A MONETARY ECONOMY?

In 1970, Crawford published an influential article, 'Money and exchange in the Roman world', which reached two significant conclusions: first, that '. . . the use of coined money as a means of exchange was largely limited to the cities of the Empire'; second, that 'the Roman government had no policy concerning the supply of coinage and no monetary policy except in matters which directly affected its own interest or standing . . .' (ibid. 45, 48). These conclusions were based on a synthesis of evidence from literary, numismatic and archaeological sources, and were in accord with the general view of the Roman economy and the involvement of the state summarised in Finley's *The ancient economy* (1973). A few years later, Reece (1979) argued that the province of Britain remained locked into a tribal economy based on social interaction rather than cash-based exchanges for the first two centuries AD; this conclusion was reached under the influence of economic anthropology (Hodder 1979).

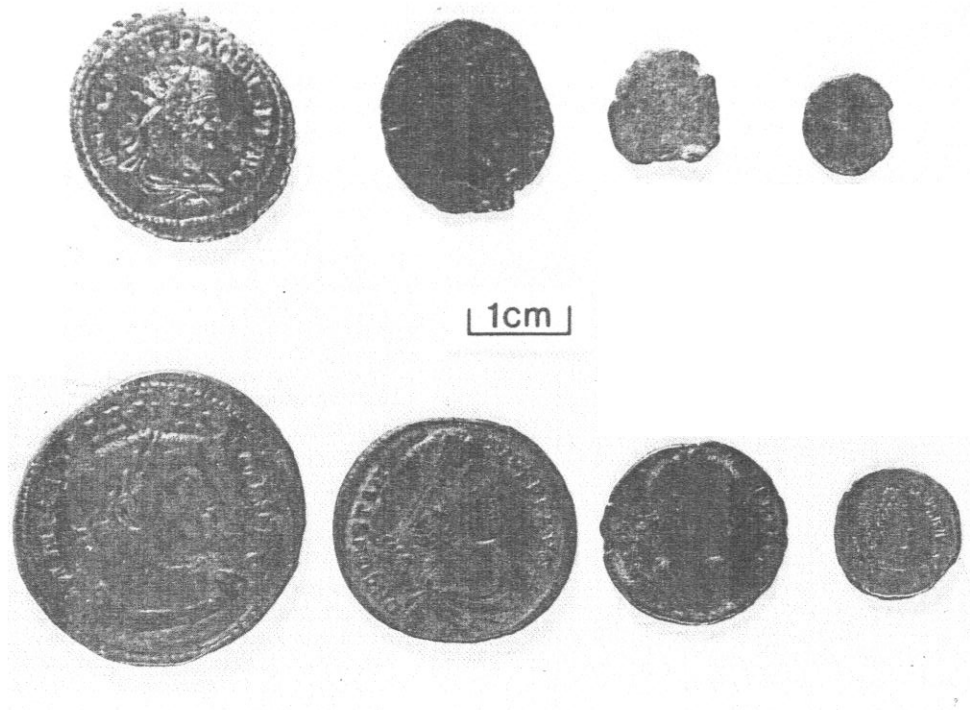
However, the pendulum of opinion has swung back in the opposite direction, as a result of momentum provided by both literary and numismatic evidence which demands different conclusions from those of Crawford and Finley. In his analysis of *The golden ass* (a Roman 'novel' of the second century AD by Apuleius), Millar emphasises the extent to which transactions at all levels were conducted in coinage in the Greek towns which provide the setting for the story: '. . . the towns in Apuleius function, not indeed as centres of production, but as the focus for organized exchanges of goods and the hiring of labour. All of this is conducted for cash; whatever else this may be, it is certainly a fully monetized economy' (1981, 72). The countryside, too, was involved in similar activity: '. . . all the food-producing operations are specialized, and the products are exchanged for cash' (ibid. 73). Millar stresses the fact that *The golden ass* '. . . depicts levels of social and economic life which the vast mass of surviving Classical literature simply ignores' (ibid. 75). It is comforting to believe that Apuleius is the exception that proves the rule that we need not be unduly perturbed by a lack of agreement between the results of archaeological research into the economy, and those derived from Roman literary sources.

The same volume of the *Journal of Roman Studies* (1981) contained a paper by Lo Cascio which proposed that the Roman government not only had a consciousness of financial issues arising from coinage, but actively controlled the relationships between different denominations with considerable success from the time of Augustus to the early third century AD. The means of control included the limitation of mining operations, and adjustments to the supply, weight and purity of the gold, silver and bronze coinage, perhaps even with the needs of the economy as well as state finances in mind – in other words, through a monetary policy. Thus, in a little over a decade, numismatists and ancient historians have been able to present two opposing views of the Roman economy, one minimising rural coin use or the state's understanding of monetary affairs, the other proposing a thoroughly monetised imperial system in which the government strove to maintain the stability of coinage for economic reasons.

Obviously, archaeology cannot provide a final answer in this debate. In the introductory chapter, the importance of Hopkins' propositions about the Roman economy was stressed (above p. 14). His proposition that the pattern of taxation and expenditure in the Roman empire promoted long-distance trade is important for the study of coins. A fuller understanding of the rôle of coinage in taxation and long-distance trade may be gained from research into coins found on sites, and also the commodities like pottery and metalwork which might have been traded for cash (Chapter 6).

THE FUNCTION OF ROMAN COINAGE

Economists' definitions of money (which need not only take the form of coins, of course) normally include the following functions:



17. Coins of the third century AD reflect the financial troubles of their times. The *antoninianus* (top left) was made of impure silver, and was copied by large numbers of 'barbarous radiates' (top right), presumably because official supplies could not keep up with inflation. In the fourth century there were normally four sizes of bronze coins (bottom row), whose weight and size fluctuated considerably; the system was completed by pure gold and silver coins resembling those of Augustan times. Late Roman bronze coinage makes up the bulk of coins found on sites (see fig. 19). (Photograph by Audio-Visual Centre, University of Newcastle)

1 a medium for exchange;
2 a means of storing wealth;
3 a measure of value and standard for payments.

These aspects of money are not only relevant in a purely market economy, in which prices are fixed according to the forces of supply and demand, but can feature just as easily in exchanges which are made on a social basis. Thus, the existence of coined money in the Roman empire does not prove that it possessed a market economy; that proof must be sought in a combination of historical sources and archaeological evidence. An important aspect of point 2 is that stored wealth can be used for social display; Painter has underlined the importance of various forms of bullion, such as gold and silver table ware, in this respect (1977).

Since Roman currency was largely derived from Greek coinage, it is obviously essential to investigate the reasons for the original development of coins in Asia Minor. It will be remembered that for a considerable period, Greek currency was minted only in precious metals, and therefore had a high value. Even in its smallest subdivisions it would have been more suitable for payments such as a day's wages rather than for the purchase of a loaf of bread (Price 1983, 5). Price concludes that the earliest coins were used in an almost ceremonial fashion to pay bonuses, which were gifts made on the completion of services (not necessarily paid for in currency at all):

> . . . the personal nature of early electrum coins seems to require a specific function of this sort. The donor could be the state, or a monarch, or indeed a private individual. While it might be realised that the recipient could use the metal to acquire other

> objects or to make any form of payments, he could equally keep it as indicative of wealth. This, after all, is the nature of a bonus. The coin type as the seal of origin represents the source of the bonus, the personal authority of the issuer . . . The place of such objects in the economy would grow as the practice of electrum bonus payments and gifts of coin became more widely adopted and as the coins circulated in other transactions. By the time Croesus of Sardes had within his kingdom the cities of the western seaboard such as Ephesus, the economy was ripe for the reform which brought gold and silver coinage into existence for the first time. It is then that the view of coinage as a medium for standardising payments to the state becomes attractive. With the existence of coins it would become normal to standardise in terms of coins . . . (Price 1983, 7–8)

Thus, Price sees the development of the use of coins in the Greek economy as an accidental result of a social practice. It proved so useful that coins are still universal in the developed economies of the twentieth century, despite the substitution of non-precious metals or even paper for metals of actual value. The principal difference between early Greek and modern currency is that none of the coins in circulation today is considered to have anything more than a token value, in contrast to gold sovereigns or Krugerrands which do not circulate, but are valued in terms of the fluctuating bullion price of the gold which they contain.

The distinction between bullion coins (worth the market value of their metal content) and token coins (which stand for a value defined in terms of something else) is fundamental. In 1757, the English Assay Master Joseph Harris stated this point long before any official coins were minted in base metals:

> Copper coins with us are properly not money, but a kind of token passing by way of exchange instead of parts of the smallest pieces of silver coin; and useful in small home traffic. (Whiting 1971, title page)

The relative importance of token and bullion coins in the Roman empire must therefore be considered with great care.

The other matter which requires careful study is the purpose for which Roman coins were issued. Their rather modern appearance, with higher and lower value denominations of different metals, portraits of the ruler on the obverse, and emblems and inscriptions on the reverse, is deceptive. It does not mean that we can immediately assume that they were primarily issued for use in everyday commercial transactions, from business deals down to daily shopping. This conclusion demands proof that coins were in plentiful supply, and that their purchasing power was appropriate for such purposes. Furthermore, we must ask whether the use of coins extended throughout society, or whether they were primarily restricted to the comparatively wealthy individuals living in towns. Most important, we must remember that coins are only one form of money, and that all manner of transactions can be carried out using other forms, from cattle to cowrie shells.

The use of Roman coins

Some clear evidence exists to show that Roman coin denominations were suitable for everyday transactions. In Pompeii, many skeletons have been found, along with their purses, which contain a good mixture of gold, silver and bronze denominations; this 'loose change' is easily distinguishable from larger collections of gold or silver coins, which were evidently savings that the victims were attempting to carry to safety (Breglia 1950, 57–59). Documents from Pompeii demonstrate that the bronze denominations had low purchasing power (ibid. 50–53). For instance, an *as* in the first century AD would buy half a pound of bread flour or a litre of cheap wine, but there were still half and quarter divisions of this coin, the *semis* and *quadrans*. Values were universally expressed in terms of coinage rather than bullion value in the Roman empire, and accounts were calculated in *sestertii*, the largest bronze coin. The finds from Pompeii underline the fact that Roman coinage in general use consisted primarily of *denarii* and *sestertii*; Reece has pointed out that a similar situation existed in eighteenth-century France, where around half of all the coins minted in each decade were gold or silver issues (1984, 202).

It is clear that monetary values were in use in peripheral provinces such as Britain as well as in Italy. For example, a fascinating inscription has been found on the base of a bronze statuette discovered in the Foss Dyke near Torksey, Lincolnshire (fig. 18):

DEO.MAR.ET/
NVB.AUG.COL/
ASVNI BRVCCI/
VS ET CARATIVS DE/
SVO DONARVNT/
AD SESTERN C/
CELATIUS AERAR/
IVS.FECIT ET AERA/
MENTI LIB DONAV/
IT FACTAM *III/

> To the god Mars and the spirit of the emperor. Colasunius Bruccius and Caratius gave [this statuette] from their own resources at the cost of 100 *sestertii*. Celatius the bronzesmith fashioned it, and willingly gave the bronze, which he had made at the cost of 3 *denarii*. (Collingwood and Wright 1965, 91 no. 274)

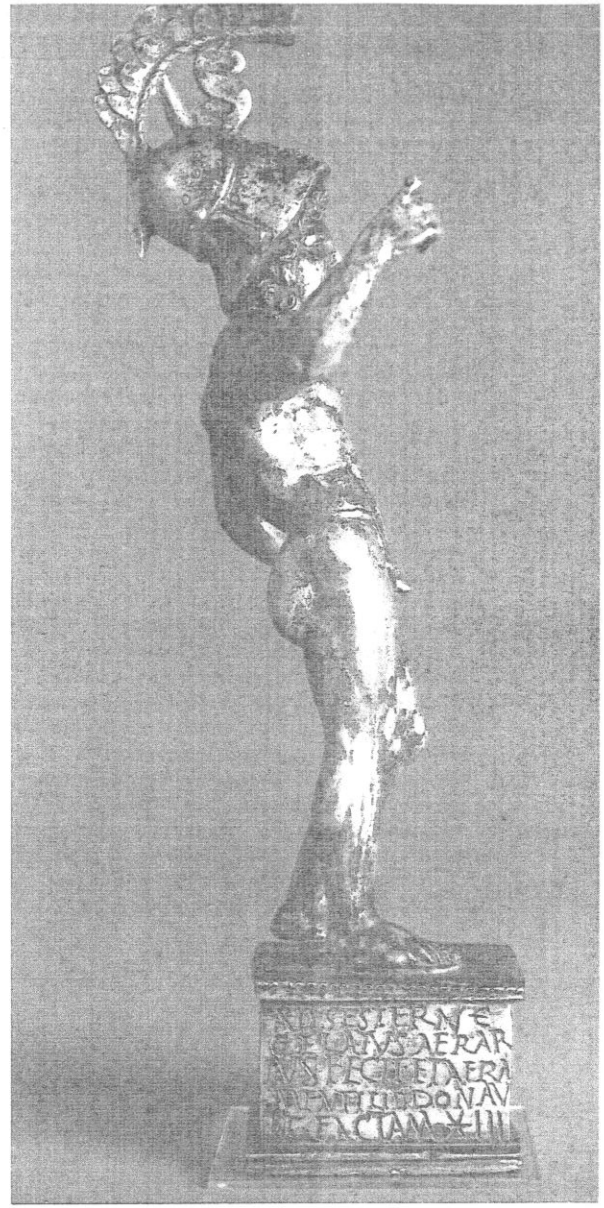
No doubt Mars was expected to give full value in exchange for such a conspicuously priced dedication.

Roman coins are still cheap and plentiful today in the shops of coin dealers, and excavations or casual finds continue to produce large numbers from all around the empire. The existence of such quantities today does not necessarily mean that they were in plentiful supply throughout the whole empire for its entire duration. As we shall see, the survival of coins on archaeological sites or in hoards needs to be carefully scrutinised before any economic conclusions may be drawn.

ROMAN COINS FROM ARCHAEOLOGICAL SITES

Individual coins tell us little apart from the date at which they were issued. During the empire, the obverse of the coin usually bore a portrait of the reigning emperors, or occasionally relatives or revered predecessors, surrounded by a series of abbreviations of the parts of their names and titles. On the reverse side, there was usually a representation of a deity, a personification of a virtue (peace, plenty, etc.), or a piece of more blatant propaganda about a military victory or state occasion. The date of issue can be determined roughly through recognition of the portrait of the emperor, and more precisely from references to any offices which he held, such as consulships. Historical evidence from Roman writers or inscriptions may provide precise dates for the acquisition of these offices or honorific titles such as *pater patriae* (father of the country) or *Britannicus* (conqueror of Britain). In practice, there are abundant detailed reference books which allow virtually all Roman coins to be identified, catalogued and dated.

It is more difficult to establish the date of loss of a coin. At the time of writing this paragraph in 1985, the author's pocket contained a range of coins with the following dates of issue: 1947, 1969 (2), 1971 (3), 1975, 1976, 1977, 1979, 1980, 1983, 1984. If these coins were lost and not recovered, and then excavated at some time in the future, none would indicate the exact year of loss.



18. Statuette of the god Mars found in the Foss Dyke, Lincolnshire. The base bears an inscription giving precise details of the cost of the raw materials and manufacture of the statuette in *sestertii* and *denarii*, showing that the use of monetary values was well established in the provinces as well as in the centre of the empire. (Photograph by courtesy of British Museum, London)

However, if only one were lost and later excavated, there would be more than a one in two chance of it being at least ten years old. It might show a certain amount of wear to suggest that it was not new when lost, but more precision would be impossible. Before the decimalisation of English coinage in 1969, it was common for a pocketful of change to stretch back into the reign of Queen Victoria, and a range of 100 years was quite normal.

The situation in the Roman period was similar, particularly in the case of large bronze coins. Thus, in order to estimate the date of loss of a Roman coin, it is necessary to determine its date of issue, the amount of wear it has received, and the length of time that the particular issue survived in circulation. The last of these factors may be established from studies of coins found on archaeological sites which were only occupied for short periods (such as forts in Germany or Britain lying on dated frontiers), or in hoards (collections of coins concealed or lost in the Roman period and never recovered). A site of known date – for instance a fort on the Antonine Wall in Scotland – or a purse full of an individual's cash can provide a cross-section of the coins which circulated together during a restricted period. The absence of previously common types will suggest that these have gone out of circulation in the manner of the 'old' British pennies and halfpennies which were rapidly taken out of circulation by banks while new decimal coins were introduced in 1969.

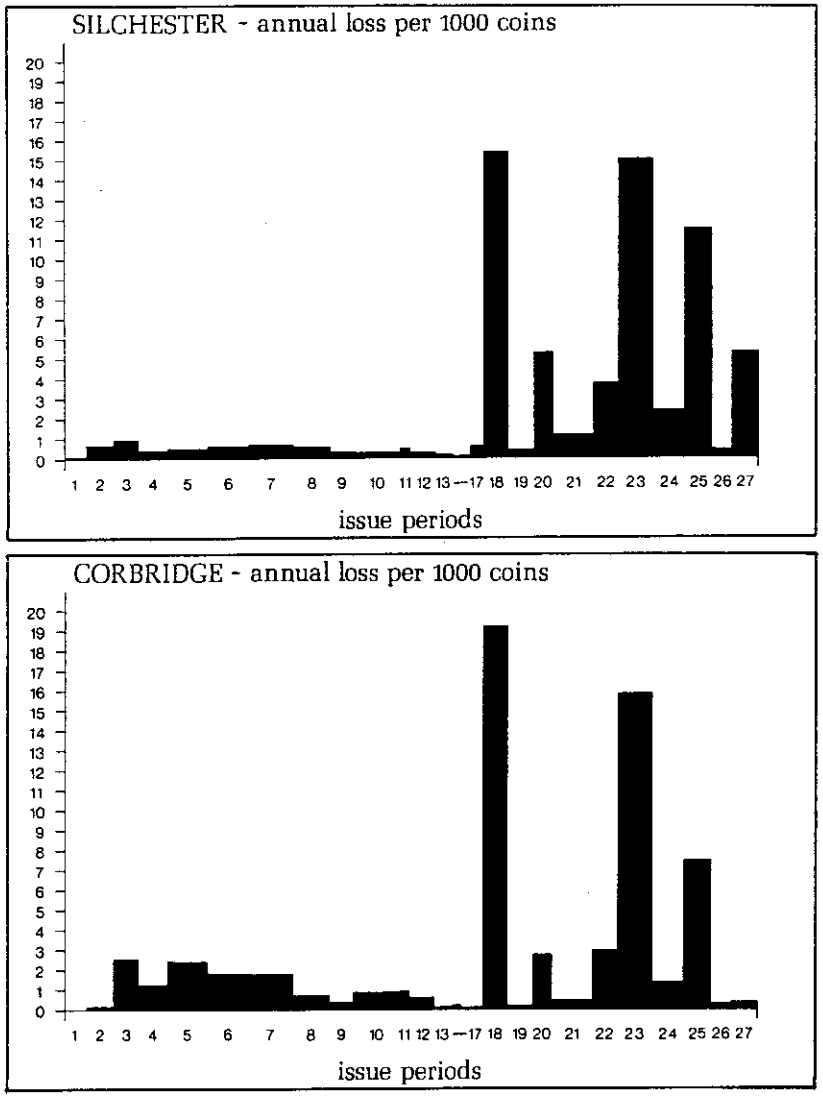
The use of coins for archaeological dating purposes involves the concept of the *terminus post quem* (Greene 1983, 63–4). A single coin can only have been lost after its issue date, but how long after may be difficult to judge. A group of coins found together, whether as an excavated group or in a hoard, is dated by the latest coin in the group, for the deposit or container of the hoard could not have been sealed or buried until after the date of the latest coin which it includes. A knowledge of the circulation life of individual coins may help to ascertain the latest date that a particular type of coin would have been available to be lost or hoarded; this *terminus ante quem* and the *terminus post quem* of the issue date, will provide a likely chronological bracket.

There are always pitfalls, however. New coins may be hoarded for a long time and then re-enter circulation in an unworn freshly-minted condition. Some coins may be preserved long after their normal lifespan as talismans or as part of jewellery, particularly if made of gold or silver. The Merovingian king Childeric was buried in Tournai in Belgium in AD 481 with a large number of coins, as well as his personal effects; the coins ranged from Alexander the Great (fourth century BC), through many of the early Roman emperors, and up to late Roman rulers of Childeric's own lifetime. No doubt these coins (mostly gold *aurei* and *solidi*) had been in treasure chests for most of their lives, changing hands only occasionally through commerce, diplomacy, gift or theft (Lasko 1971, 32, figs. 19–20).

The quantification of coins from sites

Collections of coins from individual Roman sites often run into hundreds or even thousands of items. Some may have been found in proper archaeological excavations, but most will probably have been casual finds made during building work or other disturbance of Roman deposits; others will have no record of their origin. Superficially, a large collection of coins would seem to promise the possibility of charting the economic life of a site, as well as its period of occupation. Spells of prosperity might be marked by large numbers of coins, whose loss should reflect their former abundance, whilst lean periods should be indicated by shortages of coin finds. The existence of large coin collections from several similar classes of sites (such as towns, villas or military establishments) should allow comparisons to be made between them. Similarities between coin finds should help to establish 'typical' patterns to be anticipated on sites of the same kind, whilst contrasts may point to differences in their individual histories.

Unfortunately, detailed comparisons between many sites in Roman Britain have shown that the economic life of individual sites cannot be assessed so easily (Casey 1974; 1980). Casey has demonstrated the necessity of understanding the general history of Roman coinage before any conclusions can begin to be drawn about site histories. He has devised a method of presenting coins graphically by means of a histogram, which reduces collections of different sizes to a single standardised scale in order to allow direct comparisons to be made (fig. 19). The horizontal axis of his graphs represents time, but is divided into reigns of emperors or other significant periods of coin issue rather than straightforward years or decades. The total number of coins found on the site is standardised



19. Standardised histograms of coins from two Romano-British sites, covering 27 periods of coin issues from the first to early fifth centuries AD. The general pattern is very similar, particularly after the collapse of the Augustan system of coinage in the third century. This was followed by successive reforms and debasements, which are responsible for the recurrent peaks and troughs of the right-hand part of the graphs (periods 18–27). The larger, higher-value coins of the early empire are comparatively rare on both sites, but are more prominent at Corbridge because it housed large military garrisons, and because the early levels have been extensively excavated. The final peak in period 27 is missing from Corbridge, because Roman control of the northern frontier ceased before the last official shipments of coins reached southern Britain. (Audio-Visual Centre, University of Newcastle; based on Casey 1980, 31, figs. 5–6)

to 1000 and the number assignable to each reign or issue period is determined by the following formula:

$$\frac{\text{COINS PER REIGN}}{\text{LENGTH OF REIGN}} \times \frac{1000}{\text{TOTAL FROM SITE}}$$

The vertical scale of the histogram indicates the number of coins lost each year out of every thousand found on the site. The division of the number of coins in each reign or issue period by its length in years balances out the distorting effects of short reigns with small issues of coins, or long reigns with large issues.

An unavoidable weakness in this method of presenting coin losses is that it does not take any account of the length of time for which coins circulated before being lost. Coins of the early empire in particular are likely to have been lost well after their date of issue. However, histograms of this kind are at least objective and standardised, so that direct comparisons can be made between them. The size of the coin collection should *always* be stated, for it would be nonsensical to use this graph to compare a collection of 50 coins with one of 5000. Even when two samples of comparable size are examined, small differences should not be taken too seriously, for no two collections will have been lost and recovered in exactly the same way; economic and historical judgements may only begin to be made when gross discrepancies occur. Such factors as different sample sizes, or differing proportions of coins derived from excavation rather than casual finds, must be taken into account. Even then, it is advisable to carry out statistical tests of significance in order to eliminate random variations.

It is salutary to realise just how few coins have actually been recovered from sites, compared with the numbers which once circulated there. John Casey has made this calculation for Corbridge in Northumberland (1974, 38). The site was founded in *c.*AD 85, and was occupied by a succession of forts for a century or more, before developing into a frontier town with a predominantly civilian population in the hinterland of Hadrian's Wall. The site has produced 1387 coins of the first two centuries AD, with a combined value of 26 *aurei*, the standard gold coin of the period. However, if the pay of the soldiers who were accommodated in the forts over the same length of time is calculated, the minimum amount of cash paid out on the site would have totalled 240,000 gold *aurei*, or 24,000,000 *sestertii* (the largest bronze coin).

This calculation demonstrates just how small our surviving samples of coins really are, and this fact should always be remembered when such information is used. The Roman town of Silchester in Hampshire has produced a collection of 8870 coins, which sounds impressive, but comes from a site which was a major urban centre for 300 years or more, and which has undergone extensive excavation since the late nineteenth century. It would therefore be unwise to claim that because only very small numbers of coins are found on many rural villas and farmsteads, their occupants were not involved in a cash economy except when visiting urban markets, as was suggested by Crawford (1970).

The histogram of coin losses from Silchester has a distinctive shape. The loss per 1000 coins per year remains below one up to AD 260, and then suddenly rises to over 15, only to fall back to around one again in AD 273. A series of similarly dramatic fluctuations occurs down to the end of Roman coinage in *c.*AD 402. Such marked periods of abundance and paucity cannot possibly reflect the amount of economic activity on the site, particularly when it is found that very similar results have been obtained from other Roman town sites in Britain. In fact, these fluctuations can be explained in relation to the quality and supply of coinage in general, rather than by any characteristics of the sites themselves. The great number of coins of period 18 (AD 260–273) represents a collapse of the currency, and its coins are mainly base double-*denarii* (fig. 17) which were rendered worthless by an attempt to reform coinage in period 19. A succession of similar declines and reforms makes up the pattern for the fourth century AD, combined with occasional periods of coin shortage caused by political and military factors (Casey 1974, 43–47).

Thus, quantified studies of coins from sites (and comparisons between them) demonstrate that an abundance of coins from a site is likely to indicate bad economic circumstances rather than good. The studies also underline a further factor; unlike hoards, site finds are merely the coins which people could afford to lose. A dropped *aureus* will have occasioned a careful search, and gold coins are therefore very rare finds. Debased third-century coins containing hardly any silver merited little effort to recover them, particularly when reforms of the coinage frequently rendered them worthless. The size of coins is also relevant, for small denominations are more easily lost than large ones. Even the small bronze coins of the early empire are larger than those of most of the fourth century, and commensurately harder to lose.

Reece has compiled a graph which shows the number of coin losses on a large number of Italian sites over the period of the empire. It approximates to a straight line, showing that the short-term fluctuations may conceal an overall stability. The period when losses were greatest was the third century AD (1984, 199, fig. 1). In the same article, Reece makes the important point that, although we know where many coins have been found, we do not know their exact context. Excavations in Carthage have allowed the stratigraphy of dated coins and pottery to be compared, and have shown that many fourth-century coins still circulated well into the fifth century. It will be a long time before information of similar quality is readily available from sufficient sites to allow valid comparisons to be made.

Great care is necessary in order to establish that Roman coins really were lost in Roman times, rather than having been brought to an area by modern collectors. Many eastern issues came into Britain as souvenirs in the pockets of soldiers who had served in the First and Second World Wars, and have acquired spurious local provenances as a result of finding their way into museums. Casey (1985) has shown that the long list of stray finds of coins from Scotland is so unlike reliably-excavated site assemblages that it cannot possibly represent ancient losses – and consequently has no historical or economic value. This is unfortunate, for Davies has recently demonstrated the importance of regional studies; coins found on native sites in Wales chart the entry of their inhabitants into a monetised economy, and their return to more primitive forms of exchange in the late Roman period (1983).

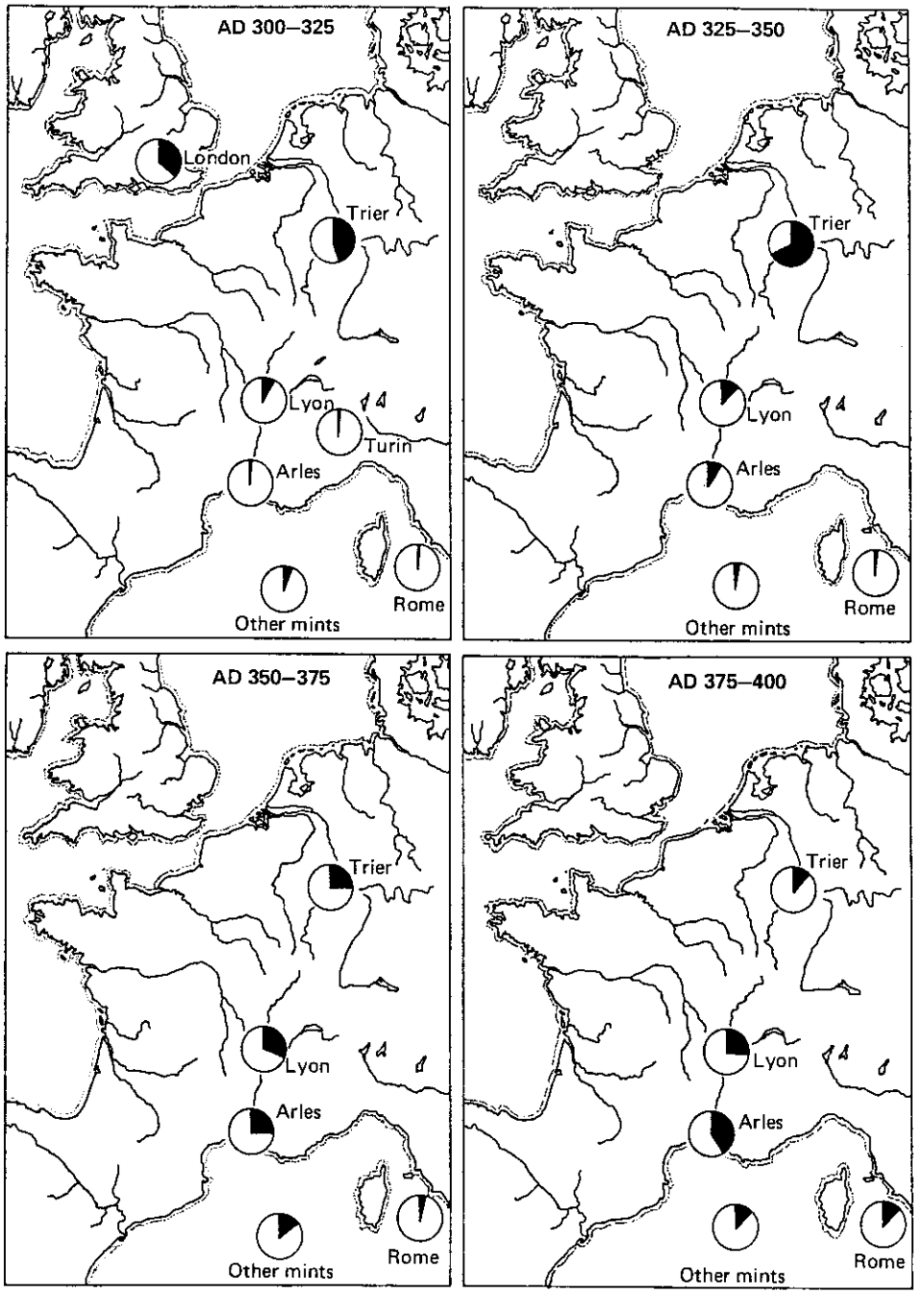
Coins and trade

Unfortunately, it is difficult to make detailed quantified comparisons between individual sites or classes of sites in different areas of the empire, because each region relied upon varying supplies from different mints. However, Hopkins has published a graph of coins from many different parts of the empire (1980, 113, fig. 4) which shows that from AD 40–180 there was a remarkable consistency in the supply of new silver coins throughout the Roman empire, in samples taken from Britain, Germany, Italy, the Balkans and Syria. This evidence certainly supports his proposition that the economy of the empire was integrated by the effects which tax collection and state expenditure had in stimulating trade, particularly because the breakdown in uniformity in the third century coincides with an apparent decline in the vitality of towns and long-distance trade (ibid. 115). Thus, although we have concluded that site-finds of coins do not tell us much in detail about localised economic activity, coins in general provide a continuous commentary upon some more important factors in Roman economic life.

Fulford has made an interesting attempt to use coins as an indicator of subtle changes in the intensity and direction of trade in the late Roman period. Fourth-century coins are consistent in bearing an abbreviation of the name of the city in which they were minted, and the number of mints in operation was increased by the subdivision of the administration of the empire. As Casey's graphs have shown, late Roman coins are exceptionally common finds on sites. Thus, a large sample of coins exists which can be divided reliably into the products of specific mints. Fulford has studied the changing proportions of coins from different mints found on a number of sites in Britain, France and Germany (fig. 20); he proposes that even in this late period, trade (rather than purely official expenditure) was an important factor in their distribution. More archaeological studies of potential trade goods of the same period are needed to test his hypothesis (1978, 90).

INFLATION IN THE ROMAN EMPIRE

An issue that has a long history of discussion in coin studies is the relationship between changes in coinage and the rate of inflation of prices. This issue has regained topical interest in the 1970s and 1980s, but the irreconcilably conflicting views held by modern economists and politicians about the connections (if any) between state spending, interest rates, the money supply and prices should serve as a warning about the difficulty of drawing firm conclusions about the Roman period. Evidence that inflation was a problem in Roman times comes from a number of different sources, including contemporary literature, inscriptions, and even personal letters preserved on papyrus in Egypt. It is more difficult to establish the rate and severity of inflation, although this is what we



really need to know in order to estimate its effects on economic life.

Wages and prices

Two measurable sources of information about wages and prices may provide some guidance – army pay, and the price of wheat, although the former is more reliably documented than the latter (Duncan-Jones 1974, 10).

Army pay

Under Augustus (27 BC–AD 14), a legionary received 900 *sestertii* each year; under Domitian (AD 81–96), pay rose to 1200 *sestertii*, and under Severus (AD 193–211) to 1800/2000. After this date, the supply of provisions as part of wages complicates the estimate of army earnings. In the two centuries between Augustus and Severus, there was an increase of 100–120 per cent in legionary pay, a rate well below that of even the most budget-conscious modern governments.

Wheat prices

Since wheat was one of the essential commodities of the Roman world, its price (allowing for seasonal fluctuations) presumably reflects general changes in the value of money. The surviving evidence is sporadic. In Egypt, the second-century price was 25 per cent higher than that of the first century; in Ephesus (Asia Minor) the early third-century price was 100 per cent higher than that of the early second. Diocletian's *Edict* on maximum prices (AD 301) gives a price 200 per cent higher than its first- to second-century cost.

These separate pieces of evidence are not inconsistent with the impression given by legionary pay, that the rate of inflation was low in the early empire. Crawford believes that it really gathered momentum from the 260s (1975, 571), and that bronze coins continued to suffer rapid inflation in terms of gold, which rose from 48,000 *denarii* to 99,000 *denarii* per pound between the late third century and Diocletian's *Edict* of AD 301 (ibid. 584). The marked increase which seems to have occurred in the third century coincided with dramatic changes in coinage.

20. Changing sources of coins in fourth-century Britain; the percentage of coins from each mint is represented by the dark sectors of the circles. There was a gradual shift away from the northern mints during the course of the century, which may reflect general economic factors such as the direction of trade, rather than purely official monetary affairs. Comparisons of this kind are possible as a result of the detailed catalogues which have been compiled of coins found on British sites. (Audio-Visual Centre, University of Newcastle; based on Fulford 1978, 66, fig. 50)

Inflation and coin denominations

In any monetary system which provides coins small enough for everyday transactions, a slow rise in prices will gradually render the smallest denominations too small for useful transactions. The English farthing (a quarter-penny) disappeared well before the decimalisation of coinage in 1969. At this date pennies became more valuable, for 100 'new' pennies made up one pound instead of 240 'old'. However, the high rate of inflation of the 1970s led to the withdrawal of the halfpenny coin in 1984, although it had in fact been worth more than one 'old' penny when first issued only 15 years earlier. Likewise, fifty-pence and one-pound coins were introduced in 1969 and 1983 to replace paper bank notes, because the fall of their purchasing power made paper an unsuitable medium for a heavily used unit of currency. Other countries have used more drastic methods in order to bring coins into line with inflated prices. In 1958, France simply knocked two decimal places off the franc, so that one new ('heavy') franc was equivalent to 100 old francs. The history of the Roman monetary system includes instances of both the disappearance of small denominations and the revision of values. Since Roman gold and silver denominations were isued according to their metal content rather than as token coins, further opportunities existed for adjusting the value of these coins by altering their weight and/or purity.

Changing uses of denominations

We have already seen how John Casey's quantified studies of coin finds from individual sites shed considerable light upon the general quality and availability of Roman coins, at least as far as their loss on sites is concerned. A different direction has been explored by Richard Reece, who has also compiled graphs of coins from sites, similarly divided up into reigns or periods of issue (Reece 1972). In addition to studying individual sites, Reece has conflated finds from large regions (Britain, northern France, southern France, northern Italy) in order to draw comparisons between them. For these regions, the proportions of different denominations of coins in the various

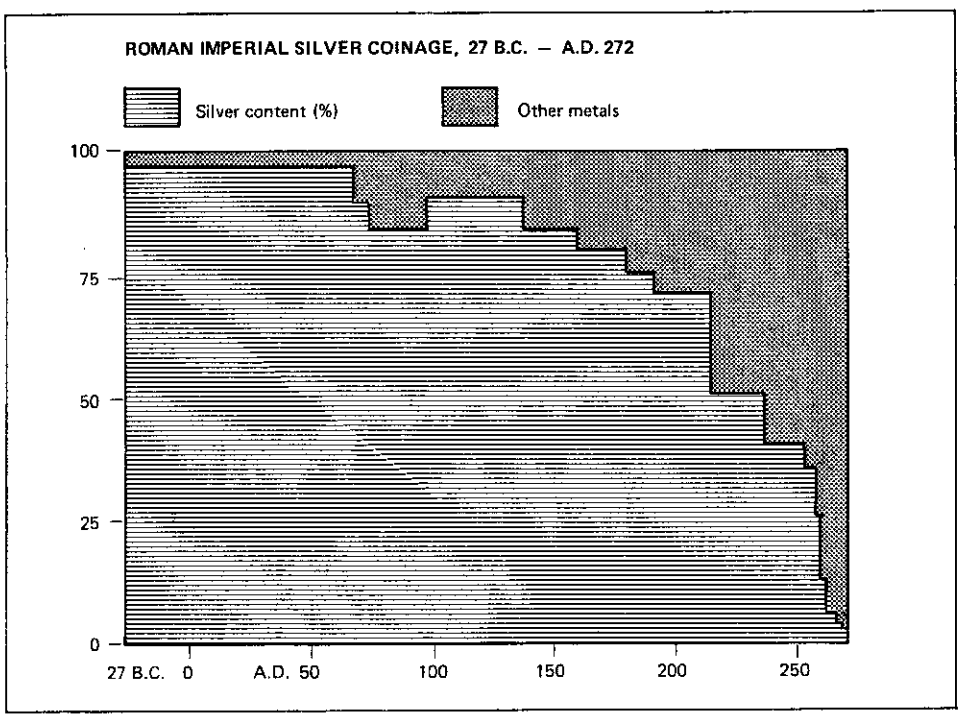
reigns and issue periods have also been computed, so that their relative frequencies can be examined (Reece 1973).

In a series of complex graphic presentations, Reece has shown that in northern Italy between Augustus (27 BC–AD 14) and AD 275 the ratio of silver *denarii* to brass *sestertii* remained roughly in balance, and equal numbers of both occur on sites (op. cit. fig. 3). A very different picture is found in the case of the smaller bronze coins (*dupondii* and *asses*). Under Augustus, there were around six times as many of the small bronze coins as *sestertii*, and the two categories came briefly into balance around AD 160. By the 250s, however, the Augustan position had been reversed, and *sestertii* were much commoner than the smaller coins. Thus, if we follow the principle that the coins lost are the least valuable ones which will not be particularly missed, it is clear that the *sestertius* had declined from being a valuable bronze coin under Augustus to being the commonest. This is confirmed by the fact that its subdivisions had largely ceased to be issued, because their purchasing power was too small. The Augustan system had originally included two subdivisions of the *as*, the *semis* and the *quadrans*; these suffered the same fate as British farthings, halfpennies and 'new' halfpenny coins, and were rarely issued after the 60s AD. Thus, the progressive but gentle inflation indicated by army pay and wheat prices is reflected by the gradual decline in the purchasing power of bronze coins.

The decline of the denarius

Inflation seems to have gathered momentum during the third century AD, which provides some good examples of financial desperation, probably

21. Scientific studies of coins can reveal both metallurgical and historical information. For example, the silver content of the *denarius* declined drastically in the late second and third centuries AD. The comparative stability up to *c.* AD 150 and the accelerating debasement of the third century accurately reflect changes in political and military security undergone by the empire in the same period. (Audio-Visual Centre, University of Newcastle; silver content from Kent 1978, 357)



brought on by political and military difficulties. The debasement of the *denarius* is particularly dramatic; whereas under Augustus, it was made of virtually pure silver, the gradual decline in purity and weight of the second century accelerated in the third, until it became little more than a bronze coin with a small percentage of silver (fig. 21). Metallurgical analyses have added considerable detail to our knowledge of the speed and extent of debasement (Walker 1976; 1977; 1978).

Lo Cascio (1981) has argued that reductions in the purity of the *denarius* were part of a careful control of the relative values of gold and silver coins, which assisted the impressive stability of the first two centuries AD, witnessed by the graphs prepared for individual sites by Casey or the whole empire by Hopkins (above p. 55). In the third century, the motive for debasement is more likely to have been to gain short-term benefits for the Roman emperors, who were involved in successive struggles for the throne within the empire as well as attacks and invasions from enemies outside. Quite simply, old *denarii* collected in taxes could be melted down to make a larger number of new, less pure, coins, which would thus go further for paying the army and civil service. To make matters even worse, the emperor Caracalla (= Antoninus, AD 211–217) introduced a new coin, now called the *antoninianus*, which was in theory a double-*denarius*, but in fact only contained 50 per cent more silver than a single *denarius* (fig. 17). Once these coins had entered general circulation, however, the newer debased coins would not be accepted for goods or services at the same rate as the old, and a rise in prices was the inevitable result. Owners of older *denarii* would probably melt them down or hoard them, rather than exchange them for coins with the same theoretical face value, but a lower silver content. However, Crawford warns against overestimating the inflationary effect of these changes upon prices, since the coins were measured in terms of their silver content (1975, 567, 591).

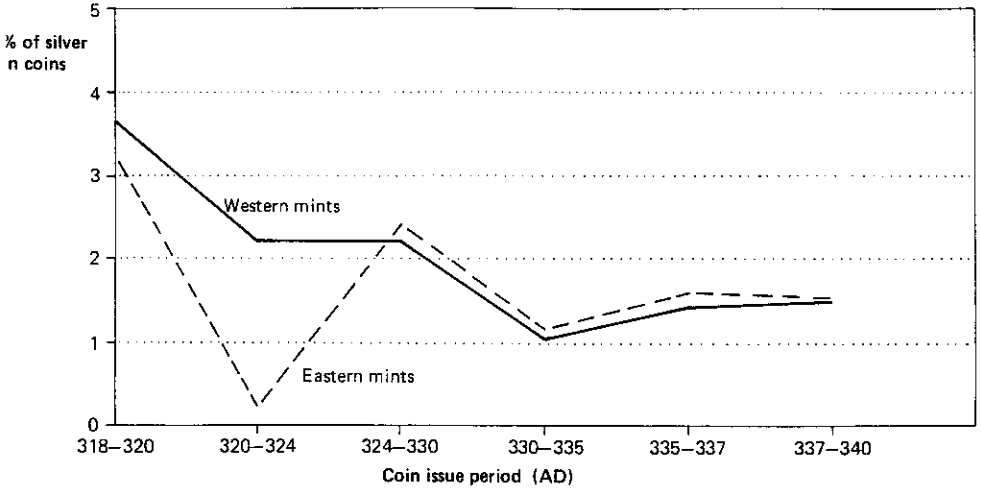
The value of bronze denominations was also reduced by these debased silver issues, since it was defined by their relationship to the *denarius*. Since the bronze coins were token rather than bullion coins, they could be revalued by government proclamation, and the third-century emperor Aurelian made a valiant attempt to structure a currency reform around a new bronze *sestertius* (Casey 1980, 13, pl. 2). Understandably, the steady reduction of the formerly pure silver *denarius* to the status of a bronze coin must have both increased inflation and hastened the demise of the traditional bronze coins; their place was taken by 'barbarous radiates', poor copies of the debased *denarii* which presumably filled the need for token small-change (Crawford 1975, 569–570). The lowest point in the debasement of the *denarius* was reached in AD 260, when the minting of even base silver coins ceased, to be replaced by copper coins with a silver surface coating which soon wore off in use (King and Hedges 1974).

Reforms of the coinage

The familiar denominations of the early empire disappeared in the later third century, and the history of coinage in the fourth century is both complex and imperfectly understood. Diocletian may have attempted to produce a new version of the Augustan system, but by AD 340, fourth-century coinage consisted of pure gold and silver coins, and enormous quantities of four different sizes of bronze coins without any silver content (fig. 17; Crawford 1975, 560–1). As Casey's histograms show, this phase is characterised by a series of currency reforms, represented by sudden reductions in the numbers of coins found on sites. Each one is followed by a deterioration in the size and weights of the new coins, leading to their increased occurrence as site finds until the same cycle was initiated by the next reform. The process ended with the virtual cessation of the issue of small bronze coins in the western parts of the empire in the early fifth century AD. However, the very existence of large quantities of fourth-century bronze coins indicates that they still fulfilled an important need; as we have seen above, Lo Cascio considers that (in the early empire at least) they were issued for the benefit of economic activity in general, and not merely for the selfish requirements of the Roman state.

THE RÔLE OF MONEY IN THE ROMAN ECONOMY

It can be argued that the Roman system encouraged the use of money in a market economy, because of the requirements of state expenditure for paying an enormous standing army and an elaborate civil service. After the initial stages of conquest of new areas, with their profits from



22. The average silver content of coins issued in the early fourth century AD by mints in the east and west of the empire was remarkably uniform, indicating close adherence to standard and careful preparation of alloys. However, the eastern mints departed from the norm in the period 320–324, at the time of civil war breaking out between the emperor Constantine and his eastern colleague Licinius, who may have reduced the silver content as an emergency measure in order to produce larger amounts of money to finance his attack on Constantine. A return to uniformity followed the defeat of Licinius. (Audio-Visual Centre, University of Newcastle; based on data from Barrandon and Brenot 1978, Barrandon *et al.* 1980)

captured spoils, the demands of garrisons, administrators and military and civil building works required money. An important objective would be to make provinces not merely self-financing but profitable in terms of tax revenue. Rather than impoverishing the subjects of new provinces, taxation (initially in produce, perhaps) would often have provided a stimulus to the use of money and markets. When subjected to taxation, farmers would need to maintain surplus production, and if taxation was demanded in the form of coinage, to market this surplus for cash. The idea that increased surpluses could not only pay taxes but could finance the purchase of other goods offered for sale in a market would not be lost on a wily country-dweller.

The ability to store and accumulate wealth from successful surplus farming might actually have allowed some landowners to increase the size of their holdings, and to achieve the political and social status which accompanied the rôle of estate owner in the Roman world. No doubt the most successful were those who were already prominent in pre-Roman society, but monetisation of the economy certainly provided new opportunities, without necessarily destroying the existing social structure. Native aristocrats in the provinces were often in receipt of large loans from rich Romans, with which they would strive to adopt the outward trappings of Roman civilisation, such as a country house with appropriate furnishing and decoration, along with wine and exotic cuisine. Such loans required repayment, and the motivation to produce agricultural surpluses and turn them into cash would, therefore, have operated at a high social level as well as amongst peasants.

The presence of an army of conquest and the attendant bureaucracy of provincial administration must have played a fundamental rôle in 'monetising' the less advanced western areas of the empire. A characteristic phenomenon in frontier areas is the growth of civilian settlements around forts; many of these subsequently developed into major towns even after the garrisons moved elsewhere. The rôle of the army in instigating quarrying for building stone, mining for precious and other metals, and in placing contracts for supplies and equipment will be discussed further in Chapter 6; the 'pump-priming' effects

of introducing coinage into provincial economies cannot be ignored.

Millar's discussion of Apuleius' *Golden ass* (above p. 50) provides good testimony for the comprehensive use of coinage throughout the Roman social and economic system, at least near the Mediterranean in the second century AD. The extent to which relatively humble categories of pottery and other goods reached ordinary rural sites, and the very density of non-urban settlement patterns (Chapter 5 below), also argue for thoroughly monetised interactions. Hopkins' model of integration through taxation provides a logical framework for conceptualising the way in which this complex system operated. There is another view, however; Millett (1981) has proposed that the rapid penetration of samian pottery into rural sites in Britain may have been the result of the redistribution of prestige goods downwards from the higher levels of society which had access to (and probably controlled) the trade in luxury goods. In this instance, I believe that the literary evidence for coin use, whether from Apuleius or papyri from Egypt, favours an interpretation centred upon coinage rather than social relations; the significance of alternative economic systems must not be ignored, however.