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Directeurs
François de CALLATAÝ, Johan van HEESCH,
Ghislaine MOUCHARTE, Raf VAN LAERE

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BRUXELLES BRUSSEL
ANTONY KROPFF (*)

« RADIATE COPIES »:
LATE THIRD CENTURY ROMAN EMERGENCY COINS

1. Introduction and theme

The term « barbarous radiates » was (and still is) used for a group of Roman coins, characterised by careless workmanship and by a style, type and representation deviating from the regular Roman coin series. Most of these coins present the radiate head of Tetricus I or Tetricus II. The Tetrici were the last rulers over the autonomous Gallic (or Gal-lo-Roman) Empire, which included most of the Roman territory to the northwest of the Alps and Spain. The Gallic Empire broke free from central Roman authority after Postumus’ rebellion and held its own from 260 to 274 AD.

The « barbarous radiates » do not fit into the regular coin series, but seem to copy regular coins.

Site finds and coin hoards dating from the last three decades of the third century, found in France, Belgium, Britain and other countries in the north-western part of the former Roman Empire as a rule include a large number of these copies.

The present study deals with these radiate copies, focussing on two questions: who produced these coins and why?

The current hypothesis, assuming the copies to be tolerated issues originating from small, private, local workshops, not commissioned by the authorities, is put to the test. The present survey sets out to show that this hypothesis is less probable. A new hypothesis in relation to the origin of the copies will be presented and tested.

2. The nature of « radiate copies »

2.1. Characteristics

Research in the field of radiate copies is still in its infancy. It has even been doubted whether an in-depth study of this coinage would be worth-

(*) Antony Kropff, Erasmusweg 1183 J, NL-2542 PW Den Haag, The Netherlands. E-mail: tkropff@hetnet.nl

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while ('). Up to this moment, there is no uniform description or even a generally accepted definition of radiate copies as a coin type (2). A full review of the characteristics of radiate copies has as yet not been published.

The distinguishing characteristics of this coinage are of a numismatical and of a technical/physical nature.

The numismatical characteristics refer to obverse and reverse dies. A copy may show a portrait type or reverse type and/or a specific combination of these two, not existing in the regular series. A reverse type or image (deity, personification) may be combined with reverse legends, not belonging to this type. Many copies are hybrid, combining obverse and reverse types taken from the regular coins belonging to different issues of the same ruler, or even to different rulers (2).

Irregularities in the numismatic characteristics however will not always distinguish a copy from a regular coin, as hybrids are also found in the regular series. For instance, a coin for Tetricus I, clearly originating from the regular Gallic mint, can sometimes show a reverse type from the regular Tetricus II series (4). On the other hand, a copy may show an obverse/reverse combination exactly the same as the regular coin that served as a pattern (6).

The technical/physical characteristics of the copies include a number of items. The copies often show that the die-cutter and/or the moneyer lacked professional skill: the portrait or reverse type will be simplified and schematic, sometimes even hardly recognisable. Legends sometimes contain errors, sometimes will be blundered or even completely meaningless. Radiate copies will often (but not always) be struck in a rather careless way and show an irregular or deformed flan, flan cracks, etc. The technical/physical characteristics also include weight, size and alloy of the coin. Compared to the regular emissions, the copies can be smaller and/or lighter, but a small and/or light coin will not always be a copy. The very small copies (minimi) were produced (much) later than the original, full-size radiate copies discussed here (6). Minimi are not dealt with in this survey.

(3) H.J. Schulzki, op. cit. (n. 2 ), p. 34.
(4) Ibidem, p. 97-98, nr. 15-17.
(5) Ibidem, p. 34.
The most striking and distinctive physical characteristic of the copies is brought to light by an analysis of the coin metal. The copies may contain a small quantity of silver, but this is just a trace (0.05% or less) as an accidental part of the alloy, not an intentional addition. The regular Gallo-Roman antoniniani, even the very debased last issues of the Tetri- ci, will always contain a carefully measured and added amount of silver, around 0.5% (*).

2.2. Status

Some authors have stated that the copies were in fact counterfeit, false coinage and consequently these coins could never have been officially recognised (*). Other authors explicitly leave the question open whether these coins were forgeries, tolerated private copies or even sanctioned emergency money (*). However: considering the large share of the radiate copies in hoards and site finds in the West, we must conclude that regular coins and copies circulated together, so we can rule out any effective sanctions against the latter group of coins.

The current hypothesis is that the copies were emergency money, produced to meet the demand for coins that the regular issues could not meet. This idea has been proposed by Hill (*), others later subscribed to this view (*1). Production in small private workshops, possibly by local corporations or estate owners has been suggested (*2). There is no consensus on an eventual involvement of (local) authorities in the production of this coinage (*3).

2.3. Period of production and circulation

Copies were produced in relatively small numbers even before the rule of the Tetrarchs ended (14). The coin hoards show that mass production started after these Gallic rulers yielded to central Roman power in 274 AD (15). Large scale production of the normal size copies continued until 282 AD (16). As stated above, copies of a (very) small size (minimi) are not included in this survey. These minimi were produced after 280-282 AD (17) and circulated well into the fourth century. It is doubtful whether « full size » copies and minimi can be brought under the same hypothesis: more study will be needed.

In coin hoards buried during the rule of the Tetrarchs, as a rule at most 7% of the total number of coins for these rulers will be copies (18). In later hoards, the share of the copies increases (19). Coin hoards closing after 282 AD however will show a decreasing share of copies (20).

3. Research of radiate copies and its problems

Research of radiate copies presents a number of problems, primarily concerning the distinction between regular issues and copies. As was noted in paragraph 2.1., silver content seems to provide a solid distinction between the two, but as establishing silver content requires Röntgen spectral analysis or even destructive chemical analysis, determining the silver content of coins will not be standard procedure. Copies are usually distinguished from regular coins on the basis of « style », the die-cutter's ability to render portrait, reverse image and legends. Obvious copies will show an unrecognisable portrait, a botched reverse type and badly blundered legends. When a better style coin is examined, the combination of portrait type, reverse type and legends will be verified on the basis of the regular series. Size and weight of the coin will be taken into account.

However, a consensus or standard concerning the question: « regular coin or copy? » is lacking, as was stated before. It must be admitted that the choice « regular coin or copy » is not always easy where relatively early copies are concerned. Later copies are often of lower quality, making the distinction between « regular » and « copy » easier to make (21).

(14) G. Boon, op. cit. (p. 8), p. 129.
(20) J.-M. Doyen, op. cit. (n. 6), p. 81.
Towards the end of the Gallic Empire the production standard of coins from the regular Gallic series deteriorated. The hyperinflation of the period and the enormous production of coins resulted in a rather careless production and consequently in coins with a cracked, small or ill centred flan, a shallow relief, etc. As a result, at first sight a number of coins for the Tetraric seem to belong to a 'bordergroup' consisting of either carelessly executed regular coins, or well-executed copies. The accuracy and reliability of the assignment of coins to either of these groups depends on the knowledge and experience in the field of radiate copies of the archaeologist or numismatist identifying the coin material. Older hoard or site reports quite often do not give sufficient information to enable present reviewers to decide whether coins belong to the regular group or to the copies (22). Also, coins from older sites and hoards will often be identified with the help of the relevant Roman Imperial Coinage volume originally published in 1933, which acknowledges quite a number of copies as coins belonging to the regular series. Later studies, most notably Schulzki (23), will enable a more reliable distinction between regular coins and copies.

With these aspects in mind, it would not be a correct procedure to compare just a few sites or hoards in order to establish a pattern in the share of copies. It will be acceptable however to compare accumulated data from many sites or hoards clustered into regions in order to discern patterns of distribution of radiate copies. The influence of individual criteria of judgement on the data from an individual site will be levelled when accumulated data in reference to regions are analysed and compared. The present study deals with the data from different parts of the empire.

4. Coin circulation in the area of the (former) Gallic Empire between 260 and 295 AD

4.1. Mapping circulation: the material

Before the origin of the copies can be dealt with, the share of these coins in the circulation of different parts of the Western Roman Empire must be considered. Starting from this data, we will try to determine the immediate causes of production and the source of the radiate copies. As very little is known about the political and economical situation in the area of the Gallic Empire, the coin circulation itself will have to provide some clues.

(23) H.J. Schulzki, op. cit. (n. 2).
In view of this survey, the coin circulation in the areas that formed part of the autonomous Gallic Empire from 260 up to 274 AD has been analysed. To allow a comparison, a number of areas outside the (former) Gallic Empire were also analysed. The analysis covers the period 260-295 AD. A considerable part of the raw data used in this survey has been compiled by C.E. King (24), but as her material does not cover present day Belgium and the Dutch River area, these areas have been included in the present survey.

Up to this moment, the circulation of copies has not been mapped in detail (25). The fact that coin circulation in the various parts of the (former) Gallic Empire differed has been noted before, but no hypothesis was proposed with regard to the causes of the differences (26).

4.2. Component parts of circulation

The diagrams (fig. 1-8; see p. 82-83) show the share of the different component parts of coin circulation in the separate areas. Table 1 gives the data (source, number of sites, number of coins for the period on the sites, etc.) relating to the diagrams.

Table 1. Data diagrams 1-8 (see p. 82-83)

<table>
<thead>
<tr>
<th>Area</th>
<th>Source</th>
<th>Number of sites</th>
<th>Total number of coins from sites, issued 260-295</th>
<th>Number of coins in groups Central / Gallic / British / Copies</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Dutch River area</td>
<td>Kropff and van der Vin 2003 (n. 29), 62 (adapted)</td>
<td>12</td>
<td>359</td>
<td>76/180/-/-103</td>
</tr>
<tr>
<td>3. Middle Rhine area</td>
<td>King 1981, 108</td>
<td>19</td>
<td>1.442</td>
<td>764/103/-/-275</td>
</tr>
<tr>
<td>5. Central eastern France</td>
<td>King 1981, 106</td>
<td>12</td>
<td>3.164</td>
<td>2028/1042/9/87</td>
</tr>
<tr>
<td>7. Spain</td>
<td>King 1981, 112</td>
<td>7</td>
<td>2.925</td>
<td>1880/109/-/-36</td>
</tr>
<tr>
<td>8. Northern Italy</td>
<td>King 1981, 113</td>
<td>18</td>
<td>11.446</td>
<td>10.809/599/38/-</td>
</tr>
</tbody>
</table>

We can distinguish four components: « Central », « Gallic », « British » and « Copies ». Here « Central » indicates all coins produced for the legitimate Roman emperors between 260 and 295 AD. We will have to keep in mind that the coinage of Aurelian and successors was in short supply in the west, with the exception of Italy (27). The bulk of central coins in table 1 therefore are emissions for Gallienus and Claudius II. In Britain for instance, the share of these emissions in the « central » component is 93% (28), in the Dutch River area 91% (29) and in the region formed by Northern France, Belgium and Luxemburg 74% (30).

« Gallic » denotes the coinage produced on behalf of the rulers of the Gallic Empire from 260 up to 274 AD. « British » refers to the coins, produced for Carausius and Allectus, governing yet another temporarily autonomous part of the Empire, this time (287-296 AD) based on the British Isles. Very few of these coins were recovered outside Britain, as the diagrams show.

« Copies », the last component of circulation, is by now self-evident.

How can we interpret the diagrams? In order to answer this question, the « legitimate » coins produced between 260 and 270 AD (Gallienus sole reign, Claudius II) should be considered first. These coins played a prominent part in circulation all over the Roman Empire for many decades, but their circulation period did not begin at the same time in all areas.

Schulzki (31) has compiled a review of coin hoards dating from the last decades of the third century, originating from the former Gallic Empire and from other parts of the Roman Empire. Hoards, concealed in the former Gallic Empire during the years 275 and 276 AD, on an average include a good 20% of coins, minted for Gallienus (sole reign) and Claudius II. Hoards recovered from the other parts of the Roman Empire, dating from the same years, on an average include 62% of these coins (32). The hoards show, that the initial low share of coins for Gallienus and Claudius II in the circulation of the Gallic Empire was compensated by the coins for the Gallic Rulers (mainly the Tetrarchs) and the radiate copies of their coins.

Later hoards however show a change. Hoards concealed in the area of the former Gallic Empire between 280 and 295 AD (29) on an average include nearly 40% of coins for Gallienus and Claudius II, which even

(27) Ibidem, p. 96.
(28) Ibidem, p. 103.
(32) Ibidem, p. 151-152.
Fig. 1 Britain

Fig. 2 Dutch River Area

Fig. 3 Middle Rhine area

Fig. 4 Northern France, Belgium and Luxemburg
Fig. 5 Central Eastern France

Fig. 6 Southern France

Fig. 7 Spain

Fig. 8 Northern Italy
exceeds the share of these coins in hoards of this period, found in the other areas of the Roman Empire. The hoards show that the coins, minted for Gallienus and Claudius II before 270 AD, entered the circulation of the (former) Gallic Empire with a considerable delay. These coins did not come to this area in appreciable numbers until the end of the seventies, beginning of the eighties of the third century (34). This fact will prove to be relevant when we analyse the diagrams in detail.

4.3. Reviewing the diagrams

A comparison of the diagrams (fig. 1-8) shows that the copies had a large share in the circulation of the region formed by Northern France, Belgium and Luxemburg (fig. 4). The copies played a rather important role in Britain (fig. 1) and the Dutch River area (fig. 2). The copies were a modest component in the coin circulation of the Middle Rhine area (fig. 3). In the other areas, the share of the copies turns out to be very small or even non-existent.

Looking at the regular coins produced for the Gallic rulers, we find the largest share for these coins in the Dutch River area (fig. 2) and Britain (fig. 1). We see a fair share for these coins in Central Eastern France (fig. 5), the Middle Rhine area (fig. 3) and also in Southern France (fig. 6). The regular Gallic coins played a more limited part in Northern France, Belgium and Luxemburg (fig. 4). The regular Gallic coins were relatively scarce in Spain (fig. 7) and Northern Italy (fig. 8).

Finally, we turn to the central coins, coins for the legitimate Roman emperors. We find a relatively modest share for the central coins in Northern France, Belgium and Luxemburg (fig. 4), the Dutch River area (fig. 2) and Britain (fig. 1). The share of the central coins is much larger in the Middle Rhine area (fig. 3) and larger still in Central Eastern France (fig. 5) and Southern France (fig. 6). Central coins completely dominate coin circulation in Spain (fig. 7) and Northern Italy (fig. 8). The diagrams will be analysed in detail later.

5. Background and reason of production

5.1. Coin reform of 274 AD

The general assumption is that a coin shortage caused the production of radiate copies (35). The cause of this shortage itself is still under discussion. A number of factors could have played a role. Regular coins pro-

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(34) Ibidem, p. 52.
duced after the coin reform by Aurelian in 274 AD were very scarce in the area of the former Gallic Empire (36). This coin reform, an attempt to substitute the very debased issues from the period of hyperinflation after 260 AD by better coins, failed completely in this area. The western part of the empire saw a troubled period and the general climate of upheaval, disturbances and incursions would not have been favourable to a successful coin reform. Logistical problems may have hindered transport of coinage (37). Moreover, the central government would have been reluctant to introduce relatively good coins into the coin circulation of the former Gallic Empire after its collapse, as the coinage in this area had become even more debased than in the other parts of the empire. The post-reform coinage of a better standard, immediately after introduction would have been driven out of circulation and into the money-box (39).

5.2. Supply of coins

The fate of the coin reform in the west could have been sealed as well by the fact that the mint at Rome, an important source of coins for the north-western part of the empire, had been closed by Aurelian in 272 AD following the quelling of the Felicissimus revolt (39). The supply of new coins was also impeded by the closing down of the mints at Cologne and Trier after the reconquest of the Gallic Empire by Rome (40).

The non-recovery of often enormous hoards in the area of the (former) Gallic Empire may also have added an extra strain on the circulation. And finally, after the Gallic Empire was formed in 260 AD, the emissions of the legitimate Roman rulers hardly reached the west. The demand for new coinage was met by the issues of the Gallic rulers. When the Gallic Empire was recovered, the Roman government took no adequate measures in order to adjust the supply of coins to the area when the balance of coin circulation was disrupted.

5.3. Failure of coin reform as sole cause?

Up to now the production of copies has been linked to the extreme scarcity of the post-reform issues for Aurelian and successors in the

(37) C.E. King, op. cit. (n. 24), p. 90.
(40) Ibidem, p. 61.
West (41) but the question arises, whether a causal connection exists. Even if we accept the hypothesis that the absence of post-reform coinage caused the production of copies, we must conclude that this explanation does not hold good in the entire (former) Gallic Empire. In Southern France as well as in Northern France, Belgium and Luxemburg we find very few coins for Aurelian and his successors. But unlike Northern France, Belgium and Luxemburg, where copies are abundant in site finds, Southern France proportionally yields a rather limited number of copies. Coin circulation must have been dissimilar in these two regions (42). Still, interpreting the radiate copias as a sign of coin shortage seems obvious, particularly in the light of precedents in the Roman era. The policy of Tiberius in closing local mints led to a shortage of bronze coins in the West. The suspension of the production of aes coinage for eight years under Nero aggravated the shortage. This shortage was obviated by large scale copying of Claudius' bronze coins in local workshops (43). Production of these first century copies by the army has been proposed (44), a proposition that has been resisted (45).

Nevertheless, we will have to interpret the third century copies in their own context. If the scarcity of post-reform regular coins in the West cannot have been the sole cause of the production of copies, we will have to consider other factors that could have exerted an influence.

5.4. Delayed influx of pre-reform coins

The diagrams do not show a strong connection between the share of the regular Gallic coins in the circulation of a region and the share of copies. We find a relatively large share of regular Gallic coins linked with a likewise large share of copies in Britain (fig. 1) and the Dutch River area (fig. 2). In other regions however, a large share of regular Gallic coins can be seen together with a small share of copies, for instance in Central Eastern France (fig. 5) and Southern France (fig. 6).

The diagrams show, that two other components of coin circulation in the (former) Gallic Empire seem to be linked up: the copies on the one side and the «central» coins (as indicated in most regions mainly Gallienus' sole reign and Claudius II) on the other. The two associated diagram bars could be compared to communicating vessels. The regions of the former Gallic Empire with a small share of «central» coins, present a large share of copies (for instance Northern France, Belgium and Luxemburg,

(41) C.E. King, op. cit. (n. 24), p. 96-97.
(42) Ibidem, p. 97.
(45) G. Boon, op. cit. (n. 8), p. 116, 123.
fig. 4). A large share of « central » coins in a Gallic Empire region corresponds with a small share of copies (for instance in Southern France, fig. 6). The quantity of available « central » coinage in a region seems to have regulated the production and circulation of the radiate copies.

In relation to the « central » coins, a few items are worth noting. Coins struck before 260 AD, still with a perceptible silver content, were driven out of circulation in the decade following that year by the very debased coinage of the period. The production of regular Gallic coins had ended in 274 AD. New supplies of coins were urgently needed in the area of the former Gallic Empire, and this need would have to be met by an new supply of « central » coins to the area. We already noted that the coins produced for Aurelian and direct successors after the coin reform of 274 AD never played a noticeable part in the circulation of the west. In fact, coin supplies to the area of the former Gallic Empire shortly after 274 AD could only have consisted of the debased inflation issues, produced between 260 and 270 for Gallienus and Claudius II. These issues provided the bulk of coin circulation everywhere in the Roman Empire at the time. In some areas of the former Gallic Empire these coins seem to have penetrated shortly after 274 AD and in these areas copies played a small part. This can be observed in Central Eastern France (fig. 5) and Southern France (fig. 6).

Copies however did play an important part in areas where these « central » coins entered circulation only in limited quantities. This seems to have occurred in Northern France, Belgium and Luxemburg (fig. 4) and to a lesser extent also in Britain (fig. 1) and the Dutch River area (fig. 2). In these areas, coin supply seems to have been hindered, possibly by a logistical problem. Areas situated in the periphery of the empire apparently did not receive enough coins from central empire mints to provide for the need of new coinage.

6. Origin of radiate copies: present position of research

6.1. Introduction

The present position of research concerning radiate copies does not result in a hypothesis in regard to the source of production. King states: "Their widespread distribution on Northern Gallic sites suggests they had acceptance, even if for a relatively short period, but it is not yet possible to state positively by whom they were made and precisely who used them" (46). More than two decades later, this statement is still relevant to recent research.

6.2. Role of local authorities

Up to this moment, the role of the public authorities with regard to the production of radiate copies remains unclear. It has been suggested that the copies were not officially commissioned, but were connived at by the provincial and local authorities. The actual production would have been effected on a purely local level in private workshops or villae (47).

A divergent hypothesis suggests a more active involvement of the local authorities. This hypothesis also proposes production of copies outside an official, regular mint, but assumes some form of direction by the local authorities (48).

6.3. Private workshops

A local, small scale, private production of copies seems to fit in with the recovery on a number of sites of what appears to be a workshop for the production of copies. In most cases, these workshops were located in rooms or cellars of a villa rustica and uncirculated copies struck from the same dies, bronze bullion and semi-manufactured material suggest the moneyers' trade. Presumed workshops were found near Autun and Éprave (49), more recently in Hambacher Forst near Düren (50) and near Sarreinsming (51). Two workshops were found in Britain (52). In Britain more traces of the production of copies (mostly minimi) were found: coins with raw material buried in isolation, not associated with the site of a possible workshop (53).

7. Radiate Gallic copies outside the Gallic Empire

During the last decades of the third century, copying was not restricted to the area of the (former) Gallic Empire. The reformed coinage of Aurelian and his successors was very rare in the west, but furthermore these coins were rather scarce in the rest of the Roman Empire.

In the former Gallic Empire, where part of the gap was filled by the issues of the Gallic emperors, their coins were copied. Throughout the rest of the empire the shortage of newly minted low value coins was

(49) P.V. Hill, op. cit. (n. 10), p. 5.
(50) R. Ziegler, op. cit. (n. 7), p. 75-77, n. 143.
(52) C.E. King, op. cit. (n. 8), p. 242, 262.
partly filled by the posthumous *Divo Claudio* issues and by copies of
these coins, which were produced on an enormous scale (54). The *Divo
Claudio* issues and their copies did enter into the area of the (former)
Gallic Empire in relatively small numbers, but in the rest of the empire
these coins had a much higher proportion in hoards and site finds (55).
On the other hand, Gallic copies (mainly Tetricus) were found on sites re-
move from the area of the (former) Gallic Empire, sites that do not yield
any regular Gallic coins (56).

During the past decade, excavations have brought to light large num-
bers of Gallic copies in North Africa and Asia Minor. In the course of
excavations by the University of Georgia in the Yasmina necropolis near
Carthago, many hundreds of radiate copies were found, all with the heads
of the Tetrads. Analysing this find, the staff members connected the cop-
ies with a break in the supply of regular coins to the area between 274
and 310 AD. Even the large coin production for Constantine I initially
could not drive the copies out of circulation in this part of North Afri-
ca (57). Site finds from Aphrodisias and Pergamon (Asia Minor) have also
yielded large numbers of Gallic copies. Anatolia probably did not receive
regular coins between 270 and 295 AD (58). The question who supplied
the Gallic copies to these areas will be dealt with later.

8. Private workshops and the concept of emergency coinage:
some problems

A theory proposing a local, private and relatively small-scale produc-
tion of radiate copies seems to be in perfect agreement with the identifi-
cation of a small number of sites as production workshops. However, if
we want to attribute the production of all copies to this kind of work-
shops, we are facing a number of problems and discrepancies. These dis-
crepancies will have to be discussed first.

8.1. Large scale production from small-scale workshops?

The huge number of recovered radiate copies seems to challenge the
attribution of the entire production to private, small-scale workshops.

(54) R. Bland and A. Burnett, *The Normandy Hoard and other Roman Coin
Hoards*, London, 1988, p. 139, 143-144.

(55) Ibidem, p. 144.


(57) Written communication to the author dated April 2, 1999 by John D. Mac
Isaac.

(58) Written communication to the author dated April 1, 1999 by David MacDonald,
working on the site finds from Aphrodisias.
The volume of production must have been enormous, as is shown by the share of copies in coin hoards, some of which are of a very large size (up to 50,000 coins and even more). The total production of copies over the years has been estimated to be at least equal to the total number of regular, official coins produced for the Gallic rulers (66). This seems plausible, judging by diagram 4 (Northern France, Belgium and Luxemburg) and 2 (Dutch River area). The size of the production is also reflected by the relatively small number of coins from identical dies even within the large hoards (66). The large number of dies evidently used in the production of copies does not necessarily indicate a large number of workshops, as it is possible that one mint or a small number of mints employed a large number of die cutters (66).

8.2. Emergency coinage from a private production?

The present hypothesis in relation to the production of radiate copies also presents a more fundamental problem. Can a decentralised, small scale, private production of radiate copies be in agreement with the character of emergency money in antiquity? The current theory states it can, but we will have to reconsider.

In modern history, emergency money has been produced by (local) authorities, but also by banks, societies and merchants (63). Modern history of emergency coinage is often taken as a point of departure in the study of ancient emergency coins. Boon (62) has drawn a parallel between modern and ancient emergency coins, comparing British copper copies from the 18th century with the radiate copies. Just like the British copper coins, originating from ‘subterranean coiners’, the radiate copies must have come from a private production.

This view of radiate copies seems to be based on anachronism. In the Roman Empire, the government minted only for its own financial purposes. Troops and officials had to be paid and a medium for tax payment had to be provided (64). Of course, these two purposes were counterbalanced by the circumstance that soldiers and officials had to spend their salaries and civilians had to obtain coins to meet their tax obligations. This pattern of buying and selling stimulated trade and economy in general. This whole cycle has been called the complementary flow of taxes and trade (65).

(59) P. Le Gentilhomme, op. cit. (n. 13), p. 41.
(60) R. Ziegler, op. cit. (n. 7), p. 80-81.
(63) G. Boon, op. cit. (n. 8), p. 117-118.
(64) J.F. Drinkwater, op. cit. (n. 22), p. 206-207.
In modern history, given a high volume of trade and a fully developed monetary economy, a coin shortage may result in the production of emergency coins ("tokens") by merchants, private companies and banks. However, in third century Gallic economy, a coin shortage most of all would have led to severe problems for the authorities, as pay for the legions would have to be provided.

8.3. The effects of coin shortage: who suffers?

Any theory placing the production of the copies in private hands fails to appreciate this absolute primacy of the government in relation to coin circulation. Any private production would have resulted in false coins, unacceptable as fulfilment of tax obligations. Furthermore, we will always have to bear in mind that privately produced emergency coins (tokens) always circulate for a limited period of time in a limited area (66). The radiate copies however circulated for a decade all over the former Gallic Empire.

It is also improbable that the authorities commissioned private workshops to carry out the actual production of copies because this would have opened the door to fraudulent surplus production of "counterfeit" copies to be spent privately by the producers.

All this seems to indicate a direct active involvement of a public authority in the production and circulation of copies.

9. Source of radiate copies: a new hypothesis

9.1. Aspects of consideration

When we try to formulate a hypothesis with regard to the origin of the radiate copies, a number of aspects and characteristics of these coins should be taken into account.

— For at least eight years (274-282 AD) radiate copies formed a generally accepted part of coin circulation. These coins were not suppressed or discriminated against (67).

(67) Discussing the Belgian sites, Lallemand (J. Lallemand, Le comportement des imitations radiées et de leurs prototypes dans les sites « belges », in P. Bastien, Fr. Dumas, H. Huvelin, C. Morrison (eds), Mélanges de numismatique, d'archéologie et d'histoire offerts à Jean Lafaurie, Paris, 1980, p. 117-123) has argued that those who concealed hoards, favoured the regular coins over the copies, resulting in a higher share for the copies in the site finds, as compared to the hoards. Nevertheless, it is noteworthy that hoards as well as site finds contain both regular coins and copies.
The copies should be regarded as emergency coinage, not as counterfeit coins. Consequently, a (local) authority would have been involved in producing and circulating the coins.

The production of copies was in all probability mass production. The main circulation areas of the copies were Northern France, Belgium and Luxemburg, the Dutch River area and also Britain. A large part of the main circulation area can be characterised as limes area.

Regular coins for the Gallic rulers are found outside the former Gallic Empire only in (very) small quantities. Radiate copies of these coins however are found in considerable quantities outside the Gallic area, for instance in Northern Africa and Asia Minor.

9.2. The army as source of production

A hypothesis that covers and interrelates these aspects and characteristics of radiate copies can now be formulated. The military authorities in charge of units in or close to the limes area were responsible for the production of radiate copies. After the closing down of the Gallic mints at Trier and Cologne, copies where produced for and probably by the army at a number of unknown locations. For want of sufficient regular coins in circulation, the copies were circulated primarily in the form of soldiers' pay. The coin shortage leading to the production was caused by a lack of new regular coins on the supply side, while on the demand side the army itself, obliged to obtain coins for payments, aggravated the shortage.

9.3. Testing the hypothesis

When we try to test this hypothesis, the five aspects and characteristics mentioned above should be interpreted and interrelated.

Having defined the radiate copies as emergency coinage, we will have to accept that a public authority will have been involved in the production. In this part of the Roman Empire and during this period, the military authorities seem to be the only plausible option. The fact that in the Roman Empire, regular coins were put into circulation primarily through the Roman army, foremost in the form of pay (68) suggests that the radiate copies were circulated through the same channel. This would explain the fact that the share of copies in the total circulation was greatest in the areas near the limes, as most of the army was deployed in this area. Also, in Britain a strong association of the copies has been noted with town defences, suggesting the possibility that the coins were struck for

(68) R. Reece, op. cit. (n. 11), p. 49, 128.
the labour force employed in the construction of the walls (*). The relatively large share of copies and regular Gallic coins in Britain could also partly be the result of continental trade on the isles, causing these coins to gravitate towards Britain (*). The fact that a considerable number of copies are found far beyond the borders of the Gallic Empire also gives support to our hypothesis. The copies would have been brought in by units transferred after 274 AD from the area of the former Gallic Empire, partly in the military chest, partly in the purses of soldiers. As the areas of destination also witnessed a coin shortage and other copies had previously found acceptance there in the form of Divo Claudio copies, the Gallic copies could also be circulated without a problem.

10. Small private workshops and « counterfeit copies »

The aspects discussed seem to fit in with the presumption that the army produced the copies. Within the framework of this hypothesis however, it seems difficult to account for the small workshops, allegedly equipped for the production of copies. In view of the enormous number of copies it is unlikely that the main production of copies was situated in this type of « mini-mints ».

In this context it is worth noting that most copies show signs of a careless production. Dies, blanks and finished coins are executed in a hasty, sketchy way. This low quality of production would probably have presented an open invitation to private persons to copy on their own account and to add privately copied coins to the general circulation by using the « private » copies as payment. Where this occurred, the private copies would have been counterfeit, not emergency money. The small workshops with traces of minting activity could hypothetically be identified as counterfeiters’ workshops, not as mints for the production of emergency coins. This identification would also make sense from another point of view. It seems peculiar to find traces of minting activity — melting furnace, bronze bullion, blanks, series of copies from the same dies (*) — in quite a number of Gallic workshops, whereas the regular minting activities of the Roman era have left us next to nothing when it comes to tools and materials from the moneyers’ trade. The few dies that were in fact recovered, were not found on a site that could be identified as a mint (*). The « counterfeit copies » option however accounts for the presence of these materials in the workshops. Official, regular coin production

(69) J.A. Davies, op. cit. (n. 16), p. 221.
was surrounded by numerous security measures. Production, storage of coin dies and administrative recording were all carried out in a meticulous way (73).

Counterfeiting however requires speed and secrecy, not exactitude. This is why we do not find traces of regular minting, but we do find the counterfeit coiners' tools and materials.

A private, counterfeit production alongside the regular production of copies would also explain the striking differences in quality between copies. The persons producing copies in the workshops at Hambacher Forst and Sarreinsming had very little professional skill, as can be inferred from the coins (74). This might indicate that the most degenerated copies could have originated from the small private workshops and were counterfeit copies, as opposed to emergency copies.

The small counterfeit workshops are concentrated around Trier (75). This suggests that the bulk of the regular copies (providing the cover for the counterfeit copies) could possibly have been produced in or near Trier. It can be noted that the official Trier mint before its closure in 274 AD had produced a large part of the regular Gallic coins. Workers of the former Trier mint could have been employed in the production of (part of) the copies.

11. Summary and conclusion

Site finds and coin hoards from Northern France, Belgium, the Rhine area and Britain usually include a considerable number of late third century radiate coins which do not fit into the regular Roman coin series. These coins are obviously copies of contemporary regular coins. The radiate copies were produced mainly between 274 and 282 AD to meet a coin shortage, setting in after the end of the autonomous Gallic Empire in 274 AD. The causes of this coin shortage, the monetary status of the copies and the origin of these coins are still under discussion and the present study focuses on these problems.

The fact that the coin reform by Aurelian in 274 AD seems to have failed in the Gallic area is often thought to have been the cause of the coin shortage: coins for Aurelian and immediate successors are rare in the area of the former Gallic Empire. However, these coins were rather scarce in all parts of the Roman Empire. During the years after the end of the Gallic Empire in 274 AD, circulation in the non-Gallic part of the Roman Empire was dominated by the coins of Gallienus (sole reign, 260-268 AD) and Claudius II (268-270 AD). After the Gallic area broke free

(73) Ibidem, p. 169, 222.
(74) H.J. Schulzki, op. cit. (n. 2), p. 36.
(75) C.E. King, op. cit. (n. 8), p. 262, map 2.
from central Roman rule in 260 AD, these coins had entered the circulation of the Gallic Empire only in limited numbers.

After the end of the Gallic Empire, the Gallienus/Claudius emissions would as yet have to be supplied to the west to provide new coinage, as no other issues were readily available.

However, the coins of Gallienus and Claudius II did not reach all areas within the former Gallic Empire in sufficient numbers until circa 280 AD. This delay was most likely caused by a number of logistical problems, discussed in this study. The present survey has shown a clear causal relation between the amount of coins for Gallienus and Claudius II that reached the separate parts of the (former) Gallic Empire and the share of copies in circulation. The shortage of coins caused by the delayed supplies was very conspicuous in the North-Western periphery of the former Gallic Empire, especially in Northern France, Belgium and Luxemburg, the Dutch River area and Britain. In these areas the shortage of coins in circulation was met by the radiate copies. In areas where the Gallienus/Claudius emissions did enter circulation early, for instance in Southern and Eastern France, radiate copies merely reached a relatively small share in circulation.

Who produced the copies and what was the status of these coins in circulation? The radiate copies are generally thought to have come from a local, small scale, private production, merely tolerated by the authorities. This assumption finds support in the discovery of what appear to be small workshops for the production of radiate copies. Traces of the production of copies were found on a number of sites of a private nature, for instance the cellar of a villa. However, a small-scale private production can be called in question. Hoards and site finds show that the copies were a fully accepted part of general circulation for more than a decade. The copies were not discriminated against or withdrawn from circulation. The fact that hardly any regular Gallic coins were found outside the former Gallic Empire, while many hundreds of copies were recovered on sites in Northern Africa or Asia Minor, also seems to contradict the notion of privately produced, tolerated coins.

Furthermore, we can raise a conceptual objection to the present notions and hypotheses concerning the production of radiate copies. A severe coin shortage is an inconvenience for all parties involved in the monetary economy. But the shortage is really harming the (local) authorities, as these were compelled to make regular payments to meet the current obligations. Any notion concerning a production by private persons, or private bodies fails to explain in what way this private production and private emission could be of any use to local authorities, hard pressed for cash. Any private production will result in counterfeit coins, and the issuer obtains a profit, injuring the receiver and the government. However, the coin shortage in the former Gallic Empire called for emergency coin-
age, and the local authorities would have taken the initiative to carry out, or at least to direct the actual production. This enabled the authorities to obtain the amount of coins needed to meet their financial obligations.

The only way to explain all aspects of the radiate copies covered in this study seems to accept a full status of emergency coinage, implying direct control of production and circulation of the copies by the local authorities. Given the situation in the former Gallic Empire, we conclude that the Roman army produced the radiate copies in the north-western part of this area. The army circulated the copies in the form of soldiers' pay.

In all probability the regular radiate copies were not produced in small private workshops, a few of which have been located. These small workshops must be held responsible for low quality counterfeit copies, produced privately and used as payment in order to obtain a private profit under the cover provided by the mass of regular emergency coins.