitas Capital	Isca Dumnoniorum	64
Cirencester	Civitas Capital	Corinium	45
Silchester	Civitas Capital	Calleva Atrebatum	36
Leicester	Civitas Capital	Ratae Corieltauvorum	19
Ilchester	Civitas Capital	? Lindinis	158
Dorchester (Maumbury Rings)	Civitas Capaital	Durnovaria	17
Wroxeter	Civitas Capital	Viroconium	1905
Chichester	Civitas Capital	Noviomagus Reginorum	272
Chester (Amphitheatre)	Legionary Fort	Deva	24

TOTAL = 3103, of which only 3089 could be fully identified

Coins from urban sites:

		Den	Ant	Sest	Dup As	Quad	AE	?	Quin	Total
1	REPUBLICAN	14	.	.	1		.	.	.	15
1	MARK ANTONY	9	.	.	.		.	.	.	9
501	AUGUSTUS	2	.	.	3		.	.	.	5
504	TIBERIUS	2	.	.	2		.	.	.	4
508	GAIUS (TIB)	.	.	.	1		.	.	.	1
509	AGRIPPA (TIB)	.	.	.	5		.	.	.	5
510	GAIUS	.	.	.	10		.	.	.	10
511	AGRIPPINA I (GAIUS)	.	.	1	.		.	.	.	1
512	NERO (GAIUS)	.	.	.	2		.	.	.	2
513	GERMANICUS (GAIUS)	.	.	1	4		.	.	.	5
516	AGRIPPA (GAIUS)	.	.	.	1		.	.	.	1
515	CLAUDIUS I	.	.	3	128		2	2	.	135
519	ANTONIA (CL)	.	.	3	.		.	.	.	3
525	NERO	2	.	7	29		1	.	.	39
514	JULIO CLAUDIAN	.	.	.	1		.	.	.	1
538	VESPASIAN	9	.	6	70		.	.	.	85

Coins from urban sites (cont.):

		Den	Ant	Sest	Dup/As/Quad	AE	?	Quin	Total
539	TITUS (VESP)	1	.	1	5	.	.	.	7
540	DOMITIAN (VESP)	1	.	.	2	.	.	.	3
541	TITUS	.	.	.	1	.	.	.	1
543	JULIA (TITUS)	.	.	.	1	.	.	.	1
555	FLAVIAN	.	.	.	6	.	.	.	6
556	DOMITIAN	6	.	7	35	.	1	.	49
557	DOMITIA (DOM)	.	.	1	1	.	.	.	2
567	NERVA	1	.	.	8	.	.	.	9
570	TRAJAN	13	.	18	40	1	1	.	73
585	HADRIAN	13	.	24	34	1	.	.	72
589	SABINA (HAD)	.	.	1	2	.	.	.	3
594	ANTONINUS PIUS	4	.	17	39	.	.	.	60
595	FAUSTINA I (A.P.)	3	.	3	10	.	.	.	16
596	FAUSTINA II (A.P.)	3	.	4	8	1	.	.	16
604	FAUSTINA II (M.A.)	3	.	6	1	.	.	.	10
598	FAUSTINA (?)	2	.	.	2	.	.	.	4
597	MARCUS AURELIUS (A.P.)	1	.	2	2	.	.	.	5
599	MARCUS AURELIUS	3	.	16	10	.	.	.	29
600	A.PIUS POSTH (M.A.)	12	.	.	.	.	1	.	13
601	LUCIUS VERUS (M.A.)	.	.	1	.	.	.	.	1
602	COMMODUS (M.A.)	.	.	5	1	.	.	.	6
605	LUCILLA (M.A.)	.	.	5	.	.	.	.	5
606	COMMODUS	5	.	14	2	.	.	.	21
608	CRISPINA (COMM)	2	.	.	.	.	.	.	2
614	CLODIUS ALBINUS	1	.	.	.	.	.	.	1
615	SEPTIMUS SEVERUS	47	.	3	1	.	.	.	51
623	GETA	7	.	.	.	.	.	.	7
617	JULIA DOMNA (?)	1	.	.	.	.	.	.	1
618	JULIA DOMNA (SEV)	16	.	.	2	.	.	.	18
619	CARACALLA	16	.	.	.	1	.	.	17
619	SEPT SEV POSTH	1	.	.	.	.	.	.	1
622	JULIA DOMNA (CAR)	1	.	.	.	.	.	.	1
624	MACRINUS	1	.	.	.	.	.	.	1
627	ELAGABULUS	22	.	.	.	.	.	.	22
630	JULIA SOAEMIAS (ELAG)	2	.	.	.	.	.	.	2
631	JULIA MAESA (ELAG)	6	.	.	.	.	.	.	6
632	JULIA PAULA (ELAG)	2	.	.	.	.	.	.	2
633	SEVERUS ALEXANDER	32	.	.	.	.	.	.	32
634	ORBIANA	1	.	.	.	.	.	.	1
635	JULIA MAMAEA (S.A.)	8	.	.	1	.	.	.	9
639	MAXIMINUS I	.	1	.	.	.	.	.	1
645	GORDIAN III	.	4	.	1	.	.	.	5
647	GORDIAN III AUG.	.	2	1	1	.	.	.	4
649	PHILIP I	1	3	.	1	.	.	.	5
650	OTACILIA SEVERA (PH I)	.	.	.	1	.	.	.	1
651	PHILIP II CAES. (PH I)	.	2	.	.	.	.	.	2
655	TRAJAN DECIUS	.	3	.	3	.	.	.	6
656	HERENNIA ETRUSCILLA	.	1	.	.	.	.	.	1
672	TREBONIANUS GALLUS	.	2	.	.	.	.	.	2
678	VALERIAN	.	10	.	1	.	.	.	11
679	VALERIAN II	.	4	.	.	.	.	.	4
681	GALLIENUS (J R)	.	9	.	.	.	.	.	9
682	SALONINA (J R)	.	7	.	.	.	.	.	7
683	SALONINUS	.	1	.	.	.	.	.	1
684	GALLIENUS (SOLE REIGN)	.	153	.	.	.	.	.	153
685	GALLIENUS & SAL.	.	6	.	.	.	.	.	6
686	SALONINA (SOLE REIGN)	.	13	.	.	.	.	.	13
687	CLAUDIUS II	.	170	.	.	.	.	.	170
688	QUINTILLUS	.	2	.	.	.	.	.	2
689	AURELIAN	.	3	.	.	.	.	.	3
690	CLAUDIUS II POSTH	.	121	.	.	.	.	.	121
691	SEVERINA	1	.	.	.	.	.	.	1
692	TACITUS	.	6	.	.	.	.	.	6
693	FLORIAN	.	1	.	.	.	.	.	1

Coins from urban sites (cont.):

		Den	Ant	Sest	Dup/As	Quad	AE	?	Quin	Total
695	PROBUS	.	2	.	.	.	.	.	.	2
702	GALLIC EMPIRE	.	95	.	.	.	.	.	.	95
703	POSTUMUS	.	38	2	.	.	.	.	1	41
705	MARIUS	.	2	.	.	.	.	.	.	2
706	VICTORINUS	.	146	.	.	.	.	.	.	146
707	TETRICUS I	.	556	.	.	.	.	.	.	556
708	TETRICUS (?)	.	235	.	.	.	.	.	.	235
709	CARAUSIUS	.	135	.	.	.	.	.	.	135
711	DIOCLETIAN (CAR.)	.	2	.	.	.	.	.	.	2
712	MAXIMIANUS H. (CAR...	.	1	.	.	.	.	.	.	1
713	ALLECTUS	.	15	.	.	.	.	.	9	24
714	BRITISH EMPIRE	.	1	.	.	.	.	.	.	1
726	BARBAROUS RADIATE	.	406	.	.	.	.	.	.	406
727	GALERIUS	.	1	.	.	.	.	.	.	1
	TOTAL	277	2159	152	479		7	5	10	3089

8. Villas

The sites:

090	Angmering	SUSW	6	055	Latimer	BUCK	32
097	Ashtead	SURR	9	081	Llantwit Major	GLAM	15
099	Atworth	WILT	44	328	Lockleys	HERT	5
001	Barnsley Park	GLOS	82	074	Lufton	SOMS	2
194	Droitwich	WORC	47	334	Magor Fm. Cambourne	CORN	11
110	Beadlam	YORK	17	344	Mileoak	NNTS	3
877	Beddington	GLON	65	355	Newport	IOW	6
115	Bignor	SUSW	17	021	Northchurch	HERT	19
022	Boxmoor	HERT	70	365	Norton Disney	LINC	7
125	Brading	IOW	24	366	Nuthills	WILT	1
133	Brislington	AVON	2	371	Otford	KENT	16
046	Cheddar Vicarage	SOMS	16	027	Park Street	HERT	16
011	Chedworth	GLOS	74	385	Preston	DORS	1
160	Chesters	GLOS	26	391	Rapsley	SURR	4
024	Chew Park: Chewstoke	AVON	39	398	Rockbourne	HANT	170
051	Chilgrove 1	SUSW	20	-	Rudston	YORK	14
052	Chilgrove 2	SUSW	33	412	Saunderton	BUCK	2
165	Cobham Park	KENT	3	047	Shakenoak A	OXON	40
172	Combley: Arreton	IOW	3	048	Shakenoak B & F	OXON	90
029	Cox Green	BERK	16	049	Shakenoak C	OXON	35
179	Cranhill	BERK	3	589	Sidlesham	SUSW	2
200	Darenth	KENT	49	418	Southwick	SUSW	7
188	Denton	LINC	2	041	Spoonley Wood	GLOS	94
192	Ditchley	OXON	10	012	Star Villa: Shipham	SOMS	1
193	Downton	WILT	10	442	Thornford	DORS	2
216	Ely	GLAM	5	449	Titsey Park	SURR	1
218	Engleton	STAF	3	450	Tockington Park	GLOS	1
224	Farnigham II	KENT	2	053	Upmarden	SUSW	4
014	Fishbourne	SUSW	217	462	Walton on the Hill 1	SURR	1
503	Frilford Villa	BERK	1	463	Walton on the Hill 2	SURR	1
032	Frocester Court	GLOS	273	470	West Coker	SOMS	5
043	Gadebridge Park	HERT	99	035	Whatley Combe	SOMS	3
017	Gatcombe	AVON	175	037	Whittington	GLOS	9
241	Gayton Thorpe	NORF	3	054	Whitton	GLAM	14
245	Great Casterton (Villa)	RUTL	16	484	Wingham	KENT	1
265	Hambleden	BUCK	176	013	Wint Hill: Banwell	AVON	85
272	Harpsden Wood	OXON	5	485	Winterton	HUMB	32
284	High Wycombe	BUCK	6	038	Witcombe	GLOS	15
288	Holcombe	DEVN	9	494	Woolstone	OXON	2
837	Hucclecote 1	GLOS	4	496	Worplesden	SURR	1
023	Keynsham	AVON	3	010	Wraxall	SOMS	11
039	Kings Weston	AVON	20	500	Yeovil Westland	SOMS	14
678	Lansdown: Little Down	AVON	24				

TOTAL = 2523, of which only 2511 could be fully identified

Coins from villas:

		Den	Ant	Sest	Dup/As	AE	?	Quin	Total
1	REPUBLIC	5	.	.	.	.	.	.	5
501	AUGUSTUS	4	.	.	1	1	.	.	6
503	DIVUS AUGUSTUS	.	.	.	1	.	.	.	1
504	TIBERIUS	3	.	.	.	.	.	.	3
509	AGRIPPA (TIB)	.	.	.	2	.	.	.	2
510	GAIUS	.	.	.	1	.	1	.	2
515	CLAUDIUS I	1	.	3	75	.	7	.	86
525	NERO	.	.	3	10	.	12	.	25
538	VESPASIAN	4	.	4	21	.	31	.	60
539	TITUS (VESP)	.	.	.	1	.	.	.	1
540	DOMITIAN (VESP)	1	.	.	2	.	.	.	3
541	TITUS	1	.	.	1	.	.	.	2
543	JULIA (TITUS)	1	.	.	1	.	.	.	2
556	DOMITIAN	3	.	2	10	.	11	.	26
567	NERVA	1	.	.	5	1	2	.	9
570	TRAJAN	5	.	14	11	2	16	.	48
585	HADRIAN	6	.	21	14	.	22	.	63
589	SABINA (HAD)	.	.	1	.	.	1	.	2
592	L. AELIUS CAESAR (HAD)	.	.	.	.	.	1	.	1
594	ANTONINUS PIUS	1	.	12	11	.	22	.	46
595	FAUSTINA I (A.P.)	.	.	6	2	.	5	.	13
596	FAUSTINA II (A.P.)	.	.	3	1	.	.	.	4
604	FAUSTINA II (M.A.)	1	.	5	1	.	4	.	11
597	MARCUS AURELIUS (A.P.)	1	.	1	1	.	.	.	3
599	MARCUS AURELIUS	.	.	13	2	.	8	.	23
601	LUCIUS VERUS (M.A.)	.	.	2	1	.	.	.	3
602	COMMODUS (M.A.)	.	.	.	1	.	.	.	1
605	LUCILLA (M.A.)	.	.	3	.	.	2	.	5
606	COMMODUS	.	.	8	3	.	5	.	16
608	CRISPINA (COMM)	1	.	1	.	.	.	.	2
614	CLODIUS ALBINUS	.	.	.	.	.	1	.	1
615	SEPTIMIUS SEVERUS	11	.	2	.	.	2	.	15
618	JULIA DOMNA (SEV)	4	.	.	.	.	6	.	10
623	GETA	4	.	.	.	.	1	.	5
619	CARACALLA	6	.	.	.	.	2	.	8
621	PLAUTILLA (CAR)	1	.	.	1	.	.	.	2
624	MACRINUS	.	.	1	.	.	.	.	1
627	ELAGABULUS	5	.	.	.	.	1	.	6
630	JULIA SOAEMIAS (ELAG)	1	.	.	.	.	1	.	2
631	JULIA MAESA (ELAG)	3	.	.	.	.	2	.	5
633	SEVERUS ALEXANDER	13	.	.	1	.	3	.	17
635	JULIA MAMAEA (S.A.)	4	.	.	1	.	1	.	6
639	MAXIMINUS I	1	.	.	.	.	.	.	1
647	GORDIAN III AUG.	.	1	1	1	.	2	.	5
649	PHILIP I	.	.	.	.	.	2	.	2
650	OTACILIA SEVERA (PH I)	.	.	.	.	.	1	.	1
651	PHILIP II CAES. (PH I)	.	1	.	.	.	.	.	1
655	TRAJAN DECIUS	.	.	.	.	.	1	.	1
672	TREBONIANUS GALLUS	.	1	.	.	.	1	.	2
674	VOLUSIAN AUG. (TREB.G)	.	1	.	.	.	1	.	2
678	VALERIAN	.	5	.	1	.	1	.	7
679	VALERIAN II	.	1	.	.	.	.	.	1
681	GALLIENUS (JOINT REIGN) 12		.	12	.	.	.	.	.
682	SALONINA (JOINT REIGN)	.	3	.	.	.	.	.	3
684	GALLIENUS (SOLE REIGN)	.	156	.	.	.	.	.	156
686	SALONINA	.	8	.	.	.	.	.	8
687	CLAUDIUS II	.	251	.	.	.	.	.	251
688	QUINTILLUS	.	9	.	.	.	.	.	9
689	AURELIAN	.	12	.	.	.	.	.	12
691	SEVERINA	.	2	.	1	.	.	.	3
692	TACITUS	.	5	.	.	.	.	.	5
695	PROBUS	.	20	.	.	.	.	1	21
696	CARUS	.	1	.	.	.	.	.	1
701	NUMERIAN AUG. (CARUS)	.	2	.	.	.	.	.	2

Coins from villas (cont.):

		Den	Ant	Sest	Dup/As	AE	?	Quin	Total
703	POSTUMUS	.	43	.	.	.	.	.	43
706	VICTORINUS	.	169	.	.	.	.	.	169
707	TETRICUS I	.	345	.	.	.	.	.	345
708	TETRICUS II	.	127	.	.	.	.	.	127
709	CARAUSIUS	.	145	.	.	.	.	.	145
711	DIOCLETIAN (CAR.)	.	1	.	.	.	.	.	1
712	MAXIMIANUS H. (CAR.)	.	2	.	.	.	.	.	2
713	ALLECTUS	.	52	.	.	.	.	16	68
726	BARBAROUS RADIATE	.	542	.	.	.	.	.	542
728	DIOCLETIAN	.	5	.	.	.	2	.	7
729	MAXIMIANUS HERC.	.	3	.	.	.	1	.	4
		92	1925	106	185	4	182	17	2511

Summary Tables:

1. Cemetery data: summary

		Den	Ant	Sest	Dup/As	AE	?	Quin	Total
A	Republican	0	0	0	0	0	0	0	0
B	Mark Antony	0	0	0	0	0	0	0	0
C	Julio Claudian 1	0	0	0	1	0	0	0	1
D	Julio Claudian 2	0	0	0	0	0	0	0	0
E	Civil War	0	0	0	0	0	0	0	0
F	Flavian 1	0	0	0	2	0	0	0	2
G	Flavian 2	0	0	0	2	0	0	0	2
H	Trajanic	0	0	1	3	0	0	0	4
I	Hadrianic	0	0	0	1	0	0	0	1
J	Antonine 1	0	0	2	3	3	0	0	8
K	Antonine 2	0	0	2	0	0	0	0	2
L	Antonine 3	0	0	1	0	0	0	0	1
M	Severan 1a	0	0	0	0	0	0	0	0
N	Severan 1b	0	0	0	0	0	0	0	0
O	Severan 2a	0	0	0	0	0	0	0	0
P	Severan 2b	0	0	0	0	0	0	0	0
Q	Balbinus-Hostilian	0	0	0	0	0	0	0	0
R	Treb. Gallus-Valerian	0	0	0	0	0	1	0	1
S	Gallienus & Salonina	0	2	0	0	0	0	0	2
T	Central Empire 1	0	4	0	0	0	0	0	4
U	Central Empire 2	0	2	0	0	0	0	0	2
V	Gallic Empire	0	3	0	0	0	0	0	3
W	British Empire	0	1	0	0	0	0	0	1
X	Radiate Copies	0	10	0	0	0	0	0	10
	TOTAL	0	22	6	12	3	1	0	44

2. Military sites: summary

		Den	Ant	Sest	Dup/As	AE	?	Quin	Total
A	Republican	17	0	0	1	0	0	1	19
B	Mark Antony	6	0	0	0	0	0	0	6
C	Julio Claudian 1	9	0	0	3	0	0	0	12
D	Julio Claudian 2	0	0	7	231	0	0	0	238
E	Civil War	2	0	0	0	0	0	0	2
F	Flavian 1	19	0	5	37	0	0	0	61
G	Flavian 2	7	0	8	22	0	0	0	37
H	Trajanic	7	0	39	30	0	0	0	76
I	Hadrianic	9	0	31	16	0	1	0	57
J	Antonine 1	17	0	35	35	0	0	0	87
K	Antonine 2	6	0	15	5	0	0	0	26
L	Antonine 3	7	0	8	2	0	0	0	17
M	Severan 1a	37	0	2	0	0	0	0	39
N	Severan 1b	13	0	0	0	0	0	0	13
O	Severan 2a	14	0	0	0	0	0	0	14
P	Severan 2b	19	0	3	1	0	0	0	23
Q	Balbinus-Hostilian	1	3	0	0	0	0	0	4
R	Treb. Gallus-Valerian	0	3	0	0	0	0	0	3
S	Gallienus & Salonina	0	36	0	0	0	0	0	36
T	Central Empire 1	0	33	0	0	0	0	0	33
U	Central Empire 2	0	3	0	0	0	0	0	3
V	Gallic Empire	0	136	0	0	0	0	0	136
W	British Empire	0	67	0	0	0	0	2	69
X	Radiate Copies	0	65	0	0	0	0	0	65
	TOTAL	190	346	153	383	0	1	3	1076

3. Rural sites: summary

		Den	Ant	Sest	Dup/As/Quad	AE	?	Quin	Total
A	Republican	1	0	0	0	0	0	0	1
B	Mark Antony	0	0	0	0	0	0	0	0
C	Julio Claudian 1	3	0	0	1	0	1	0	5
D	Julio Claudian 2	4	0	3	28	0	6	0	41
E	Civil War	1	0	0	0	0	0	0	1
F	Flavian 1	2	0	0	19	0	6	0	27
G	Flavian 2	2	0	2	12	0	4	0	20
H	Trajanic	4	0	6	6	3	8	0	27
I	Hadrianic	3	0	20	12	3	16	0	54
J	Antonine 1	1	0	38	21	1	17	0	78
K	Antonine 2	4	0	19	3	0	9	0	35
L	Antonine 3	2	0	19	5	0	2	0	28
M	Severan 1a	16	0	4	0	0	1	0	21
N	Severan 1b	9	0	2	0	0	1	0	12
O	Severan 2a	5	0	0	0	0	0	0	5
P	Severan 2b	6	0	0	2	0	1	0	9
Q	Balbinus-Hostilian	0	5	0	1	0	1	0	7
R	Treb. Gallus-Valerian	0	1	0	0	0	3	0	4
S	Gallienus & Salonina	0	105	0	0	0	0	0	105
T	Central Empire 1	0	162	0	0	0	0	0	162
U	Central Empire 2	0	21	0	0	0	0	3	24
V	Gallic Empire	0	417	2	0	0	0	0	419
W	British Empire	0	110	0	0	0	0	11	121
X	Radiate Copies	0	596	0	0	0	0	0	596
	TOTAL	63	1417	115	110	7	76	14	1802

4. Small Towns with early forts: summary

		Den	Ant	Sest	Dup/As/Quad	AE	?	Quin	Total
A	Republican	17	0	0	0	0	0	0	17
B	Mark Antony	48	0	0	0	0	0	0	48
C	Julio Claudian 1	2	0	0	10	0	0	0	12
D	Julio Claudian 2	4	0	4	134	9	0	0	151
E	Civil War	7	0	0	1	0	0	0	8
F	Flavian 1	91	0	16	133	10	0	0	250
G	Flavian 2	38	0	43	125	3	1	0	210
H	Trajanic	76	0	115	134	1	3	0	329
I	Hadrianic	76	0	113	96	1	3	0	289
J	Antonine 1	98	0	89	154	0	2	0	343
K	Antonine 2	47	0	29	11	0	0	0	87
L	Antonine 3	23	0	16	5	0	0	0	44
M	Severan 1a	144	0	3	2	0	1	0	150
N	Severan 1b	53	1	0	1	2	0	0	57
O	Severan 2a	50	0	0	0	0	1	0	51
P	Severan 2b	78	1	1	1	0	1	0	82
Q	Balbinus-Hostilian	2	27	0	1	0	0	0	30
R	Treb. Gallus-Valerian	0	17	0	0	0	2	0	19
S	Gallienus & Salonina	0	488	0	0	0	0	0	488
T	Central Empire 1	0	905	0	0	0	0	0	905
U	Central Empire 2	0	41	0	0	0	0	0	41
V	Gallic Empire	0	2042	0	1	0	0	0	2043
W	British Empire	1	434	0	0	0	2	5	442
X	Radiate Copies	0	691	0	0	0	0	0	691
	TOTAL	855	4647	429	809	26	16	5	6787

5. Small Towns: summary

		Den	Ant	Sest	Dup/As	AE	?	Quin	Total
A	Republican	2	0	0	0	0	0	0	2
B	Mark Antony	0	0	0	0	0	0	0	0
C	Julio Claudian 1	0	0	0	3	0	0	0	3
D	Julio Claudian 2	0	0	1	6	0	0	0	7
E	Civil War	0	0	0	0	0	0	0	0
F	Flavian 1	2	0	1	15	0	0	0	18
G	Flavian 2	1	0	1	6	0	1	0	9
H	Trajanic	2	0	3	7	0	2	0	14
I	Hadrianic	0	0	5	5	0	0	0	10
J	Antonine 1	1	0	9	12	0	2	0	24
K	Antonine 2	0	0	2	0	0	1	0	3
L	Antonine 3	1	0	3	2	0	0	0	6
M	Severan 1a	8	0	1	0	0	0	0	9
N	Severan 1b	2	0	0	0	0	1	0	3
O	Severan 2a	3	0	0	0	0	0	0	3
P	Severan 2b	12	0	0	1	0	0	0	13
Q	Balbinus-Hostilian	0	0	0	0	0	0	0	0
R	Treb. Gallus-Valerian	0	4	0	0	0	0	0	4
S	Gallienus & Salonina	0	47	0	0	0	0	0	47
T	Central Empire 1	0	69	0	0	0	0	0	69
U	Central Empire 2	0	12	0	0	0	0	0	12
V	Gallic Empire	0	185	2	0	0	0	0	187
W	British Empire	1	30	0	0	0	0	8	39
X	Radiate Copies	0	90	0	0	0	0	0	90
	TOTAL	35	437	28	57	0	7	8	572

6. Temples: summary

		Den	Ant	Sest	Dup/As	AE	?	Quin	Total
A	Republican	12	0	0	0	0	0	0	12
B	Mark Antony	0	0	0	0	0	0	0	0
C	Julio Claudian 1	1	0	1	10	3	0	0	15
D	Julio Claudian 2	2	0	5	27	13	3	0	50
E	Civil War	1	0	0	0	1	1	0	3
F	Flavian 1	11	0	5	20	3	7	0	46
G	Flavian 2	6	0	3	22	4	1	0	36
H	Trajanic	14	0	9	11	7	7	0	48
I	Hadrianic	15	0	18	18	9	14	0	74
J	Antonine 1	11	0	50	32	20	13	0	126
K	Antonine 2	7	0	24	7	16	7	0	61
L	Antonine 3	6	0	27	2	2	0	0	37
M	Severan 1a	38	0	5	2	0	3	0	48
N	Severan 1b	12	4	1	0	1	0	0	18
O	Severan 2a	9	0	1	1	2	1	0	14
P	Severan 2b	28	0	2	2	5	1	0	38
Q	Balbinus-Hostilian	0	10	2	2	0	1	0	15
R	Treb. Gallus-Valerian	0	19	0	0	0	1	0	20
S	Gallienus & Salonina	0	244	0	1	0	0	0	245
T	Central Empire 1	0	477	0	0	0	0	0	477
U	Central Empire 2	0	82	0	0	0	43	0	125
V	Gallic Empire	0	854	1	0	0	0	0	855
W	British Empire	0	186	0	0	0	0	6	192
X	Radiate Copies	0	310	0	0	0	0	0	310
	TOTAL	173	2186	154	157	86	103	6	2865

7. Urban sites: summary

		Den	Ant	SestDup/As/Quad		AE	?	Quin	Total
A	Republican	14	0	0	1	0	0	0	15
B	Mark Antony	9	0	0	0	0	0	0	9
C	Julio Claudian 1	4	0	2	28	0	0	0	34
D	Julio Claudian 2	2	0	13	158	3	2	0	178
E	Civil War	0	0	0	0	0	0	0	0
F	Flavian 1	11	0	7	85	0	0	0	103
G	Flavian 2	7	0	8	44	0	1	0	60
H	Trajanic	13	0	18	40	1	1	0	73
I	Hadrianic	13	0	25	36	1	0	0	75
J	Antonine 1	16	0	32	62	1	0	0	111
K	Antonine 2	15	0	27	11	0	1	0	54
L	Antonine 3	8	0	14	2	0	0	0	24
M	Severan 1a	71	0	3	3	0	0	0	77
N	Severan 1b	18	0	0	0	1	0	0	19
O	Severan 2a	33	0	0	0	0	0	0	33
P	Severan 2b	41	1	0	1	0	0	0	43
Q	Balbinus-Hostilian	1	15	1	7	0	0	0	24
R	Treb. Gallus-Valerian	0	16	0	1	0	0	0	17
S	Gallienus & Salonina	0	189	0	0	0	0	0	189
T	Central Empire 1	0	172	0	0	0	0	0	172
U	Central Empire 2	1	134	0	0	0	0	0	135
V	Gallic Empire	0	1072	2	0	0	0	1	1075
W	British Empire	0	154	0	0	0	0	9	163
X	Radiate Copies	0	406	0	0	0	0	0	406
	TOTAL	277	2159	152	479	7	5	10	3089

8. Villas

		Den	Ant	Sest	Dup/As	AE	?	Quin	Total
A	Republican	5	0	0	0	0	0	0	5
B	Mark Antony	0	0	0	0	0	0	0	0
C	Julio Claudian 1	7	0	0	5	1	1	0	14
D	Julio Claudian 2	1	0	6	85	0	19	0	111
E	Civil War	0	0	0	0	0	0	0	0
F	Flavian 1	7	0	4	26	0	31	0	68
G	Flavian 2	4	0	2	15	1	13	0	35
H	Trajanic	5	0	14	11	2	16	0	48
I	Hadrianic	6	0	22	14	0	24	0	66
J	Antonine 1	3	0	27	16	0	31	0	77
K	Antonine 2	0	0	18	4	0	10	0	32
L	Antonine 3	1	0	9	3	0	6	0	19
M	Severan 1a	19	0	2	0	0	9	0	30
N	Severan 1b	7	0	0	1	0	2	0	10
O	Severan 2a	9	0	1	0	0	4	0	14
P	Severan 2b	18	0	0	2	0	4	0	24
Q	Balbinus-Hostilian	0	2	1	1	0	6	0	10
R	Treb. Gallus-Valerian	0	8	0	1	0	3	0	12
S	Gallienus & Salonina	0	179	0	0	0	0	0	179
T	Central Empire 1	0	260	0	0	0	0	0	260
U	Central Empire 2	0	42	0	1	0	0	1	44
V	Gallic Empire	0	684	0	0	0	0	0	684
W	British Empire	0	208	0	0	0	3	16	227
X	Radiate Copies	0	542	0	0	0	0	0	542
	TOTAL	92	1925	106	185	4	182	17	2511

Appendix 3.22
Additional site list bibliography

The following sites do not appear in Ryan's database, therefore their sources are not published in Ryan (1988). Most of the lists are from northern sites to try and redress the bias of Ryan's site distribution.

Baldock	Rural	HERT	Baldock, the excavation of a Roman and pre-roman settlement, 1968-72. I.M. Stead & V. Rigby, Britannia Monograph Series No.7, 1986.
Castle Nick (Milecastle 39)	Military	NTHM	Unpublished listing, R.J.Brickstock 1988
Corbridge	Mixed	NTHM	Unpublished listing, P.J. Casey & R.J. Brickstock 1986
Cosgrove	Temple	NNTS	Unpublished listing, R.J.Brickstock 1989
Ilchester R10, R11, R2, R9	Urban	SOMS	Leech, R.H., 1982, Ilchester, volume 1, excavations; Bristol
Usk	Military	GWEN	Boon, G.C., 1982, Report on the Excavations at Usk 1965-1976: the Coins, Cardiff
Vindolanda Fort (1969-75)	Military	NTHM	Unpublished listing, P.J. Casey
Bewcastle (1937-78)	Military	CUMB	Unpublished listing, P.J. Casey
Piercebridge	Mixed	DURH	Unpublished listing, P.J. Casey & R.J. Brickstock
Wroxeter (3 lists)	Urban	SHRP	Wroxeter Palaestra 1968-86, provisional unpublished listing, P.J. Casey & R.J. Brickstock 1986; A furthe catalogue of coin finds from Roman Wroxeter, P.J. Casey & R.J. Brickstock 1987.
Aldborough	Urban	YORK	'The defences of Isurium Brigantium (Aldborough)', JNL Myres, KA Steer & AMH Chitty, Yorkshire Archaeological Journal, 40, 1959-62, pp 1-77.
Carrawburgh Fort	Military	NTHM	'Excavations at the Roman fort of Carrawburgh, 1967-1969', by D. Breeze, Archaeologia Aeliana 4th Series, 50, 1972, pp 81-144.
Catterick Fort	Mixed	YORK	'Cataractonium, fort and town', E W J Hildyard, Yorkshire Archaeological Journal 39, 1957, pp 224-65.
Ebchester Fort	Military	DURH	'Excavations at Ebchester Roman Fort 1972-3', V.A. Maxfield & A. Reed, Archaeologia Aeliana, 5th Series, 3, 1975, pp 43-104.
High Rochester	Military	NTHM	The coins from the excavations at High Rochester in 1852 and 1855', P.J. Casey & M. Savage, Archaeologia Aeliana, 5th Series, 8, 1980, pp 75-87.
Malton	Mixed	YORK	'Roman Malton: the civilian settlement', N. Mitchelson, Yorkshire Archaeological Journal, 41, 1963-6.
Rudston	Villa	YORK	'The Roman Villa at Rudston (E. Yorks): 4th Interim report: the excavations of 1936', K. A. Steer, Yorkshire Archaeological Journal, 33, 1936-7.
Sewingshields	Military	NTHM	'Sewingshields', D. Haigh & M. Savage, pp 33-147, Archaeologia Aeliana, 5th Series, 12, 1984, pp 33-147.
South Shields (1983-7)	Military	TYNE	Unpublished listing, R.J.Brickstock 1989
Turret 33b	Military	NTHM	'The excavation of Turret 33b (Coesike): the Coins' R.A.G. Carson, Archaeologia Aeliana, Series 4, 50, 1972, pp 145-78.
Wallsend	Military	TYNE	Unpublished listing, P.J. Casey & R.J. Brickstock 1987
York: Bedern	Urban	YORK	Unpublished listing, R.J. Brickstock
York: Bishophill	Urban	YORK	Unpublished listing, P.J. Casey & R.J. Brickstock
York: Blake Street	Urban	YORK	Unpublished listing, R.J. Brickstock
York: Cattle Market	Urban	YORK	Unpublished listing, R.J. Brickstock
York: Church Street Sewer	Urban	YORK	Unpublished listing, R.J. Brickstock
York: Clementhorpe	Urban	YORK	Unpublished listing, R.J. Brickstock
York: Coney Street	Urban	YORK	Unpublished listing, R.J. Brickstock
York: Coppergate	Urban	YORK	Unpublished listing, R.J. Brickstock
York: Coppergate ?	Urban	YORK	Unpublished listing, R.J. Brickstock
York: Ebor Brewery	Urban	YORK	Unpublished listing, R.J. Brickstock
York: Friends burial ground	Urban	YORK	Unpublished listing, R.J. Brickstock

York: Gillygate	Urban	YORK	Unpublished listing, R.J. Brickstock
York: Minster	Urban	YORK	Unpublished listing, P.J. Casey
York: Museum Chambers	Urban	YORK	Unpublished listing, R.J. Brickstock
York: Piccadilly	Urban	YORK	Unpublished listing, R.J. Brickstock
York: Skeldergate	Urban	YORK	Unpublished listing, P.J. Casey & R.J. Brickstock
York: St Mary's	Urban	YORK	Unpublished listing, R.J. Brickstock
York: Tanners Row	Urban	YORK	Unpublished listing, R.J. Brickstock
York: Trentholme drive	Urban	YORK	Unpublished listing, R.J. Brickstock
York: Union Terrace	Urban	YORK	Unpublished listing, R.J. Brickstock

Appendix 3.23
Site find emperor codes

These codes are based on Ryan's database. However as the database has been extended and refined further codes have become necessary. All additions to Ryan's coding have been indicated by an asterisk. Many of these insertions have been possible because gaps in the number sequence. Where gaps have not existed the next nearest gap has been used. This means that the codes are not given in acsolute chronological order. Other codes have been used for two type of coin. For example Ryan did not distinguish between Mark Antony and Republican coins, though many of these distinctions can be established using the catalogue references.

The columns below represent the code, the face on the coin, the code of the issuing authority and the Reece period.

001	REPUBLIC	001	1
(001)	MARK ANTONY	001	1*
501	AUGUSTUS	501	1
502	TIBERIUS CAESAR (AUG)	501	1
503	DIVUS AUGUSTUS	501	1
504	TIBERIUS	504	1
505	DIVUS AUGUSTUS (TIB)	504	1
506	DRUSUS (TIB)	504	1*
508	GAIUS (TIB)	504	1*
509	AGRIPPA (TIB)	504	1
510	GAIUS	510	1
507	DRUSUS (GAIUS)	510	1*
511	AGRIPPINA I (GAIUS)	510	1
512	NERO (GAIUS)	510	1
513	GERMANICUS (GAIUS)	510	1
514	JULIO CLAUDIAN	514	(2)*
515	CLAUDIUS I	515	2
518	NERO (CL)	515	2
519	ANTONIA (CL)	515	2
525	NERO	525	3
535	GALBA	535	3
536	OTHO	536	3
537	VITELLIUS	537	3
538	VESPASIAN	538	4
539	TITUS (VESP)	538	4
540	DOMITIAN (VESP)	538	4
541	TITUS	541	4
542	DOMITIAN (TITUS)	541	4
543	JULIA (TITUS)	541	4
544	VESPASIAN POSTH (TITUS)	541	4*
554	CLAUDIUS I (TITUS)	541	4
555	FLAVIAN	555	(4)*
556	DOMITIAN	556	4
557	DOMITIA (DOM)	556	4
567	NERVA	567	5
570	TRAJAN	570	5
585	HADRIAN	585	6
589	SABINA (HAD)	585	6
592	L. AELIUS CAESAR (HAD)	585	6
594	ANTONINUS PIUS	594	7
595	FAUSTINA I (A.P.)	594	7
596	FAUSTINA II (A.P.)	594	7
597	MARCUS AURELIUS (A.P.)	594	7
598	FAUSTINA (?)	594	(7)*
599	MARCUS AURELIUS	599	8
600	A.PIUS POSTH (M.A.)	599	8*
601	LUCIUS VERUS (M.A.)	599	8
602	COMMODUS (M.A.)	599	8
604	FAUSTINA II (M.A.)	599	8
605	LUCILLA (M.A.)	599	8
(605)	LUCILLA (?)	599	8
606	COMMODUS	606	9
607	MARCUS AURELIUS POSTH (COMM)	606	9*
608	CRISPINA (COMM)	606	9
610	LUCILLA (COMM)	606	9*
609	PERTINAX	609	9
614	CLODIUS ALBINUS	614	9
615	SEPTIMIUS SEVERUS	615	10
617	JULIA DOMNA (?)	(615)	10*
618	JULIA DOMNA (SEV)	615	10
619	CARACALLA	619	10
(619)	SEPT SEV POSTH	619	10*
620	CARACALLA/GETA	619	10*
621	PLAUTILLA (CAR)	619	10
622	JULIA DOMNA (CAR)	619	10
623	GETA	623	10
624	MACRINUS	624	10
625	DIADUMENIAN CAES.	624	10
627	ELAGABULUS	627	10
628	ELAGABULUS/SEV.ALEX	(627)	10*
629	AQUILIA SEVERA (ELAG)	627	10*
630	JULIA SOAEMIAS (ELAG)	627	10
631	JULIA MAESA (ELAG)	627	10
632	JULIA PAULA (ELAG)	627	10
633	SEVERUS ALEXANDER	633	11
634	ORBIANA	633	11
635	JULIA MAMAEA (S.A.)	633	11
639	MAXIMINUS I	639	11
641	MAXIMUS (MAX I)	639	11
645	GORDIAN III	646	12*
646	GORDIAN III CAES.	646	12
647	GORDIAN III AUG.	646	12
649	PHILIP I	649	12
650	OTACILIA SEVERA (PH I)	649	12
651	PHILIP II CAES. (PH I)	649	12
655	TRAJAN DECIUS	655	12
656	HERENNIA ETRUSCILLA	655	12
672	TREBONIANUS GALLUS	672	12
674	VOLUSIAN AUG. (TREB.G)	672	12
678	VALERIAN	678	12
679	VALERIAN II	678	12
680	MARINIANA	678	12
681	GALLIENUS (JOINT REIGN)	681	12
682	SALONINA (JOINT REIGN)	681	12
683	SALONINUS	681	12
684	GALLIENUS (SOLE REIGN)	684	13
685	GALLIENUS & SALONINA (?)	684	13*
686	SALONINA	684	13
687	CLAUDIUS II	687	13
688	QUINTILLUS	688	13
689	AURELIAN	689	13
690	CLAUDIUS II POSTH	687	13*
691	SEVERINA	689	13
692	TACITUS	692	14
693	FLORIAN	693	14
695	PROBUS	695	14
696	CARUS	696	14
698	CARINUS AUG. (CARUS)	696	14
701	NUMERIAN AUG. (CARUS)	696	14
702	GALLIC EMPIRE	702	13*
703	POSTUMUS	703	13
704	LAELIAN	704	13
705	MARIUS	705	13
706	VICTORINUS	706	13
707	TETRICUS I	707	13
708	TETRICUS II	707	13
(708)	TETRICUS (?)	707	13*
709	CARAUSIUS	709	14
710	CARAUASIUS (&'COLLEAGUES)	709	14
711	DIOCLETIAN (CARAUSIUS)	709	14
712	MAXIMIANUS H. (CARAUSI	709	14
713	ALLECTUS	713	14
714	BRITISH EMPIRE	714	14*
726	BARBAROUS RADIATE	726	14
727	GALERIUS	727	14
728	DIOCLETIAN	728	14
729	MAXIMIANUS HERCULEUS	729	14
730	CONSTANTIUS I	730	14
900	1ST TO 2ND CENTURY	900	-*
901	1ST TO 3RD CENTURY	901	-*
902	1ST CENTURY	902	-*
903	2ND CENTURY	903	-*
904	3RD CENTURY	904	-*

Appendix 3.51
Denarius site finds

F = Military sites
M = Towns with millitary sites
R = Rural settlements
S = Small towns
T = Temples
U = Civitas capitals, municipia etc.
V = Villas

Copies, where identified, are indicated in brackets.

Code	Emperor	F	M	R	S	T	U	V
001	Republican	17	17	1	2	12	14	5
001	Mark Antony	6	48	.	.	.	9	.
501	Augustus	3	.	3	.	1	2	4
504	Tiberius	5	2	.	.	.	2	3
515	Claudius I	.	(1)	(1)	.	.	.	1
525	Nero	.	3	3	.	2	2	.
535	Galba	2	2	.	.	1	.	.
536	Otho	1	.	1	.	.	.	.
537	Vitellius	.	5	.	.	.	.	.
538	Vespasian	15	62	2	2	11	9	4
539	Titus (Vesp.)	1	2	.	.	.	1	.
540	Domitian (Vesp.)	1	7	.	.	.	1	1
541	Titus	.	11	.	.	.	.	1
542	Domitian (Titus)	.	3	.	.	.	.	.
543	Julia (Titus)	.	1	.	.	.	.	1
544	Vespasian Posth. (Titus)	1	1	.	.	.	.	.
555	Flavian	1	4	.	.	.	.	.
556	Domitian	5	24	2	1	5	6	3
567	Nerva	2	14	.	.	1	1	1
570	Trajan	6(1)	75	4	2	14	12(1)	5
585	Hadrian	9	70(2)	2	.	15	11(2)	6
589	Sabina (Hadrian)	.	4	1	.	.	.	.
594	Antoninus Pius	6(2)	49(1)	.	1	7	3(1)	1
595	Faustina I (A.P.)	1	24	.	.	3	3	.
596	Faustina II (A.P.)	.	4	.	.	.	3	.
604	Faustina II (M.A.)	.	9	.	.	1	3	1
598	Faustina (?)	.	.	.	.	.	2	.
597	Marcus Aurelius (A.P.)	.	11	1	.	.	1	1
599	Marcus Aurelius	5	27(1)	2	.	5	3	.
600	A. Pius Posth. (M.A.)	.	1	.	.	.	2	.
601	Lucius VerusS (M.A.)	1.	9(1)	1.	.	1(1).	.	.
602	Commodus (M.A.)	.	3	1	.	.	.	.
605	Lucilla (M.A.)	.	5	.	.	.	.	.
610	Lucilla (Commodus)	1	.	.	.	.	.	.
606	Commodus	4(1)	17	2	.	5	5	.
607	Marcus Aurelius Posth.	.	2	.	.	.	.	.
608	Crispina (Commodus)	1	1	.	.	1	1(1)	1
609	Pertinax	.	.	.	1	.	.	.
614	Clodius Albinus	.	3	.	.	.	1	.
615	Septimius SeverusS	17(7)	81(4)	13(1)	4(1)	30	35(12)	11
617	Julia Domna (?)	.	32(3)	.	.	.	(1)	.
618	Julia Domna (Sev.)	7(1)	2	1	2	6	11(5)	4
623	Geta	4(1)	21(1)	1	1	2	6(1)	4
620	Caracalla/Geta	(1)	(1)	.	.	.	.	.
619	Caracalla	9(1)	45(4)	7(1)	1(1)	10	14(2)	6
619	Septimius Severus Posth.	.	.	.	.	.	1	.
621	Plautilla (Caracalla)	.	3	.	.	2	.	1
622	Julia Domna (Caracalla)	2	.	1	.	.	1	.

Code	Emperor	F	M	R	S	T	U	V
624	Macrinus	1	2(1)	.	.	.	1	.
625	Diadumenian Caes.	1	.	.	.	.	.	.
627	Elagabulus	7(2)	30	3	1	6	17(5)	4(1)
628	Elagabulus/Severus Alexander	.	1	.	.	.	.	.
629	Aquilia Severa (Elagabulus)	.	2	.	.	.	.	.
630	Julia Soaemias (Elagabulus)	1	3	.	.	1	1(1)	1
631	Julia Maesa (Elagabulus)	1	7(3)	2	2	1	5(1)	3
632	Julia Paula (Elagabulus)	1	1	.	.	.	2	.
633	Severus Alexander	16	50(6)	4(1)	6(2)	22	28(4)	13
634	Orbiana	.	2	.	1	1	1	.
635	Julia Mamaea (S.A.)	3	15	.	3	4	6(2)	4
639	Maximinus I	.	4	1	.	.	.	1
641	Maximus (MAX I)	.	(1)	.	.	1	.	.
645	Gordian III	1	1	.	.	.	.	.
649	Philip I	.	1	.	.	.	1	.
691	Severina	.	.	.	.	.	1	.
709	Carausius	.	1	.	1	.	.	.
900	1st to 2nd Century	1	.	.	.	.	1	.
901	1st to 3rd Century	2(1)	.	.	.	.	2	.
903	2nd Century	2	.	.	.	.	.	.
904	3rd Century	.	.	.	.	.	(6)	.
905	2nd to 3rd Century	2(2)	.	.	.	.	3	.

Summary:

Code	Emperor	F	M	R	S	T	U	V
A	Republican	17	17	1	2	12	14	5
B	Mark Antony	6	48	.	.	.	9	.
C	Julio-Claudian 1	8	2	3	.	1	4	7
D	Julio-Claudian 2	.	3(1)	3(1)	.	2	2	1
E	Civil War	3	7	1	.	1	.	.
F	Flavian 1	19	91	2	2	11	11	7
G	Flavian 2	7	38	2	1	6	7	4
H	Trajanic	6(1)	75	4	2	14	12(1)	5
I	Hadrianic	9	74(2)	3	.	15	11(2)	6
J	Antonine 1	7(2)	97(1)	1	1	11	15(1)	3
K	Antonine 2	7	45(2)	4	.	6(1)	5	.
L	Antonine 3	5(1)	23	2	1	6	7(1)	1
M	Severan 1a	28(10)	136(10)	15(1)	7(1)	38	52(19)	19
N	Severan 1b	11(1)	48(4)	8(1)	1(1)	12	16(2)	7
O	Severan 2a	12(2)	46(4)	5	3	8	26(7)	8(1)
P	Severan 2b	19	71(7)	5(1)	10(2)	28	35(6)	18
Q	Severan 2c	1	2	.	.	.	2	.

Appendix 3.52
Denarius Supply Curves

Method 1 (no recovery factor) - See Fig. 35.02

Date	Value	Date	Value	Date	Value
40	0.0	125	3.4	210	5.0
45	5.7	130	3.7	215	6.0
50	5.2	135	3.7	220	6.1
55	1.4	140	3.7	225	6.3
60	1.3	145	3.6	230	41.8
65	1.2	150	3.5	235	52.2
70	1.1	155	3.0	240	7.2
75	1.0	160	2.9	245	4.7
80	0.9	165	2.9	250	1.0
85	0.9	170	3.1	255	0.0
90	0.8	175	4.8	260	0.0
95	0.7	180	4.9	265	0.0
100	0.7	185	5.0	270	0.0
105	1.1	190	5.0	275	0.0
110	1.3	195	4.8	280	0.0
115	1.4	200	4.8		
120	2.9	205	4.9		

Method 2 (with recovery factor) - See Fig. 35.03

Date	Value	Date	Value	Date	Value
40	0.0	125	3.3	210	5.8
45	8.5	130	3.3	215	5.5
50	6.1	135	3.1	220	5.5
55	0.9	140	3.0	225	6.1
60	0.8	145	2.9	230	19.8
65	0.8	150	2.8	235	21.8
70	0.8	155	2.8	240	3.5
75	0.8	160	2.8	245	2.0
80	0.7	165	2.8	250	0.3
85	0.6	170	3.3	255	0.0
90	0.8	175	5.5	260	0.0
95	0.9	180	5.7	265	0.0
100	1.2	185	5.9	270	0.0
105	1.8	190	5.7	275	0.0
110	1.9	195	5.3	280	0.0
115	3.0	200	6.4		
120	3.2	205	6.5		

Appendix 3.53
Coins in Scotland

Part 1: Denarii from the Antonine Wall
Part 2: Sestertii from the Antonine Wall
Part 3: Summary table of coins from Scotland
Part 4: Bibliography

Part 1: Denarii from the Antonine Wall

Site	Code	Emperor	Catalogue No.	Reference
Bar Hill	-	No details	-	Macdonald, G. (1918)
Bar Hill	-	No details	-	Macdonald, G. (1918)
Bar Hill	-	No details	-	Macdonald, G. (1918)
Bar Hill	-	No details	-	Macdonald, G. (1918)
Mumrills	-	No details	-	Macdonald, G. (1934)
Bar Hill	001	MARK ANTONY	-	Macdonald, G. (1918)
Bearsden	001	MARK ANTONY	-	Robertson A.S. (1983)
Balmuildy	001	MARK ANTONY	-	Macdonald, G. (1918)
Castlecary	001	MARK ANTONY	Cohen 35	Macdonald, G. (1934)
Mumrills	001	MARK ANTONY	Cohen 36	Robertson A.S. (1961)
Mumrills	001	MARK ANTONY	-	Macdonald, G. (1924)
Rough Castle	001	MARK ANTONY	Cohen 39	Macdonald, G. (1924)
Mumrills	525	NERO	RIC 45	Robertson A.S. (1961)
Cadder	535	GALBA	-	Macdonald, G. (1934)
Balmuildy	537	VITELLIUS	Cohen 47	Macdonald, G. (1918)
Mumrills	537	VITELLIUS	-	Macdonald, G. (1934)
Bar Hill	538	VESPASIAN	-	Macdonald, G. (1918)
Bar Hill	538	VESPASIAN	-	Macdonald, G. (1918)
Old Kilpatrick	538	VESPASIAN	Cohen 36	Macdonald, G. (1924)
Mumrills	538	VESPASIAN	RIC 110	Robertson A.S. (1961)
Kirkintilloch	544	VESP. POSTH (TITUS)	Cohen 497	Macdonald, G. (1934)
Bar Hill	556	DOMITIAN	-	Macdonald, G. (1918)
Croy Hill	556	DOMITIAN	RIC 159	Robertson A.S. (1983)
Duntocher	556	DOMITIAN	-	Macdonald, G. (1918)
Old Kilpatrick	556	DOMITIAN	-	Macdonald, G. (1934)
Old Kilpatrick	556	DOMITIAN	Cohen 30	Macdonald, G. (1924)
Falkirk	556	DOMITIAN	-	Robertson A.S. (1983)
Bar Hill	567	NERVA	-	Macdonald, G. (1918)
Bar Hill	570	TRAJAN	-	Macdonald, G. (1918)
Bar Hill	570	TRAJAN	-	Macdonald, G. (1918)
Bar Hill	570	TRAJAN	-	Macdonald, G. (1918)
Bar Hill	570	TRAJAN	-	Macdonald, G. (1918)
Bar Hill	570	TRAJAN	-	Macdonald, G. (1918)
Bar Hill	570	TRAJAN	-	Macdonald, G. (1918)
Bar Hill	570	TRAJAN	-	Macdonald, G. (1918)
Bar Hill	570	TRAJAN	-	Macdonald, G. (1918)
Bar Hill	570	TRAJAN	-	Macdonald, G. (1918)
Bearsden	570	TRAJAN	-	Robertson A.S. (1983)
Bearsden	570	TRAJAN	-	Robertson A.S. (1983)
Croy Hill	570	TRAJAN	RIC 109	Robertson A.S. (1983)
Duntocher	570	TRAJAN	Cohen 190	Macdonald, G. (1918)
Old Kilpatrick	570	TRAJAN	-	Macdonald, G. (1934)
Balmuildy	570	TRAJAN	Cohen 83	Macdonald, G. (1918)
Cadder	570	TRAJAN	-	Macdonald, G. (1934)
Castlecary	570	TRAJAN	Cohen 301	Macdonald, G. (1918)
Castlecary	570	TRAJAN	-	Macdonald, G. (1918)
Mumrills	570	TRAJAN	-	Macdonald, G. (1924)
Mumrills	570	TRAJAN	-	Macdonald, G. (1934)
Bar Hill	585	HADRIAN	-	Macdonald, G. (1918)
Bar Hill	585	HADRIAN	-	Macdonald, G. (1918)
Bar Hill	585	HADRIAN	-	Macdonald, G. (1918)
Bar Hill	585	HADRIAN	RIC 39b	Robertson A.S. (1983)
Bearsden	585	HADRIAN	Cohen 335	Macdonald, G. (1939)
Westwood	585	HADRIAN	-	Macdonald, G. (1934)
Balmuildy	585	HADRIAN	Cohen 315	Macdonald, G. (1918)
Castlecary	585	HADRIAN	-	Macdonald, G. (1918)
Old Kilpatrick	592	L. AELIUS (HADRIAN)	Cohen 53	Macdonald, G. (1924)
Bar Hill	594	ANTONINUS PIUS	RIC 155	Robertson A.S. (1983)

Old Kilpatrick	594	ANTONINUS PIUS	-	Macdonald, G. (1934)
Mumrills	594	ANTONINUS PIUS	-	Macdonald, G. (1934)
Mumrills	594	ANTONINUS PIUS	-	Macdonald, G. (1934)
Mumrills	594	ANTONINUS PIUS	-	Macdonald, G. (1934)
Duntocher	595	FAUSTINA I (A.P.)	-	Macdonald, G. (1918)
Old Kilpatrick	595	FAUSTINA I (A.P.)	Cohen 34	Macdonald, G. (1924)
Bar Hill	596	FAUSTINA II (A.P.)	-	Robertson A.S. (1983)
Bar Hill	599	MARCUS AURELIUS	-	Macdonald, G. (1918)
Old Kilpatrick	605	LUCILLA (M.A.)	-	Macdonald, G. (1934)

Part 2: Sestertii from the Antonine Wall

Kirkintilloch	535	GALBA	RIC 43	Robertson A.S. (1971)
Balmuildy	556	DOMITIAN	Cohen 307	Macdonald, G. (1918)
Croy Hill	570	TRAJAN	RIC 543	Robertson A.S. (1983)
Old Kilpatrick	570	TRAJAN	Cohen 328	Macdonald, G. (1924)
Balmuildy	570	TRAJAN	Cohen 534	Macdonald, G. (1918)
Balmuildy	585	HADRIAN	Cohen 356	Macdonald, G. (1918)
Balmuildy	585	HADRIAN	Cohen 895	Macdonald, G. (1918)
Balmuildy	585	HADRIAN	Cohen 974	Macdonald, G. (1918)
Mumrills	585	HADRIAN	-	Robertson A.S. (1961)
Carriden	585	HADRIAN	Cohen 386b	Robertson A.S. (1983)
Duntocher	594	ANTONINUS PIUS	-	Macdonald, G. (1918)
Duntocher	594	ANTONINUS PIUS	-	Macdonald, G. (1918)
Mumrills	595	FAUSTINA I (A.P.)	Cohen 182	Macdonald, G. (1924)
Old Kilpatrick	600	A.PIUS POSTH (M.A.)	RIC 1266	Robertson A.S. (1983)

Part 3: Summary table of coins from Scotland

		Military			Native			Wall		
Ref	Emperor	AV	AR	AE	AV	AR	AE	AV	AR	AE
001	REPUBLIC		18			2				
(001)	MARK ANTONY		22			1			7	
501	AUGUSTUS		4	1						
504	TIBERIUS		2	1						
512	NERO (GAIUS)			1						
513	GERMANICUS (GAIUS)		1	1						
515	CLAUDIUS I			2						
519	ANTONIA (CL)						1			
525	NERO	2	6	3		1			1	2
535	GALBA		4	2					1	1
536	OTHO		1		1					
537	VITELLIUS		1						2	
538	VESPASIAN	2	60	70	2	5	4	2	4	1
539	TITUS (VESP)			4						
540	DOMITIAN (VESP)			1						
541	TITUS	2	6	14		1	1			
542	DOMITIAN (TITUS)									1
544	VESPASIAN POSTH (TITUS)		1						1	
555	FLAVIAN			4						
556	DOMITIAN		27	68	1	2	3		6	3
567	NERVA		7	2		1	1		1	
570	TRAJAN	3	40	68		4	2	1	20	17
571	PLOTINA	1								
585	HADRIAN		47	56		6	4	1	8	23
589	SABINA (HAD)		1	2			1			3
592	L. AELIUS CAESAR (HAD)								1	
594	ANTONINUS PIUS	2	14	30		7	1		5	12
595	FAUSTINA I (A.P.)		9	10		3	1		2	1
596	FAUSTINA II (A.P.)		1	1					1	
597	MARCUS AURELIUS (A.P.)			2						1
598	FAUSTINA (?)		3	7						
599	MARCUS AURELIUS		3	4		1			1	4
600	A.PIUS POSTH (M.A.)									1
601	LUCIUS VERUS (M.A.)		2	1						1
604	FAUSTINA II (M.A.)		2							
605	LUCILLA (M.A.)		1	3					1	
606	COMMODUS		1	1						1
608	CRISPINA (COMM)		1							
609	PERTINAX					1				
615	SEPTIMIUS SEVERUS		17			1				
618	JULIA DOMNA (SEV)		6							
619	CARACALLA	1	3	1		1				
621	PLAUTILLA (CAR)		4							
623	GETA	1	2				1			
633	SEVERUS ALEXANDER		2							
655	TRAJAN DECIUS								1	
684	GALLIENUS (SOLE REIGN)		1			2				
695	PROBUS					1				
706	VICTORINUS		2							
707	TETRICUS I		2							
708	TETRICUS II		1							
709	CARAUSIUS		1			3				
713	ALLECTUS					1				

Part 3: Summary table of coins from Scotland (cont.)

		Military			Native			Wall		
Ref	Emperor	AV	AR	AE	AV	AR	AE	AV	AR	AE
A	Republican		18			2				
B	Mark Antony		22			1			7	
C	Julio-Claudian 1		7	4						
D	Julio-Claudian 2	2	6	5		1	1		1	2
E	Civil War		6	2	1				3	1
F	Flavian 1	4	67	93	2	6	5	2	5	2
G	Flavian 2		34	70	1	3	4		7	3
H	Trajanic	4	40	68		4	2	1	20	17
I	Hadrian		48	58		6	5	1	9	26
J	Antonine 1	2	29	50		10	2		8	14
K	Antonine 2		6	8		1			2	6
L	Antonine 3		2	1		1				1
M	Severan 1a	1	25			1	1			
N	Severan 1b	1	7	1		1				
O	Severan 2a									
P	Severan 2b		2							
Q	Mid Third Century		1			2			1	
-	Central Empire					1				
-	Gallic Empire		5							
-	British Empire		1			4				

Part 4: Bibliography

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Robertson A.S. (1983)

In all of these articles the finds are divided up into four groups, those from the Antonine Wall, from other 'Roman sites not on the wall', 'Native sites' and isolated finds. Only the first three groups from known sites have been used.

Appendix 4.11

The denominational structure of LPRIA monetary systems (after Haselgrove 1987)

The data is derived from Haselgrove (1987). The numbers represent the number of Mack entries in each series. As such a broad idea of the number of types and their spread across the denominations is arrived at. However it should be noted that there are several biases in this picture. Firstly some series are divided into more types than others owing to finer divisions rather than to there actually being more variation in the series. Secondly, no indication is given of the number of dies per type is given, and this may have varied greatly. Thirdly, the number of coins struck per die may have varied.

Southern LPRIA Coinage Zone

AV			AV 1/4			AR			AR 1/4			AE/AR			AE		
S 1.1	GB BA1	7.8	S 1.2	GB BB2	1.9												
S 1.2	GB BB1	7.8															
S 4.11	M029	6.4															
S 4.12	M031	6.1															
S 4.13	-	-															
S 4.14	M033	5.1															
S 5.01	S1	6.2	S 5.1	M064	1.3										S 5.03	-	>6.0
S 5.01	S2	6.2	S 5.1	M065	1.3												
S 5.03	S3	6.0	S 5.1	M070	1.3												
S 5.1	M058	5.9	S 5.1	M063	1.3												
S 5.2	M059	5.8	S 5.1	M071	1.3												
			S 5.2	M068	1.2												
S 6.31	M058	5.4	S 6.31	M066	1.1	S 6.61	M089	1.2	S 6.61	M090	0.3	S 6.82	-	0.8			
S 6.31	M060	5.4	S 6.31	M067	1.1	S 6.62	M446B	1.1	S 6.61	M091	0.3						
S 6.31	M061	5.4	S 6.31	M069	1.1	S 6.63	-	1.0									
S 6.32	M092	5.4	S 6.41	M075	0.9	S 6.64	M088	1.3									
			S 6.42	M077	1.0	S 6.71	M373	1.1									
			S 6.42	M081	1.0	S 6.72	-	1.3									
			S 6.51	M074	0.8	S 6.81	M086	1.2									
			S 6.52	M072	1.1												
			S 6.52	M073	1.1												
			S 6.52	M037	1.1												
			S 6.53	M080	1.1												
S 7.1	M093	5.3	S 7.1	M095	1.0	S 7.1	M106A	1.1	S 7.1	M119	0.3						
S 7.1	M094	5.3	S 7.21	M097	1.0	S 7.21	M106	1.1	S 7.1	M120	0.3						
S 7.21	M096	5.3	S 7.21	M099	1.0	S 7.22	M105	1.0	S 7.21	M118	0.3						
S 7.21	M098	5.3	S 7.22	M101	1.0												
S 7.22	M100	5.2	S 7.22	M102	1.0												
			S 7.22	M103	1.0												
			S 7.22	M104	1.0												
S 8.11	M109	5.2	S 8.11	M111	1.2	S 8.11	M115	1.3	S 8.11	M117	0.3						
S 8.11	M110	5.2	S 8.11	M112	1.2	S 8.12	M123	1.2	S 8.11	M120B	0.3						
S 8.12	M121	5.3	S 8.11	M113	1.2	S 8.22	M128	1.2	S 8.12	M120A	0.3						
S 8.21	M125	5.3	S 8.12	M114	1.3	S 8.22	M129	1.2	S 8.21	-	-						
			S 8.12	M122	1.3	S 8.22	M130	1.2	S 8.22	M116	0.3						
			S 8.21	M124	-	S 8.22	M131	1.2	S 8.22	M120E	0.3						
			S 8.22	M126	-				S 8.22	M132	0.3						
			S 8.22	M127	-												
S 9.1	M262	5.3				S 9.1	M263A	1.1	S 9.1	M264	0.3						
						S 9.2	M263	1.2	S 9.2	-	-						
						S 9.3	M265	1.3	S 9.3	-	-						
						S 9.4	M371	-	S 9.4	M372	-						

East Anglian LPRIA Coinage Zone

AV			AV 1/4			AR			AR 1/2		
EA 5.1	M049	6.1									
EA 6.11	M049A	5.7				EA 6.12	M414	1.0	EA 6.2	M411	0.5
EA 6.12	M397	5.4				EA 6.2	M407	1.1			
EA 6.12	M398	5.4									
EA 6.12	M399	5.4									
EA 6.12	M403B	5.4									
EA 7.11	M400	5.6	EA 7.11	M404	0.9	EA 7.11	M415	1.0	EA 7.11	M417A	0.5
EA 7.11	M401	5.6				EA 7.21	M408	1.2			
EA 7.12	M402	5.6				EA 7.22	M409	1.2			
EA 7.12	M403A	5.6				EA 7.23	M434	1.2			
						EA 7.24	M469	-			
						EA 7.31	M413A	1.2			
						EA 7.31	M413B	1.2			
						EA 7.31	M413C	1.2			
						EA 7.32	M413	1.2			
EA 8.1	M418	5.4				EA 8.1	M419	1.2	EA 8.1	M422	0.5
						EA 8.1	M420	1.2			
						EA 8.1	M421	1.2			
						EA 8.31	M413D	1.2			
						EA 8.32	-	1.2			
						EA 9.11	M423	1.2	EA 9.11	M417A	0.6
						EA 9.11	M424	1.2	EA 9.11	M431	0.6
						EA 9.11	M425	1.2	EA 9.4	M434A	0.7
						EA 9.11	M429	1.2			
						EA 9.11	M430	1.2			
						EA 9.12	M425	1.2			
						EA 9.13	M426	1.2			
						EA 9.13	M427	1.2			
						EA 9.13	M428	1.2			
						EA 9.13	M432	1.2			
						EA 9.13	M433	1.2			

North Eastern LPRIA Coinage Zone

AV			AR			AR 1/2			AR 1/4		
NE 5.11	M052	6.2									
NE 5.11	M053	6.2									
NE 5.12	M054	5.9									
NE 5.21	M050	6.2									
NE 5.22	M051	5.9									
NE 6.11	M055	5.9	NE 6.11	M405A	1.2	NE 6.11	M451	0.8	NE 6.12	M451A	0.3
NE 6.11	M056	5.9	NE 6.11	M405B	1.2	NE 6.11	M445C	0.8			
NE 6.11	M057	5.9	NE 6.12	M405	1.3	NE 6.2	M406A	0.6			
NE 6.12	M447	5.4	NE 6.2	M406	1.3						
NE 6.12	M448	5.4	NE 6.2	M410	1.3						
NE 7.11	M449A	5.6	NE 7.11	M452	1.2	NE 7.11	M455	0.5	NE 7.11	M455B	0.2
NE 7.11	M449B	5.6	NE 7.11	M453	1.2	NE 7.11	M455A	0.5			
NE 7.11	M449C	5.6	NE 7.12	M454	1.3	NE 7.12	M454A	0.4			
NE 7.12	M449	5.6	NE 7.2	M453A	1.0	NE 7.2	M456	0.5			
NE 7.2	-	5.4				NE 7.2	M456A	0.5			
NE 8.1	M457	5.5	NE 8.1	M458	1.0	NE 8.1	M458A	-			
NE 8.2	M456B	5.4	NE 8.2	M456C	1.1	NE 8.31	M464A	0.5			
NE 8.31	M459	5.3	NE 8.31	M464	1.1	NE 8.32	M464B	0.5			
NE 8.31	M460	5.3	NE 8.32	M460B	1.1						
NE 8.32	M460A	-									
NE 9.1	M461	5.4	NE 9.1	M462	1.2	NE 9.21	M465	0.5			
NE 9.21	M463	5.4	NE 9.21	M463A	1.3	NE 9.22	M467	0.5			
NE 9.22	M466	4.9	NE 9.31	M416	0.8	NE 9.23	M468	0.5			
			NE 9.32	-	-	NE 9.32	-	0.5			

Western LRRIA Coinage Zone

AV			AV 1/4			AR		
W 6.1	M374	5.6				W 6.1	M376	1.2
						W 7.11	M378	1.0
						W 7.11	M388A	1.0
						W 7.11	M379	1.0
						W 7.12	M380	1.2
						W 7.12	M382	1.2
W 8.1	M385	5.4	W 8.2	-	-	W 8.1	M387	1.0
W 8.1	M386	5.4				W 8.2	M389	0.9
W 8.2	M388	5.4						
W 9.1	M390	5.5	W 9.1	M394	-	W 9.1	M384B	0.9
W 9.1	M391	5.5				W 9.1	M383	0.9
W 9.1	M392	5.5				W 9.1	M384	0.9
W 9.1	M393	5.5				W 9.2	M396	1.0
W 9.2	M395	5.4						

South Eastern LPRIA Coinage Zone

AV			AV 1/4			AR			AR 1/4		AE		AE fractions	
SE 1.11	S 8/1	7.6	SE 1.11	S 8/1	2.0									
SE 1.12	S 8/4-5	7.7	SE 1.12	S 8/3-5	1.9									
SE 1.21	S 8/2	7.8	SE 1.21	S 8/2	1.7									
SE 1.22	S 8/6	7.5	SE 1.22	S 8/6	1.8									
SE 2.1	S 8/3	7.3	SE 2.21	S 8/7-8	1.8									
SE 2.21	S 8/7	7.5												
SE 2.22	S 8/8	7.2												
SE 3.11	S 8/4b	7.2	SE 3.2	S 13/1 2	1.7									
SE 3.11	S 9/1	7.2												
SE 3.12	S 9/2	7.0												
SE 4.11	S 9/3	6.6	SE 4.21	S 13/3	1.5									
SE 4.12	S 9/5	6.4	SE 4.22	M040	1.4									
SE 4.13	S 9/3	6.3	SE 4.23	M043	1.5									
SE 4.14	GB C	6.5	SE 4.24	M044	1.4									
SE 4.15	M046	6.2	SE 4.31	M035	1.5									
SE 4.15	M050A	6.2	SE 4.32	M045	1.4									
SE 5.11	S 24/1	6.3	SE 5.21	M041a	1.4						SE 5.17	S 24/7 4.6		
SE 5.12	S 24/2	6.2	SE 5.22	M041A	1.3									
SE 5.13	S 24/3	6.2	SE 5.23	M039	1.3									
SE 5.14	S 24/4	5.9	SE 5.24	M036	1.2									
SE 5.15	S 24/5	2.8												
SE 5.16	S 24/6	5.5												
SE 6.1	M294	5.7	SE 6.1	M078	1.4	SE 6.1	M272	1.0			SE 6.3	M295 1.9 (dual module)		
SE 6.2	M084	5.5	SE 6.2	M085	1.3	SE 6.2	M442	0.9			SE 6.3	M296 1.9 (dual module)		
SE 6.2	M292	5.5				SE 6.2	M443	0.9			SE 6.3	M316A1 9 (dual module)		
						SE 6.3	M445	1.2			SE 6.3	M316B1.9 (dual module)		
						SE 6.3	M446	1.2						
SE 7.11	M282	5.4	SE 7.11	M284	1.3	SE 7.11	M286	0.9			SE 7.11	M289 1.7 & 2.4	SE 7.52	M280C
SE 7.11	M283	5.4	SE 7.11	M285	1.3	SE 7.11	M287	0.9			SE 7.11	M290 1.7 & 2.4		
SE 7.12	M279	5.4	SE 7.21	M276	1.3	SE 7.11	M288	0.9			SE 7.11	M291 1.7 & 2.4		
SE 7.21	M275	5.5	SE 7.22	M298	1.3	SE 7.23	M446D	-			SE 7.13	M316D 1.3		
SE 7.22	M293	5.3	SE 7.31	M271	1.4	SE 7.31	-	0.6			SE 7.21	M277 1.6 & 2.5		
SE 7.31	M266	5.6	SE 7.32	M20	1.4	SE 7.32	M272A	-			SE 7.21	M281 1.6 & 2.5		
SE 7.32	M267	5.5	SE 7.33	M269	1.2	SE 7.41	M274A	1.1			SE 7.21	M278 1.6 & 2.5		
SE 7.33	M268	5.5				SE 7.42	M441	1.4			SE 7.21	M280A 1.6 & 2.5		
											SE 7.41	M274 1.7		
											SE 7.42	M273 1.4		
											SE 7.51	- -		
SE 8.21	M300	5.4	SE 8.1	M107	1.1	SE 8.1	M108	1.2	SE 8.22	M316E	SE 8.21	M309 2.2	SE 8.22	M316F
SE 8.21	M301	5.4	SE 8.1	M302	1.1	SE 8.21	M305	1.2			SE 8.21	M310 2.2		
			SE 8.21	M303	1.3	SE 8.21	M306	1.2			SE 8.21	M311 2.2		
			SE 8.21	M304	1.3	SE 8.21	M307	1.2			SE 8.21	M312 2.2		
						SE 8.21	M308	1.2						
						SE 8.22	M299A							

South Western LPRIA Coinage Zone

AV			AR			AR 1/4			AE/AR			AE		
SW 4.1	M032	6.1												
			SW 5.1	MB17	5.9	SW 5.1	MB19A	1.3						
			SW 6.1	MB17	5.0	SW 6.1	MB19	1.0						
			SW 7.1	MB17	4.1	SW 7.1	MB19	-						
									SW 8.1	MB19	3.1	SW 8.1	MB18	3.1
												SW 9.1	MB22+	2.2

Eastern LPRIA Coinage Zone

AV			AV 1/4			AR			AE/AR			AE 2			AE			AE fractions		
E 4.11	M028	6.4																		
E 4.12	M047	6.2																		
E 4.13	M048	6.4																		
E 5.1	M133	5.8	E 5.1	M134A	1.2															
E 5.1	M134	5.8																		
E 5.1	M135	5.8																		
E 5.1	M138A	5.8																		
E 5.2	M140	5.8																		
E 6.11	M136	5.6	E 6.11	M073A	1.2	E 6.13	M439	1.0	E 6.13	-	-									
E 6.11	M137	5.6	E 6.11	M076	1.2	E 6.13	M440	1.0												
E 6.11	M138	5.6	E 6.12	-	-	E 6.13	M076A	1.0												
E 6.12	M147	5.4	E 6.21	-	-	E 6.31	M438	1.5												
E 6.12	M148	5.4	E 6.31	M079	1.3	E 6.32	M435	1.0												
E 6.21	M141	5.6				E 6.32	M437	1.0												
E 6.21	M142	5.6				E 6.33	M280	0.5												
E 6.21	M143	5.6																		
E 6.22	M144	5.4																		
E 6.22	M145	5.4																		
E 6.22	M146	5.4																		
E 6.22	M059A	5.4																		
E 7.11	M149	5.5	E 7.11	M151	1.3	E 7.11	-	1.3				E 7.13	M178	5.1	E 7.11	M167	2.0	E 7.11	M182	0.9
E 7.11	M150	5.5	E 7.11	M153	1.3	E 7.12	M158	1.3							E 7.12	M169	2.0	E 7.12	M173	1.1
E 7.12	M154	5.4	E 7.12	M152	1.3	E 7.12	M161	1.3							E 7.12	M170	2.0	E 7.12	M183	1.1
E 7.12	M155	5.4	E 7.13	M185	1.3	E 7.12	M162	1.3							E 7.12	M171	2.0	E 7.2	-	0.3
E 7.12	M156	5.4	E 7.4	M195	1.3	E 7.12	M164	1.3							E 7.12	M172	2.0	E 7.3	M193	0.7
E 7.12	M157	5.4	E 7.51	M198	1.3	E 7.12	M165	1.3							E 7.12	M174	2.0			
E 7.13	M184	5.4	E 7.52	M187	1.3	E 7.12	M166	1.3							E 7.12	M175	2.0			
E 7.4	M194	5.5				E 7.13	M159	1.2							E 7.12	M179	2.0			
E 7.51	M197	5.4				E 7.13	M160	1.2							E 7.12	M180	2.0			
E 7.52	M186	5.5				E 7.13	M163	1.2							E 7.13	M176	1.3			
						E 7.2	M188	1.2							E 7.13	M177	1.3			
						E 7.4	M196	1.2							E 7.2	M168	2.0			
						E 7.51	M199	1.1							E 7.2	M177	2.0			
															E 7.2	M192	2.0			
															E 7.3	M189	2.2			
															E 7.3	M190	2.2			
															E 7.3	M191	2.2			
															E 7.51	M170A	1.5			
															E 7.51	M200	1.5			
															E 7.52	-	-			
E 8.1	M208	5.4	E 8.1	M202	1.3	E 8.1	M214	1.1				E 8.1	-	4.1	E 8.1	M222A	2.0	E 8.21	M233A	-
E 8.21	M210	5.4	E 8.21	M209	1.3	E 8.1	M216	1.1							E 8.1	M223	2.0			
E 8.21	M211	5.4	E 8.21	M204	1.3	E 8.1	M217	1.1							E 8.1	M227	2.0			
E 8.21	M212	5.4	E 8.21	M205	1.3	E 8.1	M254	1.1							E 8.1	M228	2.0			
E 8.21	M203	5.4	E 8.22	M234A	1.3	E 8.1	M255	1.1							E 8.1	M232	2.0			
E 8.21	M213	5.4				E 8.21	M215	1.2							E 8.1	M257A	2.0			
E 8.22	M206	5.4				E 8.21	M256	1.2							E 8.1	M261	2.0			
E 8.22	M207	5.4				E 8.22	M218	1.2							E 8.21	M222	2.1			
E 8.22	M208	5.4				E 8.22	M219	1.2							E 8.21	M224	2.1			
						E 8.22	M234	1.2							E 8.21	M226	2.1			
						E 8.22	M241A	1.2							E 8.21	M229	2.1			
						E 8.22	M258	1.2							E 8.21	M230	2.1			
						E 8.32	M235	1.2							E 8.21	M231	2.1			
						E 8.32	M236	1.2							E 8.21	M233	2.1			
						E 8.32	M237	1.2							E 8.22	M225	2.0			
						E 8.32	M238	1.2							E 8.22	M250	2.0			
						E 8.32	M239	1.2							E 8.22	M251	2.0			
						E 8.32	M240	1.2							E 8.22	M252	2.0			
						E 8.34	M259	1.1							E 8.22	M253	2.0			
						E 8.35	M313	1.0							E 8.22	M260	2.0			
						E 8.35	M314	1.0							E 8.31	M220	2.5			
															E 8.31	M221	2.5			
															E 8.31	M245	2.5			
															E 8.31	M247	2.5			
															E 8.32	M242	2.0			
															E 8.32	M243	2.0			
															E 8.32	M244	2.0			
															E 8.32	M246	2.0			
															E 8.32	M248	2.0			
															E 8.32	M249	2.0			
															E 8.35	M315	1.5			

Summary data for periods 7 to 9:

	AV	AV 1/4	AR	AR 1/2	AR 1/4	AE/AR	AE2	AE	AE 1/2
W 7			5						
W 8	3	1	2						
W 9	5	1	4						
SW 7			1		1				
SW 8						1		1	
SW 9								1	
S 7	5	7	3		3				
S 8	4	8	6		7				
S 9	1		4		4				
SE 7	8	7	8					11	1
SE 8	2	4	6		1			4	1
E 7	10	7	13				1	20	5
E 8	9	5	21				1	31	1
EA 7	4	1	9	1					
EA 8	1		5	1					
EA 9			11	3					
NE 7	5		4	5	1				
NE 8	5		4	3					
NE 9	3		4	4					

Appendix 4.12
Roman Coins in Iron Age Hoards

The data are from Haselgrove (1987) and Van Arsdell (1989). The corpus reference numbers for each hoard are given. The T.P.Q. have been assessed by the coin of Haselgrove's latest period within each hoard, as can be judged from the summary records. Those hoards recorded by Van Arsdell, but not by Haselgrove, have been converted from his reference system to Mack and thence to Haselgrove's periodisation. Appendix 4.11 gives the concordance between the Mack and Haselgrove classifications.

TPQ	Roman Coins	VA	H	Name	County	Series Represented
P7	-	10	3	High Wycomb	Buckinghamshire	E
P7	-		21	St Albans	Hertfordshire	E
P7	-	42	40b	Freckenham	Suffolk	EA
P7	-	12	19	Portsmouth	Hampshire	Foreign, SW, ST
P7	-	48		South Ferriby	Lincolnshire	NE
P7	-	102		Snettisham (1987)	Norfolk	S, E, EA
P7	-	17	50	Alfriston	Sussex	S, SE
P7	-	59	52	Birling (forgeries)	Sussex	S, SE, E
P7	-	49	7	Clacton II	Essex	S, SE, E
P7	-	8	9	Colchester (2) near...	Essex	SE
P7	-	3		Okeford Fitzpaine	Dorset	SW
P7	-	16		Cranbourne Chase	Dorset	SW
P7	-	78		Tollard Royal	Wiltshire	SW
P7	-	85	59	Corfe Castle	Dorset	SW, E
P7	-	93		Badbury-Shapwick	Dorset	SW, ST
P7	-	13		Mount Batten	Devon	W, SW
P8	Claudius	37	25	Tunstall	Kent	E
P8	AD 42		5	Chippenham	Cambridgeshire	E
P8	AD 86	51	19a	Romsey	Hampshire	SW
P8	-	58	10	Colchester (3)	Essex	E
P8	-		8	Colchester (1)	Essex	E
P8	-		11	Epping Forest	Essex	E
P8	-	87		Finkley Down	Hampshire	S
P8	-	94	15	Andover	Hampshire	S
P8	-		39	Watlington	Oxfordshire	S, SE
P8	-	18	53	Bognor	Sussex	S, SE, E, ST
P8	-	19	13	Marks Tey II	Essex	SE, E
P8	-	23	43	Farley Heath	Surrey	SW
P8	-	33		Cotley Farm	Devon	SW
P8	-	71		Armsley, Godshill	Hampshire	SW
P8	-	60		near Wanborough	Wiltshire	W
P9	Republican	22		Weston	Norfolk	EA
P9	Tiberius	39	75	Savernake	Wiltshire	SW, S
P9	AD 37	72	74	Lakenheath	Suffolk	EA, E
P9	AD 39-41	11		Lightcliffe	Yorkshire	NE
P9	AD 41	35		Santon Downham	Suffolk	EA
P9	AD 43	28		Nunney	Somerset	W
P9	AD 55-60	73		Joist Fen	Suffolk	EA
P9	Nero		40a	Eriswell	Suffolk	EA
P9	AD 69	96	2	Waltham St. Lawrence	Berkshire	S, SE, E
P9	AD 72-3	44		Honley	Yorkshire	NE
P9	?	52		Hengistbury I	Dorset	Gaul, SE, SW, ST, W
P9	?	89		Stonea	Cambridgeshire	EA
P9	-	1		Thorpe-Next-Norwich	Norfolk	EA
P9	-	15	51	Battle	Sussex	EA
P9	-	25		Wimblington	Cambridgeshire	EA
P9	-	26		March	Cambridgeshire	EA
P9	-	67		Honingham	Norfolk	EA
P9	-	77		Brettenham	Norfolk	EA
P9	-		63	Chatteris	Cambridgeshire	EA
P9	-	41	16	Alresford	Hampshire	S
P9	-		45	Kew Bridge	Surrey	S, SE
P9	-	43	M11	Wallingford ?	Berkshire ?	S, SE, NE, W
P9	-	50		Holdenhurst	Hampshire	SW
P9	-	47		Sherborne	Dorset	W
P9	-	88		Farnborough	Avon	W
P9	-	69		Bagendon	Gloucestershire	W, SW, S

Appendix 4.21
The proportion of sestertii in British bronze hoards

The table shows the cumulative proportion of sestertii in hoards. The periods are Julio-Claudian, Flavian 1 and 2, Trajanic, Hadrianic, Antonine 1, 2 and 3, and Severan.

Date	JC	F1	F2	Tr	Had	A1	A2	A3	Sev
40	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
50	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
60	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
70	95.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
80	3.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
90	2.0	50.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
100	2.0	30.0	97.0	100.0	100.0	100.0	100.0	100.0	100.0
110	2.0	20.0	82.0	100.0	100.0	100.0	100.0	100.0	100.0
120	1.5	12.0	67.0	98.0	100.0	100.0	100.0	100.0	100.0
130	1.5	7.0	52.0	88.0	100.0	100.0	100.0	100.0	100.0
140	1.5	5.0	36.0	77.0	99.0	100.0	100.0	100.0	100.0
150	1.5	3.0	24.0	65.0	93.0	100.0	100.0	100.0	100.0
160	1.0	2.0	15.0	50.0	78.0	100.0	100.0	100.0	100.0
170	1.0	2.0	9.0	32.0	63.0	97.0	100.0	100.0	100.0
180	1.0	2.0	5.0	17.0	55.0	93.0	97.0	100.0	100.0
190	1.0	2.0	4.0	8.0	47.0	87.0	92.0	100.0	100.0
200	1.0	2.0	3.5	5.0	43.0	83.0	88.0	99.0	100.0
210	1.0	2.0	3.0	4.0	40.0	78.0	85.0	98.0	100.0
220	1.0	2.0	3.0	4.0	37.0	75.0	83.2	97.0	100.0
230	1.0	2.0	3.0	4.0	35.0	72.0	81.6	96.0	100.0
240	1.0	2.0	3.0	4.0	34.0	69.0	80.0	95.0	100.0
250	1.0	2.0	3.0	4.0	33.0	67.0	79.0	94.0	100.0
260	1.0	2.0	3.0	4.0	32.0	65.0	78.0	93.0	100.0
270	1.0	2.0	3.0	4.0	32.0	64.0	77.0	92.0	100.0
280	1.0	2.0	3.0	4.0	32.0	63.0	76.0	91.0	100.0

Appendix 4.22
Sestertius Supply Curve Data

Note: Unlike the denarius curve, this curve was constructed using only ten year intervals between dates, since it was thought the data would not stand more detailed analysis (the denarius curve used five year intervals). From c.AD 230 onwards the shape of the curve is problematic. See the text for further details.

Date	Value
40	0.0
50	1.4
60	2.0
70	2.0
80	1.9
90	1.5
100	1.4
110	1.6
120	2.5
130	5.0
140	6.5
150	7.4
160	7.9
170	8.2
180	8.1
190	7.9
200	7.0
210	6.0
220	5.0
230	5.0
240	5.0
250	5.5
260	24.0
270	25.0
280	25.0

Input Data:	
Julio-Claudian	42
Flavian 1	38
Flavian 2	67
Trajanic	204
Hadrianic	234
Antonine 1	280
Antonine 2	134
Antonine 3	96
Severan	42
Total	1137

Chi Squared = 8.721

Appendix 4.23
SestertiusSite Finds

Individual on the coin	Number	Date of issue
Augustus, Agrippina & Germanicus	3	*43
Claudius & Antonia	23	*43-54
Nero	16	54-68
Vespasian & Titus Caesar	29	69-79
Titus & Vespasian Posth.	8	79-81
Flavian	1	69-96
Domitian & Domitia	52	81-96
Nerva	15	96-98
Trajan	205	98-117
Hadrian, Sabina & L.Aelius	234	117-138
Antoninus Pius, Faustina I & II & M. Aurelius	236	138-161
Faustina I or II	1	138-180
Marcus Aureliu Faustina II & Lucilla	163	161-180
Lucius Verus	9	161-169
Commodus Caesar	9	175-177
Commodus & Crispina	94	177-192
Marcus Aurelius Posth	1	180-181
Clodius Albinus	2	195-197
Septimus Severus & Julia Domna	19	193-211
Caracalla & Julia Domna	3	198-217
Geta	1	209-212
Macrinus	1	217-218
Elagabulus	1	218-222
Severus Alexander & Julia Mamaea	5	222-235
Maximus	1	235-238
Gordian III	3	238-244
Otacilla Severa	1	244-249
Postumus	7	259-268
Total	1143	

Example of part of one of the spreadsheets computating the number of sestertii in circulation on the basis of wastage rates. The extract only displays integers, though the calculations were done to 4 significant figures. The figures in italics represent the period of introduction of the issue. The rate of decrease here is 15% per annum.

1. Augustus, Agrippina & Germanicus (43)
2. Claudius & Antonia (43-54)
3. Nero (54-68)
4. Vespasian & Titus Caesar (69-79)
5. Titus & Vespasian Posth. (79-81)
6. Flavian (69-96)
7. Domitian & Domitia (81-96)
8. Nerva (96-98)
9. Trajan (98-117)
10. Hadrian, Sabina & L.Aelius (117-138)
11. Antoninus Pius, Faust. I & II M. Aurelius (138-61)
12. Faustina I or II (138-180)
13. Marcus Aureliu Faustina II & Lucilla (161-180)
14. Lucius Verus (161-169)

Reference:		1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.
Number of sestertii:		3	23	16	29	8	1	52	15	205	234	236	1	163
Date	Total													
43	3	*3*	*0*	-	-	-	-	-	-	-	-	-	-	-
44	4	3	*2*	-	-	-	-	-	-	-	-	-	-	-
45	6	2	*3*	-	-	-	-	-	-	-	-	-	-	-
46	7	2	*5*	-	-	-	-	-	-	-	-	-	-	-
47	7	2	*6*	-	-	-	-	-	-	-	-	-	-	-
48	8	1	*7*	-	-	-	-	-	-	-	-	-	-	-
49	9	1	*8*	-	-	-	-	-	-	-	-	-	-	-
50	9	1	*8*	-	-	-	-	-	-	-	-	-	-	-
51	10	1	*9*	-	-	-	-	-	-	-	-	-	-	-
52	10	1	*10*	-	-	-	-	-	-	-	-	-	-	-
53	11	1	*10*	-	-	-	-	-	-	-	-	-	-	-
54	11	1	*10*	*0*	-	-	-	-	-	-	-	-	-	-
55	10	0	9	*1*	-	-	-	-	-	-	-	-	-	-
56	10	0	8	*2*	-	-	-	-	-	-	-	-	-	-
57	10	0	7	*3*	-	-	-	-	-	-	-	-	-	-
58	9	0	6	*3*	-	-	-	-	-	-	-	-	-	-
59	9	0	*5*	*4*	-	-	-	-	-	-	-	-	-	-
60	9	0	4	*4*	-	-	-	-	-	-	-	-	-	-
61	8	0	4	*5*	-	-	-	-	-	-	-	-	-	-
62	8	0	3	*5*	-	-	-	-	-	-	-	-	-	-
63	8	0	3	*5*	-	-	-	-	-	-	-	-	-	-
64	8	0	2	*5*	-	-	-	-	-	-	-	-	-	-
65	8	0	2	*6*	-	-	-	-	-	-	-	-	-	-
66	8	0	2	*6*	-	-	-	-	-	-	-	-	-	-
67	8	0	1	*6*	-	-	-	-	-	-	-	-	-	-
68	7	0	1	*6*	-	-	-	-	-	-	-	-	-	-
69	6	0	1	5	*0*	-	*0*	-	-	-	-	-	-	-
70	8	0	1	5	*2*	-	*0*	-	-	-	-	-	-	-
71	9	0	1	4	*5*	-	*0*	-	-	-	-	-	-	-
72	11	0	1	3	*6*	-	*0*	-	-	-	-	-	-	-
73	12	0	0	3	*8*	-	*0*	-	-	-	-	-	-	-
74	13	0	0	2	*9*	-	*0*	-	-	-	-	-	-	-
75	13	0	0	2	*11*	-	*0*	-	-	-	-	-	-	-
76	14	0	0	2	*12*	-	*0*	-	-	-	-	-	-	-
77	15	0	0	2	*12*	-	*0*	-	-	-	-	-	-	-
78	15	0	0	1	*13*	-	*0*	-	-	-	-	-	-	-
79	15	0	0	1	*14*	*0*	*0*	-	-	-	-	-	-	-
80	17	0	0	1	12	*3*	*0*	-	-	-	-	-	-	-
81	18	0	0	1	10	6	*0*	-	-	-	-	-	-	-
82	18	0	0	1	9	6	*0*	*0*	-	-	-	-	-	-
83	19	0	0	1	8	5	*0*	*3*	-	-	-	-	-	-
84	19	0	0	1	7	4	*0*	6	-	-	-	-	-	-
85	20	0	0	0	6	3	*0*	*8*	-	-	-	-	-	-
86	20	0	0	0	5	3	*0*	*10*	-	-	-	-	-	-
87	20	0	0	0	4	3	*0*	*11*	-	-	-	-	-	-
88	20	0	0	0	4	2	*0*	*13*	-	-	-	-	-	-
89	20	0	0	0	3	2	*0*	*14*	-	-	-	-	-	-
90	21	0	0	0	3	2	*0*	*15*	-	-	-	-	-	-
91	21	0	0	0	2	1	*0*	*16*	-	-	-	-	-	-
92	21	0	0	0	2	1	*0*	*17*	-	-	-	-	-	-
93	21	0	0	0	2	1	*0*	*17*	-	-	-	-	-	-
								18						

Reference:		1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.
Number of sestertii:		3	23	16	29	8	1	52	15	205	234	236	1	163
94	21	0	0	0	1	1	*0*	*18*	-	-	-	-	-	-
95	21	0	0	0	1	1	*0*	*19*	-	-	-	-	-	-
96	21	0	0	0	1	1	*1*	*19*	*0*	-	-	-	-	-
97	25	0	0	0	1	1	0	16	*6*	-	-	-	-	-
98	28	0	0	0	1	0	0	14	*12*	*0*	-	-	-	-
99	33	0	0	0	1	0	0	12	10	*9*	-	-	-	-
100	38	0	0	0	1	0	0	10	9	*17*	-	-	-	-
101	42	0	0	0	1	0	0	9	8	*24*	-	-	-	-
102	45	0	0	0	0	0	0	8	7	*30*	-	-	-	-
103	48	0	0	0	0	0	0	7	6	*35*	-	-	-	-
104	51	0	0	0	0	0	0	6	5	*39*	-	-	-	-
105	53	0	0	0	0	0	0	5	4	*43*	-	-	-	-
106	55	0	0	0	0	0	0	4	4	*46*	-	-	-	-
107	56	0	0	0	0	0	0	4	3	*49*	-	-	-	-
108	58	0	0	0	0	0	0	3	3	*52*	-	-	-	-
109	59	0	0	0	0	0	0	3	2	*54*	-	-	-	-
110	60	0	0	0	0	0	0	2	2	*55*	-	-	-	-
111	61	0	0	0	0	0	0	2	2	*57*	-	-	-	-
112	62	0	0	0	0	0	0	2	1	*58*	-	-	-	-
113	62	0	0	0	0	0	0	1	1	*59*	-	-	-	-
114	63	0	0	0	0	0	0	1	1	*60*	-	-	-	-
115	63	0	0	0	0	0	0	1	1	*61*	-	-	-	-
116	64	0	0	0	0	0	0	1	1	*62*	-	-	-	-
117	64	0	0	0	0	0	0	1	1	*63*	*0*	-	-	-
118	65	0	0	0	0	0	0	1	1	54	*10*	-	-	-
119	65	0	0	0	0	0	0	1	1	46	*18*	-	-	-
120	66	0	0	0	0	0	0	1	0	40	*25*	-	-	-
121	66	0	0	0	0	0	0	0	0	34	*31*	-	-	-
122	66	0	0	0	0	0	0	0	0	29	*36*	-	-	-
123	67	0	0	0	0	0	0	0	0	25	*41*	-	-	-
124	67	0	0	0	0	0	0	0	0	22	*45*	-	-	-
125	67	0	0	0	0	0	0	0	0	19	*48*	-	-	-
126	67	0	0	0	0	0	0	0	0	16	*51*	-	-	-
127	67	0	0	0	0	0	0	0	0	14	*53*	-	-	-
128	68	0	0	0	0	0	0	0	0	12	*55*	-	-	-
etc...														

Appendix 4.24
The hoarding of Bronze coins with precious metal

Precious Metal Coins ONLY		Mixed Assemblages		Bronze Coins ONLY	
40s					
J 029	Bredgar	J 220f	Santon Downham	J 179n	Minster Lovell
J 060	Chippenham	J 188n	Nunney	J 216	Richborough
J 003q	Almondbury			J 265n	Wilcote
J 006n	Ayott Saint Lawrence				
J 143f	Lightcliffe				
50s					
J 157	London			J 068	Colchester
J 241	Usk				
60s					
J 103	Eriswell	J 128q	Honley	J 275	Worcester
J 221	Scole			J 244	Usk
J 260n	Weston Longville				
S 082	Glamis				
J 146n	Little Chester				
70s					
S 023	Broonholme			J 107	Exeter
S 024	Brough under Stainmore			J 255	Watling Court
S 176	York			J 228q	Southwark
J 036	Budge Row				
S 014	Binnington Carr				
S 080	Gillingwood Hall				
80s					
J 179	Mildenhall	J 238n	Timsbury	S 032	Carlisle
J 130	The Howe	J 151n	Llanfaethlu	J 242	Usk
J 005s	Askham			J 133	Kempsford
90s					
J 063	Cirencester	S 058	Corbridge 1914		
J 064	Cirencester				
J 240n	Upton				
S 142	Shap				
J 176	Mereclough				
100s					
J 222f	Selston				
J 036n	Bulwick				
110s					
J 141q	Lavenham				
J 190q	Oughtibridge				
J 246	Verulamium				
S 078	Gateshead				
S 151	Sowerby				
J 139	Lancaster				
J 262n	Wheathampstead				
S 011	Bewcastle				
S 093	Howstean Beck				
S 106	Lancaster				
S 059	Corbridge 1965				
S 155	Thorngrafton				
120s					
J 141	Lathom	J 277f	Wroxeter	S 152	Stanwix
J 028n	Brecon	J 277h	Wroxeter		
S 015	Birdoswald				
S 016	Birdoswald				
S 084	Great Chesters				
S 056	Corbridge 1911c				

130s					
J 084	Dewsbury	J 251	Waddington		
J 261	Weston				
S 114	Mallerstang				
J 236	Swaby				
S 034	Carlisle				
S 101	Lanark				
J 159	Londonthorpe				
S 037	Carlisle (east of)				
S 067	Deskford				
S 116	Maryport				
S 167	Westgate				
S 003	Backworth				
140s					
J 258	Westmeston			S 041	Castledykes
S 112	Linlithgow			S 018	Bowness on Solway
S 119	Mindrum				
J 127n	Hengistbury Head				
S 127	Norton				
S 005	Bar Hill				
S 031	Carlisle				
S 161	Ugthorpe				
S 098	Kirkintilloch				
J 165q	March				
J 255p	London, Jewin Street				
J 154	Llanynynech Hill				
150s					
J 053	Chatburn	J 052	Chalfont St. Giles	J 077q	Croydon
S 180	York	S 055	Corbridge 1911b	J 140	Langford
J 158	Londonthorpe				
S 129	Piercebridge				
J 212	Pyrford				
160s					
S 060	Corbridge 1969	J 187n	Nottingham	J 190	Old Sleaford
S 070	Edinburgh	J 198	Piercebridge		
S 135	Rudchester				
S 166	West Calder				
J 005	Allerton Bywater				
J 248	Waddington				
J 215	Ribchester				
J 085	Dewsbury				
S 086	Hampsthwaite				
J 039n	Caistor St Edmund				
J 193q	Parwich Hill				
170s					
J 098n	Elmham	J 001	Aldworth	J 118n	Great Chesterford
J 128s	Horseheath	J 121	Gurnard	J 263n	Whitchurch Wier
J 005q	Ashwell	J 048q	Castle Thorpe		
J 006q	Babworth				
J 017n	Benacre				
J 062n	Cilhaul				
J 086n	Doncaster (near...)				
J 125n	Hanwell				
J 174f	Melton Magna				
J 222h	Sheffield				
J 270a	Wirksworth (near...)				
J 136	Knapwell				
J 257	Westgate				
J 028	Braughing				
S 033	Carlisle				
S 069	Drummond Castle				
S 131	Pitcullo				
S 181	York				
J 048n	Castle Bromwich				
J 206	Poughill				
J 011n	Beachamwell				
J 097	Edwinstone				

180s					
J 184q	Naseby	J 227n	Slay Hills Saltings	J 214	Rembridge
Foreshore					
S 019	Braco			J 240	Upchurch
S 154	Taymouth			J 132	Isle of White (?)
S 158	Torfoot				
S 097	Kirkby Thore				
J 022	Blerchley				
S 146	South Shields Hoard 1				
J 010	Barway				
J 162n	Lydney (near...)				
J 162	Lowestoft				
S 164	Wallsend				
S 022	Briglands				
190s					
J 033	Brixworth	J 193	Owston Ferry	J 142	Leegrave
J 193f	Oxnead			J 274n	Woolmer Pond
S 048	Chesters				
S 063	Cowie Moss				
S 110	Leuchars				
J 125	Handley				
J 223	Silchester Hoard 1				
J 120	Great Melton				
S 132	Portmoak				
S 174	York				
200s					
J 003n	Alfreton	S 096	Kirkby Thore		
S 115	Malton	J 032	Bristol		
J 183	Muswell Hill				
J 165n	Mansfield				
210s					
S 117	Hill of Megray			S 091	Housteads
J 199	Piercebridge				
S 039	Carrawburgh				
J 079	Darfield 2				
J 081	Darfield 4				
J 019	Billingsgate				
J 051	Chadwell St Mary				
S 122	Nawton				
220s					
J 004	Akenham				
J 265	Wigan				
J 068n	Colchester				
J 096	Edlington Wood				
J 149	Llanarmon Dyffryn...				
J 220	Saint Mary Cray				
J 221f	Segontium				
J 089n	East Anglia				
J 193h	Padfield				
J 246f	Verulamium				
S 092	Housteads				
230s					
J 043	Camborne Roman Villa	J 135	Kirkham		
J 188	Nuneaton	J 058	Chesterfield		
S 071	Falkirk				
J 284	? Britain				
J 036s	Cadeby				
J 078q	Darfield 1				
240s					
J 030n	Brighton (near...)			J 111	Felixtowe
S 173	York				
J 119	Great Chesterford				
J 099	Elveden				
250s					
J 155	London	J 003	Alcester		
S 162	Upper Holker				
J 204	Poole Harbour				
J 087	Dorchester				
J 093	Edlington Wood				
J 173	Mattishall				

260s J 151 Llandovery J 205 Portsdown Hill J 009 Barton upon Humber J 041 Caistor-by-Yarmouth J 168 March J 283 ? Britain S 128 Piercebridge J 253 Wateringbury J 163 Magdalen S 077 Fulwell J 233 Stiffkey (?) J 095 Edlington Wood	J 069 Colchester	J 143 Leysdown J 166 March
270s 81 Hoards	J 026 Bourne End S 001 Adderstone J 115 Gare J 118 Great Chesells J 203 Poole J 266 Willingdon J 070 Colchester	
280s 58 Hoards	J 104q Ewelme J 195n Peterborough J 153q Llanidan J 066 Clapton-in-Gordano	
290s 44 Hoards	J 195 Pen-y-Corddyn J 148 Little Orm's Head J 192n Oundle	

Appendix 4.31

Weight and silver content of denarii & antoniniani

Raw Data from Walker (1976, 1977 & 1978) and Crawford (1974)

Summary Data:		Number of Coins	Average Weight of Coin	Average Percentage of silver	Average Weight of silver
GROUP A	(REPUBLICAN)	35	3.65	96.52	3.52
GROUP B	(MARK ANTONY)	15	3.65	86.42	3.15
GROUP C	(JULIO-CLAUDIAN 1)	221	3.66	97.51	3.56
GROUP D	(JULIO-CLAUDIAN 2)	56	3.35	95.91	3.21
GROUP E	(CIVIL WAR)	84	3.23	93.04	3.00
GROUP F	(FLAVIAN 1)	213	3.20	90.59	2.89
GROUP G	(FLAVIAN 2)	171	3.24	93.34	3.02
GROUP H	(TRAJANIC)	275	3.22	90.49	2.91
GROUP I	(HADRIANIC)	365	3.20	88.90	2.85
GROUP J	(ANTONINE 1)	287	3.21	85.51	2.74
GROUP K	(ANTONINE 2)	222	3.23	79.75	2.58
GROUP L	(ANTONINE 3)	187	3.02	75.73	2.29
GROUP M	(SEVERAN 1a)	308	3.21	59.37	1.90
GROUP N	(SEVERAN 1b)	100	3.21	51.98	1.67
GROUP O	(SEVERAN 2a)	104	3.08	49.12	1.51
GROUP P	(SEVERAN 2b)	246	3.04	45.25	1.37
GROUP Q	(SEVERAN 2c)	37	2.93	51.95	1.52

GROUP A (REPUBLICAN)

35 coins from L.Iulius (224/1: 141bc) to P.Clodius (494/23: 42bc) have been taken to provide an average. This selection is somewhat artificial, and is unweighted (Crawford 1974, 570-1):

97.50	98.40	96.00	99.50	97.90	98.90	96.00	98.50
98.80	98.40	94.87	97.70	93.00	91.20	98.39	95.80
95.80	95.50	92.60	97.00	95.10	98.60	99.07	95.20
98.20	98.00	97.00	97.00	92.50	98.60	95.40	95.40
95.50	94.50	96.70					

Average = 96.52 % Silver

The weight standard was 3.86 g. (Crawford 1974, 594), however see the note below.

GROUP B (MARK ANTONY)

15 Coins of Mark Antony contained the following percentages of Silver (Crawford 1974, 571):

92.49	85.50	90.10	85.10	77.62	83.80	89.50	90.60
83.95	89.75	83.80	83.80	85.60	87.40	87.30	

Average = 86.42 % Silver

The weight standard was 3.86 g. (Crawford 1974, 595), however see the note below.

Note on the weight of the denarii of the Republic & Mark Antony:

Since all these coins were well worn before entry into Britian, a lower value than this is required. A lesser nominal, weight is therefore needed. Crawford pointed out that though the Legionary denarii were debased, they were still struck to the full Repubican weight. Therefore by looking at the weight of both these issues in hoards in Britain we should be able to arrive at a justifiable nominal 'issue weight' for their weight in AD43.

Chippenham	(Burnett & Bland, 1986, 2)	c.40s-50s?	3.62g
Scole	(Burnett & Bland, 1986, 7)	c.60/61?	3.54g
Eriswell	(Burnett, 1984, 6)	c.60/61?	3.55g
Mildenhall	(Burnett, 1984, 15)	c.80-85	3.45g
Howe (part 2)	(Burnett & Bland, 1986, 13)	c.87	3.24g
Howe (part 1)	(Burnett, 1984, 25)	c.87	3.23g
Cirencester	(Carson & Burnett 1979, 7)	c.94	3.33g
Londonthorpe	(Carson & Burnett 1979, 9)	c.154	2.40g

This data suggests that a nominal value of c. 3.65g for the weight of denarii of the Republic and Mark Antony would seem fair.

Later groups:

1. Emperor; 2. Approx date of issue; 3. Sample size;
4. Average weight; 5. Standard deviation of weight;
6. Percentage silver; 7. Standard deviation of percentage silver;
8. Weight of silver in coin.

1	2	3	4	5	6	7	8
Augustus	28BC	41	3.64	±0.20	98.84	±0.39	3.52
Augustus	22BC	15	3.73	±0.20	97.63	±0.48	3.64
Augustus	21BC	12	3.74	±0.23	98.08	±0.62	3.65
Augustus	20BC	68	3.60	±0.25	97.44	±1.02	3.51
Augustus	17BC	6	3.61	±0.33	94.92	±0.55	3.43
Augustus	15BC	44	3.72	±0.23	96.24	±0.56	3.58
Augustus	1BC	24	3.69	±0.21	97.91	±1.00	3.65
Tiberius	25	7	3.72	±0.13	98.07	±0.62	3.64
Gaius	39	4	3.57	±0.12	97.69	±0.82	3.48
GROUP C (JULIO-CLAUDIAN 1)		221	3.66	-	97.51	-	3.56
Claudius	47	19	3.56	±0.17	98.00	±0.72	3.49
Nero	59	13	3.37	±0.24	97.35	±0.79	3.28
Nero	66	24	3.18	±0.23	93.48	±1.08	2.97
GROUP D (JULIO-CLAUDIAN 2)		56	3.35	-	95.91	-	3.21
Galba	68	34	3.23	±0.12	93.2	±1.25	3.01
Otho	69	21	3.28	±0.16	93.59	±0.68	3.06
Vitellius	69	29	3.21	±0.17	92.47	±1.90	2.96
GROUP E (CIVIL WAR)		84	3.23	-	93.04	-	3.00
Vespasian	70	26	3.20	±0.13	88.28	±4.35	2.82
Vespasian	71	11	3.17	±0.21	89.29	±5.12	2.82
Vespasian	72	18	3.21	±0.17	91.68	±2.78	2.94
Vespasian	73	13	3.25	±0.21	88.65	±5.19	2.83
Vespasian	74	19	3.19	±0.17	90.52	±2.73	2.88
Vespasian	75	12	3.18	±0.24	91.89	±3.50	2.91
Vespasian	76	13	3.19	±0.19	90.86	±3.95	2.89
Vespasian	77	28	3.19	±0.22	89.77	±4.02	2.85
Vespasian	79	16	3.23	±0.22	90.78	±4.25	2.93
Titus	79	18	3.20	±0.20	92.69	±2.07	2.96
Titus	80	39	3.21	±0.19	91.73	±2.79	2.94
GROUP F (FLAVIAN 1)		213	3.20	-	90.59	-	2.89
Domitian	81	20	3.19	±0.20	90.56	±3.92	2.89
Domitian	82	8	3.20	±0.17	91.03	±2.70	2.91
Domitian	84	14	3.33	±0.20	98.01	±0.85	3.26
Domitian	87	23	3.23	±0.15	93.43	±0.57	3.02
Domitian	90	37	3.28	±0.13	93.39	±0.74	3.05
Domitian	94	32	3.26	±0.15	93.75	±0.71	3.05
Nerva	96	9	3.20	±0.23	93.08	±0.71	2.97
Nerva	97	25	3.23	±0.19	93.19	±0.80	3.01
Nerva	97	3	3.26	±0.20	93.14	±0.83	3.03
GROUP G (FLAVIAN 2)		171	3.24	-	93.34	-	3.02
Trajan	98	23	3.27	±0.28	93.55	±0.98	3.05
Trajan	100	10	3.21	±0.21	92.38	±1.52	2.97
Trajan	101	22	3.22	±0.22	93.01	±1.11	2.99
Trajan	103	3	3.21	±0.23	92.75	±1.80	2.98
Trajan	104	11	3.26	±0.21	89.89	±3.48	2.93
Trajan	105	6	3.21	±0.17	92.04	±0.77	2.95
Trajan	106	8	3.21	±0.18	92.22	±1.99	2.96
Trajan	107	22	3.27	±0.22	92.23	±0.96	3.01
Trajan	107	29	3.20	±0.21	89.99	±3.28	2.87
Trajan	108	19	3.22	±0.18	88.95	±4.39	2.86
Trajan	110	22	3.19	±0.12	88.47	±4.73	2.82
Trajan	112	26	3.16	±0.21	89.69	±3.92	2.91
Trajan	114	16	3.21	±0.19	89.92	±2.98	2.88
Trajan	115	27	3.25	±0.24	89.48	±3.41	2.90
Trajan	116	12	3.26	±0.26	87.87	±4.59	2.86
Trajan	117	19	3.20	±0.24	88.95	±3.44	2.84
GROUP H (TRAJANIC)		275	3.22	-	90.49	-	2.91

1	2	3	4	5	6	7	8
Hadrian	117	20	3.23	±0.21	87.39	±4.83	2.82
Hadrian	118	20	3.24	±0.31	86.90	±5.22	2.81
Hadrian	119	20	3.21	±0.28	88.65	±4.87	2.84
Hadrian	121	16	3.14	±0.19	89.78	±2.79	2.81
Hadrian	122	15	3.18	±0.19	89.73	±4.39	2.85
Hadrian	123	34	3.18	±0.30	88.34	±4.73	2.80
Hadrian	124	11	3.18	±0.14	89.00	±4.70	2.83
Hadrian	125	15	3.26	±0.22	88.40	±4.71	2.87
Hadrian	126	17	3.25	±0.32	88.16	±5.87	2.86
Hadrian	127	10	3.17	±0.27	89.53	±2.45	2.83
Hadrian	128	18	3.22	±0.20	87.33	±4.00	2.81
Hadrian	128	15	3.18	±0.28	89.28	±4.18	2.83
Hadrian	130	24	3.25	±0.20	88.94	±4.49	2.89
Hadrian	132	10	3.22	±0.19	88.23	±3.40	2.83
Hadrian	133	14	3.18	±0.15	90.82	±2.85	2.88
Hadrian	134	11	3.20	±0.25	89.80	±2.86	2.87
Hadrian	135	18	3.21	±0.19	89.17	±3.26	2.86
Hadrian	136	30	3.18	±0.21	90.52	±2.76	2.88
Hadrian	137	30	3.23	±0.19	89.84	±2.93	2.90
Hadrian	138	17	3.25	±0.27	88.46	±4.12	2.87
GROUP I (HADRIANIC)		365	3.20	-	88.90	-	2.85
Antoninus	138	9	3.25	±0.18	87.81	±4.97	2.85
Antoninus	139	27	3.27	±0.27	87.93	±3.92	2.87
Antoninus	140	8	3.23	±0.28	85.03	±4.65	2.74
Antoninus	141	21	3.21	±0.30	87.43	±4.93	2.81
Antoninus	142	16	3.19	±0.32	88.67	±4.00	2.83
Antoninus	143	8	3.24	±0.24	87.09	±4.48	2.82
Antoninus	144	14	3.15	±0.23	88.00	±2.99	2.77
Antoninus	145	8	3.25	±0.22	87.78	±2.94	2.86
Antoninus	146	14	3.18	±0.15	85.89	±6.29	2.73
Antoninus	147	12	3.18	±0.26	89.67	±2.43	2.85
Antoninus	148	22	3.25	±0.25	84.75	±5.51	2.74
Antoninus	150	10	3.25	±0.15	84.45	±5.28	2.74
Antoninus	151	13	3.17	±0.28	83.08	±6.19	2.63
Antoninus	152	10	3.25	±0.22	83.63	±6.32	2.71
Antoninus	154	14	3.16	±0.38	85.68	±6.17	2.71
Antoninus	155	20	3.22	±0.28	82.61	±6.00	2.66
Antoninus	156	11	3.26	±0.24	84.30	±5.86	2.75
Antoninus	157	15	3.16	±0.29	81.37	±7.19	2.57
Antoninus	158	13	3.19	±0.22	82.85	±6.41	2.64
Antoninus	160	22	3.21	±0.23	83.30	±7.17	2.66
GROUP J (ANTONINE 1)		287	3.21	-	85.51	-	2.74
Marcus Aurelius	161	13	3.25	±0.15	77.81	±4.43	2.53
Marcus Aurelius	161	11	3.28	±0.22	81.27	±3.57	2.67
Marcus Aurelius	162	16	3.30	±0.16	76.28	±4.65	2.52
Marcus Aurelius	163	22	3.19	±0.21	81.55	±6.61	2.60
Marcus Aurelius	164	19	3.27	±0.23	78.33	±6.19	2.56
Marcus Aurelius	165	19	3.25	±0.21	79.30	±6.16	2.58
Marcus Aurelius	166	9	3.12	±0.20	82.53	±5.19	2.57
Marcus Aurelius	167	11	3.21	±0.25	81.25	±4.24	2.60
Marcus Aurelius	168	9	3.27	±0.21	83.02	±4.86	2.71
Marcus Aurelius	169	10	3.18	±0.25	82.37	±5.36	2.62
Marcus Aurelius	171	13	3.35	±0.19	77.00	±1.79	2.58
Marcus Aurelius	173	19	3.25	±0.25	79.50	±5.02	2.58
Marcus Aurelius	175	23	3.20	±0.28	80.41	±5.37	2.57
Marcus Aurelius	177	28	3.23	±0.36	79.36	±5.81	2.56
GROUP K (ANTONINE 2)		222	3.23	-	79.75	-	2.58

1	2	3	4	5	6	7	8
Commodus	180	13	3.00	±0.21	76.98	±4.28	2.31
Commodus	181	10	3.14	±0.31	77.40	±6.35	2.43
Commodus	183	13	3.01	±0.41	74.09	±4.78	2.23
Commodus	183	14	3.14	±0.23	77.34	±4.63	2.43
Commodus	184	17	3.08	±0.41	75.11	±3.77	2.31
Commodus	186	19	2.93	±0.22	74.26	±4.39	2.18
Commodus	186	13	2.94	±0.31	76.71	±4.82	2.25
Commodus	188	22	3.02	±0.32	75.33	±3.88	2.27
Commodus	190	21	3.02	±0.42	72.12	±3.09	2.18
Commodus	192	28	3.01	±0.37	72.83	±6.60	2.19
Pertinax	193	11	3.16	±0.42	87.11	±5.66	2.75
Didius Julianus	193	6	2.95	±0.19	81.33	±8.18	2.40
GROUP L (ANTONINE 3)		187	3.02	-	75.73	-	2.29
Severus	193	23	3.18	±0.38	78.12	±5.23	2.48
Severus	194	6	3.10	±0.27	78.71	±4.74	2.44
Severus	194	8	2.95	±0.34	65.84	±9.60	1.94
Severus	194	12	3.08	±0.34	66.50	±8.81	2.05
Severus	195	14	3.17	±0.31	61.40	±6.14	1.95
Severus	196	24	3.11	±0.48	57.59	±6.05	1.79
Severus	197	12	2.96	±0.26	58.88	±5.88	1.74
Severus	197	24	3.33	±0.43	55.58	±6.18	1.85
Severus	199	26	3.28	±0.20	55.53	±8.26	1.82
Severus	200	36	3.31	±0.24	57.00	±5.14	1.89
Severus	202	15	3.25	±0.25	57.67	±8.46	1.87
Severus	204	15	3.30	±0.29	57.16	±6.28	1.89
Severus	206	10	3.20	±0.28	54.75	±8.45	1.75
Severus	207	21	3.38	±0.46	57.07	±6.88	1.93
Severus	208	12	3.20	±0.48	53.21	±5.77	1.70
Severus	209	20	3.14	±0.22	57.63	±6.36	1.81
Severus	210	30	3.25	±0.37	55.17	±5.79	1.78
GROUP M (SEVERAN 1a)		308	3.21	-	59.37	-	1.90
Caracalla	211	23	3.20	±0.32	54.41	±6.29	1.75
Caracalla	212	12	3.24	±0.40	50.54	±2.53	1.64
Caracalla	213	12	3.43	±0.32	51.42	±2.94	1.76
Caracalla	214	9	3.30	±0.28	51.28	±3.17	1.69
Caracalla	215	22	3.17	±0.35	50.54	±4.69	1.60
Caracalla	216	13	3.15	±0.30	53.35	±5.56	1.68
Caracalla	217	9	3.07	±0.20	50.78	±2.55	1.56
GROUP N (SEVERAN 1b)		100	3.21	-	51.98	-	1.67
Macrinus	217	4	3.27	±0.41	50.50	±7.70	1.65
Macrinus	217	23	3.15	±0.25	57.85	±4.79	1.82
Elagabalus	218	25	3.15	±0.25	45.30	±6.18	1.43
Elagabalus	219	27	2.96	±0.44	48.39	±9.49	1.43
Elagabalus	221	25	3.05	±0.32	45.48	±4.44	1.38
GROUP O (SEVERAN 2a)		104	3.08	-	49.12	-	1.51
Alexander	222	27	3.04	±0.36	43.65	±5.85	1.33
Alexander	223	19	3.09	±0.34	42.08	±4.01	1.30
Alexander	224	10	2.96	±0.31	43.70	±4.18	1.29
Alexander	225	23	3.02	±0.26	46.83	±9.22	1.41
Alexander	226	20	3.04	±0.40	39.05	±5.18	1.19
Alexander	227	12	3.06	±0.34	36.33	±8.56	1.11
Alexander	228	18	2.91	±0.25	44.44	±7.89	1.30
Alexander	229	13	3.26	±0.44	43.50	±9.62	1.42
Alexander	230	22	3.22	±0.35	46.73	±8.51	1.50
Alexander	231	17	3.05	±0.41	46.50	±9.92	1.42
Alexander	232	26	2.92	±0.35	51.58	±7.01	1.51
Maximinus	235	30	3.01	±0.40	49.47	±4.74	1.49
Maximinus	237	9	3.07	±0.41	46.00	±7.51	1.43
GROUP P (SEVERAN 2b)		246	3.04	-	45.25	-	1.37
Gordian I & II	238	5	2.77	±0.34	62.8	±10.29	1.71
Balbinus & Pupienus	238	10	2.8	±0.33	55.00	±14.91	1.55
Gordian III	240	22	3.03	±0.33	48.11	±5.64	1.46
GROUP Q (SEVERAN 2c)		37	2.93	-	51.95	-	1.52

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1	2	3	4	5	6	7	8
Caracalla	215	8	5.13	± 0.41	49.69	1.28	
Caracalla	216	11	5.03	± 0.38	52.18	1.31	
Caracalla	216	16	5.11	± 0.33	51.68	1.32	
Macrinus	217	4	4.87	± 0.21	60.38	1.47	
Elagabalus	218	24	4.94	± 0.47	45.58	1.13	
Balbinus & Pupienus	238	12	4.79	± 0.40	49.75	1.19	
Gordian III	238	22	4.51	± 0.49	47.77	1.08	
Gordian III	240	30	4.48	± 0.56	49.77	1.12	
Gordian III	242	25	4.43	± 0.52	44.68	0.99	
Gordian III	243	23	4.06	± 0.39	41.63	0.83	
Philip I	244	22	4.22	± 0.53	42.82	0.91	
Philip I	246	20	4.01	± 0.52	43.25	0.87	
Philip I	247	24	4.14	± 0.48	43.25	0.89	
Philip I	248	22	4.12	± 0.41	47.07	0.97	
Decius	249	7	4.02	± 0.31	47.64	0.96	
Decius	250	29	3.97	± 0.61	41.12	0.82	
Gallus	251	25	3.42	± 0.52	36.54	0.63	
Gallus	252	26	3.52	± 0.46	36.15	0.64	
Gallus	253	12	3.45	± 0.51	35.12	0.61	
Aemilian	253	14	3.53	± 0.53	35.50	0.68	

Appendix 4.52
Silver in the circulation pool

Table 1: Walker's values for the percentage of silver in each series (See Appendix 4.31)

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
96.52	86.42	97.51	95.91	93.04	90.59	93.34	90.49	88.9	85.51	79.75	75.73	59.37	51.98	49.12	45.25	51.95

Table 2: Weight of coins throughout their circulation life.

Each series starts at the weight observed by Walker (Appendix 4.31), and then declines at the rate calculated by the wear analysis. The rate of wear used is as recorded in Appendix 2.32, being the avarage rate of wear for all coin series. This information runs out at around AD 220 (where the rate was c. 0.012 gms pa.). For the years AD 225 to 239 this same rate has been used in default of any known value. However from AD 240 onwards no wear on denarii has been assumed. This means that the silver content from then on will be slightly over estimated as no assumed rate of wear is applied.

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	Date
3.650	3.650	3.660	.	.	.	.	.	.	.	.	.	.	.	.	.	.	40
3.602	3.602	3.612	.	.	.	.	.	.	.	.	.	.	.	.	.	.	45
3.558	3.558	3.568	3.350	.	.	.	.	.	.	.	.	.	.	.	.	.	50
3.519	3.519	3.529	3.310	.	.	.	.	.	.	.	.	.	.	.	.	.	55
3.458	3.458	3.468	3.250	.	.	.	.	.	.	.	.	.	.	.	.	.	60
3.405	3.405	3.415	3.196	.	.	.	.	.	.	.	.	.	.	.	.	.	65
3.357	3.357	3.367	3.149	3.230	3.200	.	.	.	.	.	.	.	.	.	.	.	70
3.315	3.315	3.325	3.107	3.188	3.158	.	.	.	.	.	.	.	.	.	.	.	75
3.287	3.287	3.297	3.078	3.160	3.130	.	.	.	.	.	.	.	.	.	.	.	80
3.262	3.262	3.272	3.053	3.135	3.105	3.240	.	.	.	.	.	.	.	.	.	.	85
3.240	3.240	3.250	3.031	3.113	3.083	3.218	.	.	.	.	.	.	.	.	.	.	90
3.221	3.221	3.231	3.012	3.094	3.064	3.199	.	.	.	.	.	.	.	.	.	.	95
3.204	3.204	3.214	2.996	3.077	3.047	3.183	3.220	.	.	.	.	.	.	.	.	.	100
3.190	3.190	3.200	2.981	3.063	3.033	3.168	3.206	.	.	.	.	.	.	.	.	.	105
3.177	3.177	3.187	.	3.050	3.020	3.155	3.193	.	.	.	.	.	.	.	.	.	110
3.166	3.166	3.176	.	3.039	3.009	3.144	3.181	.	.	.	.	.	.	.	.	.	115
3.155	3.155	.	.	3.028	2.998	3.134	3.171	3.200	.	.	.	.	.	.	.	.	120
3.145	3.145	.	.	3.018	2.988	3.124	3.161	3.190	.	.	.	.	.	.	.	.	125
3.136	3.136	.	.	3.009	2.979	3.114	3.152	3.181	.	.	.	.	.	.	.	.	130
3.126	3.126	.	.	2.999	2.969	3.105	3.142	3.171	.	.	.	.	.	.	.	.	135
3.116	3.116	.	.	2.989	2.959	3.094	3.132	3.161	3.210	.	.	.	.	.	.	.	140
.	3.105	.	.	2.978	2.948	3.083	3.121	3.150	3.199	.	.	.	.	.	.	.	145
.	3.093	.	.	2.966	2.936	3.071	3.108	3.137	3.187	.	.	.	.	.	.	.	150
.	3.083	.	.	2.956	2.926	3.062	3.099	3.128	3.177	.	.	.	.	.	.	.	155
.	3.071	.	.	2.944	2.914	3.050	3.087	3.116	3.165	3.230	.	.	.	.	.	.	160
.	3.057	.	.	2.930	2.900	3.035	3.072	3.101	3.151	3.215	.	.	.	.	.	.	165
.	3.039	.	.	2.912	2.882	3.017	3.055	3.084	3.133	3.197	.	.	.	.	.	.	170
.	3.019	.	.	2.892	2.862	2.998	3.035	3.064	3.113	3.178	.	.	.	.	.	.	175
.	2.996	.	.	2.868	2.838	2.974	3.011	3.040	3.090	3.154	3.020	.	.	.	.	.	180
.	2.967	.	.	.	2.810	2.946	2.983	3.012	3.061	3.126	2.992	.	.	.	.	.	185
.	2.934	.	.	.	2.777	2.912	2.950	2.979	3.028	3.093	2.958	.	.	.	.	.	190
.	2.896	.	.	.	2.739	2.874	2.912	2.941	2.990	3.054	2.920	3.210	.	.	.	.	195
.	2.843	.	.	.	2.686	2.822	2.859	2.888	2.937	3.002	2.868	3.157	.	.	.	.	200
.	2.795	.	.	.	2.638	2.773	2.810	2.839	2.889	2.953	2.819	3.109	3.210	.	.	.	205
.	2.742	.	.	.	2.585	2.721	2.758	2.787	2.836	2.901	2.767	3.056	3.158	.	.	.	210
.	2.686	.	.	.	2.529	2.664	2.702	2.731	2.780	2.845	2.710	3.000	3.101	.	.	.	215
.	2.625	.	.	.	2.468	2.604	2.641	2.670	2.719	2.784	2.650	2.940	3.041	3.080	.	.	220
.	2.565	.	.	.	2.408	2.543	2.581	2.610	2.659	2.723	2.589	2.879	2.980	3.019	3.040	.	225
.	2.504	.	.	.	2.347	2.483	2.520	2.549	2.598	2.663	2.529	2.818	2.920	2.959	2.979	.	230
.	.	.	.	.	2.287	2.422	2.459	2.489	2.538	2.602	2.468	2.758	2.859	2.898	2.919	.	235
.	.	.	.	.	2.287	2.422	2.459	2.489	2.538	2.602	2.468	2.758	2.859	2.898	2.919	2.930	240
.	.	.	.	.	2.287	2.422	2.459	2.489	2.538	2.602	2.468	2.758	2.859	2.898	2.919	2.930	245
.	.	.	.	.	.	2.422	2.459	2.489	2.538	2.602	2.468	2.758	2.859	2.898	2.919	2.930	250
.	.	.	.	.	.	.	2.459	2.489	2.538	2.602	2.468	2.758	2.859	2.898	2.919	2.930	255
.	.	.	.	.	.	.	.	.	2.538	2.602	2.468	2.758	2.859	2.898	2.919	2.930	260
.	.	.	.	.	.	.	.	.	.	.	2.468	2.758	2.859	2.898	2.919	2.930	265
.	.	.	.	.	.	.	.	.	.	.	.	2.758	2.859	2.898	2.919	2.930	270
.	.	.	.	.	.	.	.	.	.	.	.	.	2.859	2.898	2.919	2.930	275
.	.	.	.	.	.	.	.	.	.	.	.	.	2.859	2.898	2.919	2.930	280

Table 3: Weight of silver in coins throughout their circulation life.

The values for the weights of the coins (Table 2) have been multiplied by the percentage silver in each coin series (Table 1) to calculate the weight of silver in each coin, at different stages in its circulation life. Naturally this diminishes as the coin is worn.

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	
3.523	3.154	3.569	.	.	.	.	.	.	.	.	.	.	.	.	.	.	40
3.477	3.113	3.522	.	.	.	.	.	.	.	.	.	.	.	.	.	.	45
3.435	3.075	3.480	3.213	.	.	.	.	.	.	.	.	.	.	.	.	.	50
3.396	3.041	3.441	3.175	.		.	.	.	.	.	.	.	.	.	.	.	55
3.338	2.989	3.382	3.117	.	.	.	.	.	.	.	.	.	.	.	.	.	60
3.286	2.942	3.330	3.065	.	.	.	.	.	.	.	.	.	.	.	.	.	65
3.240	2.901	3.283	3.020	3.005	2.899	.	.	.	.	.	.	.	.	.	.	.	70
3.200	2.865	3.242	2.980	2.966	2.861	.	.	.	.	.	.	.	.	.	.	.	75
3.172	2.840	3.215	2.952	2.940	2.835	.	.	.	.	.	.	.	.	.	.	.	80
3.148	2.819	3.190	2.928	2.916	2.812	3.024	.	.	.	.	.	.	.	.	.	.	85
3.127	2.800	3.169	2.907	2.896	2.793	3.004	.	.	.	.	.	.	.	.	.	.	90
3.109	2.783	3.150	2.889	2.878	2.775	2.986	.	.	.	.	.	.	.	.	.	.	95
3.093	2.769	3.134	2.873	2.863	2.760	2.971	2.914	.	.	.	.	.	.	.	.	.	100
3.079	2.757	3.120	2.859	2.850	2.747	2.957	2.901	.	.	.	.	.	.	.	.	.	105
3.067	2.746	3.108	.	2.838	2.736	2.945	2.889	.	.	.	.	.	.	.	.	.	110
3.056	2.736	3.097	.	2.827	2.726	2.935	2.879	.	.	.	.	.	.	.	.	.	115
3.045	2.727	.	.	2.817	2.716	2.925	2.869	2.845	.	.	.	.	.	.	.	.	120
3.036	2.718	.	.	2.808	2.707	2.916	2.861	2.836	.	.	.	.	.	.	.	.	125
3.027	2.710	.	.	2.799	2.699	2.907	2.852	2.828	.	.	.	.	.	.	.	.	130
3.017	2.702	.	.	2.790	2.690	2.898	2.843	2.819	.	.	.	.	.	.	.	.	135
3.008	2.693	.	.	2.781	2.680	2.888	2.834	2.810	2.745	.	.	.	.	.	.	.	140
.	2.683	.	.	2.771	2.670	2.878	2.824	2.800	2.735	.	.	.	.	.	.	.	145
.	2.673	.	.	2.759	2.659	2.866	2.813	2.789	2.725	.	.	.	.	.	.	.	150
.	2.665	.	.	2.750	2.651	2.858	2.804	2.781	2.717	.	.	.	.	.	.	.	155
.	2.654	.	.	2.739	2.640	2.847	2.794	2.770	2.707	2.576	.	.	.	.	.	.	160
.	2.642	.	.	2.726	2.627	2.833	2.780	2.757	2.694	2.564	.	.	.	.	.	.	165
.	2.626	.	.	2.709	2.611	2.816	2.764	2.741	2.679	2.550	.	.	.	.	.	.	170
.	2.609	.	.	2.691	2.593	2.798	2.746	2.724	2.662	2.534	.	.	.	.	.	.	175
.	2.589	.	.	2.669	2.571	2.776	2.725	2.703	2.642	2.515	2.287	.	.	.	.	.	180
.	2.564	.	.	.	2.546	2.749	2.699	2.678	2.618	2.493	2.266	.	.	.	.	.	185
.	2.536	.	.	.	2.516	2.718	2.669	2.648	2.589	2.466	2.240	.	.	.	.	.	190
.	2.503	.	.	.	2.481	2.683	2.635	2.614	2.557	2.436	2.212	1.906	.	.	.	.	195
.	2.457	.	.	.	2.434	2.634	2.587	2.568	2.512	2.394	2.172	1.875	.	.	.	.	200
.	2.415	.	.	.	2.389	2.588	2.543	2.524	2.470	2.355	2.135	1.846	1.669	.	.	.	205
.	2.370	.	.	.	2.342	2.539	2.496	2.478	2.425	2.313	2.095	1.815	1.641	.	.	.	210
.	2.321	.	.	.	2.291	2.487	2.445	2.428	2.377	2.269	2.053	1.781	1.612	.	.	.	215
.	2.269	.	.	.	2.236	2.430	2.390	2.374	2.325	2.220	2.007	1.745	1.581	1.513	.	.	220
.	2.217	.	.	.	2.181	2.374	2.335	2.320	2.274	2.172	1.961	1.709	1.549	1.483	1.376	.	225
.	2.164	.	.	.	2.126	2.317	2.280	2.266	2.222	2.124	1.915	1.673	1.518	1.453	1.348	.	230
.	.	.	.	.	2.072	2.261	2.226	2.212	2.170	2.075	1.869	1.637	1.486	1.424	1.321	.	235
.	.	.	.	.	2.072	2.261	2.226	2.212	2.170	2.075	1.869	1.637	1.486	1.424	1.321	1.522	240
.	.	.	.	.	2.072	2.261	2.226	2.212	2.170	2.075	1.869	1.637	1.486	1.424	1.321	1.522	245
.	.	.	.	.	.	2.261	2.226	2.212	2.170	2.075	1.869	1.637	1.486	1.424	1.321	1.522	250
.	.	.	.	.	.	.	2.226	2.212	2.170	2.075	1.869	1.637	1.486	1.424	1.321	1.522	255
.	.	.	.	.	.	.	.	.	2.170	2.075	1.869	1.637	1.486	1.424	1.321	1.522	260
.	.	.	.	.	.	.	.	.	.	.	1.869	1.637	1.486	1.424	1.321	1.522	265
.	.	.	.	.	.	.	.	.	.	.	.	1.637	1.486	1.424	1.321	1.522	270
.	.	.	.	.	.	.	.	.	.	.	.	.	1.486	1.424	1.321	1.522	275
.	.	.	.	.	.	.	.	.	.	.	.	.	1.486	1.424	1.321	1.522	280

Table 4: The relative amount of silver in the circulation pool as a whole

Table 3 has calculated the amount of silver represented by one coin of any one issue throughout its circulation life. However different proportions of each issue were in circulation at different dates. The proportions are given in Appendix 2.42. The table below adjusts for this. For example, in the first period (nominally AD 40) 75.56% of the coins in circulation are Republican issues containing 3.523 gms of silver. There are also 7.41% early Julio Claudian coins with 3.154 gms of silver and 17.03% later Julio Claudian coins with 3.569 gms of silver in them. If a random sample from the circulation pool was taken and melted down, then the weight of silver per coin recorvered would be 3.503 gms of silver. This is the value shown in the last column. This is simply a weighted avarage, the weighting coming from the prportionas taken to be in the circulation pool from an analysis of hoard composition.

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	Date	Wt AV
2.662	0.234	0.608	.	.	.	.	.	.	.	.	.	.	.	.	.	.	40	3.503
2.447	0.208	0.809	.	.	.	.	.	.	.	.	.	.	.	.	.	.	45	3.463
2.239	0.205	0.722	0.238	.	.	.	.	.	.	.	.	.	.	.	.	.	50	3.404
2.038	0.203	0.561	0.541	.	.	.	.	.	.	.	.	.	.	.	.	.	55	3.342
1.780	0.199	0.476	0.808	.	.	.	.	.	.	.	.	.	.	.	.	.	60	3.264
1.607	0.174	0.444	0.976	.	.	.	.	.	.	.	.	.	.	.	.	.	65	3.201
1.488	0.129	0.413	0.962	0.134	0.021	.	.	.	.	.	.	.	.	.	.	.	70	3.147
1.328	0.127	0.336	0.618	0.242	0.424	.	.	.	.	.	.	.	.	.	.	.	75	3.075
1.222	0.126	0.262	0.459	0.153	0.798	.	.	.	.	.	.	.	.	.	.	.	80	3.020
1.143	0.104	0.213	0.325	0.173	0.958	0.067	.	.	.	.	.	.	.	.	.	.	85	2.983
1.065	0.083	0.164	0.258	0.150	1.034	0.200	.	.	.	.	.	.	.	.	.	.	90	2.956
0.990	0.082	0.117	0.171	0.128	1.110	0.332	.	.	.	.	.	.	.	.	.	.	95	2.930
0.917	0.082	0.093	0.085	0.106	1.104	0.396	0.130	.	.	.	.	.	.	.	.	.	100	2.912
0.867	0.082	0.069	0.021	0.105	1.018	0.416	0.322	.	.	.	.	.	.	.	.	.	105	2.900
0.795	0.102	0.046	.	0.063	0.912	0.371	0.599	.	.	.	.	.	.	.	.	.	110	2.888
0.747	0.101	0.023	.	0.063	0.787	0.326	0.832	.	.	.	.	.	.	.	.	.	115	2.879
0.699	0.121	.	.	0.063	0.664	0.325	0.808	0.190	.	.	.	.	.	.	.	.	120	2.869
0.517	0.201	.	.	0.062	0.582	0.324	0.721	0.441	.	.	.	.	.	.	.	.	125	2.848
0.224	0.221	.	.	0.062	0.660	0.301	0.718	0.628	.	.	.	.	.	.	.	.	130	2.815
0.089	0.160	.	.	0.062	0.697	0.258	0.758	0.772	.	.	.	.	.	.	.	.	135	2.797
0.022	0.140	.	.	0.062	0.675	0.214	0.776	0.833	0.061	.	.	.	.	.	.	.	140	2.783
.	0.119	.	.	0.062	0.593	0.192	0.816	0.830	0.162	.	.	.	.	.	.	.	145	2.774
.	0.079	.	.	0.061	0.532	0.191	0.792	0.826	0.283	.	.	.	.	.	.	.	150	2.764
.	0.059	.	.	0.061	0.471	0.212	0.748	0.803	0.402	.	.	.	.	.	.	.	155	2.757
.	0.039	.	.	0.061	0.430	0.211	0.724	0.801	0.461	0.019	.	.	.	.	.	.	160	2.746
.	0.039	.	.	0.061	0.389	0.210	0.659	0.776	0.519	0.076	.	.	.	.	.	.	165	2.729
.	0.039	.	.	0.040	0.367	0.209	0.573	0.751	0.575	0.151	.	.	.	.	.	.	170	2.706
.	0.039	.	.	0.020	0.346	0.207	0.508	0.686	0.631	0.244	.	.	.	.	.	.	175	2.681
.	0.038	.	.	0.020	0.324	0.206	0.424	0.601	0.685	0.317	0.034	.	.	.	.	.	180	2.648
.	0.019	.	.	.	0.339	0.204	0.380	0.536	0.679	0.332	0.118	.	.	.	.	.	185	2.606
.	0.019	.	.	.	0.335	0.181	0.316	0.471	0.691	0.292	0.249	.	.	.	.	.	190	2.554
.	0.019	.	.	.	0.312	0.179	0.273	0.387	0.644	0.181	0.360	0.113	.	.	.	.	195	2.468
.	0.018	.	.	.	0.306	0.137	0.230	0.342	0.558	0.142	0.113	0.486	.	.	.	.	200	2.332
.	0.018	.	.	.	0.283	0.134	0.170	0.262	0.494	0.105	0.079	0.547	0.124	.	.	.	205	2.215
.	0.018	.	.	.	0.278	0.094	0.130	0.184	0.431	0.086	0.078	0.538	0.267	.	.	.	210	2.102
.	0.017	.	.	.	0.255	0.074	0.090	0.126	0.370	0.067	0.076	0.541	0.382	.	.	.	215	1.998
.	0.017	.	.	.	0.215	0.054	0.071	0.088	0.293	0.066	0.074	0.530	0.293	0.191	.	.	220	1.891
.	0.016	.	.	.	0.178	0.053	0.052	0.052	0.202	0.064	0.102	0.519	0.195	0.220	0.132	.	225	1.785
.	0.016	.	.	.	0.126	0.051	0.034	0.034	0.165	0.063	0.085	0.509	0.124	0.258	0.230	.	230	1.693
.	.	.	.	.	0.077	0.067	0.016	0.033	0.097	0.061	0.083	0.473	0.154	0.200	0.342	.	235	1.604
.	.	.	.	.	0.046	0.050	0.016	0.016	0.080	0.046	0.069	0.437	0.143	0.221	0.342	0.102	240	1.570
.	.	.	.	.	0.015	0.033	0.033	0.016	0.048	0.046	0.041	0.388	0.165	0.253	0.372	0.124	245	1.536
.	.	.	.	.	.	0.017	0.033	0.016	0.016	0.046	0.041	0.315	0.165	0.316	0.401	0.135	250	1.503
.	.	.	.	.	.	.	0.016	0.016	0.016	0.031	0.028	0.218	0.165	0.401	0.440	0.135	255	1.467
.	.	.	.	.	.	.	.	.	0.016	0.015	0.028	0.109	0.187	0.475	0.479	0.124	260	1.433
.	.	.	.	.	.	.	.	.	.	.	0.028	0.061	0.165	0.517	0.528	0.113	265	1.411
.	.	.	.	.	.	.	.	.	.	.	.	0.036	0.143	0.548	0.577	0.090	270	1.395
.	.	.	.	.	.	.	.	.	.	.	.	.	0.132	0.569	0.607	0.079	275	1.387
.	.	.	.	.	.	.	.	.	.	.	.	.	0.088	0.591	0.626	0.079	280	1.384

Appendix 4.33
Denarius hoards from the continent

References are:

Bolin 0.00: Bolin, S. (1958) State and Currency in the Roman Empire to AD 300, Stockholm.

Belgique (000): Thirion, M (1967) Les Trésors Monétaires Gaulois et Romains Trouvés en Belgique, Cercle d'etudes numismatiques travaux 3, Bruxelles.

Area (00): Société Française de Numismatique, Paris, Corpus des Trésors Monétaires Antiques de la France.

Tome II	(1983)	Nord - Pas-de-Calais
Tome III	(1984)	Pays de la Loire
Tome IV	(1985)	Haute-Normandie
Tome Vi	(1987)	Rhône-Alpes
Tome Vii	(1988)	Rhône-Alpes

Reference	Area	Name	T.P.Q	Date	NAD
Nord (10)	France	Bavay	54	54	2161
Bolin 1.08	Italy	Ostia	69-70	69	-340
Bolin 1.03	Germany	Rheingönheim Platinate	69	69	-675
Bolin 1.04	?Western	Stein Schaffhausen	70	70	-1683
Bolin 1.13	Rumania	Sapte Sate Rumania	75	75	-692
Bolin 1.09	Italy	Este Venetia	79	79	-5007
Bolin 1.05	Germany	Hammermühle Hesse	80	80	-988
Bolin 1.06	France	Aubenton, Aisne	80-81	80	-2861
Bolin 1.14	Rumania	Poiana Gorj Rumania	81	81	-1097
Bolin 1.11	Italy	Otricoli Umbria	90	90	-48
Bolin 1.15	Rumania	Pasul Vûlcanului Rumania	93-94	93	-1721
Bolin 2.01	Bulgaria	Junuzlar	96-98	98	980
Bolin 3.05	Rumania	Broos	98	98	-6402
Bolin 3.04	Italy	Mozatella Reggio	112	112	4901
Bolin 3.07	Germany	Gauting Upper Bavaria	113-117	113	-2876
Bolin 3.10	Egypt	Nile Delta	114-117	117	4494
Bolin 3.09	Bulgaria	Lovec Bulgaria	98-117	117	3814
Bolin 3.08	Bulgaria	Popovom Bulgaria	98-117	117	3334
Bolin 4.13	Morocco	Volubilis	119-124	124	3607
Bolin 4.10	Italy	Castagnaro Verona	128-134	134	1853
Belgique (237)	Belgium	Peer Limbourg	117-138	135	-22
Belgique (326)	Belgium	Waudrez Hinaut	134-138	138	1332
Bolin 4.11	Bulgaria	Slatino	117-138	138	695
Bolin 4.12	Hungary	Tiszanagyrev	117-138	138	430
Bolin 4.14	Palestine	Eleutheroupolis	134-138	138	23
Bolin 5.09	Germany	Heddernheim Nassau	139	139	158
Bolin 5.10	?Western	Mont. Moselle	143-144	144	1407
Bolin 5.11	?D/B	Altenmark Steiermark	145	145	889
Bolin 5.12	Danube	Vyskovce Slovakia	151-152	151	-398
Bolin 5.13	Rumania	Visa	155-156	155	-24
Bolin 5.07	Germany	Gressenich Rhineland	138-161	157	-21
Bolin 5.14	?D/B	Wallern Burgenland	158	158	-6409
Bolin 6.33	Bulgaria	Mokres Bulgaria	161-180	163	1
Bolin 6.25	Hungary	Tolna Megye	164	164	798
Bolin 6.23	Yougoslavia	Osiek Croatia	164	164	417
Bolin 6.24	Hungary	Mocsolad	164	164	-611
Bolin 6.26	Hungary	Barbura	165	165	1936
Bolin 6.22	Italy	Verona	166	166	1040
Bolin 6.28	Yougoslavia	Sotin Croatia	166	166	-1206
Bolin 6.27	Austria	Dtsch. Altenburg Lower Aust.	166	166	-6384
Bolin 6.32	Bulgaria	Metkovce Bulgaria	161-180	167	2
Bolin 6.29	Austria	Spital Upper Aust.	167	167	-1073
Bolin 6.31	Austria	Dtsch. Altenburg Lower Aust.	168	168	1066
Bolin 6.19	?Western	Stockstadt Lower Franconia	164-169	169	1035
Bolin 6.20	Germany	Kleinredrichingen Platinate	169	169	667
Bolin 6.41	Spain	Riopar	161-180	171	11
Bolin 6.42	Egypt	?	175-176	176	1111
Bolin 6.36	Rumania	Szasz-Regen	177	177	864
Bolin 6.35	Bulgaria	Chasanfakla	177-192	177	-653
Bolin 6.34	Austria	Vienna	177-192	177	-2054
Bolin 6.37	Bulgaria	Vratza	180	180	1018
Bolin 6.38	Germany	Unterammergau Upper Bavaria	184	184	-5895
Bolin 6.39	Danube	Prelasko, Slovenia	185	185	1103
Bolin 6.40	Rumania	Gyulafehérvar	185	185	-256
Pas-de-Calais (43)	France	Haillicourt	186-187	187	1812

Reference	Area	Name	T.P.Q	Date	NAD
Bolin 6.21	?Western	Silly Orne	177-192	192	-28
Bolin 7.10	Hungary	Elek	193	193	1736
Bolin 7.15	Hungary	Menden	193	193	1702
Bolin 7.13	Hungary	Tiszaföldvar	193	193	1659
Bolin 7.12	Hungary	Miskocz	193	193	1637
Bolin 7.08	?Western	Préhaute Loiter	193-217	193	-12
Bolin 7.07	France	Annecy Haute-Savoie	193-217	198	-9
Haute Savoie (33)	France	Vaulx	198-211	198	-290
Bolin 7.14	?D/B	Lauterach Vorarlberg	193-217	199	21
Bolin 7.06	Germany	Flonheim Hesse	198-202	202	1297
Bolin 7.11	Hungary	Katajenön	192-211	203	54
Bolin 7.16	Syria	?	214	214	397
Bolin 7.09	?Western	Kervian Finistère	215	215	-3217
Bolin 8.09	Germany	Mainz Hesse	217-218	218	311
Bolin 8.21	Italy	Rome 1	218-222	218	-738
Belgique (324)	Belgium	Waregem	218-222	222	155
Bolin 8.12	Germany	Welzheim Würtemberg	222-235	222	-70
Bolin 8.11	Germany	Quettich Baden	222-235	222	-103
Bolin 8.25	Bulgaria	Akandzilar	222-235	222	-2215
Bolin 8.14	Germany	Mainz Hesse	222-235	222	-2816
Haute Savoie (7)	France	Annecy	222-235	222	-3093
Bolin 8.27	Bulgaria	Causevo	222-235	225	56
Bolin 8.10	France	Reims Marne	222-235	226	-56
Belgique (75)	Belgium	Éghezée	227	227	1702
Bolin 8.24	Austria	Seewaldsen Upper Austria	222-235	230	88
Bolin 8.13	Germany	Einsiedel Würtemberg	222-235	234	-30
Bolin 8.28	Germany	Kirchmatting Lower Bavaria	222-235	235	931
Bolin 8.30	Austria	Salzburg	235-238	235	-728
Bolin 8.16	Germany	Cologne	235-238	235	-1031
Bolin 8.29	Germany	Niederaschau Upper Bavaria	235-238	238	1316
Bolin 8.15	Germany	Wachtendonk Rhineland	235-238	238	1159
Bolin 8.32	Hungary	Sopron	238-244	238	-856
Bolin 8.31	Bulgaria	Tas-Tepe	238-244	238	-3594
Bolin 8.17	?Western	Compiègne Oise	238-244	238	-5262
Bolin 8.22	Italy	Rome 2	238-244	241	-52
Bolin 8.23	Italy	Stellata Ferrara	238-244	242	-5
Belgique (79a)	Belgium	Ellignies Sainte Anne	241-243	243	983
Bolin 8.18	?Western	Jupille Liège	244-249	244	-642
Bolin 8.33	Bulgaria	Razgradsko	244-249	244	-2900
Bolin 8.34	Albania	Usküb	244-249	247	-5
Bolin 8.37	Rumania	Bogsan	249-251	249	-256
Bolin 8.35	Bulgaria	Rustschuk	249-251	249	-609
Bolin 8.36	Bulgaria	Knizovnik	249-251	249	-3239
Bolin 8.38	Bulgaria	Reka-Devnia	249-251	249	-3915
Nord (13)	France	Bavay	251	251	-143
Bolin 8.19	Germany	Neuenheim Baden	251-253	251	-2286
Haute Savoie (17)	France	Faverges	251-253	251	-3148
Savoie (9)	France	Gresy-sur-Isére	251-253	253	269
Bolin 8.20	?Western	Widenhub St. Gallen	253-258	253	-1828
Belgique (47b)	Belgium	Clavier III	254	254	290
Rhône (19)	France	Ouroux	253-256	256	91
Nord (18)	France	Berlaimont	258-260	258	-483
Ain (10)	France	Ceyzériat	259-260	259	397
Drôme (16)	France	Donzére	259-260	259	-102
Nord (7)	France	Bavay	259-269	259	-795
Nord (65)	France	Santes	259-268	259	-3789
Loire (15)	France	Villerest	259-260	260	108
Pas-de-Calais (58)	France	Oisy-le-Verger	259-268	261	-9
Seine Maritime (3)	France	Anneville-Ambourville	262	262	301
Pas-de-Calais (67)	France	Saulty	266	266	715
Pas-de-Calais (32)	France	Étaples	266	266	-562
Pas-de-Calais (38)	France	Étaples	267	267	-885
Sarthe (2)	France	Allonnes	259-268	268	1989
Pas-de-Calais (45)	France	Harnes	268	268	-399
Pas-de-Calais (6)	France	Ardres	259-269	269	61
Seine Maritime (81)	France	Tôtes	271	271	926
Mayenne (3)	France	Ernée	271-273	273	585

Appendix 4.41
Imitation Denarii: coin moulds and site finds

Denarius coin moulds:
Data from Boon (1988, 127)

Upto Hadrian:	3	10.7 %
Antonine:	6	21.4 %
Severus to Alexander:	16	57.1 %
MAximin to Valerian:	3	10.7 %

Plated denarii site finds:
Summary Statistics:
1. Ryan's ruler code; 2. Denarius code; 3. Denarius group;
4. Emperor; 5. Number; 6. Sub-totals; 7. Percentage breakdown of sub-totals.

1.	2.	3.	4.	5.	6.	7.
515	Den 4	D	Claudius	1	*D = 1*	*1.1 %*
570	Den 16	H	Trajan	2	*H = 2*	*2.2 %*
585	Den 18	I	Hadrian	4	*I = 4*	*4.4 %*
594	Den 21	J	Antoninus Pius	3		
597	Den 25	J	Marcus Aurelius Caesar	1	*J = 4*	*4.4 %*
599	Den 26	K	Marcus Aurelius	1		
601	Den 28	K	Lucius Verus (M.A.)	1	*K = 2*	*2.2 %*
606	Den 32	L	Commodus	1		
608	Den 33	L	Crispina (Commodus)	1	*L = 2*	*2.2 %*
615	Den 38	M	Septimius Severus	24		
618	Den 41	M	Julia Domna (Sept.Sev.)	7		
618 ?	Den 41 ?	M	Julia Domna (?)	3		
623	Den 40	M	Geta	4	*M = 38*	*42.2 %*
619	Den 45	N	Caracalla	8		
-	Den 45	N	Caracalla/Geta	2	*N = 10*	*11.1 %*
624	Den 46	O	Macrinus	1		
627	Den 48	O	Elagabulus	8		
630	Den 49	O	Julia Soaemias (Elag.)	1		
631	Den 51	O	Julia Maesa (Elag.)	4	*O = 14*	*15.6 %*
633	Den 52	P	Severus Alexander	12		
635	Den 53	P	Julia Mamaea (Sev.Alex.)	1	*P = 13*	*14.4 %*

Full details overleaf:

Full details of imitation coins:

Claudius	
Baldock	Copy of BMC 107
Trajan	
Old Penrith	Copy of RIC 119
Wroxeter B	Copy
Hadrian	
Wroxeter C	Copy of RIC 137 b
Wroxeter C	Copy
Corbridge	Copy
Corbridge	Copy
Antoninus Pius	
Old Penrith	Copy of RIC 181
High Rochester	Copy of RIC 251
Corbridge	Copy
Marcus Aurelius	
Walbrook (R528)	Copy of RIC 417
Corbridge	Copy
Lucius Verus (M.A.)	
Corbridge	Copy
Commodus	
Vindolanda Fort	Copy of RIC 237
Crispina (Commodus)	
York (T.)	Copy of RIC 279
Septimius Severus	
York (E.B.)	Copy of RIC 27a
York (E.B.)	Copy of RIC 46
Wallsend	Copy of RIC 39
Bath C.H. (R016)	Copy of RIC 51
York (E.B.)	Copy of RIC 53
Wallsend	Copy of RIC 58
York (B.)	Copy of RIC 61
Wroxeter C	Copy of RIC 118
High Rochester	Copy of RIC 122d
High Rochester	Copy of RIC 122d
Vindolanda Fort	Copy of RIC 131
Wroxeter C	Copy of RIC 150
Wroxeter C	Copy of RIC 182
Old Wint. (R426)	Copy of RIC 197
Wroxeter C	Copy of RIC 211
Brentford (R869)	Copy of RIC 266
York (Cop.)	Copy of RIC 288
Wallsend	Copy of RIC 380
York (B.St.)	Copy
Corbridge	Copy
Catterick	Copy
Old Penrith	Copy
Piercebridge	Copy
Wroxeter C	Copy
Julia Domna (Sept. Severus)	
York (Minster)	Copy of RIC 546
Wroxeter A	Copy of RIC 564
Old Penrith	Copy of RIC 572
Wroxeter C	Copy of RIC 572
Corbridge	Copy of RIC 574
Wroxeter A	Copy of RIC 644
Wroxeter A	Copy
Julia Domna (?)	
Corbridge	Copy
Corbridge	Copy
York (E.B.)	Copy
Caracalla	
Corbridge	Copy of RIC 54
Old Ford 3 (R062)	Copy of RIC 80b
Wroxeter IX (R532)	Copy of RIC 192
York (Cop.)	Copy of RIC 193
Corbridge	Copy of RIC 321
Corbridge	Copy
Chalton Chester	Copy
Piercebridge	Copy
Caracalla/Geta	
Corbridge	Copy
Vindolanda Fort	Copy
Geta	
Wroxeter C	Copy of RIC 5
Old Penrith	Copy of RIC 15
Corbridge	Copy
Chalton Chester	Copy
Macrinus	
Catterick	Copy of RIC 53
Elagabulus	
Wallsend	Copy of RIC 17
Wroxeter C	Copy of RIC 28
York (Minster)	Copy of RIC 82
Shakenoak B&F (R048)	Copy of RIC 150
Vindolanda Fort	Copy
Wroxeter C	Copy
Wroxeter C	Copy
York (Cop.)	Copy
Julia Soaemias (Elagab.)	
Wroxeter C	Copy of RIC 243
Julia Maesa (Elagab.)	
Piercebridge	Copy of RIC 249
Wroxeter C	Copy of RIC 268
Corbridge	Copy
Corbridge	Copy
Severus Alexander	
Wroxeter C	Copy of RIC 27
Wroxeter C	Copy of RIC 74
Kingscote (R005)	Copy of RIC 74
Wroxeter C	Copy of RIC 173
Gt. Casterton (R563)	Copy of RIC 182
Corbridge	Copy of RIC 309
Aldborough	Copy of Cohen 576
Corbridge	Copy
Corbridge	Copy
Corbridge	Copy
Corbridge	Copy
Corbridge	Copy
Julia Mamaea (Severus Alexander)	
Wroxeter A	Copy of RIC 329

Appendix 4.51
Price Indices: Wheat, Wages and Army Pay

Table 1: Wheat prices

Data on wheat prices from Corbier (1978, 279) after J.P-. Callu, La Politique Financière des Empereurs Romains de 238 à 311, Paris, 1969, pp 395-396. The wheat is priced in sestertii.

Date	Price (HS)	Index
3	3	27
45	4	36
45	8	72
56	4	36
65	2	18
79	8	72
79	10	90
79	10	90
79	11	100
79	16	145
96	13	118
104	3	27
115	10	90
125	7	63
149	7	63
153	12	109
155	8	72
162	8	72
191	20 (Egypt)	181
191	18 (Egypt)	163
200	13	118
218	18	163
254	12	109
255	16	145
256	12	109
260	30	272
269	24	218
276	200	1818
293	300	2727
294	220	2000
301	666	6054
Index: AD 150 = 11 HS = 100 units		

Table 2: Wheat Prices from Palestine

Data from Daniel Sperver, Roman Palestine 200-400, Money & Prices. Ramat Gan, 1974, p 125 and 247. After West and Johnson, Currency, p 81; and Johnson in JJP, 4, 1950, p 156.

Date	Price	Index
1st Century	0.50 D	75
2nd Century	0.66 D	100
E 3rd Century	1.00 D	150
245-46	1.00-1.33 D	150-200
269	2.00 D	300
276	15.00 D	2250
293	23.00 D	3450
Index: AD 150 = 0.66 D = 100 units		

Table 3: Wages in Palestine

Data from same source as Table 2

Date	Price	Index
1st Century	1/6 - 2/3 D	20-83
2nd Century	1/2 - 1 1/3 D	62-166
Mid 3rd Century	1 - 1 1/3 D	125-166
Index: AD 150 = 0.8 D = 100 units		

Table 4: Burnett's index

Burnett 1987, pp 108-9.

Date	Index (1)	Index (2)
Second century BC	100	35
Caesar	200	71
Late 2nc c.	300	107
Gallienus 260	600	214
Index: AD 150 = c. 280 = 100 units		

Table 5:

Wheat prices from official transactions in Lower Egypt

from Duncan-Jones, Structure and Scale in the Roman Economy, 1990, pp153-154. Valuations in Drachmas per artaba.

Date	Price (drm)	Index
79	8	100
99	16	200
99	16	200
100	8	100
100-150 (125)	8	100
128	8	100
137	8	100
149	7	87
100-200 (150)	8	100
152	8	100
154	8	100
154	8	100
154	8	100
155	8	100
162	8	100
246	24	300
260-290 (275)	40	500
293	300	3750
294	220	2750
Price no. 50 has been excluded because the date is too imprecise.		
Index: AD 150 = 8 Drachmas = 100 units		

Table 6:
Wheat prices from private transactions in Lower Egypt
Data from Duncan-Jones, Structure and Scale in the Roman Economy, 1990, pp151-152. Valuations in Drachmas per artaba.

Date	Price (drm)	Index
18bc	9.3	78
16	9	75
45	4.4	37
45	5.7	47
45	8	67
45	8	67
45	8	67
45	7.3	61
45	7.6	63
45	8	67
47	8.7	73
78	10	84
78	10	84
78	10	84
79	11	92
79	11	92
79	11	92
79	11	92
112	12	101
124	9	75
100-135 (117)	7	58
100-135 (117)	12	101
138-161 (150)	6	50
191	18	151
191	20	168
192	18	151
100-200(150)	8	67
100-200 (150)	19.4	163
180-220 (200)	18	151
254	12	101
255	16	134
250-260 (255)	12	101
269	24	202
100-300 (150)	20	168
Prices nos. 2, 34a and 36 have been excluded, since each had a questionmark against the valuation.		
Index: AD 150 = 11.88 drachmas = 100 units		

Table 7:
Army Pay

Date of rise	Pay	Index
Caesar	225 D	75
Domitian (AD84)	300 D	100
Septimius Severus	400 D	133
Caracalla	600 D	200

Table 8:
Index (fitted curve to data from tables 1,2,6 & 6)

Date	Index
40	50
50	64
60	76
70	88
80	98
90	103
100	104
110	100
120	94
130	87
140	84
150	87
160	95
170	107
180	120
190	133
200	141
210	146
220	148
230	150
240	159
250	179
260	209
270	280

Appendix 4.52
Calculation of Y

M2 = Denarius supply curve (second method)
H = Degree of variability in Hoards (inversely related to Velocity of circulation)
P = Prices index

MV = PY, therefore Y = MV/P ≈ M/PH

Date	M2	H	P	Y
40	0.00	11.74	50.0	0.00000
45	8.50	11.74	57.0	0.01270
50	6.10	11.74	64.0	0.00812
55	0.90	11.74	70.0	0.00110
60	0.80	11.74	76.0	0.00090
65	0.80	11.74	82.0	0.00083
70	0.80	25.23	88.0	0.00036
75	0.80	25.23	93.0	0.00034
80	0.70	25.23	98.0	0.00028
85	0.60	25.23	100.5	0.00024
90	0.80	25.23	103.0	0.00031
95	0.90	21.34	103.5	0.00041
100	1.20	21.34	104.0	0.00054
105	1.80	21.34	102.0	0.00083
110	1.90	21.34	100.0	0.00089
115	3.00	21.34	97.0	0.00145
120	3.20	20.39	94.0	0.00167
125	3.30	22.48	90.5	0.00162
130	3.30	22.48	87.0	0.00169
135	3.10	22.48	85.5	0.00161
140	3.00	16.49	84.0	0.00217
145	2.90	16.49	85.5	0.00206
150	2.80	7.93	87.0	0.00406
155	2.80	7.93	91.0	0.00388
160	2.80	10.28	95.0	0.00287
165	2.80	11.06	101.0	0.00251
170	3.30	11.06	107.0	0.00279
175	5.50	3.78	113.5	0.01282
180	5.70	5.78	120.0	0.00822
185	5.90	5.78	126.5	0.00807
190	5.70	12.99	133.0	0.00330
195	5.30	12.99	137.0	0.00298
200	6.40	12.99	141.0	0.00349
205	6.50	12.99	143.5	0.00349
210	5.80	17.12	146.0	0.00232
215	5.50	17.12	147.0	0.00219
220	5.50	17.12	148.0	0.00217
225	6.10	7.46	149.0	0.00549
230	19.80	26.09	150.0	0.00506
235	21.80	26.09	154.5	0.00541
240	3.50	15.53	159.0	0.00142
245	2.00	15.53	169.0	0.00076
250	0.30	15.53	179.0	0.00011
255	0.00	15.53	194.0	0.00000
260	0.00	12.63	209.0	0.00000
265	0.00	12.63	244.5	0.00000
270	0.00	12.63	280.0	0.00000