The Metallurgy of Roman Silver Coinage

The fineness of Roman imperial and provincial coinage has been regarded as an indicator of the broader fiscal health of the Roman empire, with the apparent gradual decline of the silver content being treated as evidence for worsening deficits and the contraction of the supply of natural resources from which the coins were made. This book explores the composition of Roman silver coinage of the first century AD, re-examining traditional interpretations in the light of an entirely new programme of analyses of the coins, which illustrates the inadequacy of many earlier analytical projects. In addition, minor and trace elements, and lead isotopes, provide evidence for the supply of materials and refining and minting technology. Sometimes this allows us to determine the origin of the metal, whether freshly mined or recycled. It can even pinpoint likely episodes of recycling old coins and, when combined with the study of hoards, hint at possible strategies of stockpiling of metal. The creation of reserves has a direct bearing on the question of the adequacy of revenues and fiscal health.

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From the Reform of Nero to the Reform of Trajan

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Preface

This project has been a long time coming to fruition. It has its origins in a study undertaken by one of the authors (KB) in 1990, part of which was subsequently published as a paper in the *Numismatic Chronicle* (Butcher 1992). This relied on the results of analyses undertaken by David Walker in the *Metrology of the Roman Silver Coinage*. Discussion between the authors about the quality of these analyses in 1992–3 led to a pilot project, which served to highlight the need for an entirely new compositional study of Roman imperial silver coinage (Butcher and Ponting 1995). Several articles have since appeared, some giving overviews, others dealing with specific problems (Butcher and Ponting 1997a; 1997b; 1998; 2005a; 2005b; 2009; 2012).

Initially it was thought that a programme of analyses would lend greater precision to an established picture of debasement and reform, and enable us to compare the silver content of imperial and provincial coinages with more confidence. We expected that trace element and lead isotope analysis would help to demonstrate an increasing reliance on recycled coinage over time, as the Roman empire began to run out of fresh supplies of silver. We did not anticipate that such a radically different picture would gradually emerge from this exercise. Our earlier papers demonstrated that there was a significant discrepancy between the real silver content of the coins and the figures commonly cited for the debasements, and showed that Roman mints had deliberately disguised the extent of debasement by artificially enhancing the silvery surfaces of the coins; but these early discoveries did not challenge the basic narrative of Roman imperial monetary history as one of almost continuous decline in fineness from the reign of Nero onwards. Gradually, however, it became apparent that there was a substantial difference between the standard history of Roman coinage and what our results were telling us. Important reforms had been misdated; or, even more surprisingly, some major points of change cited in the scholarly literature proved to be complete phantoms, generated by a mass of inadequate data. For the first century (the period covered by the present volume) the discrepancies were not too significant, but for the period between the reign of Trajan and the

debasement of Septimius Severus in AD 194 an entirely unfamiliar landscape emerged (overview in Butcher and Ponting 2012). While we can now map that landscape with some confidence, currently we have no clear indication of what was happening to the silver coinage between AD 194 and *c.* AD 250, the period leading up to what is generally regarded as the third-century 'collapse' of the coinage. We know that there were debasements, but *when* these occurred, how many debasements there were, and how significant each debasement was, we cannot say for certain. At the time of writing, we are in the process of applying for funding to explore this hidden territory, in the hope that the character of the decline in the silver content of Roman coinage can be mapped in its entirety.

Several earlier investigations into the fineness of Roman imperial silver coinage have tried to identify the 'tipping point' when the slide towards currency collapse became irreversible. This 'point of no return' has been variously identified as the reform of Nero *c.* AD 64, the reduction in silver content under Domitian in AD 85, the reform of Trajan (misdated to AD 107, but actually occurring in AD 99–100), or the alleged reductions in silver content under Marcus Aurelius (AD 161 and after). We have not attempted to identify any point of change presented in this volume as such, and it is not clear why any debasement must necessarily lead inexorably towards currency collapse (if indeed it truly was a collapse) rather than currency restoration. Why currency restorations were rare, and why (or indeed whether) debasement was tolerated by the general public, are certainly questions worth exploring. It would, however, be premature to present any of the conclusions drawn in this volume as the final word on the subject. At the end of this volume may be found a short chapter that summarises the conclusions, but it should be understood that the interpretations are provisional. Further work on the later coinages may modify the thoughts presented here.

Much is said about weight and fineness, and about composition, in the pages that follow. Those readers used to calculating fineness in terms of weight of silver may find the occasional lack of absolute certainty in this matter frustrating, but complete precision on such a point is impossible. That would require us having the coins in the state in which they were originally issued, which we do not. Corrosion during centuries of burial and further leaching of copper salts during cleaning ensure that those coins that have come down to us are no longer mint state, however fresh their appearance (besides, the method of manufacture of coins made of silver-copper alloys introduced slight but random changes to their weights before

they were even struck). The use of these silver-copper alloys for disguising the underlying quality of the metal worked well for ancient issuing authorities, and it is a tribute to the success of this simple technique for enhancing the surfaces of the coins that the real fineness of Roman silver coinage has eluded us for so long.

The book catalogues the results for 1,136 coins, comprising both imperial denarii and provincial silver denominations. We have not felt it necessary to include photographs of the coins, except in those cases where the classification seems uncertain (in this case, for coins of the Civil Wars of AD 68–69 attributed to mints in Spain and Gaul). The photographs are those that we have taken ourselves, or that have been provided courtesy of the British Museum's free image service. Many of the coins analysed can be seen via the project pages on the Archaeology Data Service (http://archaeologydataservice.ac.uk/archives/view/coins_lt_2005/).

The focus of this volume is on the period from Nero to Trajan, but readers will note that there are also sections devoted to earlier coins, particularly the issues of Julio-Claudian emperors before Nero, and ranging back in time to Julius Caesar, who here is credited with creating the system of precious metal denominations (an act usually attributed to Augustus). A reader might therefore wonder why we have not cast our net wider, beginning our programme of analyses with Caesar instead of Nero. One reason is entirely practical. Originally we had planned to begin with later Republican denarii, the last coinages of the Seleucids and Ptolemies and the eastern provincial issues of the first century BC, but gaining access to much of the material of that period proved impossible. In future we may be able to address the coinage of that period, which probably hides as many surprises as the post-Neronian coinage, but that will require access to the relevant material, which currently lies beyond our reach.

Given the difficulties of accessing pre-Neronian coins for sampling, the reform of Nero is a logical place to begin the story of Roman imperial silver. It marks the introduction of the silver-copper alloy for the denarius, after a long period when the denomination had been made of pure silver, and the introduction of a new weight standard that was to persist until at least Severan times. It also marks a kind of watershed in hoarding patterns, as will be seen in the pages that follow. And finally, it seems to mark the beginning of a prolonged phase of recycling of older coins, which ended only when almost all pre-Neronian denarii had been eliminated from the circulation pool. The Neronian denarius set the standard for the silver coinage of the High Roman Empire.

We have not set out to provide a comprehensive, final explanation for all the features observed here, and we regard our current interpretations of the evidence as interim. It is to be hoped that our data will provide material for further thought and debate about the nature of Roman silver coinage, and ancient coinage in general.