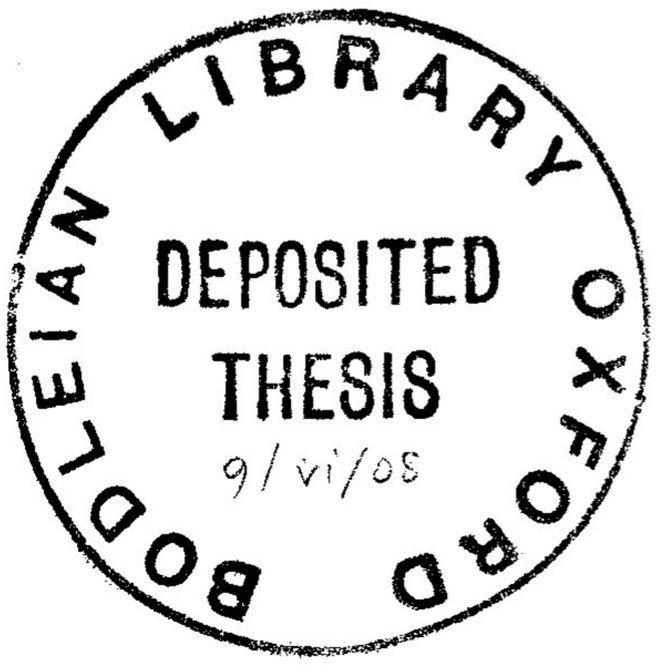
Monetary Expansion in Britain in the Late Twelfth Century

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Thesis submitted in fulfilment of the requirements for the degree of Doctor of Philosophy

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ABSTRACT (I)

Monetary Expansion in Britain in the Late Twelfth Century
Timothy Charles Reginald Crafter (St John's College, Oxford)
Thesis submitted for the degree of Doctor of Philosophy, Michaelmas Term 2007

The thesis is conceived as a contribution to the quantification of the monetary expansion that occurred in Britain *c.*1150–*c.*1200. The increased money supply facilitated developments in commerce and was connected with increasing population and urbanisation. Changes in the monetary system and the source of bullion are examined. This thesis draws upon a range of previously unpublished numismatic material that is collated and catalogued for the first time, and which is subjected to analytical techniques.

It is known that monetary expansion occurred on a large scale in the thirteenth century and it is here suggested that the increase began on a comparatively modest scale in England during the Cross and Crosslets coinage (1158–1180) and in Scotland during the Crescents coinage (*c.*1170–1195). The English coinage is considered through primary evidence of a die-study of the Northampton mint and the content of the Gayton hoard (1998–9) in conjunction and comparison with other published information. The Scottish coinage is subjected to comprehensive investigation by die-study to provide the first analysis of the structure and internal chronology of the coinage, which is prerequisite to understanding the extent of monetary expansion.

The thesis provides the first investigation of the alloy of late twelfth-century coins using Electron Probe Mircoanalysis (EPMA). The data demonstrates that alloy content varied by region and that the contribution of bullion from the 'mine of Carlisle' had only a peripheral influence on monetary expansion. EPMA data is compared with evidence from the *Dialogus de Scaccario.* Metallurgical analysis indicates that monetary expansion occurred in Scotland in the late twelfth century when coinage, functioning as a standardised means of exchange, became more useful than wealth stored in stocks of bullion; it was not specifically caused by a local argentiferous discovery. Trace elements in the alloy of Scottish coins indicate that some bullion utilised for coinage had been in Scotland since the Viking Age, and had originated from Samanid Central Asia.

100,000 words

ABSTRACT (II)

Monetary Expansion in Britain in the Late Twelfth Century
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The thesis is conceived as a contribution to the quantification of the monetary expansion that occurred in Britain *c.*1150–*c.*1200. The increased money supply facilitated developments in commerce and occurred during a long-term increase in population. The increasing availability of money allowed a proportion of the population to engage in non-agrarian production, frequently within an urban setting. Consequently, commercialisation was paralleled by the physical growth of the towns. Contemporaneously with the growth in money supply, the late Anglo-Saxon monetary system of frequent periodic recoinages was abandoned. Whether this was an act of policy or a reaction to circumstances is explored. The coinages of Britain in the late twelfth century had an intrinsic value, and, since the government did not resort to debasement, growth in the volume of coinage required the augmentation of the amount of bullion used for and circulating as coinage. Evidence is surveyed that suggests that trade between Britain and the Low Countries, principally in wool, brought 'new' silver, principally from Germany, which allowed monetary expansion. The thesis suggests that monetary expansion, though it continued in the thirteenth century, was embryonic in England during the Cross and Crosslets coinage (1158–1180) and in Scotland during the Crescents coinage (*c.*1170–1195). The extremely poor standard of production of coinage in the late twelfth century, together with the fact that the material is scattered in institutional and private collections, has served to obscure the importance of the period by obstructing the garnering of sufficient data. This thesis draws upon a range of previously unpublished numismatic material that is collated and catalogued for the first time, and which is subjected to analytical techniques.

The Cross and Crosslets coinage (1158–1180) of Henry II of England (1154–1189) is examined by volume of the coinage produced during the recoinage period during Class A (1158–1163). A complete die-study of Northampton examines the activities of moneyers during Class A and indicates that they were subsequently engaged in some extraordinary mint activity 1164×1174. Close inspection of the extant coins has revealed that the moneyers in the borough of Northampton used different techniques to address the deterioration of their dies. The data from the Northampton mint die-study and that of other published die-studies is compared with previous estimates for the number of dies used in Classes A and C in order to examine the appropriateness of earlier estimates for the potential output during the English recoinages. The Gayton hoard (1998–9) provides valuable new evidence for the composition of the English coinage during the period in which it was deposited (*c.*1174–*c.*1180). The content of this hoard is compared with that of other well-recorded hoards to improve understanding of the behaviour of the English coinage between 1158 and 1180. The content of hoards is analysed by geographical location of mints and representation of classes. The hoards suggest the prominence of mints in the south east region and of Class F to a greater extent than one would anticipate using a model based on Allen's estimates for the number of reverse dies. Some possible explanations for the predominance of Canterbury mint coins are explored, particularly in relation to the money-lending activities of moneyers and the invasiveness of the royal government in affairs at Canterbury in the 1170s.

The Crescents coinage (*c.*1170–1195) of William I of Scotland (1165–1214) is considered in its entirety by die-study. The structure of the coinage is revealed; the primary data is the first attempt to catalogue all available extant specimens, which are organised as a die-corpus. Dies are used in various combinations and the conjunction of two dies to produce a single coin is evidence that the two dies were in the same location at the same time. The structure of the

Scottish coinage is expressed in the form of a new classification system for Crescents sterlings, derived from principles of die-links and surface reduction of dies, a contemporary technique of die-renovation. Die-links are presented using a new method of 'Chart Indices', which it is hoped renders the structure of the coinage more intelligible than methods hitherto employed. The number of dies is estimated with a 95% confidence interval, separately for each class and for each mint. Metrological data is considered for the first time from a substantial body of evidence. It is perhaps possible that the Scottish coinage was distinguished from English standards to a degree hitherto unappreciated. The coinages of England and Scotland had an intrinsic parity, but Scottish coins were probably maintained on heavier, pennyweight standard and the alloy debased accordingly. The intrinsic nature of the Scottish coins suggests that in the twelfth century the Scottish exchequer, of which we possess no documentary evidence, was not blanching shire farms. Moreover, the recoinage of 1195 may have been part of an attempt to align the intrinsic standard of the Scottish coinage with that of England, and, along with a series of administrative reforms in the royal government, the Scottish Exchequer may have moved to a system of blanching, because of weight and fineness changes. The largely defective hoard evidence is considered. Single-find evidence is examined, where much of the evidence is archaeological, and suggests the geographical extent and context of the circulation of Crescents sterlings. From the estimated number of dies, the volume of the coinage is estimated to have been £8,000–£16,000. From the structural classification, an internal chronology is proposed, which provides new evidence for the effects of the settlement of Falaise (1174).

This thesis examines the causes of monetary expansion in the late twelfth century by using Electron Probe Mircoanalysis (EPMA) to investigate the composition of the alloy of surviving coins. The data concerning the alloy is also compared with the contemporary evidence for the handling of coins in the English exchequer as described in the *Dialogus de Scaccario*. Monetary expansion in the Middle Ages involved the production of new coins, which necessarily required that metal was available, either as stocks of uncoined bullion or from new argentiferous discoveries. The metallurgical data demonstrates that moneyers of the late twelfth century were creating an alloy suitable for coinage by debasing purified silver with copper; the Anglo-Saxon practice of alloying with brass (copper + zinc) had been abandoned. Accordingly, zinc is used as diagnostic element, along with gold and bismuth. Relatively quantities of trace elements, such as gold, zinc and bismuth, are crucial for identifying the probably source of bullion. Clear regional variation between the alloys, considered together with evidence for the composition of the currency provided by the Gayton hoard, indicates that bullion from the 'mine of Carlisle' did not greatly contribute to monetary expansion in Britain. Moreover, EPMA data indicates that bullion from the 'mine of Carlisle' had only a peripheral influence on Scottish coinage. Trace elements in the alloy indicate that Scottish coins were made from bullion that had been in Scotland since the Viking Age and which had originated from mines in Samanid Central Asia. Metallurgical analysis indicates that monetary expansion occurred in Scotland in the late twelfth century when coinage, functioning as a standardised means of exchange, became more useful than wealth stored in stocks of bullion; it was not specifically caused by a local argentiferous discovery.

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PREFACE

Despite an abundant scholarly literature, the coinage of Britain in the late twelfth century remains an astonishingly under-researched subject. Comprehensive analytical work has been hindered by a combination of the daunting condition and widespread dispersal of material.

During the late nineteenth century and the twentieth century numismatics emerged from its origins as the preserve of antiquarians, a change due in large part to many of those who were prominent in the British numismatic fraternity.[1] Owing to their labours numismatics won respect and recognition as a disciplined science of historical scholarship. However, without comprehensive analytical studies numismatists were apt to draw erroneous conclusions from imperfect samples and the temptation to systematise monetary history according to preconceived theories was ever present.

Instead of stimulating further detailed research in confirmation or refutation, certain concepts have penetrated deeply into the literature and thinking of medieval numismatics and have won the status of unquestioned orthodoxy.[2] Some of the most obvious and important aspects of late twelfth-century coins, such as analysis of metallurgical composition by empirical methods, have never been studied at all. The ultimate production of this tradition is the 350 pages of volume 2 of Ian Blanchard's, *Mining, Metallurgy and Minting in the Middle Ages*, vol. 2, *Afro-European Supremacy, 1125–1225* (Stuttgart: 2001), a book whose spectacular marriage of traditional misunderstanding with original fantasy has put it beyond the reach of ordinary criticism.[3] This thesis aims to contribute to the current debate about the growth in medieval money supply through analytical and, where necessary, structural work on coinages minted in Britain in the late twelfth century. The approach adopted aims to be

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[1] I. Stewart, 'Lawrence and his successors', *BNJ* 73 (2003), pp. 98–106; also I. Stewart, 'Edward Burns', *BNJ* 57 (1987), pp. 89–98.

[2] Lord Stewarby, 'English numismatics – progress and prospects', *BNJ* 58 (1988), pp. 110–22, at p. 120.

[3] See review by M. Allen, *English Historical Review*, 118 (September 2003), pp. 1037–8; there is a review by N.J. Mayhew, *Business History*, 45 no. 4 (October 2003), pp. 139–40. See also below pp. 147, 157 note 24, 159, 170, 175, 218 note 153, 241–2 and 248.

methodical and without preconception in order that the evidence provided by numismatic material, whether singularly or as a whole, may address the issue.

The thesis deals as much with England as with Scotland. Out of courtesy, I have therefore chosen to acknowledge the differences that now exist between the two countries when employing descriptive terms in their respective contexts. For example, I use 'penny' and 'sergeant' in an English context and 'sterling' and 'serjeant' in a Scottish context. Coin legends are printed using the special font *Inscription Numismatic* (© Fitzwilliam Museum, Cambridge) which provides standardised epigraphical forms. The abbreviations for page (p. and pp.) have been maintained throughout for clarity, because reference is often additionally made to number (no.), plate (pl.), and figure (fig.).

As a technical science, numismatics has is own precise descriptive terminology, which the non-specialist may find unusual. A glossary of terms is included.

The plates have been designed to illustrate all major varieties in the coinages covered by this thesis. For the Gayton hoard, a representative sample is illustrated to show the typical condition of specimens, with an emphasis on significant individual coins. Examples of all dies are illustrated from the catalogues of the Northampton mint and Crescents sterlings. The images have been drawn from a wide range of sources and this has inevitably produced some unevenness in sharpness and tone, which I hope will nonetheless be accepted. All coins are illustrated at natural size except illustrations 5–11 on Plate 1, which are twice natural size.

As I complete this thesis, my first words of gratitude must go to the Board of Management of the Pirie-Reid Fund. I express my appreciation for the opportunity to hold my Pirie-Reid Scholarship, without which I would not have been able to pursue the studies that have culminated in this thesis.

My greatest personal debts are to Professor Nicholas Mayhew and to Lord Stewartby. Professor Mayhew has been unfailing in his support since he first agreed to supervise my academic work in 2002. I thank Professor Mayhew for his interest in directing my thoughts on many issues to profitable outcomes and for his assistance at the moments of crisis that inevitably occur in a project of this magnitude. The analytical work on the coinage of late

twelfth-century Scotland contained in this thesis was only possible with the generous help of Lord Stewartby. For over six years Lord Stewartby made his unrivalled collection of Scottish Crescents sterlings available for study and incorporation into my Catalogue, first at the Fitzwilliam Museum, Cambridge, and latterly at the Ashmolean Museum, Oxford. My knowledge of the issues to be addressed for Scotland would have been immeasurably poorer without Lord Stewartby's assistance, advice and kindness.

Nicholas Holmes of the National Museums of Scotland has been a tireless correspondent on countless details and has patiently answered even my most perplexing enquiries. The hospitality extended by Mr Holmes during my various trips to Edinburgh to examine the Crescents sterlings greatly enhanced the pleasures of my numismatic research.

The synthesis of such a corpus of material derived from diverse sources can only be completed with the co-operation and diligent help of a large number of museum curators. That has been readily forthcoming for which I am most grateful.

It is a pleasure to acknowledge the courteously supplied images or other details of the Crescents sterlings in their care. The museums where information was sought, and the persons who supplied it, were at Aberdeen Art Gallery and Museums (Stewart Thain); Aberdeen University: Marischal Museum (Neil Curtis); Birmingham City Museum (Dr David Symons); Cambridge: Fitzwilliam Museum (Dr Mark Blackburn and Dr Martin Allen); Cardiff: National Museum and Galleries of Wales (Edward Besly); Copenhagen: National Museum of Denmark (Dr Jens-Christian Moesgaard); Dundee: McManus Galleries (Adrian Zealand); Edinburgh: HBOS plc Group Archives (Helen Redmond-Cooper and Sian Yates); Glasgow: Collins Gallery (Laura Hamilton); Glasgow: Hunterian Museum (Dr Donal Bateson); Hawick Museum (Shona Sinclair); Inverness Museum and Art Gallery (Patricia Weeks); Llantrisant: Royal Mint Museum (Dr Kevin Clancy); London: The British Museum (Dr Barrie Cook); Montrose Museum and Art Gallery (Rachel Benvie); Naas, Republic of Ireland: Clongowes College (Margaret Doyle); The Society of Antiquaries of Newcastle upon Tyne (A.E. Gilmour); Oslo: University Museum of Cultural Heritage (L-A. Chepstow-Lusty); Paisley Museum and Art Galleries (David A. Roberts and Susan Jeffery); Perth Museum and Art

Gallery (Mark Hall); Stranraer Museum (John Pickin); Scottish Borders Council Museum Service (Rosemary Hannay and Finlay McDermid); York: Yorkshire Museum (Craig Barclay). I also thank other curators who kindly checked the collections in their care, but without finding any relevant material.

Dr Volker Haukert facilitated access to the Gayton hoard and Crescents sterlings at the Ashmolean Museum, Oxford, during the decant of the Heberden Coin Room ahead of the redevelopment of the museum.

The Northampton mint corpus was constructed with the help of Jacqueline Minchinton (Northampton Museum and Art Gallery) and the private collectors Alan Dawson, Christopher Glazebrook and Lord Stewartby.

Dr J.P. Northover of Oxford University's Department of Materials undertook the Electron Probe Microanalysis. The analysis was supported by generous subventions from the Hunter Archaeological Trust, The Society of Antiquaries of Scotland, The Society of Antiquaries of Newcastle upon Tyne, and the Arnold Fund of Oxford University's Faculty of Modern History.

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ABBREVIATIONS USED

Allen, 'Hoards'	M. Allen, 'English coin hoards, 1158–1544', *BNJ* 72 (2002), pp. 24–88.
Amt, *Accession of Henry II*	E. Amt, *The Accession of Henry II in England: Royal Government Restored, 1149–1159* (Woodbridge: 1993).
Barratt, 'Finance and the economy'	N. Barratt, 'Finance and the economy in the reign of Henry II', *Henry II: New Interpretations*, ed. C. Harper-Bill and N. Vincent (Woodbridge: 2007), pp. 242–56.
BNJ	*British Numismatic Journal.*
BMC / BMC Henry II	D.F. Allen, *Catalogue of English Coins in the British Museum: The Cross-and-Crosslets ('Tealby') Type of Henry II* (London: 1951) Following standard practice, when specimens are cited the prefix is simply *BMC*, when cited as argument the reference is *BMC Henry II*.
Burns, *Coinage*	E. Burns, *The Coinage of Scotland*, 3 vols. (Edinburgh: 1887).
CIMS	D.M. Metcalf (ed.), *Coinage in Medieval Scotland (1100-1600)*, British Archaeological Reports no. 45 (1977).
Crafter, 'Re-examination'	T.C.R. Crafter, 'A re-examination of the classification and chronology of the Cross-and-crosslets type of Henry II', *BNJ* 68 (1998), pp. 42–63.
Dialogus	Richard fitz Nigel, *Dialogus de Scaccario: The Course of the Exchequer and Constitutio Domus Regis: The Establishment of the Royal Household*, ed. and trans. C. Johnson, F. E. L. Carter, and D. E. Greenway (Oxford: 1983).
EMCH	M.M. Archibald and B.J. Cook, *English Medieval Coin Hoards: I, Cross-and-Crosslets, Short-Cross and Long-Cross Hoards* (British Museum Occasional Paper 87) (London: 2001).
FEJ Photographs	*Photographs of Coins from the F. Elmore-Jones Collection* (London: 1983).
NC	*Numismatic Chronicle.*
PSAS	*Proceedings of the Society of Antiquaries of Scotland.*
Richardson, *Catalogue*	A.B. Richardson, *Catalogue of the Scottish Coins in the National Museum of Antiquities Edinburgh* (Edinburgh: 1901).
RRS I (Malcolm IV)	*Regesta Regum Scottorum* I: *The Acts of Malcolm IV, King of Scots 1153–1165*, ed. G. W. S. Barrow (Edinburgh: 1960).
RRS II (William I)	*Regesta Regum Scottorum* II: *The Acts of William I, King of Scots 1165–1214*, ed. G. W. S. Barrow (Edinburgh: 1971).

SCBI	*Sylloge of Coins of the British Isles.* Volumes at cited by number, the collection name following in brackets. For full details of separate volumes used, see the bibliography under '*SCBI*'.
Stewart , 'Scottish mints'	Stewart, I., 'Scottish mints', *Mints, Dies and Currency*, ed. R.A.G. Carson (London: 1971), pp. 165–289.
Inventory	J.D.A. Thompson, *Inventory of British Coin Hoards A.D. 600-1500* (London: 1956).
White, *Restoration and Reform*	G.J. White, *Restoration and Reform 1153–1165: Recovery from Civil War in England* (Cambridge: 2000).

1. The context of monetary expansion

Expansion was the principal theme of the economy of Britain between the late twelfth century and the Black Death. The surging economy during this period is implied by a parallel increase in population, the growth-rate of which has been vigorously disputed.[1] The economic expansion had a physical manifestation, for the limits of human settlement were extended and marginal lands were brought under cultivation. No significant technological innovation occurred during this period and therefore more agricultural land was required in to order to feed an increasing population.[2]

By the thirteenth century population growth was accompanied by developments in commerce and the thirteenth-century economic experience is sometimes referred to by the phrase 'commercial revolution'. More individuals were occupied in making or trading specific, non-agrarian products predominantly manufactured in towns based around established markets. It is important, however, to be aware that the expansion in commercial activity during these generations does not necessarily imply that the population as a whole became progressively more prosperous. The peasantry attempted to supply the main necessities of life from their own lands; the sale of surpluses produced money incomes, some of which could be used to purchase basic wares and utensils. The non-agrarian and urban elements of the economy were, in large measure, sustained by agricultural surpluses produced by the greater numbers of people engaged in farming an increasing amount of land. The various craft-occupations and trading opportunities in towns could also potentially absorb

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[1] For the population of Domesday England see J.S. Moore, ' "Quot homines?" The population of Domesday England', *Anglo-Norman Studies* 19 (1996), pp. 307–34. The estimates of population between Domesday and the Black Death vary considerably, but all commentators are in general agreement that it increased; the population might have more than doubled, but somewhat less than quadrupled. See R. Smith, 'Human resources', in *Countryside of Medieval England*, ed. G. Astill and A. Grant (Oxford: 1988), pp. 188–212; B.M.S. Campbell, *English Seigniorial Agriculture, 1250–1450* (Cambridge: 2000), pp. 346–410. For Scotland see I. Whyte, *Scotland before the Industrial Revolution, An Economic and Social History* c.*1050*–c.*1700* (London: 1995), pp. 38–40.

[2] The sustainability and productivity of medieval agriculture is explored by M.K. Jones, 'Agricultural productivity in the pre-documentary past', in *Land, Labour and Livestock, Historical Studies in European Agricultural Productivity*, ed. B.M.S. Campbell and M. Overton (Manchester: 1991), pp. 78–94; J.N. Pretty, 'Sustainable Agriculture in the Middle Ages: the English Manor', *Agricultural History Review* 38 (1990), pp. 1–19.

superfluous rural manpower. Moreover, trade, whether in agricultural surpluses or commercial goods, not only presupposes demand, but requires producers to have access to markets and the access to a means of exchange.[3] Although goods and services may be exchanged by barter, such a process is bound to be slow and cumbersome. In the medieval period coins provided the dominant and much preferred means of exchange; unlike in a modern economy, 'coins' and 'money' were largely synonymous. (For credit, and its relation to the supply of coins, see below pp. 24–5.)

The importance of an increase in money supply for the medieval commercialisation has now been accepted by the foremost historians of the medieval economy.[4] A leading monetary historian regards the commercial revolution as a result of a combination of an increase in the volume of money, growth in credit and the changes in coin production.[5] However, commercialisation is a complex concept and the growth in money supply is one contributory factor among many.[6]

If commercialisation was made possible in Britain by an increase in money supply in the late twelfth century, underpinned by population growth and greater agricultural production, one might expect it to have been generated from a long period of uninterrupted economic strength. By the 1150s the areas of Scotland ruled by the Canmore kings were relatively stable and had prospered under King David I (1124–1153).[7] England, however, had just emerged from civil war. The extent to which the economic condition of England in the late twelfth century was retarded by lasting effects of the civil war during the reign of King Stephen

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[3] The importance of the rural surroundings of towns has been emphasised by J. Masschaele, *Peasants, Merchants and Markets: Inland trade in Medieval England, 1150–1350* (New York: 1997).

[4] R.H. Britnell, 'Commercialisation and economic development in England', in *A Commercialising Economy*, ed. R.H. Britnell and Campbell, pp. 12–14; E. Miller and J. Hatcher, *Medieval England: Towns, Commerce and Crafts* (London: 1995), pp. 396–7.

[5] P. Spufford, 'Le rôle de la monnaie dans la revolution commerciale du XIII[e] siècle', in *Études d'Histoire Monétaire*, ed. J. Day (Lille: 1984), pp. 355–95. For the most recent work on credit and a comprehensive bibliography at the date of publication see P.R. Schofield and N.J. Mayhew, *Credit and Debt in Medieval England, c.1180–c.1350* (Oxford: 2002).

[6] A critical analysis of the concept of commercialisation in medieval England is provided by J. Hatcher and M. Bailey, *Modelling the Middle Ages: the History and Theory of England's Economic Development* (Oxford: 2000), ch. 4. The literature is reviewed by M. Bailey, 'The commercialisation of the English economy, 1086–1300', *Journal of Medieval History* 24 (1998), pp. 297–311.

[7] For a comprehensive survey of the reign see A.A.M. Duncan, *Scotland: The Making of the Kingdom* (Edinburgh: 1975), pp. 133–73 and R. R. Oram, *David I: The King Who Made Scotland* (Stroud: 2004).

(1135–1154) remains difficult to assess. Chronicles do not provide comprehensive or easily quantifiable information on the spoliation inflicted by the warring parties.

In the absence of Pipe Rolls from Stephen's reign, attempts to quantify physical devastation have focused on figures for 'waste' (*wastum*) in entries for the danegeld of 1155–6. H.W.C. Davis suggested that the amount of waste in 'figures for the danegeld in each shire gives a test by which to compare the sufferings of the various shires'.[8] Davis's interpretation was widely accepted until the 1980s when scholars engaged in renewed examination of the evidence in the Pipe Rolls. Judith Green suggested that if entries for waste did not attest to physical devastation some perhaps arose 'through disputes over liability'.[9] In a series of writings Graeme White has consistently argued that administrative structures were not seriously impaired during Stephen's reign.[10] On the specific issue of the meaning of waste in the Pipe Rolls, White has suggested that the entries were at least partially an administrative response to problems in collecting the danegeld and emphasised that the exchequer 'was prepared to exercise discretion in the handling of accounts'.[11] However, Emilie Amt has defended Davis's proposition that waste entries are testimony to physical devastation and no consensus has been reached.[12]

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[8] H.W.C. Davis, 'The anarchy of Stephen's reign', *English Historical Review* 18 (1903), 630–41 at p. 630.

[9] J. Green, 'The last century of danegeld', *English Historical Review* 96 (1981), pp. 241–58, at p. 252.

[10] Graeme White has consistently argued that although Henry II presented his government as a return to Henry I, he owed much to the administrative foundations he inherited from Stephen. G. White, 'Continuity in government', in *The Anarchy of King Stephen's Reign*, ed. E. King (Oxford: 1994), pp. 117–143; *Restoration and Reform*, Chapter 2 'The governance of England during Stephen's reign'. White has suggested that the description of Stephen's reign as 'the Anarchy' emerged in the vocabulary of historians in the late nineteenth-century and owed much to contemporary politics; see G.J. White, 'The myth of the Anarchy', *Anglo-Norman Studies* 22 (2000), pp. 323–37 and *Restoration and Reform*, pp. 12–13.

[11] White, *Restoration and Reform*, p. 157. White's 'administrative explanation' of entries concerning 'waste' is based on two detailed, geographically defined studies. G. White, 'Were the Midlands 'Wasted' during Stephen's Reign', *Midland History* 10 (1985), pp. 26–46. G. White, 'Damage and 'waste' in Yorkshire and the North Midlands in the reign of Stephen', in *Government, Religion and Society in Northern England 1000–1700*, ed. J.C. Appleby and P. Dalton (Stroud: 1997), pp. 63–76.

[12] E. Amt, 'The meaning of waste in the early Pipe Rolls of Henry II', *Economic History Review* 44:2 (1991), pp. 240–48.

1.1 Towns and trade

Towns were not a new phenomenon in England in the late twelfth century, but there is some evidence that towns were physically growing as a consequence of both population growth and migration.[13] Between 1086 and 1300 the urban population in England may perhaps have increased from approximately one-tenth to approximately one-fifth of the whole population.[14] Even small settlements could have an urban character, such that distinction between town and village is sometimes difficult, but the prevalence of urbanised populations suggests that the growth of towns and commercialisation was ubiquitous.[15]

Many of the individuals who lived in towns were engaged non-agrarian occupations. It would be wrong to assume, however, that labourers became more specialised in the twelfth and thirteenth centuries or that non-agrarian tasks were exclusive to the town-dwelling population. R. H. Britnell has suggested that 'differentiation' is a preferable term to 'specialisation' for the largely opportunist workers engaged in non-agrarian tasks, which were also a feature of many manors in the twelfth century.[16] However, the individuals linked to manors probably had greater security of tenure than an increased urban population working for profit or wages. Workers involved in non-agrarian productions in towns relied on the continued availability of provisions for purchase and such a life had potential risks. Britnell has emphasised the transitory nature of skilled employment in the twelfth and thirteenth

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[13] E. Miller and J. Hatcher, *Medieval England: Towns, Commerce and Crafts*, (London: 1995), pp. 264–68, on the difficulties of quantifying the scale of urbanisation see pp. 274–99. D. Palliser (ed.), *The Cambridge Urban History of Britain* (Cambridge: 2000) provides a comprehensive overview of every aspect of towns. Other surveys include H. Swanson, *Medieval British Towns* (Basingstoke: 1999). On the general trend of increasing population see note 1 above.

[14] C. Dyer, 'How urbanised was medieval England?', in *Peasants and Townsmen in Medieval England*, ed. J. M. Duvosquel and E. Thoen (Ghent: 1995), pp. 169–183, at pp. 173, 177.

[15] On the problems of defining 'town' and 'urban' in medieval England, see R. Holt and G. Rosser (eds.), *The English Medieval Town, A Reader in English Urban History, 1250–1540* (London: 1990), pp. 1–10. On small and large towns see R.H. Hilton, 'Small town society in England before the Black Death', *Past and Present* 105 (1984), pp. 53–78; J. Laughton and C. Dyer, 'Small towns in the East and West Midlands in the Later Middle Ages: A comparison', *Midland History* 24 (1999), pp. 24–52. The character of medieval urban topography is explored by T. Slater, 'Ideal and reality in English Episcopal medieval town planning', *Transactions of the British Institute of Geographers*, new series, 12 (1987), pp. 191–203.

[16] R.H. Britnell, 'Specialisation of work in England', *Economic History Review* 54:1 (February 2001), pp. 1–16, at p. 14; P.D.A. Harvey, 'Non-agrarian activities in twelfth- century English estate surveys', in *England in the Twelfth Century: proceedings of the 1988 Harlaxton Symposium*, ed. D. Williams (Woodbridge: 1990), pp. 101–11.

centuries, when unemployment and destitution was ever imminent.[17] Wage-labourers needed to hold enough money to obtain provisions when they were available, but shortages might have occurred if weather seriously affected crop yields or diseases devastated livestock. We might expect that demographic pressure on food supply to be demonstrable by falls in real wages or real wage incomes, but the evidence is unfortunately deficient. Paul Latimer examined the evidence for wages in detail and concluded that 'evidence for wage rates before 1250 cannot be justifiably used to help construct a model of price changes'.[18]

Demographic pressure on food supply is suggested by the ascendancy of the ox and marginalisation of the afer in the late twelfth century. The advance of the ox illustrates the complex interplay between changes in population, production and land-use. Walter of Henley, writing in the thirteenth century, considered the ox preferable to the afer, because of its lower feeding costs and greater carcass value.[19] Farmer observed that the price of oxen exceeded the price of afers from the 1180s and suggested that the long-term comparative price movement was indicative of contemporary realisation that the ox was more profitable.[20] Therefore, it may be suggested that oxen supplanted afers due to the scarcity of fodder that resulted from the vigorous development of marginal lands and the enhanced value of foodstuffs for an expanding population in the late twelfth century.

Access to markets, whether local or regional, in which different goods were in demand was important for the prosperity of towns, and the geographical situation of individual towns might make a considerable difference to expansion. Transporting goods by water was considerably easier than on land, but there was also variation within water-borne transport. A comprehensive survey of the movement of goods by water in medieval England has estimated

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[17] R.H. Britnell, 'Specialisation of work in England', *Economic History Review* 54:1 (February 2001), pp. 1–16, at pp. 10–11.
[18] P. Latimer, 'Wages in late twelfth- and early thirteenth-century England', *Haskins Society Journal* 9 (1997), pp. 185–205; quote from p. 205.
[19] Walter of Henley, *Husbandry*, chapters 39–41, in D. Oschinsky, *Walter of Henley and Other Treaties on Estate Management and Accounting* (Oxford: 1971), pp. 318–9.
[20] D.L. Farmer, 'Some price fluctuations in medieval England', *Economic History Review* 9:1 (1956), pp. 34–43 at p. 41.

that riverine transport was twice as expensive as coastal transport.[21] Transport on land was considerably more expensive than shipping goods by river and sea, but was undertaken where geography made it necessary. For example, when the government bought and sent provisions to Ireland 1170–72, the cost of hiring of ships to transport 900 sums of agrarian produce and 200 flitches of bacon from Worcester to Ireland was £4 6*s* 10*d*, which compares favourably with 44*s* 10*d* for hiring carts to carry one hundred sums of wheat from Oxford to Bristol for onward transportation.[22] Although inland towns might engage in particular industries linked to local geology, such as mining or pottery, it is reasonable to assume that coastal towns were likely to benefit from increases in commerce, but in summative effect, the particular situation of each town governed the precise nature and extent of development. (The importance of overseas trade for the importation of 'new' silver to monetary expansion is dealt with in §1.4, below).

Towns such as Boston and Bishop's (later King's) Lynn emphatically owed their growth to the prospects of involvement in maritime trade and both were developed on manorial lands of magnates, who profited from them. The growth of Lynn was actively encouraged by the Bishop of Norwich who granted settlers 'new land' north of the original manor of Gaywood in the mid twelfth century.[23] Boston emerged from a manor of Skirbeck in the honour of Richmond and possessed a fair which contributed £105 to the honour by 1183.[24] At Boston the fair met in a settlement that was sustained by its port, but at other sites commerce might only surpass local agricultural production during an annual fair.[25] For example, the fair at St Ives, granted by the abbots of Ramsey on the manor of Slepe in 1110, became an important

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[21] J. Masschaele, 'The transport costs of medieval England', *Economic History Review*, 2nd series, 46:2 (May 1993), pp. 266–79, at p. 273.
[22] *Pipe Roll 17 Henry II*, p. 131; *Pipe Roll 18 Henry II*, p. 21. The one hundred sums cost £6 9*s*.
[23] W.G. Hoskins, *Local History in England*, 2nd edition (London: 1972), pp. 92–4.
[24] J.W.S. Hill, *Medieval Lincoln* (Cambridge: 1948), pp. 315–20.
[25] For fairs see E.W. Moore, *The Fairs of Medieval England* (Toronto: 1985).

annual meeting place for merchants from the East Midlands and foreign traders arriving on the River Ouse, but St Ives itself did not develop an urban character as a result.[26]

The geography of Scotland is such that many of the burghs were located by or relatively close to the sea and able to receive sea-borne trade. In *The Miracles of St Margaret of Scotland*, a hagiography from the middle decades of the thirteenth century, we glimpse the distances involved in coastal shipping and the dangers when a ship loaded with grain at Berwick for the monks of Dunfermline is saved from destruction in a violent storm.[27] However, despite the navigable eastern coastline of Scotland, the importance of land routes for trade should not be underestimated. Journey times between northern England and lowland Scotland were surprisingly short.[28] In a grant to Kelso Abbey (1165×1171) William I envisaged that fish and goods of all kinds would be converging on Roxburgh market in carts from many directions.[29] Clearly, some roads in Scotland were fit for more than pack horses and individuals on foot.

It is most unfortunate that data on the fundamental variables of population, prices and agricultural yields in Scotland is only available from the late thirteenth century and the only existing study begins accordingly *c.*1250,[30] because urban growth in Scotland was probably not governed by the same demographic pressure on food supply that might have occurred in England. In England towns expanded, physically and demographically, but in Scotland many large towns were founded and promoted as an act of royal policy in the twelfth century.[31] The settlers who arrived in newly founded burghs were pioneers who created demand for

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[26] J.A. Raftis, 'Rent and capital at St Ives', *Mediaeval Studies* 20 (1958), pp. 79–92; J. Laughton and C. Dyer, 'Small towns in the East and West Midlands in the Later Middle Ages: A comparison', *Midland History* 24 (1999), pp. 24–52.

[27] *The Miracles of St Æbbe of Coldingham and St Margaret of Scotland*, ed. and trans. R. Bartlett (Oxford: 2003), pp. 138–9.

[28] G.W.S. Barrow, 'Land Routes', in *Scotland and its Neighbours in the Middle Ages* (London: 1992), pp. 201–16, at p. 204.

[29] *RRS* II (William I), pp. 168–9, no. 64.

[30] E. Gemmill and N.J. Mayhew, *Changing Values in Medieval Scotland* (Cambridge: 1995). For population estimates see note 1.

[31] A.A.M. Duncan, *Scotland: The Making of the Kingdom* (Edinburgh: 1975), pp. 463–519; I. Whyte, *Scotland before the Industrial Revolution, An Economic and Social History* c.*1050*–c.*1700* (London: 1995), p. 59–60. An informative topographical survey of Scottish burghs is provided by I. Adams, *The Making of Urban Scotland* (London: 1978), pp. 31–49.

agriculture produce. David I established fifteen burghs, probably modelled on new towns in northern England, and encouraged traders and artisans to settle, and further burghs were founded by his successors.[32] The burghs had political and administrative importance, because they were associated with castles and made the centres of new shires.[33] Not all burghs were founded by the king, but often royal support was crucial for the growth of a burgh. For example, Bishop Jocelin of Glasgow founded a new burgh at Glasgow Cross and William I confirmed the burgh founded by the bishop and granted a weekly market and an annual fair.[34]

Although specific data on urbanisation in Scotland is deficient, archaeological evidence indicates that the late twelfth century was a crucial period for construction. Anne Crone has discovered from denrochronological analysis that there was synchronous development of four Scottish burghs (Aberdeen, Glasgow, Inverness, and Perth) in the late twelfth century. Crone states 'that this happened roughly contemporaneously across the country would suggest that it was a response to some common factor'.[35] Concomitant with the physical expansion of burghs, Scotland underwent a sustained period of monetisation. W.W. Scott collated contemporary documentary evidence for the use of money in early medieval Scotland and suggested that the aggregate of individual references indicate the increasing use of money.[36] However, the use of money in large sums probably remained limited (see pp. 211–12).

1.2 Commercialisation and monetisation

Advances in commerce are frequently dependent on the use of money. Urban economies are sustained by money as the means of exchange for profiting from the sale of manufactured goods and thus obtaining disposable income. Theoretically economic growth could be

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[32] A critical analysis of the burghs and burgesses in medieval Scotland is provided by G.W.S. Barrow, *Kingship and Unity: Scotland 1086–1306* (Edinburgh: 1981), ch. 5. On the critical role of burghs for King David I's conquest and control of northern Scotland see R. R. Oram, *David I: The King Who Made Scotland* (Stroud: 2004), pp. 102–4. E. Miller, 'Medieval new towns', *Northern History* 3 (1968), pp. 192–8.
[33] *RRS* I (Malcolm IV), p. 47.
[34] *RRS II* (William I), p. 245–6, no. 190.
[35] A. Crone, 'Native tree-ring chronologies from some Scottish medieval burghs', *Medieval Archaeology* 44 (2000), pp. 201–16 at p. 211.
[36] W.W. Scott, 'The use of money in Scotland, 1124–1230', *Scottish Historical Review* 58 (1979), 105–131.

achieved by an increase in the velocity of circulation rather than growth in money supply (the same amount of coins perform more transactions), but in actuality the converse is true. Nicholas Mayhew has elucidated the apparent contradiction that falling velocity of circulation indicates an increasing role for money. Mayhew suggested that the high velocity in the Norman period indicated 'a society geared to money payments, but obliged to extend a money supply basically inadequate for its needs by a variety of non-monetary expedients'.[37] Consonant with Mayhew's interpretation is the view that urban populations were potentially unsustainable without coins. Pamela Nightingale has specifically connected urban development with availability of coin and has suggested that in the twelfth century there 'may have been insufficient coin in many parts of England to sustain the urban economy all the year round'.[38] As money increasingly permeated the economy a large element of non-monetary transactions were eliminated and velocity of circulation decreased; individuals anticipated using coinage in financial transactions at all times and so they kept larger amounts at hand. Evidence for such development is Harvey's view that relations with tenants were beginning to be altered through the intervention of cash payments and the formalised procedures of the manorial court.[39]

The expectation that money would remain readily available is suggested by the development of facilities of credit that came into use in the late twelfth and early thirteenth centuries, which are indicative of growth in money supply. Although temporary shortfalls in an individual's money supply may be assuaged by facilities of credit, credit assumes general availability of money to meet debts and is a reflection rather than a cause of growth in money supply. Mechanisms for providing credit remain in a rudimentary state of investigation and

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[37] See N.J. Mayhew, 'Modelling medieval monetisation', in *A Commercialising Economy, England 1086–c.1300*, ed. R.H. Britnell and B.M.S. Campbell (Manchester and New York: 1995), pp. 55–77, at pp. 68–9.
[38] P. Nightingale, *A Medieval Mercantile Community: The Grocers' Company and the Politics and Trade of London 1000–1485* (New Haven and London: 1995), p. 34.
[39] See P.D.A. Harvey, 'Initiative and authority in settlement change', in *The Rural Settlements of Medieval England*, ed. M. Aston, D. Austin and C. Dyer (Oxford: 1989), pp. 38–43.

there is substantial data only from the thirteenth century.[40] Therefore, understanding the extent of monetary expansion is important as it indicates the increased sustainability of commercialisation, because commercial development was characterised by individuals, albeit a minority, living and working in an urban environment, but inseparably connected to the surrounding rural hinterland.

The growth in money supply necessary to sustain commercialisation also had one very significant and disadvantageous effect: inflation. For England, the late twelfth century has received recognition as a period of growth in money supply since the publication of P. D. A. Harvey's seminal paper on inflation in England between 1180 and 1220.[41] Similarly, for European economy Mayhew has identified rapid monetisation as a factor in price rises discernible from the last quarter of the twelfth century.[42] However, the extent and effects of the monetary inflation remain highly contentious.[43] Harvey's paper proposed that the inflation had a monetary cause, but Paul Latimer has convincingly suggested that non-monetary factors, such as developments in administrative structures, in both royal finance and estate

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[40] For the most recent work on the subject and a comprehensive bibliography at the date of publication see P.R. Schofield and N.J. Mayhew, *Credit and Debt in Medieval England, c.1180–c.1350* (Oxford: 2002).

[41] P.D.A.Harvey, 'The English inflation of 1180-1220', *Past and Present* 61 (November 1973), pp. 3-30. Viewed from the perspective of historiography, Harvey's paper on inflation was essentially an analysis of the wider import of a series of papers on price movements in the late twelfth century, the latest of which was by D.L. Farmer, 'Some price fluctuations in Angevin England', *Economic History Review* 9^2 (1956), pp. 34–43. Also in the less well known paper, P.D.A. Harvey, 'The English trade in wool and cloth, 1150–1250: Some problems and suggestions' in *Produzione commercio e comsumo dei penna di lana (nei secoli XII–XVIII)*, ed. M. Spallanzani (Florence: 1976), pp. 369–76 at pp. 370–72, 375.

[42] N. J. Mayhew, 'Frappes de monnaies et hausse des prix en Angleterre de 1180 à 1220', *Études d'Histoire Monétaire*, ed. J. Day (Lille: 1984), pp. 159–177. N.J. Mayhew, 'Modelling medieval monetisation', in *A Commercialising Economy, England 1086–c.1300*, ed. R.H. Britnell and B.M.S. Campbell (Manchester and New York: 1995), pp. 55–77.

[43] For example, J. C. Holt has explicitly stated that 'Magna Carta is not to be considered as a consequence of monetary inflation', J.C. Holt, 'Magna Carta 1215–17: the legal and social context', in *Law in Medieval Life and Thought*, ed. E.B. King and S.J. Ridyard (Sewanee, Tennessee: 1990), pp. 17–18. Of course economic trends do not produce documents, but Holt's evaluation appears particularly unsympathetic. Nevertheless, the document regarded by Holt as a prefiguration of Magna Carta, the Langbargh Charter (1207 × Michaelmas 1209), was unquestionably the consequence of establishing a money relationship. Peter de Brus granted certain liberties to tenants in the wapentake of Langbargh, which encompassed the whole of Cleveland, in exchange for their financial support making up any shortfall in the annual farm he owed the king. J.C. Holt, *Magna Carta* (2^{nd} edition, Cambridge: 1992), pp. 67–70 and pp. 336–7. R. M. Brakely, *The Brus Family in England and Scotland 1100–1295* (Woodbridge: 2005), p. 55.

management, were contributory.[44] Recently, Harvey's characterisation of 1180–1220 as a period of continuous inflationary pressures has been challenged by J. L. Bolton's proposal that deflation occurred 1204–1214 when the exchequer accumulated money.[45] In order to provide further evidence to investigate the monetary inflation identified by Harvey and Mayhew, this thesis is conceived as a contribution to understanding the extent of the growth in the money supply in Britain in the late twelfth century. However, while earlier work has concentrated on the post-1180 period, this thesis explores the crucial final third of the twelfth century.

The nature of medieval numismatic evidence is such that it can be processed systematically and analytically in order to provide data of use and interest to historians. Principally, using statistic methodologies, mint output can be quantified. Historians might understandably find the processes rather laborious, because quantification of money supply from numismatic material is dependent on establishing the proper contexts of the approximate date and structure of mint activity. Monetisation might also be suggested by an increase in the geographical area of circulation of coinages.

Contemporaneous with urban growth and commercial development in England and Scotland the coinage of both nations underwent dramatic changes. The general outlines of monetary expansion in England in the late twelfth century are clear enough – a fairly insular, systematically recycled currency in the 1150s gave way to long-lasting coinages that became an internationally accepted standard in the thirteenth century. Monetary expansion in Scotland in the late twelfth century has until now been more indeterminate. Theories of development covering the complex incipient (pre-1195) Scottish coinage have been provided, but detailed analytical work has yet to be done.[46] The different stages of research of the various coinages

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[44] P. Latimer, 'The English inflation of 1180-1220 reconsidered', *Past and Present* 171, 1 (May 2001), pp. 3-29.

[45] J.L. Bolton, 'Inflation economics and politics in thirteenth-century England', in *Thirteenth Century England* IV, ed. P.R. Coss and S.D. Lloyd (Woodbridge: 1992), pp. 1–14.

[46] The principal point of departure for analytical work on the early Scottish coinage is Stewart, 'Scottish Mints'. See preface for comment on the potential hazards of using I. Blanchard, *Mining, Metallurgy and Minting in the Middle Ages*, vol. 2, *Afro-European Supremacy, 1125-1225* (Stuttgart: 2001).

of the two countries is due in large measure to survival rates, which has affected the treatment of coinages in this thesis.[47] Quantifying changes in monetary supply in Britain is most easily established from mint records, but such evidence is not available for the twelfth century. Therefore surviving numismatic material is the most useful primary source of information for monetary expansion when subjected to analytical techniques.

Table 1.1 provides a succinct overview of the names and dates, according to the latest available research, of the coinages of England and Scotland that are frequently mentioned in this thesis. In the late twelfth century only one denomination, the penny or sterling, was produced by mints in Britain.[48] The names of the coinages minted in the late twelfth century are derived from a short description usually based on prominent features of the reverse design, which is called a 'type'. (See the GLOSSARY at end of thesis for explanations of numismatic terms.) As can be seen from Table 1.1 the coinages under consideration in this thesis constitute a transitional phase in England and Scotland respectively between coinages of short duration and long-lasting coin types that lasted for generations.

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[47] It is probable that approximately 3,000 Cross and Crosslets coins survive, considerably less than the 5,000 coins estimated to have survived from the reign of Stephen (1135–1154) by Mark Blackburn, 'Coinage and currency', *The Anarchy of King Stephen's Reign*, ed. E. King (Oxford: 1994), Chapter 5, at p. 148. The scarcity of some late twelfth century coins is seemingly inconsonant with the premise of monetary expansion. However, survival rates for issues are contingent on the prevalence of contemporary hoarding and chance modern recovery. Thus the amount of extant specimens offers a very poor or deceptive indication as to frequency of original issue. Analytical work on Stephen's *BMC* type 7 by M. Allen, 'The English coinage of 1153/4–1158', *BNJ* 76 (2006), pp. 242–302, and on the Crescents coinage of Scotland presented in this thesis was possible by carefully collating specimens from every available source. Understanding of coinages is periodically advanced by the discovery of hoards. For example, knowledge of Stephen *BMC* 6, a substantive issue produced in the early 1150s, was deficient prior to recovery of the Wicklewood (Norfolk) hoard in 1989.

[48] An independent coinage was not produced in Wales, although an 'English' mint was active at Pembroke as late as Class A of the Cross and Crosslets coinage (1158–*c.*1163). See *BMC Henry II*, pp. clviii–clix. In Scottish numismatic circles the penny is known as the 'sterling'. Smaller denominations were made by physically halving or quartering whole coins to create halfpennies or farthings.

Table 1.1. The respective coinages of England and Scotland, *c.*1150–*c.*1210, with the dates of individual classes as applicable, according to the latest available research. Coinages and classes subjected to detailed structural and analytical work, and metallurgical study in this thesis are shaded grey.

ENGLAND			**SCOTLAND**		
Coinage	*Class*	*Dates*	*Coinage*	*Class*	*Dates*
Stephen *BMC* type 6	—	*c.*1151–1153/4	David I, phase (c)	—	late 1140s –*c.*1153
Stephen *BMC* type 7	—	1153/4–1158	———, phase (d) and Malcolm IV	—	*c.*1153–*c.*1170
Cross and Crosslets	A	1158–*c.*1163		—	
———	B	*c.*1162–*c.*1163		—	
———	C	*c.*1163–*c.*1167	'Early' William I	—	1165–*c.*1170
———	D	*c.*1167–*c.*1170	Crescents	A	*c.*1170–*c.*1174
———	E	*c.*1170–*c.*1174	———	B	
———	F	*c.*1174–1180	———	C	*c.*1180–late 1180s
Short Cross	1	1180–*c.*1189	———	D	
———	2	*c.*1189–*c.*1190	———	E	Late 1180s–1195
———	3	*c.*1190–1194	Short Cross, phase (a)	—	1195–1205×1210
———	4	1194–1204	———, phase (b)	—	1205×1210–*c.*1230
———	5	1204–*c.*1210			
Next change of type 1247			*Next change of type 1249*		

Notes on Table 1.1:

ENGLAND: The chronology of the last two types of Stephen's reign is that of M. Blackburn, 'Coinage and currency', *The Anarchy of King Stephen's Reign*, ed. E. King (Oxford: 1994), Chapter 5, 146–205, at p. 198 refined according to the latest research by M. Allen, 'The English coinage of 1153/4–1158', *BNJ* 76 (2006). The internal chronology of the Cross and Crosslets coinage is that revised by T. Crafter, 'A re-examination of the classification and chronology of the Cross and Crosslets Type', *BNJ* 68 (1998), pp. 42–63. The internal chronology of classes 1–5 of the Short Cross coinage is that proposed by M. Allen, 'The chronology, mints, and moneyers of the English coinage, 1180–1247', *SCBI* 56 (Mass), pp. 1–12, summary at p. 12.

SCOTLAND: The primary chronological framework for Scottish coinage prior to *c.*1170 presented here is taken from I. Stewart, 'Scottish Mints', *Mints, Dies and Currency*, ed. R.A.G. Carson (London: 1971), pp. 165–289 at p. 196–7. Lord Stewartby (*per. comm.*) suggests that coins of David I phase (d) are posthumous issues of the 1150s and 1160s; coinage in the name of Malcolm IV and William I before the Crescents coinage is slight and output was probably contemporaneous with David I phase (d). The internal chronology of the Crescents coinage of William I is that proposed in this thesis (see §5.10.2.), and based on the first internal class division of the coinage also proposed (see §5.2.2.). The chronology of the Short Cross coinage phases (a) and (b) is summarised in *SCBI* 35 (Oxford/Glasgow), p. xi, which is based on I. Stewart, 'The volume of early Scottish coinage', *CIMS*, pp. 65–72, at p. 68–9.

Concomitantly with the introduction of long-lasting currency types the monetary system was re-orientated in the late twelfth century by the centralisation of minting, characterised by a reduction in the number of mints. It is worth considering whether changes in the monetary system were a cause or a consequence of the economic development in the late twelfth century and whether the changes were deliberate or unplanned. In order to evaluate this proposition it is necessary to understand the monetary system in context, particularly its departure from the late Anglo-Saxon model.

1.3 Changes in the monetary system

Periodic recoinages occurred at frequent intervals from a major reform of the English coinage made near the end of the reign of King Edgar (957/9–975). Scotland's independent coinage evolved from that of England in the early twelfth century, but the extent to which recoinages occurred prior to 1195 is unclear.[49] Each English recoinage involved a change of currency type (thus requiring new dies) and between Edgar's reform and the end of the reign of Henry I fifty-one major changes of type were made. The nature and purpose of frequent periodic recoinages in late Anglo-Saxon and Norman England has long been debated and Ian Stewart has provided a useful exploration of the issues.[50] Here it worth exploring the abandonment of the system in the twelfth century in the context of the changing economic environment.

Mark Blackburn has suggested that frequent periodic recoinages were abandoned after a monetary reform in 1125, whereby the last coin type of Henry I's reign was in issue for approximately ten years.[51] The process was accompanied by moves towards centralisation of the mint system. However, some scholars have expressed misgivings about Blackburn's

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[49] The earliest phase of the Scottish coinage is beyond the scope of this thesis, but for a succinct overview see I. Stewart, 'Scottish mints', pp. 191–202. The number of Class A dies of the Crescents coinage does not indicate that a recoinage occurred at the introduction of the coinage, *c.*1170, see below p. 211.

[50] I. Stewart, 'Coinage and recoinage after Edgar's reform', in *Studies in Late Anglo-Saxon Coinage* (*Numismatiska Meddelanden* XXXV), ed. K. Jonsson (Stockholm: 1990), pp. 455–85.

[51] M. Blackburn, 'Coinage and currency under Henry I: a review', *Anglo-Norman Studies* 13 (1991), pp. 49–81, at pp. 71–2; M. Blackburn, 'Coinage and currency', *The Anarchy of King Stephen's Reign*, ed. E. King (Oxford: 1994), Chapter 5, 146–205, at p. 152.

dating of the coin types of Henry I.[52] If a system of long-lasting currency types was incipient in 1125, it was disrupted by the civil war during Stephen's reign. Two substantive types were struck between *c.*1148 and *c.*1154 in areas under royal control, but, according to Blackburn, they were emphatically not regional issues: 'they have the full attributes of substantive types intended to replace preceding issues'.[53] Stephen's last coinage (*BMC* type 7) introduced in 1153/4 re-established royal control over the entire national English mint system.[54]

It cannot definitely be established whether there was a strategy to abandon frequent periodic recoinages, either inchoate in 1125, or in 1158. All that may be stated positively is that a subsequent recoinage does not appear to have occurred as one would expect according to the preceding patterns. Such evolutionary development was emphasised by Ian Stewart in regard to the late Anglo-Saxon policy of recoinages. Stewart considered the pre-ordained pattern of recoinages to be a 'historical improbability…because competent governments are normally ready to respond to circumstances and to develop their policies in the light of experience, while incompetent governments are forced to do so'.[55] Stewart's remarks may equally apply to the process whereby recoinages were abandoned. We do not know whether the officials responsible proceeded from design or responded to circumstances.

The fact that frequent periodic recoinages were abandoned indicates that the benefits conferred by such a course exceeded the advantages of periodically reminting the national currency. An inevitable and pernicious side effect of abandoning recoinages was that the

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[52] M. M. Archibald, 'Early medieval coinage, 1066-1279', *BNJ* 73 (2003), pp. 76–88 at p. 79. The seeming lack of stylistic progression in Henry I type 15 at least warrants further consideration of Blackburn's preferred chronology. Blackburn demonstrated that the stylistic development in Stephen's *BMC* type 1 (*c.*1136–*c.*1148), namely the contraction in length of obverse legend, is chronologically significant; 'Coinage and currency', *The Anarchy of King Stephen's Reign*, ed. E. King (Oxford: 1994), pp. 146–205, at pp. 153–61. If Henry I type 15 was in issue for approximately ten years one might expect some stylistic development, but none is obviously observable. I. Stewart 'Type XV of Henry I', *Seaby Coin and Medal Bulletin*, November 1989, pp. 259–64, at p. 259 expressed the same reservation: 'It is certainly not obvious to me from the degree of progression evident within each of the two types that type XV was in issue for four or fives times as long as type XIV'.

[53] M. Blackburn, 'Coinage and currency', *The Anarchy of King Stephen's Reign*, ed. E. King (Oxford: 1994), pp. 146–205, at p. 164, for the chronological framework see p. 198.

[54] M. Allen, 'The English coinage of 1153/4–1158', *BNJ* 76 (2006), pp. 242–302, at p. 242.

[55] I. Stewart, 'Coinage and recoinage after Edgar's reform', in *Studies in Late Anglo-Saxon Coinage* (*Numismatiska Meddelanden* XXXV), ed. K. Jonsson (Stockholm: 1990), pp. 455–85, at p. 480. It is perhaps noteworthy that the obverse design of Class C Cross and Crosslets coins is quite different from

currency was not periodically renewed and as a consequence bad money accumulated in circulation. Cook has suggested that efforts to tackle currency crimes committed by the public indicate concern that the currency was deliberated degraded by the public in circulation, rather than by moneyers at emission.[56] The legitimacy of the concern for the state of circulating currency is supported by Allen's suggestion that the combustions under Henry II demonstrate the decline in the quality of coin available for payments.[57] Hence we may reasonably conclude that circumstances prevailed whereby the government was prepared to endure the deterioration of the national coinage for the sake of some other benefit. Therefore it is worth exploring the possibility of a teleological abandonment of frequent recoinages in the late twelfth century, facilitated or prompted by changes in the economic environment. Indeed, metallurgical evidence indicates that the use of the assay by the exchequer may have been an attempt by the government to offset or assuage the financial effects of abandoning recoinages.[58]

Kings of England did not readily embrace debasement. In fact to date no significant debasement has been detected between the successive substantive coinages minted in England in the late twelfth-century.[59] By maintaining the coinage at a high intrinsic standard English

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the preceding classes, A and B; without awareness of the reverse design, one might consider it a change of type. Perhaps the obverse design of Class C suggests that a complete change of type was considered?

[56] B.J. Cook, 'Crimes against the currency in twelfth- and thirteenth-century England', *Bulletin of the John Rylands University Library of Manchester* 83:1 (Autumn 2001), pp. 51–70.

[57] M. Allen, 'Henry II and the English coinage', in *Henry II: A New Interpretation*, ed. C. Harper-Bill (Woodbridge: 2007 (forthcoming)).

[58] See §6.5. If the assay was in use under Henry I, as the *Dialogus* suggests, it might be evidence that Blackburn is correct to look for an abandonment of frequent recoinages in that reign.

[59] There was probably *some* fluctuation in the standard of the coinages of England in the twelfth century. Allen examined the weight standard of *BMC* type 7 against the possible weight standard of the Cross and Crosslets coinage and suggested that 'the face value of the old currency reminted in 1158 may have been about 10 per cent more that that of the mint output derived from it'. M. Allen, 'The English coinage 1153/4–1158', *BNJ* 76 (2006), pp. 242–302, at p.261. This evidence implies that the intrinsic standard might have been strengthened in 1158. Not enough is known about the alloy of the substantive types of Stephen's reign, however, and future metallurgical analysis could eliminate the supposed discrepancy between the coinages implied by analysing the weight alone. Marion Archibald (*pers. comm.*) has conducted Electron Probe Microanalysis on coins of the early twelfth century, which will be published as a future volume of *Medieval Coin Hoards*.

kings served their own interests, because they possessed adequate machinery of government to collect receipts at fixed sums.[60]

We may, therefore, tentatively conclude that the disturbances of Stephen's reign did not affect the determination of the royal government to maintain a strong coinage at the close of the civil war. By *c.*1153/4 a comprehensive national recoinage in the name of King Stephen was underway, which according to Ralph of Diceto was the result of the political settlement.[61] Another equally capacious recoinage, with some alteration in the number and location of mints, occurred in 1158. Clearly the machinery of government functioned well enough to undertake such an operation. So why did no periodic recoinage occur after 1158? Again, there is no evidence for official intentions, but it is possible to consider the benefits of such a course.

Lord Stewartby suggested in his review of the nature and purpose of frequent periodic recoinage that reminting occurred for the purposes of accounting to the exchequer.[62] A requirement that individuals and corporate bodies owing money paid *only* in new coins would ensure the intrinsic value of payments and impel silver to the network of mints. Frequent periodic recoinages were necessitated by the policy of maintaining a strong currency in periods when the money supply was stable or contracting and it is clear that the policy of frequent periodic recoinages was not abandoned owing to the adoption of a policy of debasement.

It is perhaps therefore reasonable to conclude that recoinages were abandoned because they were no longer necessary to generate mint activity and maintain the national currency in adequate condition for payments. However, as Stewart has advocated, it is perhaps best to view the policy as a reaction of the government to circumstances. As no policy of debasement

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[60] For example, entries for 'waste' demonstrate that the English exchequer was aware what revenues it was owed in the 1150s, regardless of whether one finds either Amt's or White's view of the meaning of 'waste' persuasive (see above p. 18).

[61] Ralph de Diceto, *Opera Historica*, ed. W. Stubbs, (London: 1876), vol. 1, pp. 196–7; M. Blackburn, 'Coinage and currency', *The Anarchy of King Stephen's Reign*, ed. E. King (Oxford: 1994), pp. 146–205, at pp. 161–2 and p. 194; M. Allen, 'The English Coinage of 1153/4–1158', *BNJ* 76 (2006), pp. 242–302, at p. 242.

[62] I. Stewart, 'Coinage and recoinage after Edgar's reform', in *Studies in Late Anglo-Saxon Coinage* (*Numismatiska Meddelanden* XXXV), ed. K. Jonsson (Stockholm: 1990), p. 468.

is evident, we may conclude that sustained mint activity, and its output causing monetary expansion, may have utilised bullion that had that not been previously been circulating as coins in England.

1.4 'New' Silver

Where did the bullion that augmented the national currency stock come from? The supplementary bullion could have been previously held as wealth in a non-circulatory form or it could have come from new mineralogical discoveries in Britain or overseas. Metallurgical analysis of the late twelfth-century coins in this thesis (Chapter 6) indicates that alloy varied between geographical regions, partly owing to distinct sources of bullion. The analysis indicates that some bullion in late twelfth-century Scottish coinage was saved from the Viking period and that the contribution to coinage volume of bullion from mines in northern England was minimal. Overall, given the modest scale of Scottish coinage and silver from native mines, the larger part of monetary expansion in Britain in the late twelfth century must have come from other sources.

There is widespread acknowledgement that the increase in the size of the English coinage in the late twelfth century was due to the importation of silver from new mineralogical discoveries in Germany, which came to England in trade. During the 1160s rich silver-bearing lead-ore was discovered at Freiberg, near Meissen.[63] The previous principal source of European silver, the mines at Rammelsberg near Goslar in the Harz Mountains, had been in decline since the middle of the eleventh century, so the Freiberg discovery was fortunate.[64] The rapid exploitation of the mines *may* have led to England receiving new silver as early as the 1170s. It has been suggested that mint output began to increase in the 1170s, possibly owing to the growth in the wool trade with the Low Countries, the proceeds of which would have allowed England to share in new supplies of mined silver from Germany.[65] Peter

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[63] P. Spufford, *Money and its Use in Medieval Europe* (Cambridge: 1988), pp. 109–11.
[64] Ibid., pp. 95–6 and 111.
[65] N.J. Mayhew, 'Frappes de monnaies et hausse des prix en Angleterre de 1180 à 1220', *Études d'Histoire Monétaire*, ed. J. Day (Lille, 1984), pp. 159–77 at pp. 166–7; A. Dawson and N.J. Mayhew, 'A continental find including Tealby pennies', *BNJ* 57 (1987), pp. 113–18 at p. 115. N. J. Mayhew,

Spufford has argued that much silver was sent to England from the Netherlands and that although import of newly mined silver may possibly have begun in the 1170s, an abrupt increase occurred around 1180.[66] Silver also reached Scotland from Germany as attested by Crescents sterlings of Roxburgh directly overstruck on pfennigs minted in cities on the Rhine, and this may be connected with merchants attending the Roxburgh fair.[67]

Although new silver for coinage nurtured commerce, overseas trade with Britain probably owed much to complex changes in urban communities in Salian and Staufen Germany, characterised by a general weakening of seigneurial jurisdiction and the emergence of craft associations (*Innungen*) in cities along the Rhine.[68] The craft-guild (*métier*, *mistery*) also emerged in certain towns in Flanders, such as Arras, Bruges, Ghent, and St Omer during the same period.[69] These associations, whether formed under patronage or voluntarily, empowered traders to act as corporate bodies. These associations are paralleled in Britain by the emergence of guilds in England in the twelfth century, for example in London and Winchester, and possibly Canterbury.[70]

Evidence suggests that trade between the Low Countries and England was primarily based on wool, which farmers of English sheep produced and Flemish weavers required. Sea-borne international trade was not a new phenomenon in the late twelfth century and Flemings had established trading links with England in the eleventh century, long before the increased availability of mined silver in the late twelfth century.[71] An indigenous textile industry existed

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'From regional to central minting', in *A New History of the Royal Mint*, ed. C. E. Challis (Cambridge: 1992), pp. 83–178 at pp. 83–4.

[66] P. Spufford, *Money and its Use in Medieval Europe* (Cambridge: 1988), pp. 139–40 and 196–7.

[67] I. Stewart, 'Some German coins overstruck with sterling types', *Lagom: Festschrift für Peter Berghaus* (Münster: 1981), pp. 205–210. See §5.8.2. below.

[68] H. Jakobs, 'Aspects of urban social history in Salian and Staufen Germany', in *England and Germany in the High Middle Ages*, ed. A. Haverkamp and H. Vollrath (Oxford: 1996), pp. 283–98, at pp. 287–8.

[69] D. Nicholas, *Medieval Flanders* (London and New York: 1992), pp. 118–20 and 166–8; S.A. Epstein, *Wage Labor and Guilds in Medieval Europe* (Chapel Hill and London: 1991), pp. 242–3.

[70] P. Nightingale, *A Medieval Mercantile Community. The Grocer's Company and the Politics and Trade in London* (New Haven and London: 1995), pp. 43–60; M. Biddle (ed.), *Winchester in the Early Middle Ages* (Oxford: 1976), pp. 335–6; W. Urry, *Canterbury Under the Angevin Kings* (London: 1967), p. 124.

[71] M. Gardiner, 'Shipping and trade between England and the Continent during the eleventh century', *Anglo-Norman Studies* 22 (1999), pp. 71–93; P. Grierson, 'Relations between England and Flanders

in Anglo-Saxon England and its products were exported. One of the earliest specific references to the export of wool is Charlemagne's complaint to Offa about the length of woollen cloaks.[72] One of the earliest specific references to the export of wool as a raw commodity by Flemings is dated to 1113.[73] Monastic foundations are well known as producers of wool, but the importance of smaller woolgrowers should not be disregarded.[74] Unfortunately there is no quantitative evidence for the volume of the export trade in wool in the twelfth century and early price-data for sheep is most erratic.[75] Scotland possessed important monastic woolgrowers, as indicated by William I's grant of permission to the monks and lay brothers of Holm Cultram Abbey to carry their wool for sale in the burghs throughout the kingdom.[76] At Bruges by 1200 wool is a commodity specifically named, along with cheese and hides, as an export of Scotland, which suggests that Scotland's wool export to Flanders was sizable in the late twelfth century.[77]

Frequent references to the participation of Flemings in the commercial and political life of England may be found shortly after the accession of Henry II. During the initial years of Henry II's reign the royal government discriminated between Flemish mercenaries and Flemish traders, expelling the former from the realm while leaving the latter unmolested. William of Newburgh records that Henry II expelled all foreign mercenaries, 'especially the Flemings',[78] early in his reign. Flemish mercenaries had played a prominent role on behalf of

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before the Norman Conquest', *Transactions of the Royal Historical Society*, 4th series 23 (1941), pp. 72–112.

[72] *Roger of Wendover's Flowers of History*, trans. J. A. Giles (London: 1849), vol. 1, p. 153; P. H. Sawyer, 'The wealth of England in the eleventh century', *Transactions of the Royal Historical Society*, 5th series, 15 (1965), pp. 145--64, at pp. 161–2 Sawyer specifically associates the export trade with mint activity.

[73] Flemings accompanying the canons of Laon to England in 1113 and brought 300 marks of silver to purchase wool. P.H. Sawyer, 'The wealth of England in the eleventh century', *Transactions of the Royal Historical Society*, 5th series, 15 (1965), pp. 145–64 at pp. 162–3, citing Hermann of Tournai, *De miraculis S. Mariae laudunensis*, *Patrologia cursus completus. Series latina*. 156: 975–977.

[74] A.R. Bridbury, 'Before the Black Death', *Economic History Review* 30^2, pp. 393–410, at pp. 398–9.

[75] D.L. Farmer, 'Some price fluctuations in medieval England', *Economic History Review* 9:1 (1956), pp. 34–43, at p. 43.

[76] *RRS* II (William I), p. 184, no. 87.

[77] W.W. Scott, 'The use of money in Scotland, 1124–1230', *Scottish Historical Review* 58 (1979), 105–131, at p. 128 citing L. Gilliodts van Severan, *Cartulaire de l'Ancienne Estaple de Bruges* (Bruges: 1904), vol. 1, no. 14.

[78] William of Newburgh, *Historia Rerum Anglicarum*, ed. R. Howlett in *Chronicles and Memorials of the Reigns of Stephen, Henry II, and Richard I* (London: 1884), vol. 1, pp. 101–2.

King Stephen during the civil war – for example, the aggressive William of Ypres[79] – and Henry II was anxious to rid his kingdom of them, especially after, as Gervase of Canterbury recorded, they plotted against his life in the spring of 1154.[80] Notwithstanding Henry II's antipathy towards Flemish mercenaries, the king generously conceded commercial privileges to St Omer in Flanders 1155 × 1158.[81]

Middlemen financiers facilitated the export of English wool, and their business practices provide evidence of both the high demand for English wool and the development of trading links with Flanders. The concession of commercial privileges to St Omer by Henry II was, at least in part, recognition of the importance of Anglo-Flemish trade by the 1150s. Henry of Huntingdon, writing about 1155, included *lana pretiosissma* in his list of the outstanding riches of England.[82] However, Henry II's own financial interests were closely connected with his encouragement of Flemish trade, because William Cade of St Omer was one of the king's principal financier backers.[83] William Cade was himself was one of the leading middlemen in the trade in English wool, as demonstrated by his purchase of wool in advance of shearing.[84] William Cade's business practice implies competition to secure supplies of English wool among merchants, an urgency that must have been widespread because in 1181 the General Chapter of the Cistercian order ruled that only in the case of need might wool be sold one year in advance.[85] The ruling suggests that monastic foundations might have been accepting too much risk in their eagerness for money.

The export trade in English wool relied on the growth of the Flemish weaving industry, which was sustained by increases in productivity and capital. Entrepreneurial financiers provided organisation and capital and Flemish weavers employed the latest developed

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[79] Amt, *Accession of Henry II*, pp. 87–91.
[80] Gervase of Canterbury, *Opera Historica*, ed. W. Stubbs (Oxford: 1879–80), vol. 1, p. 158 and p. 161.
[81] *Calendar of Documents Preserved in France*, ed. J.H. Round (London: 1899), p. 491.
[82] Henry of Huntingdon, *Historia Anglorum*, ed. T. Arnold (London: 1870), p. 6.
[83] Amt, *Accession of Henry II*, pp. 94–7.
[84] H. Jenkinson, 'William Cade, a financier of the twelfth century', *English Historical Review* 28 (1913), pp. 209–27, at p. 221.
[85] *Statuta Capitulorum Generalium Ordinis Cisterciensis*, ed. J–M. Canivez (Louvain: 1933), vol. 1, p. 89 (1181, article 10).

technology: the fulling mill, the horizontal loom and the spinning wheel.[86] Technological advances increased productivity and allowed the production of superior cloth. The superiority of the cloth was crucial to ensure that it was a viable product at retail prices that accounted for the transportation costs of importing English wool and exporting finished cloth. T.H. Lloyd suggested that the demand for Flemish cloth is indicated by the distinct 'branding' of fine Flemish cloths by the 1180s with the name of the town of manufacture.[87]

Occasionally the involvement of Flemish mercenaries in English affairs affected the commercial activities of their compatriots and the evidence is illuminating. The contemporary view that Flemings had an insatiable demand for English wool is reflected in the poem of Jordan Fantosme who imagined Flemish mercenaries mustered by the Earl of Leicester against the king in 1173 vocalising their appetite for English wool.[88] Fantosme has the Flemings say that there 'is no more prosperous region on earth than Bury St Edmunds' and it is known that the town held an important annual fair.[89] Published die-studies of the mints of Bury St Edmunds and Ipswich indicate an increased number of dies in use (and hence imply an increase in mint output (see below §1.5 below) in Class F of the Cross and Crosslets coinage (*c.*1174–1180).[90] The assumed importance of Ipswich as a port in the 1170s could possibly be associated with the attendance of Flemings at the fairs of East Anglia. The landing

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[86] R. Paterson, 'Spinning and Weaving', in *A History of Technology*, vol. 2, ed. C. Singer, E.J. Holmyard, A.R. Hall, and T.I. Williams (Oxford: 1956), pp. 191–220; P. Váczy, *La transformation de la technique et de l'organisation de l'industrie textile en Flandre aux XIe–XIIIe siècles*, Studia Historica Academiae Scientiarum Hungaricae 48 (Budapest: 1960).

[87] T.H. Lloyd, *The English Wool Trade in the Middle Ages* (Cambridge: 1977), p. 5. Hektor Amman tabulated the early references to cloths in Mediterranean, H. Amman, 'Die Anfänge des Aktivhandels und der Tucheinfuhr aus Nordwesteuropa nach dem Mittelmeergebiet', *Studi in Onore di Amando Sapori* (Milan: 1957), vol. 1, pp. 273–310.

[88] *Jordan Fantosme's Chronicle*, ed. and trans. R.C. Johnston (Oxford: 1981), p 73, ll. 991–9:

> 'Soon you could have heard Flemings from Flanders and French and Picards shouting aloud: 'We have not come to this country to hang around but to destroy the king, Henry, the old warrior, and to get for ourselves the wool of England that we so much desire'. My lords, the truth is that most of them were weavers, they do not know how to bear arms like knights, and why they had come was to pick up plunder and spoils of war, for there is no more prosperous region on earth than Bury St Edmunds'.

Fantosme's editor states that 'Fantosme is the chief (or the only (?)) authority for their being weavers', p. 172, editorial note on line 996.

[89] Ibid. R.J. Eaglen, *The Abbey and the Mint of Bury St Edmunds to 1279* (London: 2006), pp. 70-1 and 84.

[90] R.J. Eaglen, *The Abbey and the Mint of Bury St Edmunds to 1279* (London: 2006), p. 118 and Table 25. T. Crafter, 'A die-study of the Cross and Crosslets type of the Ipswich mint, c.1161/2–1180', *NC* 162 (2002), pp. 237–251, at p. 241 Table 2, and p. 243.

of Flemings at Walton September 1173 and Whitsand 15 May 1174 indicates the accessibility of the East Anglian coast from the Low Countries for armed conflict as well as trade.[91] It was not all plain sailing though, because of the consequences of the war. The government shared the popular conception framed in Fantosme's poem, because the Pipe Rolls attest to punitive measures taken against Flemings after 1173: wool was seized in Essex, Sussex and Yorkshire and Flemish goods and woad were seized.[92] In 1173 royalist troops were hurried to Bury St Edmunds, Colchester and Ipswich; it is perhaps indicative of the importance that these places held for Flemish trade that these towns were perceived as being most at risk from the army of Flemish mercenaries.[93] Such evidence suggests that the distinction between the legitimate activity of foreign traders and that of alien mercenaries on the side of native rebels could become ambiguous.

That silver was progressively more available in the Low Counties to allow for increased wool purchases in England from the 1170s need not remain implicit. It is well attested that there was an increase in mint output at Cologne during the archepiscopy of Philip of Heinsburg (1167–1191), which Spufford locates in the early 1170s and has justly characterised as a 'remarkable transformation'.[94] Less well known to historians is the evidence published by Nicholas Mayhew (supplied by J. Ghyssen) of an increase in the output of Flemish mints under Count Philip d'Alsace (1168–1191).[95] Moreover, in 1173 Count Philip concluded an agreement with Emperor Frederick I Barbarossa (1152–1190) that

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[91] Roger of Howden, *Gesta Regis Henrici Secundi*, ed. W. Stubbs (London: 1867), vol. 1, pp. 60–1; Ralph de Diceto, *Opera Historica*, ed. W. Stubbs, (London: 1876), vol. 1, p. 377. The threat of invasion of the Suffolk coast from the Low Countries is to be judged by the sequel: Henry II ordered the construction of Oreford Castle.

[92] *Pipe Roll 20 Henry II*, pp. 14, 54, 131; *Pipe Roll 21 Henry II*, pp. 46, 47, 124, 155, 172, 176, 179, 180, 197, 220; *Pipe Roll 22 Henry II*, pp. 50, 69, 104–6, 184, 209.

[93] Ralph de Diceto, *Opera Historica*, ed. W. Stubbs, (London: 1876), vol. 1, p. 318. R.J. Eaglen, *The Abbey and Mint of Bury St Edmunds to 1279* (London: 2006), p. 109 citing K. Norgate, *England under the Angevin Kings* (London: 1887), vol. 2, p. 150, wrongly suggests that bodies of the Flemish mercenaries defeated at the Battle of Fornham, Suffolk were displayed in these three towns.

[94] See Peter Spufford, *Money and its Use in Medieval Europe* (Cambridge: 1988), p. 96 and 195. Little silver had been minted at Cologne between the archbishoprics of Anno (1056–1075) and Philip of Heinsburg (1167–1191). Spufford suggests that Philip's ability to mortgage the income of the mints for a year for 1,000 marks in 1174 indicates that mint output was already considerable by that date.

[95] N. J. Mayhew, 'Frappes de monnaies et hausse des prix en Angleterre de 1180 à 1220', and P. Spufford, 'Le rôle de la monnaie dans la revolution commerciale du XIII[e] siècle', both in *Études d'Histoire Monétaire*, edited by John Day (Lille, 1984), pp. 159–177, at p. 169 and p. 176 note 38.

expressly allowed the circulation of heavy German pfennigs in Flanders.[96] The agreement may have sanctioned patterns of circulation already in existence prior to 1173 and suggests that silver coins from German mints were entering Flanders in substantial numbers. Commercial links between the Low Countries and England are suggested by the mid twelfth- and thirteenth-century *petit deniers* of Flanders recovered as single finds in England. Cook discussed the find evidence and suggested that, owing to their weight, the *petit deniers* had 'some sort of role as farthings' and their use was perhaps 'mainly a thirteenth-century phenomenon'.[97] Owing to the impossibility of establishing when the loss of a single coin occurred, however, it is conceivable that some twelfth-century *petit deniers* could have been lost in the twelfth century.

The (albeit small) inflow of foreign coins was paralleled by the export English coins, particularly after 1180.[98] The commercialisation of European nation states in the thirteenth century was assisted by the rise of international currencies. The internationalisation of English sterling pennies appears to have occurred rapidly soon after the introduction of the Short Cross coinage in 1180. Although English pennies had been exported earlier, notably as tribute during the reign of Æthelred II (978–1016), the nature of the movement of pennies was not primarily commercial.[99] It is conceivable that the abandonment of frequent periodic recoinages aided the growth of sterling as an international currency, exported by traders.

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[96] Ibid., p. 169. F. Dumas, 'Comparison between the political, economic and the monetary evolution of the north of France in the thirteenth century', in *Coinage in the Low Countries 880–1500*, ed. N.J. Mayhew (Oxford: 1979), pp. 35–48, at p. 42.

[97] B. Cook, 'Foreign coins in medieval England', in *Local Coins, Foreign Coins: Italy and Europe 11th–15th Centuries*, ed. L. Travaini (Milan: 1999), pp. 231–84, at pp. 246–7.

[98] Stephen's *BMC* type 7 was exported to the Baltic, as demonstrated by the Vaida hoard (1896), see M.R. Allen, 'The English coinage of 1153/4–1158', *BNJ* 76 (2006), pp. 251–2. The recovered hoards from outside the British Isles that contained Cross and Crosslets coins have a date of deposition of *c.*1180 or later, see Crafter, 'Re-examination', p. 60, Table 14. Among the best documented hoards are from near Brussels (A. Dawson and N.J. Mayhew, 'A continental find of Tealby pennies', *BNJ* 57 (1987), pp. 113–18) and Rome (See *BMC Henry II*, p. lviii). In Scandinavia Cross and Crosslets coins were contained in the Daeli hoard (see below, pp. 196–7), which also contained Scottish Crescents sterlings, and a penny was found in a grave in Halikko, Rikala, Finland (*SCBI* 25 (Helsinki), no. 919). Continental hoards of Short Cross coinage are surveyed by M. Allen, 'Hoards and the circulation of the Short Cross coinage', in *SCBI* 56 (Mass), pp. 112–130.

[99] M.A.S. Blackburn emphasises the contrast in scale between the export of English coins to the Baltic in the eleventh century and the early twelfth century, 'Coinage and currency under Henry I: A review', *Anglo-Norman Studies* 13 (1991), pp. 49–81, at p. 52.

Without frequent recoinages, England's intrinsically strong coinage remained redeemable at face value for longer and foreign merchants might therefore have found it attractive to convert bullion into sterling pennies, not just as much as they needed.

Other changes aided the internationalisation of English sterling pennies in the late twelfth century. In his examination of the monetary system of the Angevin Empire, Cook suggested that from the English recoinage of 1180 English pennies 'became usable in a fixed and useful relationship to other components of the system'.[100] The high esteem in which British coins were held abroad is indicated by the clear tendency of continental mints to reproduce English designs and motifs from the beginning of the thirteenth century – flattery by numismatic imitation. Lord Stewartby has proposed a chronological framework for the straightforward copies of English Short Cross pennies minted in Westphalia, beginning soon after 1205 and continuing until independent types developed in the 1220s.[101] Copies of English coins predominate, but some continental mints were clearly influenced by the designs of Scottish coins, indicating that Scottish coins circulated beyond the British Isles.[102] It is conceivable that reforms introduced in Scotland in 1195, conjectured in this thesis (see p. 190), were part

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[100] B. Cook, '*En monnaie aiant cours*: The monetary system of the Angevin Empire', in *Coinage and History in the North Sea World c.500–1250*, ed. B. Cook and G. Williams (Leiden: 2006), pp. 617–686, at p. 671.

[101] Lord Stewartby, 'German imitations of English Short-Cross sterlings', *NC* 155 (1995), pp. 209–260. Lord Stewartby has provided a concise overview of the technicalities of numismatic identification of the imitations with reference to an illustrated corpus, 'Short Cross imitations', *SCBI* 56 (Mass), pp. 70–73.

[102] Influence of coin designs is, by its very nature, problematic. According to Stewart, the obverse design of pennies of Malcolm IV was clearly influenced by English Cross and Crosslets pennies (Stewart, 'Scottish mints', p. 196), so the issue is worth noting. It would be natural to expect large, dominant coinages to be imitated. However, even the Scottish Crescents coinage, which was a substantially smaller coinage than that of England, influenced Irish halfpennies of Prince John as Lord of Ireland; see I. Stewart, 'Imitation in later Medieval coinage: the influence of Scottish types abroad', *Studies in Numismatic Method*, ed. C.N.L Brooke, B.H.I.H. Stewart, J.G. Pollard, and T.R. Volk (Cambridge: 1983), pp. 303–25, at p. 306. As far as I am aware no one has suggested that design of Cross and Crosslets coins influenced the design of continental coins. However, the designs of some *pfennigs* minted in the Low Countries and Rhineland during the late twelfth century are at least evocative of Cross and Crosslets pennies. English coins were certainly exported to the Low Countries, as demonstrated by the parcel of coins found near Brussels published by A. Dawson and N.J. Mayhew, 'A continental find of Tealby pennies', *BNJ* 57 (1987), pp. 113–18, so imitation of the design would perhaps be unsurprising. It may be suggested tentatively that such imitations are *pfennigs* of Bishop Godfried of Utrecht (P. O. Van der Chijs, *De Munte der Bisschoppen, van de Heerlijkheid en de stad Utrecht* (Haarlem: 1859), Plate IV), that were themselves imitated by *pfennigs* of Rees; see W. Hävernick, *Die Münzen von Köln vom Beginn der Prägung bis 1304* (Hildesheim and New York: 1975), no. 766. The issue must, of course, remain undecided.

of the trend towards the alignment of currencies to facilitate their free interchange in the late twelfth century.

Documentary evidence and the pattern of mints adopting imitative coin designs suggest the prominence of trade between the Low Countries and the eastern coast of England. However, trade between other regions was occurring, demonstrated by the statement that merchants of Picardy frequented Bristol during the reign of Henry II, which is recorded in an inquest of 1236.[103] Additionally, political considerations could stimulate some trade between England and the Angevin dominions, as when Henry II gave lead to the church of Grossmunt, which the Pipe Rolls record was carried in two ships from Newcastle to La Rochelle.[104]

Overall, the evidence surveyed suggests that that an unknown part of the bullion necessary to stimulate monetary expansion was brought to Britain through overseas trade. Given that 'new' silver, whether entering the currency through overseas trade, from mines in northern England or from bullion-stored wealth, assisted monetary expansion in the twelfth century, it is necessary to quantify monetary expansion. From here we turn to examine how the volume of the currency is to be calculated.

1.5 Calculating the volume of currency

Without documentary evidence for mint output, historians rely on numismatists to provide estimates based on analytical studies of surviving samples of coinages. Hence much of this thesis is, of necessity, dense forensic analysis of the material, with reference to external archaeological and historical evidence, in order to establish the key data of interest to historians: when, where, how and why. Thus, without documentary evidence it is only through die-study that it is possible to provide details of internal chronology, mint activity, die

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[103] *Bristol Charters 1378-1499*, ed. H.A. Cronne, Bristol Records Society Publication 11 (1946), pp. 62-64. In the early twelfth century William of Malmesbury described Bristol as 'a very famous town in which there is a harbour for ships from Ireland and Norway and other countries over seas', *De Gestis Pontificum Anglorum Libri Quinque*, ed. N.E.S.A. Hamilton (Rolls Series, London: 1870), p. 292. During the 1140s the anonymous writer of the *Gesta Sephani* wrote that Bristol was 'almost the richest city in England' adding with a flourish of hyperbole that it possessed 'a harbour quite suitable for a thousand ships', *Gesta Stephani*, ed. K. R. Potter (Oxford: 1976), pp. 37–8.

[104] *Pipe Roll 22 Henry II*, p. 137 (1175–6).

technology and mint structure, and to establish the parameters of monetisation in the late twelfth century. Only after careful study of the extant material by die is it possible to provide an impression of 'how many' – to quantify the volume of the coinages of England and Scotland respectively that is of wider, comparative interest to historians.

From the foregoing sections of this Chapter it will be clear that an adequate quantification of the changes in money supply in the late twelfth century is not a peripheral branch of numismatic science, but stands at the heart of an adequate understanding of the economic development of Britain. As already outlined, recoinages initiated by government artificially stimulated mint activity (see p. 32 above). In theory a recoinage recycled a majority of the coins in circulation into a new coin type, and may therefore be regarded as a reliable measure of the size of the coinage at the time of the recoinage.[105] However, calculating estimates for the volume of coinage in circulation within a given period or produced by a recoinage does belong to the intricacies of numismatic science and the methodologies used require some comment.

It must be emphasised that the science of quantifying the volume of coinage is an inexact one. Volume of coinage is based on multiplying an estimate for the number of dies by the *potential* number of coins one die might have produced. This section is not a history of the various attempts to estimate the number of dies or establish a suitable multiplier of 'coins per die', which are referred to by Allen.[106] The basis of the calculations of volume used in this thesis are explored here to prevent repeated reference to contentious and complex issues in subsequent chapters that apply an array of analytical techniques to numismatic material.

At the outset, the distinction between mint output and volume of currency must be emphasised. Not all of the coins in England at a given date would be products of then current mint activity. The English currency contained some earlier coins, as attested to by hoards containing coins of more than one type, and was supplemented by a relatively small number

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[105] Martin Allen has adopted a two-year period for the recycling of the national currency stock, based on documented recoinages that occurred at late dates. See M. Allen, 'The volume of the English currency, 1158–1470', *Economic History Review* 54:4 (November 2001), pp. 595–611, at p. 598.
[106] M. Allen, 'Medieval English die-output', *BNJ* 74 (2004), pp. 39–49, at p. 39.

of foreign silver or billon coins. Earlier coins probably remained as stores of wealth, rather than circulated as currency;[107] such 'multi-type hoards' are sometimes characterised by peculiarities of content, such as artefacts or the prevalence of cut coins, which, although common in the circulating currency, were not usually hoarded.[108]

Aside from earlier coins, some foreign coins circulated in England. Barrie Cook examined documentary and single-find evidence for the use of foreign coins in England and has suggested that these 'allow for a degree of mingling' of foreign coins in the twelfth century.[109] Foreign gold coins had a role in payments, but their role in circulation in twelfth-century Britain was extremely limited. Cook explored the role of Bezants (Byzantine gold coins) and although documentary evidence testifies to their presence – for example, the exchequer was prepared to receive gold – they probably did not circulate in any meaningful sense; none has been recorded as a single find.[110] Gold also was used in payment in Scotland. David I granted, 1141 × 1147, the tenth part of gold which came into the king's possession from Fife and Fothrif to Dunfermline Abbey, but it is unclear what form the gold took.[111]

The distinction between mint output and volume of currency is especially important in regard to Scotland. Scottish coinage does not seem to have significantly penetrated England's currency, but the limited information on Scottish hoards indicates that the Scottish currency was composed of both Scottish sterlings and foreign English pennies in unknown proportions (see p. 193).[112] However, quantifying the output of Scottish mints is no less important,

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[107] Interpretation proposed for eleventh century hoards by M.A.S. Blackburn, 'The Welbourn (Lincs.) hoard of 1980–82 of Æthelred II coins', *BNJ* 55 (1985), pp. 79–83 at pp. 81–83.

[108] Among hoards concealed in the late twelfth century, the Lark Hill (Worcestershire) hoard had rings and foreign coins, see *Inventory*, no. 381. The Wicklewood (Norfolk) hoard had an unusually high number of cut coins (104 out of 482), see M. Allen, 'The English Coinage of 1153/4–1158', *BNJ* 76 (2006), p. 251.

[109] B. Cook, 'Foreign coins in medieval England', in *Local Coins, Foreign Coins: Italy and Europe 11th–15th Centuries*, ed. L. Travaini (Milan: 1999), pp. 231–84.

[110] B. J. Cook, 'The Bezant in Angevin England', *NC* 159 (1999), pp. 255–75. The absence of single finds is conspicuous.

[111] G.W.S. Barrow, *The Charters of David I* (Woodbridge: 1999), pp. 120–21, no. 140.

[112] Although no Crescents sterlings have been found in England, Reginald of Durham's *Life of Saint Cuthbert* records a Scottish coin present in Cumberland *c.*1174, see N.J. Mayhew, 'Money in twelfth century Cumberland', *Seaby's Coin and Medal Bulletin* (August 1980), pp. 254–5.

because changes over time provide a relative idea of increases in the volume of currency and the indigenous demand for coinage.

Therefore, although mint output is not the same as volume of currency, it is the essential starting point for understanding monetary expansion in Britain. Increased mint output is probably indicated by the use of an increased number of dies. The equations now universally used for estimating the number of dies from a suitable sample of numismatic material used in this thesis are those of Warren Esty, first published in 1986 with subsequent algebraic simplification (see §1.5.1 below).[113] In order to calculate the potential volume of the coinage produced by estimated numbers of dies we need to know how many coins one die might be capable of producing. Therefore potential volume (*pv*) is the estimated number of dies (*e*) multiplied by the potential output of one die (*po*), which assumes for the sake of computation that all dies had similar output potential.[114] The calculation can be expressed as $pv = e \times po$.

The potential capacity of dies depended on the technological capabilities available for their production and the malleability of the alloy of the coins struck from those dies. Martin Allen has provided a comprehensive survey of the evidence for medieval English die-output in the thirteenth and fourteenth centuries from re-examining data in extant mint accounts. From this data Allen has suggested that the 'typical' average die-outputs of penny dies in the thirteenth and fourteenth centuries were about 20,000–60,000 for obverse dies and 10,000–20,000 for reverse dies.[115] In conclusion Allen emphasises 'the folly of any attempt to use a single arbitrary figure for the average die-output to estimate the size of a coinage'.[116] Allen himself has subsequently applied his 'typical' average die-outputs of penny dies in the thirteenth and

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[113] W. W. Esty, 'How to estimate the original number of dies and the coverage of a sample', *NC* 166 (2006), pp. 359–64. W.W. Esty, 'Estimation of the size of a coinage: a survey and comparisons of methods', *NC* 146 (1986), pp. 185–215; Esty's 1997 algebraic simplification of his equations is summarised by T. Crafter, 'A die-study of the Ipswich mint, c.1161/2–1180', *NC* 162 (2002), pp. 237–251.

[114] It could be objected that the *range* of the 95% confidence interval should be used as the estimated number of dies rather than the point estimate. However, current standard practice in numismatic methodology is to use the point estimate alone; see M.R. Allen, 'The English coinage of 1153/4–1158', *BNJ* 76 (2006), p. 260. Frequently, as in many of the calculations in this thesis, the low end point of the confidence interval is *less* than the actual number of known dies, hence it is obviously preferable to use the point estimate.

[115] M. Allen, 'Medieval English die-output', *BNJ* 74 (2004), pp. 39–49.

[116] Ibid., at p. 49.

fourteenth centuries to a twelfth-century coinage, but introduced a control. In calculating twelfth-century potential mint output Allen adopts the point estimate for *reverse* dies, because 'output...would have been restricted in practice by the more limited capacity of the reverse dies'.[117] However, it is worth noting that there are a number of problems associated with using the 'typical' average die-outputs of the thirteenth and fourteenth centuries as multipliers for estimates of dies of twelfth-century coinage. The problems all relate to the qualitatively different monetary systems in each period.

The historical context that may have surrounded the abandonment of the system of frequent recoinages has already been explored (§1.3). Whatever the motivations for the changes, the twelfth century may be regarded as a period of transition for the coinage of England to a new monetary system characterised by centralised minting and long-lasting coin types.

The difference in the monetary system is worth emphasising, because we are almost entirely reliant on the survival of numismatic material for knowledge of mint activity. For example, Bedford is known as a mint in the Cross and Crosslets coinage from a single coin and Dorchester is suspected from documentary evidence, but no coins are known.[118] Therefore, it is reasonable to suggest that the geographically defuse, farmed pre-1180 mint system may have had an over-capacity that the centralised English mint system of the thirteenth century would not have possessed. As Stewart has summarised: 'It is therefore impossible, in our present states of knowledge, to decide by how much thirteenth-century figures for average die output should be scaled down to allow for this factor of under-use [of dies] through circumstance, or for the (presumed) inferiority of twelfth-century manufacturing techniques'.[119] The argument can, however, run in the contrary direction. From the reforms of

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[117] M.R. Allen, 'The English coinage of 1153/4–1158', *BNJ* 76 (2006), p. 260, note 125. The reasoning is entirely logical: the reverse die was the trussel (upper, handheld die) which received the force of the hammer blow and therefore would be expected to have a shorter working life.

[118] *BMC Henry II*, p. cxxx. Mr Alan Dawson (*pers. comm.*) believes that Dorchester was active in the coinage.

[119] I. Stewart, 'The volume of early Scottish coinage', *CIMS*, pp. 65–72, at p. 66. The English coinage before the reform of 1180 suffered from defective production techniques, which continue to stimulate universal condemnation among twentieth century commentators. Amongst historians, Charles Oman and W. L. Warren both decried the coinage. Oman noted that 'an extraordinary proportion of the pieces are badly rounded, many being slightly oblong and others approaching a rough square', *The Coinage of England* (Oxford: 1931), p. 128. Warren observed 'the workmanship of the surviving examples rarely

the mint system in England in 1180 moneyers no longer farmed dies but were employed to produce coinage from dies: profits were collected by salaried exchangers.[120] Dies were probably replaced without encumbrance as the tools that enabled a mint technician to work. Prior to 1180 moneyers who farmed dies had to purchase replacement dies and, therefore, would have been more inclined to keep those dies they already possessed in operation for as long as possible, taking measures to extend the working life of their dies. In fact the attempts of moneyers to renovate their dies is observed in this thesis in the case of the moneyers at work in Northampton and in Scotland.[121]

While pausing to note the possible problems of applying recognised thirteenth-century potential die-output to twelfth-century coinage, Allen's estimates are the best available basis upon which to proceed. As already stated (pp. 44–5) Allen has himself applied his 'typical' average *reverse* die-outputs of penny dies in the thirteenth and fourteenth centuries to twelfth-century material. Therefore, throughout this thesis Allen's judiciously cautious methodology has been adopted. Any multiplier applied as the 'typical' average output of penny dies really speaks of potentiality – actual mint output was probably less than the potential. *Potential* mint output is calculated from the limited capacity of reverse dies at 10,000–20,000 coins per die. The figures produced from this methodology provide upper-limits for *actual* mint output, which was probably less.

Martin Allen's method produces a maximum potential volume, but independent evidence from the Pipe Rolls at least obliges consideration of the correctness of Allen's application of calculations to twelfth-century die-output. From the comprehensive die-study of coinage produced in England 1153/4–1158 (*BMC* type 7) Allen provides an (albeit tentative)

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rises above the mediocre', *Henry II* (London: 1973), p. 265. Regard for the coinage is scarcely higher among numismatists. G.C. Brooke stated the coinage is 'notorious for its ugly appearance, its bad craftsmanship, and its careless execution', *English Coins* (London: 1932), p. 102. The current (though dated) standard catalogue on English medieval coins states 'the careless execution of these coins often leaves fragmentary reverse legends which are difficult to interpret and makes them arguably the ugliest in the whole English coinage', J.J. North, *The English Hammered Coinage* vol. 1 (London: 1994), p. 48. The coinage produced in Scotland before the reform of 1195 was scarcely better.

[120] M. Allen, 'Henry II and the English coinage', in *Henry II: A New Interpretation*, ed. C. Harper-Bill (Woodbridge: 2007 (forthcoming)).

[121] See pp. 76–9 and pp. 164–5 below.

computation that 'the estimated *c*.520 type 7 reverse dies might have struck about £20,000–£45,000'.[122] Through further analysis of the estimated number of dies for the classes of the Cross and Crosslets coinage Allen reduced his estimate of the size of the coinage in 1158, suggesting that it might have been *c*.£15,000–£30,000.[123]

Lord Stewartby provided a penetrating analysis of the purpose of recoinage and suggested that reminting occurred for the purposes of accounting to the exchequer.[124] If payments into the exchequer had to be made in the then current coin type we might expect the volume of the coinage to have been substantially greater than the *known* amount paid into the exchequer derived from the Pipe Rolls during one year. However, Allen's estimate for the size of the currency in 1158 (*c*.£15,000–£30,000) perhaps sits uneasily beside the known amount of money paid into the exchequer. The total amount of coin actually collected by exchequer (as opposed to monies claimed by it) for the financial year 1158–59 was £19,320 0*s*. 8*d*.[125] If Allen's estimate is accepted, between *all* and one in two coins was paid into the exchequer in 1159. However, the volume of the English coinage must have been still greater than the figure in the Pipe Rolls. It is known that payments were also made through the Curia Regis and presumably other coins were minted that never found their way to the exchequer, that is to say we cannot assume that *all* mint activity was connected with the purposes of accounting to the exchequer. From the available hoard evidence the *BMC* type 7 recoinage seemed to have been reasonably comprehensive and eliminated many early coins from circulation. Allen himself observes that two substantial hoards indicate that 'pre-type 7 coins had no more than a minor role in the circulating currency after the recoinage at the introduction of type 7, although many older coins could remain as savings'.[126]

If Allen's estimate of the size of the English coinage in 1158 perhaps sits uneasily when one considers the available documentary evidence and other factors, why should this be so?

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[122] M.R. Allen, 'The English coinage of 1153/4–1158', *BNJ* 76 (2006), p. 260.
[123] *Ibid.*, pp. 260–61.
[124] I. Stewart, 'Coinage and recoinage after Edgar's reform', in *Studies in Late Anglo-Saxon Coinage* (*Numismatiska Meddelanden* XXXV), ed. K. Jonsson (Stockholm: 1990), p. 468. See also above, p. 32.
[125] Amt, *Accession of Henry II*, p. 196–7. See Table 2.3 below.
[126] M. Allen, 'The English coinage of 1153/4–1158', *BNJ* 76 (2006), p. 260.

To recapitulate: Allen statistically adjusted his estimate for the potential mint output from *BMC* type 7 ('the estimated *c*.520 type 7 reverse dies might have struck about £20,000–£45,000') to arrive at his estimate for the size of the English coinage in 1158 (*c*.£15,000–£30,000).[127] Allen's die-study is impressively comprehensive and the data is processed using Esty's methodology. Therefore the estimate for the number of *BMC* type 7 reverse dies may be regarded as secure. Therefore if Allen's estimate for the size of the currency in 1158 is too low – and the point remains moot – one might suggest that the multipliers (number of coins per reverse die) used by Allen are too low. It has already been suggested that Allen's application of late thirteenth century die-output (10,000–20,000 coins per die), which have been established from documentary evidence, to late twelfth-century coinage perhaps warrants further consideration owing to the difference in mint systems in operation (see p. 45).

Be that as it may, the computations for potential mint output in this thesis apply Allen's multipliers (10,000–20,000 coins per die) to the estimates for the number of reverse dies, with the proviso that multipliers may be too low. As already stated, Allen's methodology provide estimates of *potential* output volume and *actual* output probably less.

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[127] *Ibid.*, pp. 260–61. Allen using a statistical methodology to produced an estimate for the number of dies used in Cross and Crosslets Class A, which, unlike estimates for the potential mint output during *BMC* type 7, was not based on an estimate for the number of mints derived from a comprehensive die-study. The methodology is discussed in detail in Chapter 3 (pp. 95–6).

1.5.1 Equations for estimating the number of dies and coverage of a sample

All die-estimates in this thesis are based on the following equations. From any sample we wish to estimate D, the original number of dies and C, the coverage of the sample. Esty defines C as the fraction

$$\frac{\text{The number of coins struck by dies represented in the sample}}{\text{The number of coins struck by all dies}}$$

C is the fraction of the coins in the issue (population) which have been observed in the die-study (sample). Therefore, coverage must be between 0 and 1 and as the sample becomes more complete C increases.

Both D and C are *e*, point estimates; the die-studies provide the following data:

n = number of coins in the sample
d = number of dies represented in sample
d_1 = number of dies that struck exactly one coin in the sample (the number of singletons)
d_2 = number of dies that struck exactly two coins in the sample
d_i = number of dies that struck exactly i coins in the sample.

D, the original number of dies, is estimated in two stages.

The coverage of the sample is estimated first using: $$C_{est} = 1 - \frac{d_1}{n}$$

Then the estimate of D is provided by using C_{est}: $$D_{est} = \left(\frac{d}{C_{est}}\right)\left(1 + \frac{d_1}{2d}\right)$$

The last formula does **not** yield D,[128] but rather a point estimate for D, defined as *e*, from a range of possible values for D with which the data is compatible. The following formula is used to generate a 95% confidence interval, which will capture the true unknown value of D 95% of the time.
The endpoints of the 95% confidence interval for D are given by:

$$e + \left(\frac{2e}{n}\right)^2 \pm \left(\frac{2e}{n}\right)\sqrt{2e}$$

It is worth emphasising that C is a property of the sample **not** the population and that C_{est} is an estimate of C, which is unknown. Given a new sample of coins, such as would appear if a new hoard was discovered, then C_{est} serves as an estimate of the faction of the coins in the new sample that would be from dies already observed in the original sample (die-study). Providing that a sample is deemed to be 'fairly large',[129] the endpoints of 95% confidence intervals for C can be generated to determine how comprehensive the sample is. Only the sample of the Crescents coinage (Chapter 10) is so deemed in this thesis.
The endpoints of the 95% confidence interval for C are given by:

$$C_{est} \pm \left(\frac{2}{n}\right)\sqrt{d_1 + 2d_2 - \frac{d_1^2}{n}}$$

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[128] As Esty observes that an 'estimate for D is effectively the number of observed dies plus an estimate of d_0' where d_0 is that number of dies that are *not* represented in the available sample. W. W. Esty, 'How to estimate the original number of dies and the coverage of a sample', *NC* 166 (2006), p. 362.
[129] Ibid.,p. 362, technically coverage requires that d_1 and d_2 are large.

2. Conceptual framework

In this thesis monetary expansion is defined primarily as an increase in the volume of coinage, and more specifically, an increase which provided growth in the money in circulation. The active money supply would not be affected by an increase in volume of coinage that was used merely as a convenient store of wealth. Monetary expansion can also, in theory, be achieved by a greater velocity of circulation, but this is unlikely to have been a major factor. This contextual framework explores some of the reasons why the late twelfth century is a period of monetary expansion as well as the complexities and limitations of the evidence presented in the rest of this thesis.

The availability of coinage as a means of exchange was crucial to the commercialisation of the economy, which was in large measure sustained by population growth and greater agricultural production (see p. 19 and references). More specifically, the commercialisation of the economy of Britain in the late twelfth century was underpinned by changes in the use and geographical spread of coinage.

A distinction must be drawn between monetary expansion and monetisation. Leading historians of the medieval economy have emphasised monetisation rather than money supply. For example, both Bolton and Nightingale have questioned the sustainability of urban commercial activities because the monetisation of the medieval economy ebbed and surged with the seasons.[1] Monetisation implies an increase in the use of coins, i.e. a greater velocity of circulation, rather than an increase in the money supply (the number or availability of coins); monetary expansion *may* facilitate monetisation, but the two issues are qualitatively different. Evidence already surveyed (§1.2) suggests that there was increasing monetisation in the late twelfth century. Unless increasing monetisation was backed by monetary expansion, however, the velocity of circulation would have increased and non-monetary expedients would have been

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[1] J. Bolton, 'The English economy in the early thirteenth century', in *King John: New Interpretations*, ed. S. D. Church (Woodbridge: 2007), pp. 27–40. For Nightingale's view see above, p. 24 and note 38.

employed to eke-out an inadequate money supply (theory elucidated in detail by Mayhew, see p. 24). Thus in practice monetisation was constrained by and dependent on monetary expansion.

Fairs and markets contributed to the seasonal fluctuation of monetisation and the geographical spread of coinage into rural areas. The staple commodities of the medieval monetary economy were agrarian and agricultural surpluses, which were prerequisite for the commercialisation of the economy because surpluses generated money incomes, and which sustained urbanised populations (see pp. 19–20). The interdependence of towns and a surrounding rural hinterland has been highlighted (p. 17 and note 3), but it was the network of markets and towns that enabled the dispersal of coins throughout the national economy, because markets were the mechanism through which commodities were accumulated and dispersed in trade. Peasantry living within the vicinity of a single town would habitually travel to that one market to sell surpluses when crops were harvested. Itinerant traders accumulated agrarian goods during progresses through networks of small towns which held markets on different days (thus avoiding direct competition with each other), climaxing in the disposal of their stock at a large town, which held its market at the end of week. The dependent relationship worked in reverse with luxury goods. Merchants from larger towns supplied goods to retailers in smaller towns who were aware of the material desires and aspirations of wealthy customers in a locality. The commercial viability of agrarian commodities varied due to prohibitive transportation costs. Cereals were only viable over limited distances owing to their bulk and weight, but another agrarian commodity, wool, could be profitably transported by merchants owing to specific demand, such as from Flemish weavers. Relatively small utensils or luxury items could be easily and profitably conveyed over large distances. The limited opportunity to purchase specialised, non-agrarian manufactured goods at important annual fairs afforded some wealthy customers the opportunity to bargain directly with merchants and to plan many months in advance to do so. For these reasons markets and fairs were a primary mechanism for the

accumulation and dispersal of coinage among different populations and monetisation was largely seasonal in an economy that remained principally agrarian.[2]

One might reasonably theorise that monetisation could be investigated by the use of single find evidence. For other periods single finds have already been employed in such a manner and theoretically such evidence might be used for the twelfth century.[3] In this thesis the dispersal of Scottish coins from mints and the context of the finds are explored (§5.8) to demonstrate how the spread of the circulation area of coins seems to have expanded. However, the evidence is not extensive or authoritative. For England, single find evidence is by contrast relatively abundant. It should be noted that particular problems pertain to the single find evidence of the Cross and Crosslets coinage, which potentially introduce bias into any given sample. Evidence suggests that Cross and Crosslets single finds are (or have been) underreported and that Class A is overrepresented among cut coins owing to a propensity to fractionalise the earlier, better struck coins.[4] Moreover, the prevalence of fractionalisation introduces a particular bias not encountered in Anglo-Saxon and Norman issues and a considerable number of single-finds allow only the most rudimentary identification owing to poor production and/or condition.[5]

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[2] J. Masschaele, *Peasants, Merchants and Markets: Inland trade in Medieval England, 1150–1350* (New York: 1997), pp. 73–105; C. Dyer, *Making a Living in the Middle Ages: The People of Britain 850–1520* (London: 2003), pp. 187–96.

[3] For methodology see D.M. Metcalf, *An Atlas of Anglo-Saxon and Norman Coin Finds, c.973–1086* (London: 1998) and D. M. Metcalf, 'The monetary economy of ninth-century England south of the Humber: A topographical analysis', in *King's, Currency and Alliances: History and Coinage of Southern England in the Ninth Century*, ed. M.A.S. Blackburn and D.N. Dumville (Woodbridge: 1998), pp. 199–240. M. Allen has attempted to use single find evidence as a indication of volume of currency, 'The volume of the English currency, *c.*973–1158', in *Coinage and History in the North Sea World c.500–1250*, ed. B. Cook and G. Williams (Leiden: 2006), pp. 488–523, at p. 499, but the methodology seems fraught with difficulties, because it does not take account of the differences in the velocity of circulation, which would probably effect the frequency of loses from circulation. For an overview of various reasons for the frequency and distribution of coins on sites see M. Blackburn, 'What factors govern the number of coins found on an archaeological site?', in *Coins and Archaeology*, ed. H. Clarke and E. Schia, BAR International series 556 (Oxford; 1989), pp. 15–24.

[4] Crafter, 'Re-examination', p. 57–8. For further on cut coins, see below, p. 240.

[5] The coincidence of poor striking, fractionalisation and underreporting is most interesting and can be most readily grasped from examining productive sites where recording of finds is comprehensive. M. Allen and S.P. Doolan, 'Finds from Dunwich', *BNJ* 72 (2002), pp. 85–94, estimate that a majority (two thirds or three quarters) of coins lost between 1180 and 1279 at Dunwich were farthings and most the remainder halfpence. That this is typical of productive sites in Britain is suggested by data from a site in north Wales, see E. Besly, 'Short Cross and other medieval coins from Llanfaes, Anglesey', *BNJ* 65 (1995), pp. 46–82. By contrast, fractional Anglo-Saxon coins are relatively uncommon compared with those of the late twelfth and thirteenth centuries. The question arises whether there has been a tendency not to report fractional coins of the later medieval period from non-productive sites, because these have been (erroneously) regarded as insignificant by finders when compared with whole coins.

Hopefully such problems concerning the single find evidence may be overcome with sufficient future work towards improved recording and identification of new finds as well as, where possible, the reworking of those finds already recorded. Without such problems cut-coins might be used to elucidate an increase in the spread and use of coins (monetisation). Nevertheless, single find evidence would not specifically address whether there was an increase in the active money supply (monetary expansion).

Despite the absence of documentary evidence the volume of coinage produced in England and Scotland can be approached through surviving coins. Statistical methodologies can be applied to samples of numismatic material, as long as the coinages under consideration have an adequate structural framework, both in terms of classification and chronology (see §1.5). Table 2.1 presents the estimated reverse dies available for the coinages of England and Scotland in the last half of the twelfth century. Table 2.2 presents the annualised rates of consumption of the estimated reverse dies used in England, based on the chronological framework presented in Table 2.1. Owing to the current imprecision concerning the chronology of the Crescents coinage (see Table 1.1, above) it would be inappropriate to annualise the estimated number of dies, so these are excluded from Table 2.2. As can be seen from Tables 2.1 and 2.2 both the estimate of the number of reverse dies and the annualised rate of consumption of those dies suggest that the highest mint output was during the 1150s and 1180s. However, the issue is more complex than the raw data suggests.

The number of dies during *BMC* type 7 is probably representative of a concerted effort towards the conversion of earlier coins. When *BMC* type 7 was introduced in 1153/4 it was the first recoinage on a national scale for approximately fifteen years and its purpose was to remove the many substandard coins that had proliferated from mints in areas where royal authority over the coinage was disrupted during the civil war in Stephen's reign.[6] Although two changes of type were undertaken by Stephen's government between the mid 1140s and 1153/4 (*BMC* types 2 and 6), these were confined to mints in eastern England under royal control. The activity of

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[6] M. Allen, 'The English coinage of 1153/4–1158', *BNJ* 76 (2006), pp. 242–302, at p. 242; M. Allen, 'Henry II and the English coinage', *Henry II: New Interpretations*, ed. C. Harper-Bill and N. Vincent (Woodbridge: 2007), pp. 257–77, at p. 258.

mints *c.*1154–1158 may have been buoyed by the desire of the public not to hold stores of currency composed of an array of coinages produced during the civil war, which seem rightly to have been regarded with suspicion.[7] *BMC* type 7 was truly a *renovatio*: it restored confidence in the coinage by purging the English currency of earlier types and Allen's survey of hoard evidence suggests that recoinage of *BMC* type 7 was relatively comprehensive.[8]

It is possible that the incentives for recoinage were not as strong in 1158–*c.*1160 as they had been in 1153/4. Confidence in the composition of national currency had already been restored with *BMC* type 7 and a possible strengthening of the intrinsic standard of the coinage in 1158 would not have encouraged the exchange of more coins of *BMC* type 7 than were required for taxation purposes.[9] According to Allen 'the lower weight standard of [*BMC*] type 7 coins must also be considered', which he proposes was approximately 90 per cent of that of Cross and Crosslets coinage. Therefore, whatever proportion of *BMC* type 7 was recoined in the recoinage of 1158–*c.*1160 the volume of that coinage would have decreased by 10 per cent.[10] It should be noted, however, that the weight increase may have been neutralised by a diminution of the metal standard, or the disparity between the coinages may have been greater than Allen suggests if the silver content was increased alongside the weight in 1158.[11] Without any analysis of the metallurgy of the coins of *BMC* type 7, the metrological alteration proposed by Allen is speculative.

Notwithstanding these important caveats, Allen suggested that *BMC* type 7 'was effectively removed from circulation, although not from savings, during the recoinage of 1158–*c.*1160'.[12] In fact, there is little evidence to support this view. It appears that during the period *c.*1174–*c.*1180, the *terminus post quem* of the large hoards of Cross and Crosslets (explored in

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[7] The metallurgy and metrology of coins produced at mints in areas of England under Angevin control rarely reached the standard of royal coins, see M. M. Archibald, 'The lion coinage of Robert earl of Gloucester and William earl of Gloucester', *BNJ* 71 (2001), pp. 71–86, at p. 83 and G. C. Boon, *Welsh Hoards 1979–81* (Cardiff: 1986), pp. 59–60.

[8] See above, p. 47.

[9] See above, p. 32.

[10] M. Allen, 'The English coinage of 1153/4–1158', *BNJ* 76 (2006), pp. 242–302, at p. 261.

[11] A similar conclusion has been formed from the analyses in this thesis, which suggest that the Scottish Crescents coinage had an approximate intrinsic parity with the English Cross and Crosslets coins even through the weight standards varied significantly (see §5.6.2).

[12] M. Allen, 'The English coinage of 1153/4–1158', *BNJ* 76 (2006), pp. 242–302, at p. 252.

Chapter 4), the currency did not contain any earlier English coins. However, the contribution of the *BMC* type 7 to the currency 1158–*c*.1174 cannot be determined from the available evidence. The only hoard from the 1160s, the Awbridge hoard (deposited *c*.1163–*c*.1167), contained Cross and Crosslets and *BMC* type 7 coins in a ratio of 2:1, but we have no similar hoards to compare it with and are not in a position to say whether the content of the hoard is representative of circulating currency or the content had some savings element.[13] In Chapter 4 it is suggested that as frequent periodic recoinages were abandoned after 1158 each successive class of Cross and Crosslets coinage (1158–1180) progressively supplemented the overall volume of coinage, subject to some wastage. But if (*pace* Allen) *BMC* type 7 coins were *not* effectively removed from circulation by in the recoinage of 1158–*c*.1160, then the proportionate increase may not have been as dramatic as that proposed in Chapter 4.

In contrast to the 1160s, *c*.1174–1180 can be identified as a period of significant monetary expansion. Owing to the available hoard evidence more certainty pertains to the currency *c*.1174–1180 and reveals that by that time *BMC* type 7 had been completely removed from the currency. The hoards provide important information concerning the period of Class F that indicates that output was considerably higher than that which might be expected if Allen's estimate for the number of dies used in Class F is correct.[14] In Allen's latest published overview of the coinages of Henry II he cites my own published work which he concludes 'does not indicate any significant rise in the total number of dies and overall national mint output in the 1170s'.[15] However, in this thesis I have argued that there appears to be a divergence between the dies and the composition of the currency in hoards that cannot be readily explained if the overall estimate for the number of dies in Class F is correct.[16] The large hoards imply that there are 'missing' Class F dies, that is, the estimate provided by Allen based on the catalogue of the national collection is too low. However, the three available die-studies of individual mints in

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[13] The Awbridge hoard contained 31 coins of *BMC* type 7 and 65 Cross and Crosslets coins, *BMC Henry II*, p. lvi–lvii. The Wicklewood hoard deposited (*c*.1173) contained coins of *BMC* type 7.
[14] Allen's estimate was derived from a statistical methodology based on the specimens in the 1951 catalogue of the national collection (see pp. 95–6 and 140).
[15] M. Allen, 'Henry II and the English coinage', *Henry II: New Interpretations*, ed. C. Harper-Bill and N. Vincent (Woodbridge: 2007), pp. 257–77, at p. 274.
[16] See below, pp. 138–40.

Class F do *not* conflict with Allen's estimates of those mints.[17] The comparison is perplexing, because one ought to regard hoards as better-quality evidence for the currency and these do suggest that the beginnings of the expansion in volume of the national coinage began during the 1170s during Class F.

It must be acknowledged that the raw data in Tables 2.1 and 2.2 does not by itself serve to elucidate the *nature* of the increase in the volume of coinage suggested by the hoard evidence examined in this thesis. However, data concerning the revenues of the English exchequer in the reign of Henry II constitute an important, independent source of comparative information regarding monetary expansion, and it is to this that we now turn.

There is an apparent conflict between the available estimates for dies and hoard evidence. Owing to the ambiguity of the statistical estimates for the volume of mint output based on an estimated number of dies, data for exchequer revenues potentially offer an alternative indication of monetary expansion, but the interpretation of the data poses its own challenges. Before embarking on a critique of the revenue data it is necessary to state the view of the most recent commentator, Nick Barratt. Barratt has recently endorsed the figures for revenue that accrued to the exchequer during the reign of Henry II published by Sir James Ramsey in 1925.[18] Barratt suggests that the average annual audited income to the exchequer prior to 1166 was £13,300, between 1166 and 1179/80 the average annual audited income was £20,400, and from 1179/80 to 1189 the average annual audited income was almost £22,000.[19] Barratt is aware of the supposed importance of the year 1180 for the beginnings of price inflation, according to the seminal study by Harvey, and he notes that the exchequer income from that date was not substantially different from the period 1166–1180.[20] Therefore, Barratt emphasises the importance of the year 1166 instead of the year 1180.

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[17] See below, p. 141.
[18] Barratt, 'Finance and the economy', p. 249. J. H. Ramsey, *A History of the Revenues of the Kings of England* (Oxford: 1925), vol. 1, p. 191.
[19] Barratt, 'Finance and the economy', p. 249.
[20] P. D. A. Harvey, 'The English inflation of 1180–1220', *Past and Present* 61 (November 1973), pp. 3–30.

Barratt based his endorsement of Ramsey's figures on recalculations of the data from 1157–8 and every five years thereafter to the end of the reign.[21] In this context, it is rather surprising that Barratt did not take the opportunity afforded by the work of both Amt and White to assess the validity of the revenue data presented by Ramsey for the first fifteen years of the reign, a period which is central to the argument advanced by Barratt and which he himself identifies as particularly problematic.[22] The data provided by Amt, and by White following Amt's conventions, is far superior in detail and scope to Ramsey's figures and acts as an independent control.[23] (Unfortunately Barratt did not publish any details concerning his recalculations of Ramsey's data.) Table 2.3 presents the figures of Ramsey for exchequer revenue 1155–67 and the available calculations by Amt and White for comparison, which roughly agree with those of Ramsey. From examining Table 2.3 it is possible to say that Barratt's argument perhaps gives the wrong impression about the early revenue data. While it is true that the *average* exchequer revenue 1155–64 (Pipe Rolls 2–10) is approximately £12,500 it would perhaps be more apposite to state that annual revenue prior to 1164 was highly erratic. From 1164 to the end of the reign the figures are more uniform (<£17,200, >£21,300) and it seems appropriate to provide a mean, which is approximately £20,500. Given these reservations it follows that it would perhaps be more prudent to say that annual revenue increased or at least became regularised from the mid-1160s, rather than emphasis the year 1166 as Barratt does.

Barratt emphasises the year 1166 because his argument largely rests on the premise that increased fiscal activity was government led. Barratt regards the effect of increased fiscal activity in the economy as indicative of 'the Crown bringing more money into circulation than at any previous point, or at the very least increasing its velocity of circulation'.[24] It is certainly the case that a series of political, legal and administrative reforms occurred in 1166. In the judicial sphere the Assize of Clarendon (1166) entrenched the General Eyre and brought the

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[21] Barratt, 'Finance and the economy', p. 249.
[22] Barratt, 'Finance and the economy', pp. 248–9. It is very surprising that Barratt does not cite either work.
[23] Amt, *Accession of Henry II*, Appendix I, 'Royal revenues, 1155–59', pp. 190–97. White, *Restoration and Reform*, Appendix II, 'Pipe Roll 11 Henry II (1164–5)', pp. 227–8.
[24] Barratt, 'Finance and the economy', p. 254.

profits of justice within the orbit of the exchequer; the *cartae baronum* (1166) was an ambitious assessment of land held by tenants in chief, the returns of which were used to levy new feudal aids; earlier 'aids' and '*dona*' were reformulated and coalesced into tallage, a regular income which made the imposition of extraordinary taxation, such as the danegeld, unnecessary.[25] Barratt interprets the physical expansion of the Pipe Rolls in 1166 as a reflection of the exchequer adapting to audit increased revenue from the new sources. In sum, Barratt states without qualification that 'the sudden rise in Crown receipts can be specifically linked to a series of important legal reforms and administrative innovations that were instigated in 1166'.[26]

The increase is not as sudden nor its cause as specific as Barratt would have us accept and should perhaps be tempered by asking whether the government's reforms were responsive to general trends of fiscalisation rather than its primary cause. It is clear that increased attention to auditing detail in the Pipe Rolls from 1166 onwards was not itself a prerequisite for the exchequer to be able to deal with annual receipts of *c.*£20,000, because as early as 1158–9 the exchequer had collected £19,320 0*s.* 8*d.* (Amt's data).[27] Direct taxation based on land was the levy least complex to administer as the machinery of government recovered from the civil war and during the first eleven years of Henry II's reign the exchequer raised two danegelds.[28] It is perhaps instructive that the danegeld was never levied after 1162 as methods of taxation which resulted from expediency were replaced by other sources, a process already underway before 1166. As Amt has observed, '*in the 1150s*, we see a shift in taxation away from the taxes on landholders...towards fee-based levies such as scutage and the knight's aid of 1159'.[29] By securing incidental sources of revenue the exchequer regularised annual revenue by limiting the dependency on individual sources or extraordinary levies, but increased the complexity of auditing exchequer accounts. It is perhaps best to view the improvement of the physical arrangement of Pipe Rolls as a reflection of such complexity. Contrary to Barratt's view of a government-led increase in revenue in 1166, it seems preferable to regard revenue as fluctuating

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[25] Ibid., p. 252–3.
[26] Ibid., p. 251.
[27] Amt, *Accession of Henry II*, p. 195.
[28] White, *Restoration and Reform*, p. 150.
[29] Amt, *Accession of Henry II*, pp. 175–6, my emphasis.

before 1166 and the government as responsive to general fiscal trends which secured annual receipts on a more stable footing after that date.

The establishment of measures for dispensing justice and assessing and collecting new forms of taxation may be regarded as mechanisms that accumulated and dispersed increasingly large volumes of money, which compare favourably with the mechanisms of markets already discussed. The evidence presented in Table 2.4 reinforces the view that revenue in the first decade of Henry II's reign was erratic, but suggests that this was largely due to taxation, not to fluctuations in receipts from the royal demesne. Revenue from farms, which represented income from the royal demesne, experienced a slight but steady increase during the first four years for the reign, while receipts from dispensing justice remained static at under 4%. Income from taxation varied wildly owing to the imposition of special levies, such as the danegeld of 1155–6. Most importantly, it is clear from Table 2.4 that even before the legal reforms of 1166 receipts from judicial procedures had already increased from a static 4% or less in 1155–59 to 28% in 1164–65. This information lends plausibility to the suggestion that the reforms of 1166 were a response to developments. Although the demesne revenue had increased further by 1164–5 it is the increase in annual revenue for dispensing justice that is really impressive, up from no more than £350 in 1155–59 to nearly £3,000 in 1164–5.

While being aware of the problems and limitations of data concerning exchequer revenue during the reign of Henry II, the information may be compared with estimates of the volume of currency derived from studies of late twelfth-century numismatic material. As explained, it is probable that *BMC* type 7 represents a comprehensive recoinage of the English currency. Therefore, we may conclude that Allen's estimate of the volume of *BMC* type 7 coinage produced (*c.*£15,000–£30,000) represents the volume of coinage with which the economy of England could function in 1158. As the average annual audited income to the exchequer was regularised by the late 1160s, if the volume of coinage had remained at the 1158 level (*c.*£15,000–£30,000) the annual demands of the exchequer would have increasingly restricted the money supply if no monetary expansion occurred. In fact the revenue data for 1158–9 (£19,320 0*s.* 8*d.*) is more authoritative and acts as a control for Allen's estimate for the volume

of coinage generated from numismatic evidence, which ought to be revised to *c.*£20,000–£30,000.[30]

As explored, it must be acknowledged that the available numismatic evidence does not serve to elucidate whether monetary expansion occurred in the 1160s. Independent data on Crown revenues suggests that the economy was increasingly fiscal in the 1160s because incidental sources of revenue became increasingly important, displacing extraordinary taxation, to which a series of reforms in 1166 may have been a response rather than a cause. All one may say positively is that well before 1180 the English state appears to have been operating in ways which imply an expanding currency. There is no evidence that the English money supply was put under undue strain by increased fiscality, but again there is at present no evidence for monetary expansion in the 1160s.

It is possible to identify monetary expansion in the 1170s much more readily than in the 1160s. Nobody doubts the high output during the initial period of the Short Cross coinage (see Table 2.2) During the period of non-recoinage output during the Short Cross coinage (Classes 1b2–2), the consumption rate was approximately 222 dies per annum, significantly higher than any rate of consumption during any class of Cross and Crosslets dies, including the recoinage of 1158–*c.*1160. *But* the hoards suggest that Allen's methodology may have yielded a significant underestimate of the number of dies used in Class F. The known large hoards of the coinage indicate the prominence of Canterbury coins (and those from mints in the south eastern region generally) and it is these mints that may yet contribute a large proportion of the 'missing' Class F dies. However, the poor condition of the numismatic material precludes an adequate exploration of the issue through die-study.[31]

An increase in the number of dies at southern mints in the 1170s is plausible owing to potential flows of bullion in trade from Europe. Evidence already explored suggests that silver

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[30] Attention has already been drawn (above p. 47) to a comparison between the estimate of the volume of coinage published by Allen for *BMC* type 7 (*c.*£15,000–£30,000) and the total monies paid into the English exchequer in 1158–9. (I have suggested this perhaps calls into question Allen's application of known thirteenth-century die-output to twelfth-century coinages (see p. 47))

[31] A difficulty reinforced by the dispersal of the Wren collection of Canterbury mint coins without record. See below pp. 112–13 and note 23.

discovered at Freiberg in the 1160s had an impact on output at Cologne and influenced the currency of Flanders by the early 1170s. Considerable value was already attached to the archbishop's mint of Cologne by 1174 (p. 38 and note 94) and an agreement of 1173 which authorized the circulation of German coins in Flanders (p. 38) suggests that pressure was already being exacted on an expanding monetary zone. Documentary evidence suggests that Flemings had an insatiable desire for English wool in 1170s, both in war and peace (see pp. 36–8), and the availability of money outstripped the availability of wool as early as 1181 when the Cistercian Order had to restrain monastic houses from taking on unacceptable risk (p. 36).

An increase in the volume of the English coinage in the 1170s might also serve to explain the reform of English coinage in 1180. The reform of 1180 vastly improved the appearance of the individual coins, but there is no evidence that the poor state of the Cross and Crosslets coinage endangered exchequer payments (see §6.5). The cosmetic renovation of the coinage might be further evidence for increasing monetisation: the (perceived) quality of individual coins mattered a great deal for transactions of low value (see §6.5.4). However, it is unlikely the government was primarily motivated to reform purely by the interests of the coin-using public. As explored in this thesis (§4.4) Canterbury moneyers were subjected to judicial processes, which may have been instigated after the government became alert to their wealth and activities. The proportion of Canterbury coins in recorded hoards deposited in the 1170s is substantial and suggests that output of some moneyers was prolific. The royal government took a particular interest in the affairs of Canterbury in the 1170s owing to the construction of the new Trinity Chapel at Christ Church accommodating the shrine of Becket, a project that seems to have been financially underwritten by some moneyers.

Given the importance of the English revenue data as a comparative source for information derived from numismatic material, it is most unfortunate that no records survive that specify the revenues of the Scottish exchequer in twelfth century. As a consequence the systematic study of the twelfth-century coinages issued in Scotland is of primary importance for assessing monetary expansion.

The classification of the Crescents coinage (*c*.1170–1195) presented in this thesis (Chapter 5) and based on the first comprehensive die-study (Chapter 10) has allowed the increase in the number of dies used in Scotland in the twelfth century to be quantified for the first time (see Table 2.1). The increase in the number of dies in Scotland *c*.1170–1195 parallels the beginnings of monetary expansion in England in the 1170s and 1180s. The increase in the English money supply may have augmented the Scottish currency and encouraged monetisation. In the thirteenth century English coins constituted a major proportion of the Scottish currency and it is probable that this was the case in twelfth century,[32] but the evidence of hoards and single finds reveal little that is concrete about the composition of the currency of Scotland prior to 1195.[33] The role of English coins in the currency of Scotland *may* have encouraged indigenous mint output.

Developments suggested in this thesis point towards the increase in the volume of coinage in Scotland specifically as monetary expansion in the late twelfth century, but the evidence is circumstantial rather than demonstrable. The analysis of the metallurgy of the coinage of Britain (Chapter 6) indicates that growth in the volume of coinage was not stimulated by a contemporaneous argentiferous discovery.[34] Analysis of the metallurgy and metrology indicates that in the twelfth century Scottish coinage was considerably different from that of England. The intrinsic standard of Scottish coinage prior to 1195 does not suggest the exchequer was blanching shire farms, but the conjectured intrinsic alignment of the Scottish coinage with that of England in 1195 may indicate that the exchequer began to do so at the end of the twelfth century. The location of the reform of the Scottish coinage as one of series of administrative reforms in 1195 lends support to this interpretation.[35] Such developments may suggest that monetary expansion occurred in Scotland. The growth in the volume of coinage produced at

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[32] Metcalf, *CIMS*, p. 10–11.

[33] The only large hoard of Crescents coins from Dyke (1780) contained coins of Henry II, but it is not known what type these were nor in what proportion they occurred, see below pp. 192–3. The limited number of single finds of Cross and Crosslets coins from Scotland are *less* than the number of Crescents finds. For details of the seventeen Crescents finds see pp. 199–203; for details of the seven Cross and Crosslets finds see p. 207, note 118.

[34] See below, pp. 248–9.

[35] See below, pp. 189–90.

Scottish mints was not simply the repository of new mineralogical wealth. The alignment of the intrinsic standard of Scottish coinage with that of England in 1195 is suggestive of the importance of English coinage in the currency of Scotland in the late twelfth century and that the Scottish coinage was not required as a store of value but had to work together with English coins in the Scottish economy.

Much of this thesis is conjectural in the absence of documentary evidence detailing monetary expansion. Many of the suggested conclusions proposed in this thesis rely on weight of forensic details garnered from twelfth-century numismatic material, the chance survival of which could never be said to represent completeness. Therefore, the limited material and the difficulty of the coinages, which again must be emphasised, allows one only to go so far. A die-study of Class F coins of Canterbury would greatly contribute to our understanding the extent to which the output of that city contributed to monetary expansion, but it is unlikely that such an undertaking will ever be possible. One may be more hopeful of the discovery of new hoards for the period, which will undoubtedly yield important information concerning the composition of the currency, especially for Scotland. No Scottish hoards containing Crescents coins have been found since 1834, as opposed to two large hoards of Cross and Crosslets coins in the last eighty years as well as numerous smaller finds, so one might well say that we are well-overdue for a Scottish find. As matters stand one can only work with the material available and do what is possible with it in order to address the question of monetary expansion in the late twelfth century. Modern historiography acknowledges that money supply was an important aspect of the commercialisation of the medieval economy (see p. 17) and that this increase in money supply had the significant and disadvantageous side-effect of inflation from 1180 (see p. 25). Owing to the reform of the English coinage in 1180 it has been opportune for numismatic scholarship to confirm the view of an increase in mint output: in Metcalf's memorable observation 'the volume of the English currency was rising like a rocket between 1180 and

1280'.[36] This thesis explores when the rocket was launched and suggests that the increase in volume of coinage in England was nascent the 1170s and in Scotland throughout the period *c*.1170–1195. Hitherto, monetary expansion in the 1170s has been largely out of sight owing to the difficult nature of the coinages in issue during that decade in Britain and this thesis may be regarded as a no more than a contribution to bringing what was hidden into the light.

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[36] D.M. Metcalf, 'A survey of numismatic research into the pennies of the first three Edwards (1279–1344) and their continental imitations', *Edwardian Monetary Affairs (1279–1344)*, ed. N.J. Mayhew (Oxford: 1977), pp. 1–31, at p. 7.

Table 2.1. The estimated number of reverse dies for the respective coinages of England and Scotland, *c.*1150–*c.*1200, with the dates of individual classes as applicable, according to the latest available research. Coinages and classes subjected to detailed structural and analytical work, and metallurgical study in this thesis are shaded grey.

ENGLAND			**SCOTLAND**		
Coinage	*Class*	*Point estimate of number of dies (95% confidence)*	*Coinage*	*Class*	*Point estimate of number of dies (95% confidence)*
Stephen *BMC* type 6	—	*No data*	David I, phase (c)	—	*No data*
Stephen *BMC* type 7	—	520 (*c.*420–*c.*645)	———, phase (d)	—	} *No data*
Cross and Crosslets	A	384 (*c.*340–*c.*435)*	and Malcolm IV	—	
———	B	66 (*c.*45–*c.*90)		—	
———	C	270 (*c.*230–*c.*315)	'Early' William I	—	*No data*
———	D	100 (*c.*80–*c.*125)	Crescents	A	} 16 (*c.*11– *c.*23)
———	E	103 (*c.*70–*c.*150)	———	B	
———	F	287 (*c.*205–*c.*405)†	———	C	} 60 (*c.*53– *c.*70)
Short Cross	1a1–1b1	801	———	D	
———	1b2–2	1,773	———	E	94 (*c.*55–*c.*167)
			Short Cross, phase (a)	—	*No data*
			———, phase (b)	—	*No data*

***DATA ENDORSED IN THIS THESIS**
†DATA QUESTIONED IN THIS THESIS

Notes on Table 2.1:
ENGLAND: No die-study has yet been undertaken of *BMC* type 6. The estimate for *BMC* type 7 is based on a the latest research and comprehensive die-study by M. Allen, 'The English coinage of 1153/4–1158', *BNJ* 76 (2006). The die estimates for the Cross and Crosslets coinage those proposed by Allen in the same article, but are *not* based on die-study, but rather derived from a statistical methodology. The estimated number of reverse dies of classes 1a1–1b2 (the recoinages of 1180–*c.*1182) and 1b2–2 (*c.*1182–*c.*1190) are those offered by M. Allen, 'The quantity of money in England 1180–1247: new data', *BNJ* 75 (2005), pp. 44–9, at p. 44–5 and Table 1.
SCOTLAND: Data concerning the Scottish coinages in issue prior to *c.*1170 is unavailable, because comprehensive structural and analytical work has not yet been undertaken. The estimates for the reverse dies of the Crescents coinage of William I are those proposed in this thesis and based on die-study (see §5.5), and based on the first internal class division of the coinage also proposed (see §5.2.2.). Thirty years ago I. Stewart, 'The volume of early Scottish coinage', *CIMS*, pp. 65–72, at p. 68–9 published 'observed' obverse dies, but no comprehensive corpus has been published in the intervening years which would enable the number of reverse dies to be estimated.

Table 2.2. Theoretical annualised consumption of reverse dies for the coinages of England *c.*1150–*c.*1190, based on the estimated number of reverse dies. Coinages subjected to detailed structural and analytical work, and metallurgical study in this thesis are shaded grey.

Coinage	*Class*	*Dates*	*Approximate number of years*	*Annualised approximate rate of consumption of dies (95% confidence)*
Stephen *BMC* type 6	—	*c.*1151–1153/4	3	*No data*
Stephen *BMC* type 7	—	1153/4–1158	4	130 (105–161)
Cross and Crosslets	A	1158–*c.*1163	5	77 (68–87)*
———	B	*c.*1162–*c.*1163	1	66 (45–90)
———	C	*c.*1163–*c.*1167	4	68 (58–79)
———	D	*c.*1167–*c.*1170	3	33 (27–42)
———	E	*c.*1170–*c.*1174	4	26 (18–38)
———	F	*c.*1174–1180	6	48 (34–68)†
Short Cross	1a1–1b1	1180–*c.*1182	2	400
———	1b2–2	*c.*1182–*c.*1190	8	222

***PRIMARY DIE ESTIMATES ENDORSED IN THIS THESIS**
†PRIMARY DIE ESTIMATES QUESTIONED IN THIS THESIS

Table 2.3. Revenues paid in or accounted for in Pipe Rolls 2–13 Henry II (1155–1167).

Pipe Roll	*Date*	*Ramsey (1925)*			*Amt (1993)*			*White (2000)*		
		£	*s.*	*d.*	£	*s.*	*d.*	£	*s.*	*d.*
2	1155–56	12,721	0	0	13,020	7	0	—	—	—
3	1156–57	8,111	16	5½	7,600	9	11	—	—	—
4	1157–58	11,657	13	8	12,473	7	7	—	—	—
5	1158–59	18,258	3	6	19,320	0	8	—	—	—
6	1159–60	10,266	15	4	—	—	—	—	—	—
7	1160–61	13,489	2	3	—	—	—	—	—	—
8	1161–62	14,939	19	6	—	—	—	—	—	—
9	1162–63	9,910	8	9½	—	—	—	—	—	—
10	1163–64	10,423	14	0½	—	—	—	—	—	—
11	1164–65	21,723	6	2	—	—	—	21,032	5	3
12	1165–66	17,283	0	0	—	—	—	—	—	—
13	1166–67	18,483	16	1½	—	—	—	—	—	—

Notes on Table 2.3:
The figures represent the total money revenues and are composed of money actually paid into the exchequer and expenditure of money that was collected by the sheriff (or other official acting on behalf of the king), but spent on the king's behalf and credited to them by the exchequer. The figures of J. H. Ramsey are those in *A History of the Revenues of the Kings of England* (Oxford: 1925), vol. 1, p. 191, Table 1, which have been endorsed by Nick Barratt, 'Finance and the economy in the reign of Henry II', *Henry II: New Interpretations*, ed. C. Harper-Bill and N. Vincent (Woodbridge: 2007), pp. 242–56 at p. 249. The data contained in the early Pipe Rolls of Henry II has been explored in detail by Emilie Amt, *The Accession of Henry II in England* (Woodbridge: 1993), Appendix I, 'Royal revenues, 1155–59', pp. 190–97. Total revenues have been calculated by adding total 'Payments' to the total 'Expenditure' in Table 9, pp. 194–7. Graeme White calculated 'payments in' and 'expenditure' for a single year, but also gave a total for revenue, *Restoration and Reform 1153–1165: Recovery from Civil War in England* (Cambridge: 2000), Appendix II, 'Pipe Roll 11 Henry II (1164–5), pp. 227–8.

Pipe Roll 1 Henry II (1154–55) has not survived. Ramsey gave a total for Pipe Roll 1 Henry II based on summaries of the lost roll in the *Red Book of the Exchequer*. Amt considered this source unreliable for the calculation of such data, *The Accession of Henry II in England* (Woodbridge: 1993), pp. 121–4, and consequently this Table begins with Pipe Roll 2 Henry II.

Table 2.4. Sources of revenue (payments in) in the Pipe Rolls 2–5 Henry II (1155–1159) based on Amt (1993) and Pipe Roll 11 Henry II (1164–5) based on White (2000).

Pipe Roll	*Date*	*Source*	*Revenue (payments in)* £	*s.*	*d.*	*As percentage*
2	1155–56	Farms, etc.	4,553	16	5	49%
		Fines, pleas and amercements	345	14	3	4%
		Taxation and other similar levies	4,322	16	4	47%
		Total payments	9,222	7	0	100%
3	1156–57	Farms, etc.	4,584	8	6	95%
		Fines, pleas and amercements	196	0	1	4%
		Taxation and other similar levies	62	6	2	1%
		Total payments	4,842	14	9	100%
4	1157–58	Farms, etc.	6,392	0	2	78%
		Fines, pleas and amercements	314	2	5	4%
		Taxation and other similar levies	1,458	10	9	18%
		Total payments	8,164	13	4	100%
5	1158–59	Farms, etc.	6,210	4	2	59%
		Fines, pleas and amercements	172	17	3	1%
		Taxation and other similar levies	8,767	15	11	54%
		Total payments	16,150	17	4	100%
11	1164–65	Farms, etc.	9,477	0	2	55%
		Fines, pleas and amercements	2,939	10	8	17%
		Taxation and other similar levies	4,791	4	7	28%
		Total payments	17,207	15	5	100%

Notes on Table 2.4:
The data for Pipe Rolls 2–5 Henry II is derived from the figures presented by Emilie Amt, *The Accession of Henry II in England* (Woodbridge: 1993), Appendix I, 'Royal revenues, 1155–59', pp. 190–97, organised according to the arrangement of the material adopted by Graeme White for Pipe Roll 11 Henry II, *Restoration and Reform 1153–1165: Recovery from Civil War in England* (Cambridge: 2000), Appendix II, 'Pipe Roll 11 Henry II (1164–5), pp. 227–8.

3. Understanding mint activity during the recoinage of 1158 and in the 1160s: A die-study of the Northampton mint during the Cross and Crosslets coinage

3.1 Introduction

In order to quantify monetary expansion in Britain in the late twelfth century, one must know the volume of the currency at a given date at the beginning of the period. For England the most convenient date is 1158 when a recoinage was initiated that recycled the national currency stock, eliminating sub-standard coinage that had proliferated during the reign of Stephen. The recoinage of 1158 was executed by individual moneyers working in towns using official dies cut with the national standardised coin type.

Martin Allen's die-study of *BMC* type 7 is the latest in a series of papers that have revised the estimate for the potential volume produced by the recoinage initiated in 1158. [1] Martin Allen has adopted a two-year period for the recycling of the national currency stock, based on documented recoinages that occurred at later dates.[2] Allen's timeframe for the recoinage is followed here and is dated to 1158–*c*.1160.

Previous calculations of volume have been based on figures produced by Michael Metcalf for the number of Class A dies.[3] The figures proposed by Metcalf have never been verified by independent die-study (see below §3.4.2). My own study of the Ipswich mint cannot address the issue because the mint was first active only after the recoinage, first striking coins of Class B, *c*.1161/2. In order to assess the volume of currency it is necessary to study a suitably large borough mint active during the recoinages. Northampton fits that profile. Northampton mint[4] has been selected for study over other mints with a similar-sized complement of moneyers at

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[1] M. Allen, 'The English coinage of 1153/4–1158', *BNJ* 76 (2006), pp. 242–311.
[2] M. Allen, 'The volume of the English currency, 1158–1470', *Economic History Review* 54:4 (November 2001), pp. 595–611, at p. 598.
[3] D. M. Metcalf, 'An estimate of the total output of the English mints during the "Cross and Crosslets" Coinage, 1158-1180', Appendix to 'A survey of numismatic research into the pennies of the first three Edwards (1279-1344) and their continental imitations', in N. J. Mayhew, ed., *Edwardian Monetary Affairs (1279-1344): a symposium held in Oxford, August 1976* (British Archaeological Reports 36, Oxford 1977), pp. 1-31 at pp. 26-31. M. Allen, 'The volume of the English currency, 1158–1180', *Economic History Review* 54.4 (November 2001), pp. 595–611 at p. 598. P. Latimer, 'The quantity of money in England 1180–1247: a model', *Journal of European Economic History* 32.3 (Winter 2003), pp, 637–659 at pp. 642–3.
[4] Throughout this thesis the phrase 'Northampton mint' is used to indicate the body of moneyers actively coining in the borough of Northampton.

work in Class A, because it did not have any moneyers farming dies on behalf of ecclesiastics. Accessing output from moneyers working on behalf of ecclesiastics is complicated by the possibility that they may have undertaken some coining directly for them, rather than competing for business, or they may have held office in order to have *seisin* of a right held by royal grant, which might otherwise be rescinded.[5] Conversely, where minting was exclusively under ecclesiastical privilege, with the number of moneyers limited to a fixed number (usually one) by royal grant, such as at Bury St Edmunds and Durham, unusually high mint output might have occurred from one moneyer due to the monopoly.[6] The information concerning mint output derived from the Northampton die-study is compared with the published die-study of Lincoln, another borough mint, and also the published die-study of Bury St Edmunds, with the provisos already mentioned (see below pp. 96–8 and Tables 3.6–3.8 for the comparison of data).

In the absence of literary evidence for the organisation and working practices employed in the mints, an analysis of an adequate numismatic corpus can yield surprisingly detailed information concerning these arrangements. This chapter examines the provision of dies and analyses the working practices employed by the moneyers of Northampton, as revealed by their use and treatment of dies. It demonstrates that questions concerning the volume of currency cannot be divorced from numismatic analysis and that historians seeking to estimate

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[5] There is a general consensus that Henry II actively sought to withdraw privilege mints during the period in which the Cross and Crosslets coinage was in issue; P. Nightingale, ' "The King's Profit": trends in English mint and monetary policy in the eleventh and twelfth centuries', *Later Medieval Mints: Organisation, Administration and Techniques*, (eds.) N.. J. Mayhew and P. Spufford. BAR international series 389 (Oxford, 1988), pp. 61-75; N. J. Mayhew, 'From regional to central minting', in *A New History of the Royal Mint*, ed. C. E. Challis (Cambridge: 1992), pp. 83–178. M. Allen, 'Henry II and the English coinage', in *Henry II: New Interpretations*, ed. C. Harper-Bill (Woodbridge: 2007 (forthcoming)). At Canterbury one moneyer was at work on behalf of the Abbot of St Augustine's and one moneyer worked for the archbishop, who possibly had the right to three. York mint is known to have been partly ecclesiastical; at London, Norwich and Winchester one moneyer may have worked on behalf of the bishop, *BMC Henry II*, pp. xcviii–xcix. I have explored the circumstances under which the Abbot of St Augustine's lost the right to a moneyer, T.C.R. Crafter, 'Henry II, the St Augustine's dispute and the loss of the Abbey's mint franchise', in *Coinage and History in the North Sea World c.500–1250*, ed. B. Cook and G. Williams (Leiden: 2006), pp. 601–16.

[6] M. Allen, 'Durham mint before Boldon Book', in *Anglo Norman Durham*, ed. D. Rollason, M. Harvey and M. Prestwich (Woodbridge: 1994), pp. 381–98 at p. 397 and Plate 81. R.J. Eaglen, *The Abbey and Mint of Bury St Edmunds* (London: 2006), pp. 239–41.

the volume of the currency require an understanding of numismatic material, particularly as evidence for the provision and use of dies.

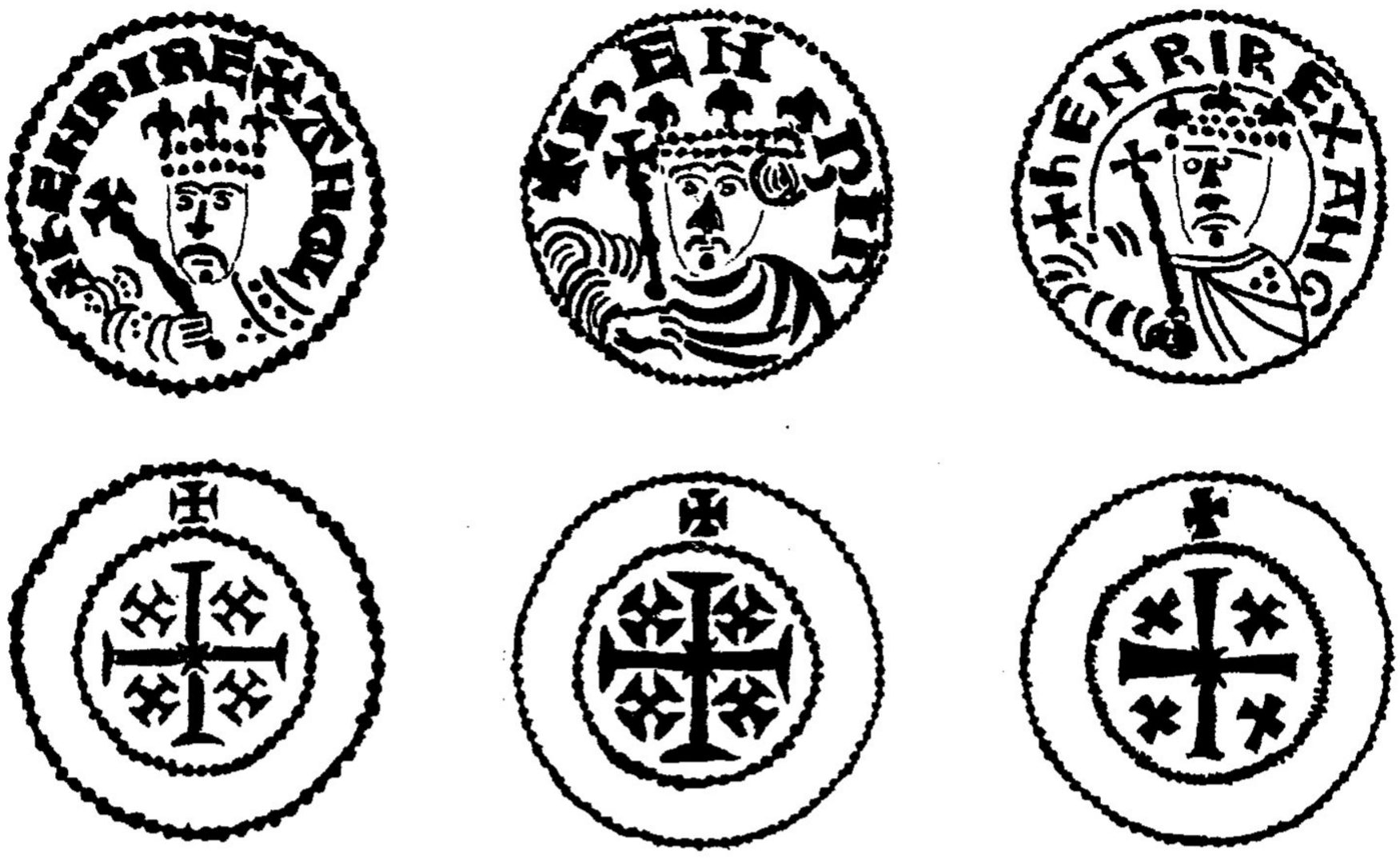
The analysis in this chapter relies on the primary evidence of the corpus of extant material, that has been painstakingly gathered and corroborated and which is organised in Chapter 8. The catalogue reference system is there explained (§8.3) and is used continually in the text of this chapter; readers are expressly advised to understand how the material has been organised before continuing.

The Cross and Crosslets coinage was in issue for 22 years (1158–80) and there was variation in stylistic features on the dies, especially in the rendering of the king's bust. According to the differences the coins are classified into six primary classes (A–F), which are chronologically significant (see Table 1.1); these six classes also have obverse subclasses.[7] Northampton mint is known unquestionably to have struck in Class A and Class C and the names of seven different moneyers are known from the extant coins (see Table 3.1 and Figure 3.1). It is not suprising that Class B is not represented at Northampton, because Class B is a stylistic development from Class A, of short duration, issued on the basis of need without any intention to withdraw and replace existing Class A dies.[8]

Table 3.1. Classes of coin known for the moneyers of Northampton

Moneyer	*Class A*	*Class C2*	*Class C3*
Engelram	+	+	+
Iosep	+	—	+
Pieres	+	—	—
Reimund	+	+	+
Stefne	+	—	—
Waltier	+	—	+
Warnier	+	—	+

[7] For the six classes *BMC Henry II*, pp. xxi-xxxii. The chronology of the six classes is presented in Table 1.1 (p. 28). In *BMC Henry II* the terms 'bust' and 'class' are use synonymously. This is rather misleading as the class of coins can be deduced from the reverse alone, a factor important for the discussion of muling of dies of different classes.
[8] Crafter, 'Re-examination', pp. 43–4.



Class A **Class C2** **Class C3**

Figure 3.1. Illustrative line drawings of the classes of Cross and Crosslets coins unequivocally minted at Northampton, reverse legends excluded (Drawings by Timothy Crafter, approximately ×1.5).

3.1.1. Coins of Class D

Coins of Class D ascribed to Northampton have been excluded from the die study. The assertion that coins of Class D were struck at Northampton is based upon the attribution of a pair of die duplicates by a moneyer named Pieres in the British Museum to this mint by Allen in *BMC*. These are *BMC* 625 **(Plate 1, 1)** and *BMC* 626 **(Plate 1, 2)** respectively. A further die duplicate was in the collection formed by F. Elmore Jones (*FEJ Photographs* 28/11) and he assigned his coin to the London mint **(Plate 1, 3)**. The obverse legend gleaned from the three die duplicates is +hENRIREXA. The letters of the reverse legend that are visible with certainty are [ ]PIERE[ ]ON:[ ]. *BMC* gives the beginning of the mint signature on *BMC* 625 as N?O, but I cannot see this. Until such time as another die duplicate appears that provides the mint signature these coins should not be assigned to any mint. Besides Northampton, moneyers named Pieres are known to have struck coins at Colchester and London. The

reverse die had developed a distinctive die-flaw when it was employed to strike the three known specimens. This flaw stretches from the bottom of the lowest limb of the reverse cross into the crosslet in the fourth quarter. This feature may aid the process of identifying further die duplicates.

3.2 Evidence from use of dies

3.2.1 Die links

The uniformity of all Class A dies of the Cross and Crosslets type indicates the re-establishment of the absolute monopoly of the FitzOtto workshop in London over die production following the reign of Stephen. Allen discusses the hereditary privilege of the office of Engraver in *BMC*.[9] We may refer to the products of the FitzOtto workshop as 'metropolitan dies'. The organisational mechanisms for the provision of dies during the Cross and Crosslets type are undocumented, but it is assumed that the moneyers themselves had to purchase their dies. The account of £25 6*s*. 8*d*. rendered by Sherrif Simon fitz Peter in 1158–9 SHIRE for the moneyers is probably an example of such a payment.[10] Surviving medieval dies are extremely rare and no Cross and Crosslets dies of Northampton survive.

Although the dies responsible for the Northampton coins of Class A and C2 are undoubtedly metropolitan, it is plausible that those for C3 are not. Allen observed that 'during the issue of Class C there was a breakdown in this organisation and dies of irregular, presumably local, manufacture were in use'.[11] The fabric of all the coins of Class C3 struck at Northampton is atypical. These coins are treated at length in §3.3. 'Problematic die-cutting styles in Class C' (below).

Die-links are frequently found in the Cross and Crosslets type, typically when one obverse die is found used with two reverse dies. Inter-moneyer die-links are found in both Classes A and C. The known die-links as demonstrated from the coins in the Catalogue are illustrated as a chart index of dies (Figure 8.1). In certain cases die-links allow inferences to be drawn as to the professional relationships of individual moneyers, although a particular die could either have been used contemporaneously or consecutively by moneyers.

The clear degeneration and subsequent modification of obverse die 10^{A} suggests that it passed from Waltier to Warnir consecutively. Similarly, the wear that is noted to have

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[9] *BMC Henry II*, pp. cxii-cxiii.
[10] *Pipe Roll 5 Henry II*, p. 17. See §3.3.1 (below) for explanation of the designation 'SHIRE' after date.
[11] *BMC Henry II*, p. cxiii.

occurred to obverse die 5^{A} indicates that it was used extensively by Reimund and subsequently that it passed to Pieres. The use of obverse dies 2^{A} and 18^{C} by Engelram and Warnir is compelling evidence that these two moneyers worked together in tandem during both classes. In contrast, the die-pair 3^{A}/I1 used by Iosep does not link to any other dies and it is entirely plausible he worked alone. The name Iosep suggests that he may have been a Jew, which may be an explanation for his apparent professional isolation.[12] In the late twelfth century Northampton had a sizeable Jewish community, which is first mentioned in 1158–9 SHIRE when the community paid a *dona* of £15.[13]

Other die-links may be important, but in many cases the small number of extant specimens struck from a particular die prevents useful conjecture as to the pattern of use. For example, further specimens may augment our understanding of the relationship of dies between Reimund and Stefne, who both used obverse 7^{A}, and reveal the identity of the moneyer of coin **16a** who used obverse 8^{A} which is otherwise known to have been used by Reimund.[14]

The pattern in inter-moneyer die-links at Northampton mint during the Cross and Crosslets Type indicates that the majority of moneyers were working together in some loose sense, which is probably best described in terms of partnership and co-operation rather than as a mint, in the modern sense.

The pattern of die-linking is furthermore important in comparison to other mints. In contrast to the seemingly indiscriminate use of dies at Northampton, at Winchester in 1166–67 Herbert Fitz Westman and some other (unnamed) moneyers paid a fine (*misericordia*) of 100*s*., because they had worked together in one house (*quia fabricauerunt simul in una domo*).[15] The only inter-moneyer die-link noted at Winchester occurs in connection with a Class D1 obverse, which was used by both Herbert (*FEJ Photographs* 34/14) and Osbert (*BMC* 771*x*).[16]

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[12] Allen's suggestion: *BMC Henry II*, p. cvii.
[13] *Pipe Roll 5 Henry II*, p. 17. The medieval Jewish population of Northampton is discussed by Michael Jolles, *A Short History of the Jews of Northampton, 1159-1996* (London, 1996).
[14] Owing to the fact that only ON:NO is visible on the reverse of **16a**, I checked this coin against all the known reverse dies of Norwich, aware of the possibility this was an extremely rare example of an inter-mint die-link; I did not find a die-link.
[15] *Pipe Roll 13 Henry II*, p. 193; *BMC Henry II*, p. clxvii.
[16] M. Biddle (ed.), *Winchester in the Middle Ages* (Oxford, 1976), p. 418 note 2 states that F. Elmore Jones knew of a die duplicate of *BMC* 771* (presumable an error for *BMC* 771*x*) that gave the

If this die-link is indicative of the moneyers *fabricauerunt simul* the date is also consistent with the introduction of Class D in *c.*1167.[17] This occurrence at Winchester indicates the active exercise of royal judicial prerogative, not seen in the case of Northampton, to keep the activities of moneyers separate.

3.2.2. Die renovation

The extant coins testify to the modifications made to the dies employed at Northampton by the moneyers, during their life of use. Such modifications appear to be attempts on the part of the moneyer to rectify deterioration. This appears in two forms: the surface reduction of dies and recutting of dies. The former will be considered first as this phenomenon has not previously been observed on coins of the Cross and Crosslets Type. Surface reduction is of the foremost importance to an adequate understanding of the Crescents coinage of Scotland, and is discussed at length in §5.4.2.

Put simply, a coin may have the appearance of being weakly struck, when instead the surface of the die had been reduced and therefore the incuse design had become shallower. When a die was manufactured, punches were introduced to the high carbon steel die-cap in order to produce the incuse design. In this process, there was displacement of iron around the punch, which created a 'lip' immediately around the area of the design (see Figure 3.2, A). When struck this would accentuate the width of such features as letterforms and the king's sceptre on a coin. If the surface of the die was reduced, these 'lips' would be the first parts to be removed and the effect of this would be to reduce the width of the features of the design on the struck coin. Any engraved features on the die do not have such a lip, as metal was removed from the die-cap rather than displaced. The majority of the design was made from a few varied punches, which were intentionally not struck in at 90° to the die-cap. Typically one wedge-shaped punch produced a wedge of different lengths on the die depending upon the

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moneyer's name as OSEBERN and Dr. von Feilitzen preferred to see this as a different person from Hosbert. Dr. Veronica Smart concurs with this interpretation and has informed me that '-bern' and '-bert' are different etymological roots. Whether Hosbert or Osbern, the conclusion still stands.

[17] Crafter, 'Re-examination', p. 55.

angle at which it was held by the die-sinker, with the effect that one end of the impression might be of greater depth than the other. This has implications for the design if the surface of the die was reduced, since such a wedge shape would contract in length (see Figure 3.2, B). Thus the effect of reducing the surface of the die was to change the design materially by lowering the relief on the struck coin; today, this renders the identification of coins struck from the same die problematic. An awareness of this phenomenon is necessary to avoid overestimating the number of dies employed at mints, and, by implication, producing an overestimation of the volume of output.

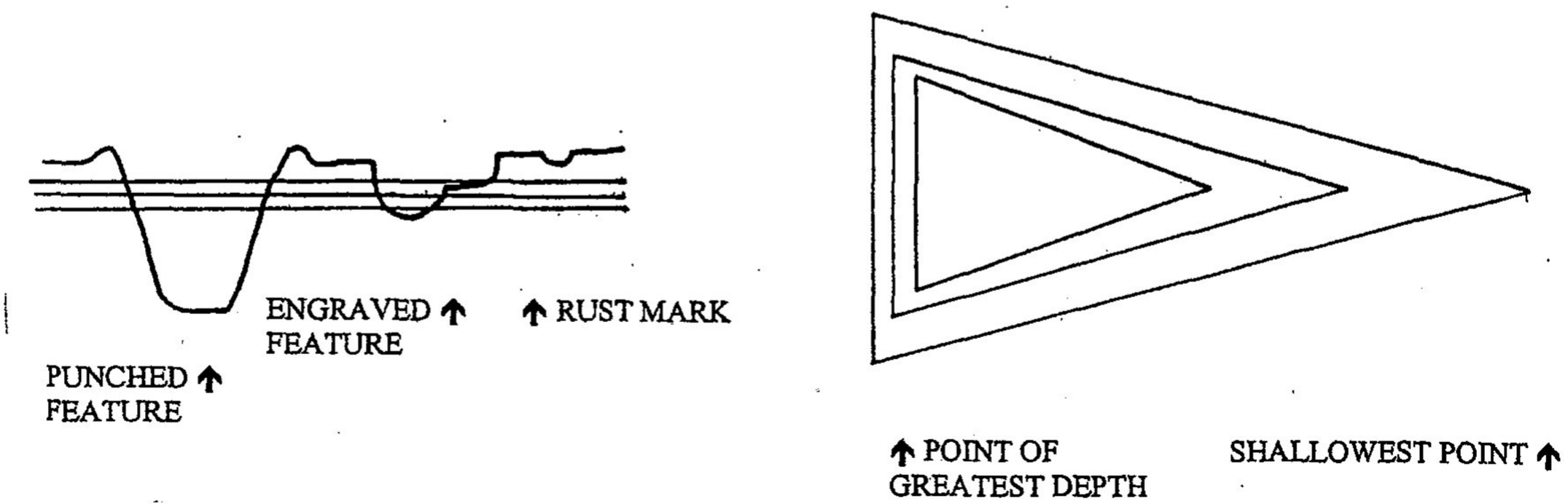


Figure 3.2. **A**: Cross-section through a theoretical die-face under-going surface reduction. **B**: Theoretical contraction of wedge-form in a die face.

For example, before this study *BMC* 619*x* and *FEJ Photographs* 30/35 were catalogued as struck from different obverse dies. In fact these coins share obverse die 3^{A}, but this die was in radically different state when it was used to strike each of the specimens and this has caused the earlier erroneous identification. The former and latter states of obverse die 3^{A} may be compared **(Plate 1, 5 and 6)**. Other die pairs that appear to have undergone surface reduction are die combinations **1** and **10**. Owing to the fact that this line of research is wholly dependent upon the survival of coins struck when a die was in a particular condition, it is likely that further evidence will be provided in the future by coins as yet undiscovered.

The altered state of the obverse die 3^{A} is not due to natural processes of wear. An example of unredressed die-wear from Northampton mint is obverse die 5^{A}, which was used by Pieres and Reimund. Obverse 5^{A} can be observed in many states from extant coins and appears to

have suffered considerable wear which caused the edges of the design to become less sharp **(Plate 1, 7 and 8)**. The life of use for medieval dies may have varied considerably depending on how the iron shank fissured under the pressure of repeated hammering and how the dies were stored when not in use. The obverse die was usually the 'pile' (lower-die), secured perhaps in a block of wood, because this would encourage the longevity of the die with more intricate design of the king's image, which was more time-consuming to produce. As the pile was secured, its condition may have been more difficult to sustain compared to the 'trussel' (the upper, hand-held die, normally the reverse) which was potentially easier to store away. In the case of the reverse die I1, which was used in conjunction with obverse die 3^{A}, surface reduction can be observed, although the comparative simplicity of the reverse design renders this less apparent without close scrutiny.

The surface reduction of dies could be achieved by friction generated from polishing or rubbing the die-cap in an abrasive mixture such as of grease and fine sand. That this occurred is supported by the non-linear marks in the field of the design on obverse die 3^{A} which do not support the interpretation that a hand-held file was used **(Plate 1, 6)**. The necessity of altering the die-cap in this manner may have resulted from a desire on the part of the moneyer to remove rust marks or die-flaws: in short, to improve the surface of the die. In the case of the formation of rust, the rate of deterioration of the die would depend on how the die was cared for and, indeed, on the seasonal climatic conditions.

Besides surface reduction and allowing natural wear, another option open to moneyers was to recut the surface of the die as it wore down in order to sharpen up the features of the design. This phenomenon of recutting can be observed on obverse 10^{A}. The die was used in its original state by Waltier **(Plate 1, 9)**, after which it seems to have been used extensively by Warnier when the edge of the king's face was redefined by a wavy line **(Plate 1, 10)**.[18] This phenomenon of recutting the face is not seen on any other die used at Northampton, nor indeed has it been noted at any other mint. Moreover, when the die was used by Warnier a

[18] *BMC* 634 entry states 'traces of wavy line round face perhaps indicate beard'.

die-flaw developed in between the crown bands above the sinister eye of the king, which enables this deterioration of the die to be placed last in the sequence **(Plate 1, 11)**.

By way of some summary remarks, by renovating a die by surface reduction or recutting, it is probable that the moneyers attempted to prolong the life of the die. Surface reduction of dies was not due to the natural processes of wear, but achieved by physical intervention to improve the surface of the die-face. Recutting was an attempt to counter the adumbration of the design by engraving over the punch-made features of the die. The incidence of surface reduction and recutting of dies at Northampton, alongside other dies which were left untouched, suggests that die-renovation was sporadic and that no standard practice was adopted, which further indicates that the decision to renovate a die was that of an individual moneyer.

3.2.3. Techniques of flan preparation and separation

The different methods in which flans were separated from sheet-silver at Northampton during the first coinage of Henry II deserves some comment. Engagement with this subject is highly pertinent because Allen discussed what he called the 'buckling' of coins of the Cross and Crosslets type in *BMC* and cited *BMC* 634 of Northampton, here coin **15a**, as a representative example **(Plate 1, 10)**.[19] I have noticed that 'buckled' coins are always circular, from which a causal link may be inferred.

One would imagine that the easiest way to produce coins was to produce blanks first and then strike these between dies. However, if a mint was under pressure, it may well have been easier to strike polygonal pieces of sheet-silver with a pair of dies and then cut the finished coin from this. Separating the coin could have been achieved by hammering a tubular steel cutter, sharpened at one end rather like a pastry-cutter, through it against a flat surface. It is possible that such a process would have buckled the finished coin into the states observed.[20]

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[19] *BMC Henry II*, p. xliv.

[20] The use of Tubular Steel Cutters ('Pastry cutters') has been explored by D. Sellwood, 'Medieval minting techniques', *BNJ* 31 (1962), pp. 57–65, and D.M. Metcalf, 'The premises of early medieval mints: The case of eleventh-century Winchester', in *I Luoghi Della Moneta: Le Sedi Delle Zecche Dall'Antichità All'Età Moderna*, ed. R. La Guardia, S. Masserbli, and T. Tibiletti (Milan: 2001), pp.

Exceptionally well struck-up lettering at the edge of coins that appear to be struck slightly off-centre is indicative of the lack of metal displacement at the moment of striking, that is to say the flan was not yet separated from surrounding sheet-silver **(Plate 1, 5)**. Such coins were not struck off-centre; rather their appearance resulted from the moneyer inaccurately separating the coin from a sheet. Nevertheless, dies were at times seriously misaligned as specimen **16a** clearly demonstrates (illustrated on **Plate 2**).

Interestingly, the coins struck by Reimund of die combination **9** are exceptionally well struck, when all coins from other die-combinations for which he was responsible were poorly produced. It is entirely plausible that different moneyers employed different techniques at different times or that these represent products of different workmen labouring on their behalf. The decentralised nature of borough minting did not require standardisation and facilitated personal discretion in the workshop environment.

All the extant coins of Class C2 of Northampton mint are circular and display some evidence of buckling like those of Class A. Additionally, the edges of the Class C2 coins appear to be turned over towards one side so that they form something like a piecrust lip. This may be the result of a modified method of removing the excess metal beyond the circumference of the impression made by the dies.

In contrast to the Northampton mint coins of classes A and C2, all the extant coins of Class C3 show no signs of being buckled and are only roughly round, from which it may be inferred that either the flans were cut or the coins separated from sheet-silver by hand. The processes employed for manufacturing the coins struck from Class C3 dies appear to have been different from earlier mint practices, which may be significant. This necessitates a more through investigation of the irregular dies used at Northampton and the analogous dies used at other mints.

59–67, at pp. 63–4. I have conducted a preliminary examination with Dr J.P. Northover of the potential advances that could be made in understanding numismatic material by analysing the use of cutters.

3.3. Problematic die-cutting styles in Class C

During the preparation of the Catalogue it became clear from the evidence surveyed that it is necessary to revise my views expressed on the subject of coins struck from anomalous dies at Northampton. I previously discussed these coins, together with those struck at other mints, in generalities and identified them as products from dies of the last phase of die-cutting in Class C; I had separated such coins as sub-class C3 for consistency with the established classification.[21] Martin Allen has suggested that it is possible that some or all of these dies were produced by an auxiliary die-cutter in London or some other centre.[22] Although there is no revision to be made in the classification (these coins appear under the heading 'Class C3' in the Catalogue) it has become clear that these coins do not form a unified group and that the Northampton dies were in all probability locally cut.[23]

The status of the anomalous C3 dies that were employed at Northampton mint may appear esoteric but has ramifications for the accountability of borough government in the early to mid 1160s and the volume of the currency. Although the cutting of dies locally was not particularly difficult, it was a usurpation of the Crown's prerogative. Mark Blackburn discussed the use of locally cut dies during Stephen's reign and suggested that this was indicative of the wider breakdown in the accountability of shire administrations to the mechanisms of royal government.[24] It is necessary therefore, to assess the administrative status of Northampton in the initial part of Henry II's reign.

3.3.1. Royal administration and personnel

In the 1150s Northamptonshire was one of the counties in which a local earl was deprived of his shire administration and the accountability of the sheriff successfully transferred to the

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[21] Crafter, 'Re-examination', p. 45.
[22] M. Allen, 'The Durham Mint before Bolden Book', *Anglo-Norman Durham*, ed. D. Rollason, M. Harvey and M. Prestwich (Woodridge: 1994), pp. 381-398 at p. 393.
[23] The term 'locally cut' or 'local dies' in the following analysis is employed to indicate that the dies have no parallel and are only found at a particular mint.
[24] M. Blackburn, 'Coinage and currency', *The Anarchy of King Stephen's Reign*, ed. E. King (Oxford: 1994), pp. 146-205 at p. 175-6.

king and royal exchequer.[25] The transcript of the lost Pipe Roll for 1154–5 preserved in the *Red Book of the Exchequer* implies that Stephen may have recovered the Exchequer revenues of Northamptonshire before he died.[26] The death of Earl Simon II de Senlis in August 1153, before the accession of Henry II, may have facilitated this extension of royal authority. It is possible that Simon III de Senlis may have been regarded as Earl of Northampton and briefly held the honor.[27]

The borough farm was accounted for separately from the shire farm by a different sheriff until 1168–9.[28] This separation of powers is not found in the single extant Pipe Roll for Henry I and presumably arose when the revenues of the borough were diverted to Earl Simon II de Senlis during Stephen's reign.[29] Entries concerning the moneyers of Northampton appear under both of the jurisdictions and hence 'BOROUGH' or 'SHIRE' appears after the Pipe Roll dates in the following discussion to indicate the jurisdiction. The two previous commentators on the documentary evidence concerning the mint and moneyers at Northampton did not comment upon the separation in jurisdictions.[30]

According to the *Red Book of the Exchequer* the sheriff of Northamptonshire in 1154–5 was Robert Grimbald.[31] William le Bocheton accounted for the borough farm in 1154–5.[32] The sheriff of Northamptonshire for 1155–61 and 1164–69 was Simon fitz Peter who had been household steward or seneschal of Simon II de Senlis; by 1159–60 he was one of only two

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[25] White, *Restoration and Reform*, pp. 61–2.
[26] *Ibid.*, p. 73–4.
[27] K. J. Stringer, 'A Cistercian archive: the earliest charters of Sawtry Abbey', *Journal of The Society of Archivists* 6 (1980), pp. 325–34 at p. 329 note 23.
[28] From Pipe Roll 16 Henry II until Pipe Roll 27 Henry II both the borough and shire farms are accounted for by successive sheriffs Robert fitz Sawin, Hugo de Gundeville and Thomas fitz Bernard.
[29] White, *Restoration and Reform*, p. 144. Elsewhere White suggests that the transcript of the Pipe Roll of 1154-5 in the *Red Book of the Exchequer* (Rolls Series, 1896), II, pp. 648–58, implies that King Stephen had secured control of the sheriff's farm of Northamptonshire before his death in October 1154; see, *Restoration and Reform*, p. 73–4.
[30] See P. W. P. Carlyon-Britton, 'Historical notes on the first coinage of Henry II', *BNJ* 2 (1905), pp. 185–242 at p. 197 and pp. 231–3; *BMC Henry II*, pp. cxlix–cli.
[31] *Red Book of the Exchequer* (Rolls Series, 1896), II, p. 655. E. Amt, *The Accession of Henry II in England: Royal Government Restored, 1149-1159* (Woodbridge, 1993), p. 114 and p. 119.
[32] G. H. Fowler, 'The shire of Bedford and the earldom of Huntingdon', *Publications of the Bedfordshire Historical Record Society* 9 (1925), pp. 23–34.

curiales holding a shrievalty.[33] During the three accountancy years 1161–64 that Simon fitz Peter did not account for the Northamptonshire farm he was elsewhere engaged as an agent of royal authority; the shrievalty of Northamptonshire was held by Hugo Gubiun.[34] Simon fitz Peter served as a royal justice in 1163 and was present at the Clarendon council in 1164.[35] Moreover, it is probable that Simon fitz Peter acted as a commissioner for the recovery of the royal demesne during the early to mid 1160s, with responsibility for supervising purprestures and escheats.[36]

Robert fitz Sawin, who held the borough of Northampton at farm from 1155–6 onwards, was one of the Christian moneylenders upon whom Henry II relied during the initial decade of his reign.[37] White considered Robert fitz Sawin's appointment as borough-sheriff as evidence that Henry II was willing to use sheriffs for whom the office must have been partly seen as a means to healthy personal profit.[38] Therefore we may tentatively suggest that Robert fitz Swain was endowed with the shrievalty of Northampton by Henry II as means by which he might recoup the money he had lent to the king, and this may account for the separation of jurisdictions.

Although control of the borough passed to Earl Simon II de Senlis during Stephen's reign the Pipe Rolls attest to the unbroken answerability of the borough of Northampton and Northamptonshire to the exchequer. From the outset of the reign of Henry II the personnel appear to have been closely allied to the interests of the king. Consequently, the anomalous coins of Class C3 were not produced owing to a breakdown in governmental structures. In order to explore the issues further we must turn to the extant coins themselves.

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[33] Pipe Rolls 2–7 Henry II and Pipe Rolls 11–15 Henry II. White, *Restoration and Reform*, p. 97 note 116, see p. 93 note 92 for evidence of Simon fitz Peter named as *dapifer* as a witness to charters.
[34] *Pipe Roll 8 Henry II*, p. 6; *Pipe Roll 9 Henry II*, p. 34; *Pipe Roll 10 Henry II*, p. 31.
[35] White, *Restoration and Reform*, p. 93–4 and note 99.
[36] Warren, *Henry II*, p. 274, note 2; *Pipe Roll 12 Henry II*, p. 32.
[37] White, *Restoration and Reform*, p. 98 and p. 133; also E. Amt, *The Accession of Henry II in England* (Woodbridge: 1993),pp. 99–100.
[38] White, *Restoration and Reform*, p. 98.

3.3.2. Numismatic analysis

The problem may be stated concisely: whether dies of Class C3 were locally cut yet have an affinity with one another or whether they were produced at a die-cutting centre and distributed to mints. The evidence is equivocal, but implies that both possibilities transpired.

In approaching this dilemma the affinities in the arrangement of the bust must be acknowledged but these probably derive from copying a common prototype (Class C1). All Class C3 coins have lettering with reduced serifs.[39] However, key etymological differences in the form of the obverse legend can be used satisfactorily to delineate groups. Coins of Class C3 struck at Canterbury, Durham, London, Norwich and Stafford have a stylistic unity and their obverse legends display a preference for the contraction ꟸG for Anglorum. None of these coins has an inner circle on the obverse; henceforth I term these the 'metropolitan group' as these dies must have been centrally cut and distributed to these mints. Figure 3.3 illustrates the archetypal design of the Class C3 metropolitan group and specific specimens are listed in Table 3.2.

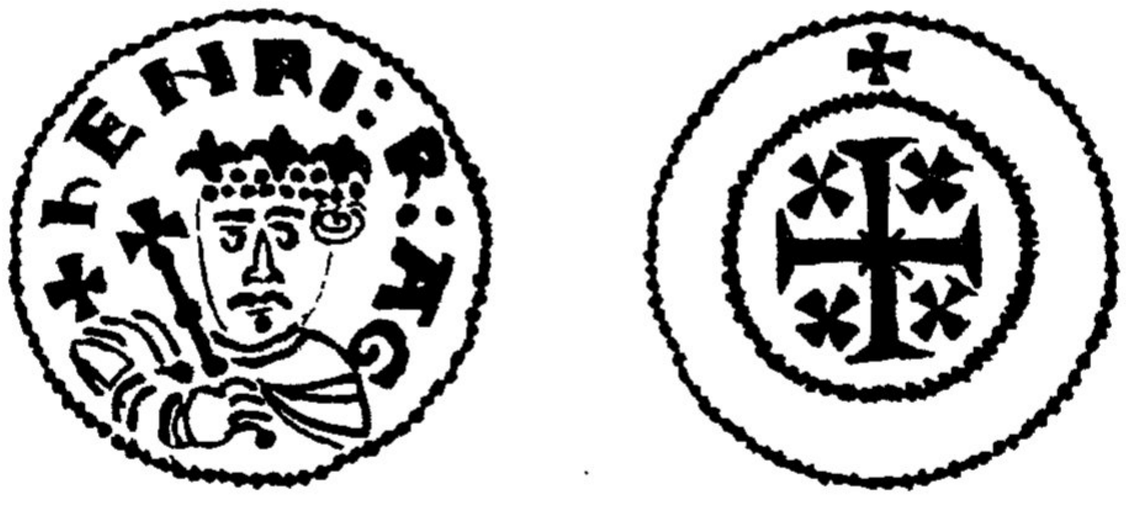


Figure 3.3. Archetypal design of dies, Class C3 metropolitan group, reverse legend excluded (drawings by Timothy Crafter, approximately ×1.5).

[39] In *BMC Henry II* D.F. Allen stated that in respect of Northampton, 'while the coins of Class A are quite regular, all those of Class C are from unusual dies'. This is statement is misleading because the coins of Class C2 appear to have been struck from dies of typical metropolitan production; it is the coins catalogued in this thesis as Class C3 that are 'unusual'. Problematically, Allen's terminology concerning these coins is not consistent and he identifies them variously as 'Class C1 variety' (p. xxxviii and Epigraphic Table facing p. clxxxiv), coins that have 'lettering with reduced serifs' (Catalogue entries, cf. Northampton, pp. 116-22), 'local and irregular varieties' (pp. xxvi-xxvii) and 'local varieties' (p. clxxvi). Moreover, Allen thought that the die-pair used by Cristien at Durham 'appears to be of local workmanship and is close in style to the locally made 'inner circle' dies of Northampton' (*BMC Henry II*, p. cxxxii).

Table 3.2: Coins of Class C3 metropolitan group. All the coins are illustrated on **Plate 3**.

No.	*Mint*	*Moneyer*	*Obverse*	*Reverse*	*Reference*
1a	Canterbury	Golteep	+hENRIREXĀG Trefoil in drapery on shoulder.	+GOLTEP:ON:CĀNTO	*BMC* 73
1b	Canterbury	Golteep	+hENRIREXĀG Trefoil in drapery on shoulder.	+GOLTEP:ON:CĀNTO	*FEJ Photographs* 14/34
2	Canterbury	Golteep	[ ]REX[ ]G	+[ ]LTE[ ]CĀN:	*BMC* 74
3	Canterbury	Ricard	+hENRIREXĀG	+RICĀRD:ON:CĀIITO	*BMC* 103
4	Durham	Cristien	+hENRI:R:ĀG No curl of hair.	+CRISTIEN:ON:DVN	*BMC* 250
5a	London	Hunfrei	+hEN[RI]:R:Ā[G]	+h[VN]FREI:[ON:]LVN: (+ and h ligated)	*BMC* 494
5b	London	Hunfrei	+hENRI:R:ĀG	+hVNFREI:ON:LVN: (+ and h ligated)	*FEJ Photographs* 27/6 = *BMC* 494*a*
6a	Norwich	Herebert	+hENRI:R:Ā	[ ]RT:ON:NOR:	*BMC* 650
6b	Norwich	Herebert	+hENRI:R:Ā	[ ]RT:ON:NOR:	*FEJ Photographs* 31/25
7	Stafford	Willem	+hENRI:R:ĀG	+WILLEƟ:ON:STĀ:	*BMC* 708

In contrast to the metropolitan group the coins of Northampton display a preference for the legend ending ĀNG, a contraction rarely found on any Class C coins.[40] All the Northampton coins have a linear inner circle or half-circle, which is also found on one die of Bury St Edmunds and one of Lincoln. The obverse of the single pair of Class C3 dies used at Lincoln has the unique legend +hENREXĀNGL (*BMC* 424) and the obverse of the single pair of Class C3 used at Bury St Edmunds reads +hENRI:R (*FEJ Photographs* 13/21); these dies were probably unique to each local situation and are unrelated both to the Northampton die-style and the metropolitan die-style of Class C3.

[40] From examining the extant coins, the Class C3 dies used at Northampton mint appear to have been of rougher workmanship that those of the metropolitan group. It is interesting to note that prior to the establishment of the current classification G. C. Brooke incorporated the coins here defined as Class C3 metropolitan group into his regular Group B (= Class C in *BMC Henry II*) on the basis that they read ĀG. See G. C. Brooke, 'The first coinage, or "Tealby" type, of Henry II', *Numismatic Chronicle* 5:7 (1927), pp. 313-341 at p. 333.

3.3.3. Discussion

From the foregoing forensic analysis of the numismatic material it is suggested that C3 dies used at Northampton constitute a unified group, probably made locally by the same hand, and unconnected with the metropolitan group C3 dies.

Dating evidence for the metropolitan group C3 dies is provided by a reference to the moneyer Cristien of Durham, who is only known to have struck coins from one pair of such dies, in Chapter 95 of Reginald of Durham's *Libellus*.[41] According to Victoria Tudor's analysis the first 111 chapters were completed by January 1167.[42] This date provides a *terminus ante quem* for Cristien's arrogation of the office of moneyer and it is reasonable to conclude that the metropolitan Class C3 dies may be dated to early 1167 or before. The metropolitan C3 dies were placed within the general schema of Class C (*c*.1163–*c*.1167) on stylistic grounds and the evidence from Reginald of Durham's *Libellus* confirms this. However, the evidence from Reginald of Durham concerning the dating may only be applied to coins of the metropolitan C3 dies.

Although both the Class C3 metropolitan group and Northampton dies share a common prototype, regular Class C (*c*.1163–*c*.1167), the Northampton dies could conceivably be of a later date. Moreover, the C3 dies are not found muled with the C2 dies at Northampton despite the fact that both Engelram and Reimund struck both sub-classes of coins (see Table 3.1). The absence of muling *perhaps* indicates that C2 and C3 dies were never present together.[43] Hoard evidence provides the best possible means for dating the production of the

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[41] Reginald of Durham, *Libellus de admirandis beati Cuthberti vertutibus quae novellis patratae sunt temporibus*, chapter 95, ed. James Raine (Surtees Society, 1835, volume 1), p. 210.
[42] V. Tudor, 'The cult of St Cuthbert in the twelfth century: the evidence of Reginald of Durham', *St Cuthbert, his Cult and Community to AD 1200*, ed. G. Bonner, D. Rollason and C. Stancliffe (Woodbridge, 1989), pp. 447-467 at p. 449.
[43] The general absence of coins produced from muled dies at Northampton is striking in an issue where mules are common. From this it may be surmised that all dies of Class A were relinquished by the Northampton moneyers, presumably returned to London, but certainly not available to be brought back into use as required. Owing to the abandonment of *renovatio* the essential design of the dies remained the same throughout the twenty-two years the Cross and Crosslets coinage was in issue and many mints managed to retain dies that were re-employed at a later date as necessary. (For a list of known Cross and Crosslets mules see Crafter, 'Re-examination', p. 47). An example of this widespread practice is from Hereford mint where the moneyer Driv struck coins from muled C1/A dies (*BMC* 284–7), indicating that the Class A reverse die was kept at the mint and brought back into use many years after it was made. The complete re-establishment of the supremacy of the FitzOtto workshop, which had

Northampton coins of Class C3. Table 3.3 lists the coins of Northampton mint recorded in hoards, and locations of hoards, together with the single finds, are mapped in Figure 3.4. As can be seen, the penny struck by Waltier (**22c**) in the Wicklewood hoard provides a *terminus post quem* for the Northampton C3 coins of *c*.1174.[44] Four of the five single finds that have been recorded are Class C3, but these have been all been recovered by metal-detectorists and do not unfortunately have archaeological context to provide dating evidence.[45] Numismatic evidence does not, therefore, allow the date of the Northampton coins to be more exactly defined than *c*.1163 × *c*.1174.

Before exploring the possible reasons for the existence of Northampton C3 dies it is helpful to recapitulate the evidence thus far. The stylistic unity of the dies suggests that the dies were produced by a lone artisan. The lack of mules with dies of another sub-class suggests that no other dies were available. There was no breakdown in the accountability of the borough to the royal government. The use of the locally produced Class C3 dies at Northampton attests to some anomalous production of coins, which is best cautiously described as 'extraordinary mint activity'.

Understanding the reason for the extraordinary mint activity is crucial for the understanding of monetary expansion. The use of the C3 dies by four moneyers, rather than one moneyer using dies in succession, suggests that output was required simultaneously from all dies. The four known C3 reverse dies used at Northampton might have struck £150–£350 at 10,000–20,000 coins per die (see below §3.4.3.). At Northampton the anomalous dies of Class C3 allow such activity to be detected. If extraordinary mint activity occurred elsewhere,

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been threatened during Stephen's reign, with the production of Class A dies has been noted and it seems unlikely that this was again lost.

[44] The latest coin in this hoard was a penny of Cross and Crosslets Type Class E, providing a *terminus post quem* of 1173 according to my revised internal chronology for the type, see Crafter, 'Re-examination', p. 52. M. M. Archibald is currently preparing the Wicklewood hoard for publication; she has accepted my revised chronology and assigns this date to the deposit of the hoard.

[45] One Class A penny was found at South Kyme, Lincolnshire (**15d**) on a productive site. Four Class C3 coins have been recovered. Pennies have been found near Darlington (**20c**) and at Dereham, Norfolk (**22e**), cut halfpennies have been found at Bawsey, Norfolk (**22d**) and Brundish, Suffolk (**19e**). (Two of the five single finds were identified as Northampton mint in the course of compiling the Catalogue). We may conclude from five single finds that coins of Northampton, including the unusual Class C3 coins, were dispersed into circulation and were lost far from the borough.

employing moneyers already in possession of metropolitan dies, we would not be able to detect it. The question is whether high-intensity mint output occurred at times other than a recoinage. If so, it would seriously affect our ability to understand monetary expansion as a development, as it would affect wastage rates from the various classes of the coinage. Thus far we are in no position to judge whether the mint activity at Northampton using the C3 dies is an aberration.

In order to address this issue it is necessary to consider two possibilities:

1) Was there any national event during the period when the coins could have been produced, *c*.1163–*c*.1174, which could have occasioned exceptional coin production at Northampton?
2) Was there any event particular to Northampton during the period *c*.1163–*c*.1174 that could have occasioned exceptional coin production?

The cutting of new dies indicates that coin was required and that either a time constraint or physical obstruction prevented the importation of metropolitan dies. Was there a national tax 1163 × 1174 that could have required production from the dies? In 1164–5 an aid (*dona*) of 100 marks was assessed on the borough of Northampton.[46] Presumably the aid could have been raised from cash already in existence, but even if mint activity was required and dies were unavailable, the cutting of dies does not seem likely given the relatively short distance from London (approximately 70 miles).

As the group of Northampton C3 dies is unique to the borough, it is perhaps prudent to look to an explanation specific to the borough that might have occasioned extraordinary mint activity.

Archbishop Becket was arraigned before the king and barons at a council at Northampton in October 1164, which also debated the king's forthcoming Welsh campaign.[47] During this council financial assessments were made on individuals concerning serjeants raised for the

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[46] *Pipe Roll 11 Henry II*, p. 96. The contribution made by Northampton is noted specifically in the Pipe Roll as '*de Exercitu Walie*'. White, *Restoration and Reform*, p. 151. See also C. Stephenson, 'The aids of English boroughs', *English Historical Review* 34 (1919), pp. 457–75, at pp. 468–70.
[47] The Exchequer met at Northampton at Michaelmas 1164, White, *Restoration and Reform*, p. 131.

campaign.[48] Over fifty years ago J.O. Prestwich expressed the view that military success depended more on the availability of money for hiring mercenaries than on the loyalty of feudal vassals.[49] Warren Hollister argued that the existence of a 'highly organised commutation system' harmonised with the views of J.O. Prestwich.[50] On this understanding monetary expansion – the increased availability of money – facilitated increased commutation of military service. More latterly Michael Prestwich has stated the argument from monetary effects: monetary inflation caused military costs to rise sharply, therefore 'it was increasingly difficult for magnates to supply the very large numbers of men traditionally due when the king summoned the feudal host'.[51] It seems unlikely, however, that the Northampton Class C3 dies are connected with commutation of military service for the Welsh campaign, because it would be an unparalleled occurrence. If it were to have occurred, we might think the government would have anticipated the need for dies in advance and made sure metropolitan dies were brought.

Derek Allen proffered the possibility, which he himself considered 'conceivable, but unlikely', that the Northampton coins of Class C3 were struck during the rebellion of 1173–4.[52] Northampton was one of the centres of royal authority in the Midlands affected by the events of the rebellion. Earl David of Scotland led a successful raid on the town and Henry II arrived at Northampton to receive the surrender of those who had been in rebellion against him (31 July 1174).[53] Henry II was at Barfleur, Normandy, by 8 August, and so the king was at Northampton for only a few days. It is unlikely therefore that the dies are connected with

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[48] P. Latimer, 'Henry II's campaign against the Welsh in 1165', *Welsh History Review* 14 (1989), pp. 523–52, at p. 531 and 545.

[49] J.O. Prestwich, 'War and finance in the Anglo-Norman state', *Transactions of the Royal Historical Society*, 5th series, 4 (1954), 19–43. It is interesting to note that E. Amt regarded the Toulouse campaign of 1159 as a turning point in royal finances, with *dona* assessed on the knights of counties in the Pipe Rolls, which were scutage in all but name, *The Accession of Henry II in England*, 183.

[50] C.W. Hollister, 'The significance of scutage rates in eleventh and twelfth century England', *English Historical Review* 75 (1960), pp. 577–88, at p. 587.

[51] M. Prestwich, 'Money and mercenaries in English medieval armies', in *England and Germany in the High Middle Ages*, ed. A. Haverkamp and H. Vollrath (Oxford: 1996), pp. 129–50 at p. 132.

[52] In *BMC Henry II*, p. cli, Allen describes Northampton as 'one of the principal strongholds of the insurgents in 1173–4'. Northampton was in fact a royalist stronghold, W. L. Warren, *Henry II* (London: 1973), p. 134 and p. 136 and maps pp. 130–31.

[53] *Itinerary*, pp. 182–3.

production during the king's visit. It is also unlikely that the coinage was required by the inhabitants to pay off Earl David, because Jordan Fantosme implies that the Earl's raid was a response to the intransigence of the population: 'They were valorous men of Northampton, but Earl David of Scotland put them in dire straits. He could not get taxes or anything out of them willingly, so he led a raid on them one day.'[54]

Despite these problematic aspects, in many ways the events in 1174 provide many of the key elements which would serve to explain the existence of the Northampton C3 dies. Need for coinage might have arisen quickly, for example to provide pay or supplies for mercenaries, such as could not have been anticipated; access to metropolitan dies might not have been possible, owing to a dangerous journey or pressure of time. However, if the historical circumstances lend themselves to assigning the C3 dies to 1174, the numismatic evidence becomes problematic. If the Northampton C3 dies were made in 1174 it is unclear why regular Class C should be their prototype rather than Class E, which was in issue during the period prior to 1174 or indeed Class D which preceded Class E (see Table 1.1.).

To summarise, coins of Class C3 are to be divided into those of the metropolitan group and those that are anomalous and without parallel at other mints. The Class C3 dies used at Bury St Edmunds, Lincoln and Northampton were probably locally cut and are unrelated to each other and the metropolitan group. However, the stylistic unity of the Northampton C3 dies and the use of those dies by four moneyers is unparalleled in the coinage. A plausible explanation for the Northampton dies is that they were locally cut for a specific purpose, which must, unfortunately, remain uncertain. The production of metropolitan C3 dies can be dated to 1167 or before, a date suggested by the textual evidence concerning the moneyer Cristien of Durham. The C3 dies used at Northampton cannot presently be dated more exactly than 1163 × 1174. Discoveries of further hoards containing Northampton coins of Class C3 would present the best means of explaining the occurrence of the dies, by further defining the possible date of production.

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[54] *Jordan Fantosme's Chronicle*, ed. and trans. R.C. Johnston (Oxford: 1981), p. 85, ll. 1119–22.

Table 3.3. Hoards containing Cross and Crosslets coins of Northampton mint.

No	*Place of dicovery, county/country, date of discovery*	*Date of deposition*	*Class A*	*Class C2*	*Class C3*	*Total coins in hoard*
1	Awbridge, Hampshire, 1903	*c.*1165	1	—	—	*c.*180
2	Outchester, Northumberland, 1817	*c.*1173	1	—	—	*c.*1000
3	Wicklewood, Norfolk, 1989	*c.*1174	3	—	1	482
4	Lark Hill, Worcester, 1853	*c.*1175	4	—	—	229
5	Tealby, Lincolnshire, 1807	*c.*1180	5	—	1	*c.*6000
6	Ampthill, Bedfordshire, 1836	*c.*1180	1	1	1	142
7	Leicester, 1927	*c.*1180	2	1	1	238
8	Gayton, Northamptonshire, 1998-9	*c.*1180	1	1	—	*c.*315
9	Corne, near Angers, France, *c.*1930	*c.*1180?	—	—	1	16+?
	Total		14	3	5	

Notes on Table 3.3:

No	*Catalogue*	*References*
1.	**14b**	*Inventory* 16; H. A. Grueber, 'A find of coins of Stephen and Henry II at Awbridge, near Romsey', *Numismatic Chronicle* 4:5 (1905), pp. 354-63; G.C. Brooke, *A Catalogue of English Coins in the British Museum: The Norman Kings* (London, 1916), pp. xxxi-xxxii; *BMC Henry II* pp. lvi-lvii; R. P. Mack, 'Stephen and the Anarchy', *British Numismatic Journal* 35 (1966), pp.38-112 at p. 106; Crafter, 'Re-examination', no. 1; Allen, 'Hoards', no. 6.
2	**11a**	*Inventory* 299; *BMC Henry II*, pp. xlix-lii; R. P. Mack, 'Stephen and the Anarchy', British Numismatic Journal 35 (1966), pp.38-112 at p. 106; D. M. Metcalf, 'The evidence of Scottish coin hoards', number 5; Crafter, 'Re-examination', no. 4; Allen, 'Hoards', no. 11.
3.	**5g, 7d, 10a, 22c**	Unpublished information kindly provided by M. M. Archibald; Crafter, 'Re-examination', no. 10; Allen, 'Hoards', no. 12. Lot 152 of the auction catalogue (Christies (London) Auction, 15th May 1990) lists six coins of Northampton (two pennies, four cut halfpennies) without illustration. I have not been able to account for two cut halfpennies listed in Lot 152 after studying the British Museum's security photographs of the hoard.
4.	**1b, 5c, 5d, 14a**	*Inventory* 381; *BMC Henry II*, pp. liv-lvi; Crafter, 'Re-examination', no. 12; Allen, 'Hoards', no. 14 .
5.	**2b, 6a, 7a, 9b, 20a.**	*Inventory* 352; *BMC Henry II*, pp. xlviii-xlix; C. Sturman, 'Sir Joseph Banks and the Tealby hoard', *Lincolnshire History and Archaeology* 24 (1989); Crafter 14; Allen 13.
6.	**2a, 17a, 23b**	*Inventory* 7; Rev. Assheton Pownall, 'On some pennies of Henry II found in a hollow stone at Ampthill', *Numismatic Chronicle*, 1862, pp. 233-9; L. A. Lawrence, 'Further notes on the Ampthill find', *Numismatic Chronicle*, 1920, pp. 166-74; *BMC Henry II*, pp. lii-liii; Crafter, 'Re-examination', no. 17; Allen, 'Hoards', no. 15.
7.	**4a, 5b, 17b, 23a**	*Inventory* 231; *BMC Henry II*, pp. lix; Crafter, 'Re-examination', no. 18; Allen, 'Hoards', no. 17.
8.	**4e, 17d**	Crafter, 'Re-examination', no. 16; Chapters 3 and 8, this thesis.
9.	**19b**	F. Elmore Jones, 'A parcel of "Tealby" type pennies from France', *Spink's Numismatic Circular* 1965, pp. 125-6; Crafter, 'Re-examination', no. 23.

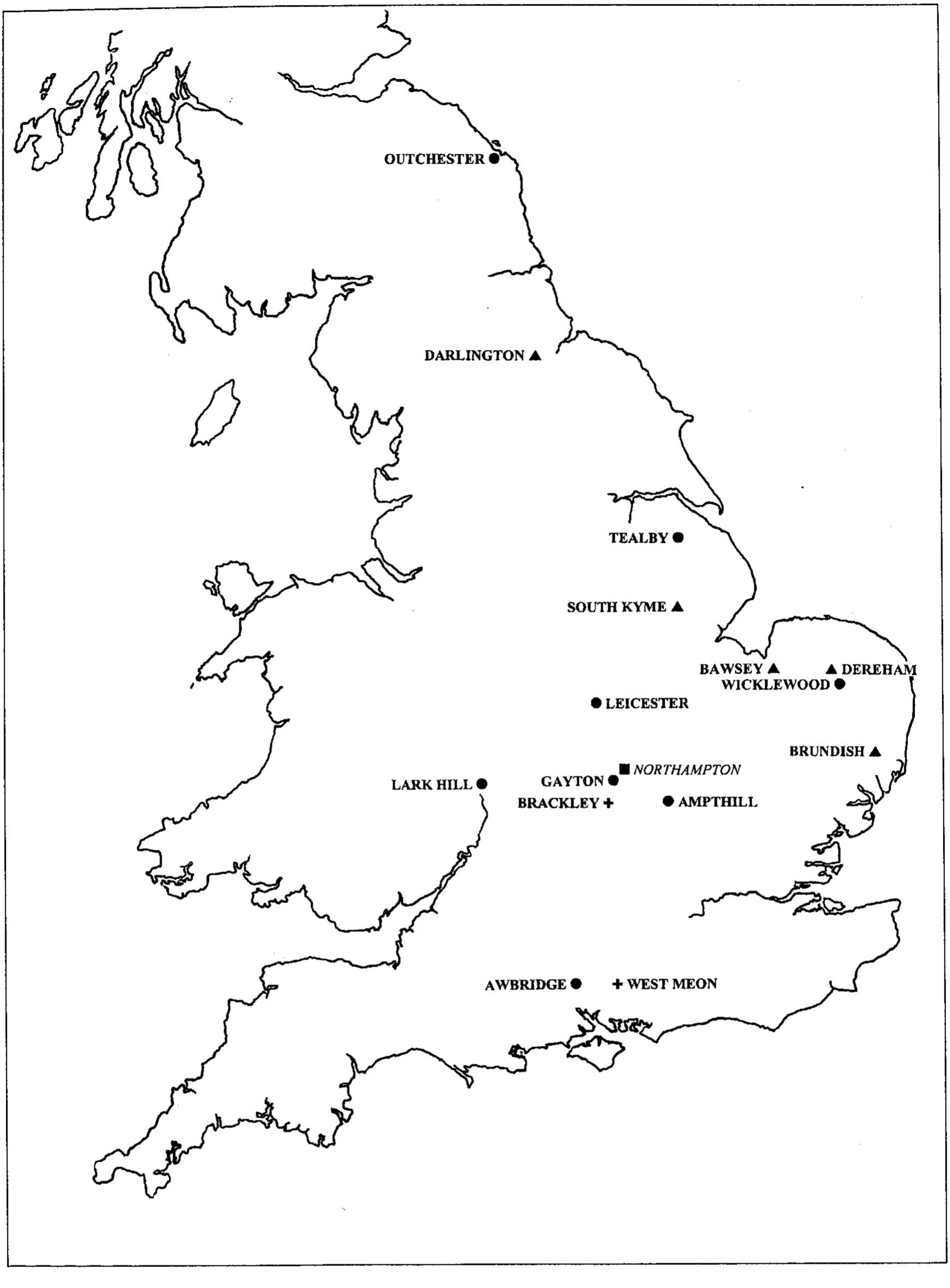


Figure 3.4. Map of hoards containing Cross and Crosslets coins of Northampton mint and single finds from England. Key: ● = Hoards containing Northampton mint Cross and Crosslets coins; ▲= Single find of a Northampton mint Cross and Crosslets coin; ✚ = Other Cross and Crosslets hoard mentioned in the text; ■ = Borough of Northampton.

3.4 Volume of Currency

3.4.1. Volume of currency produced by moneyers at Northampton

The statistical methodology employed in this section has been explained and considered in Chapter 1 (p. 41–9). The construction of the Catalogue involved the location of all extant specimens in minor collections with the effect that in a majority of cases the number of die-duplicates has increased and the number of singletons has decreased compared with earlier studies. In consequence the statistical view of the numbers of dies is now much more balanced than would otherwise be the case.

Table 3.4 provides the primary data derived from the Catalogue (Chapter 7). Table 3.5 organises the point estimates for the number of dies together with the high and low endpoints of the 95% confidence interval for each of the four sets of data (Class A and C, obverses and reverses). Figure 3.5 illustrates the data in Table 3.5 in graphical form.

The coverage of the sample (C_{est}) for each of the four sets of data cover a range 0.94—0.98 and this indicates that in the Catalogue is an excellent representative sample of the Cross and Crosslets coins struck at Northampton.[55] This confirms the appropriateness of the sample (§8.1) used in the die-study.

The estimated 14 Class A reverse dies might have produced approximately £600–£1,200 at 10,000–20,000 coins per die, using the point estimate of the number of dies.[56] On the basis of the sub-classes of dies represented it is reasonable to regard this as the recoinage output.[57] The estimated 7 Class C reverse dies might have produced approximately £250–£550 at 10,000–20,000 coins per die.

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[55] 1.00 represents completeness. C_{est} data: Class A, 0.978723 (obverse), 0.93617 (reverse); Class C 0.952381 (obverse), 0.952381 (reverse).

[56] See Chapter 1, §1.5, especially p. 44 and note 114.

[57] None of the known Class A dies of Northampton belongs to the (late) transitional phases, which implies that no provision of Class A dies was made to Northampton beyond those supplied for the recoinage, Crafter 1998. From examining the extant Cross and Crosslets coins of Northampton it is clear that some dies (such those of the moneyer Pieres) did incur considerable wear due to heavy use. As also explored, however, the pattern of the use and renovation of dies was subject to variation.

Table 3.4. Basic data from the Catalogue concerning obverse and reverse dies.

Class	*Coins (n)*	*Known Dies (d)*	*Singletons (d_1)*	*Non-Singletons*
Obverse figures				
A	48	11	1	47
C	24	6	1	23
Reverse figures				
A	48	12	3	45
C	24	6	1	23

Table 3.5. Comparison of the actual dies in the catalogue with the estimated numbers of dies, together with the high and low endpoints of the 95% confidence interval of the point estimate.

Class	*Number of dies in Catalogue*	*Low endpoint of 95% Confidence Interval*	*Point estimate of number of dies*	*High endpoint of 95% Confidence Interval*
Obverse Dies				
A	11	10	12	14
C	6	5	7	9
Total	17	15	19	24
Reverse Dies				
A	12	12	14	18
C	6	5	7	10
Total	18	17	21	28

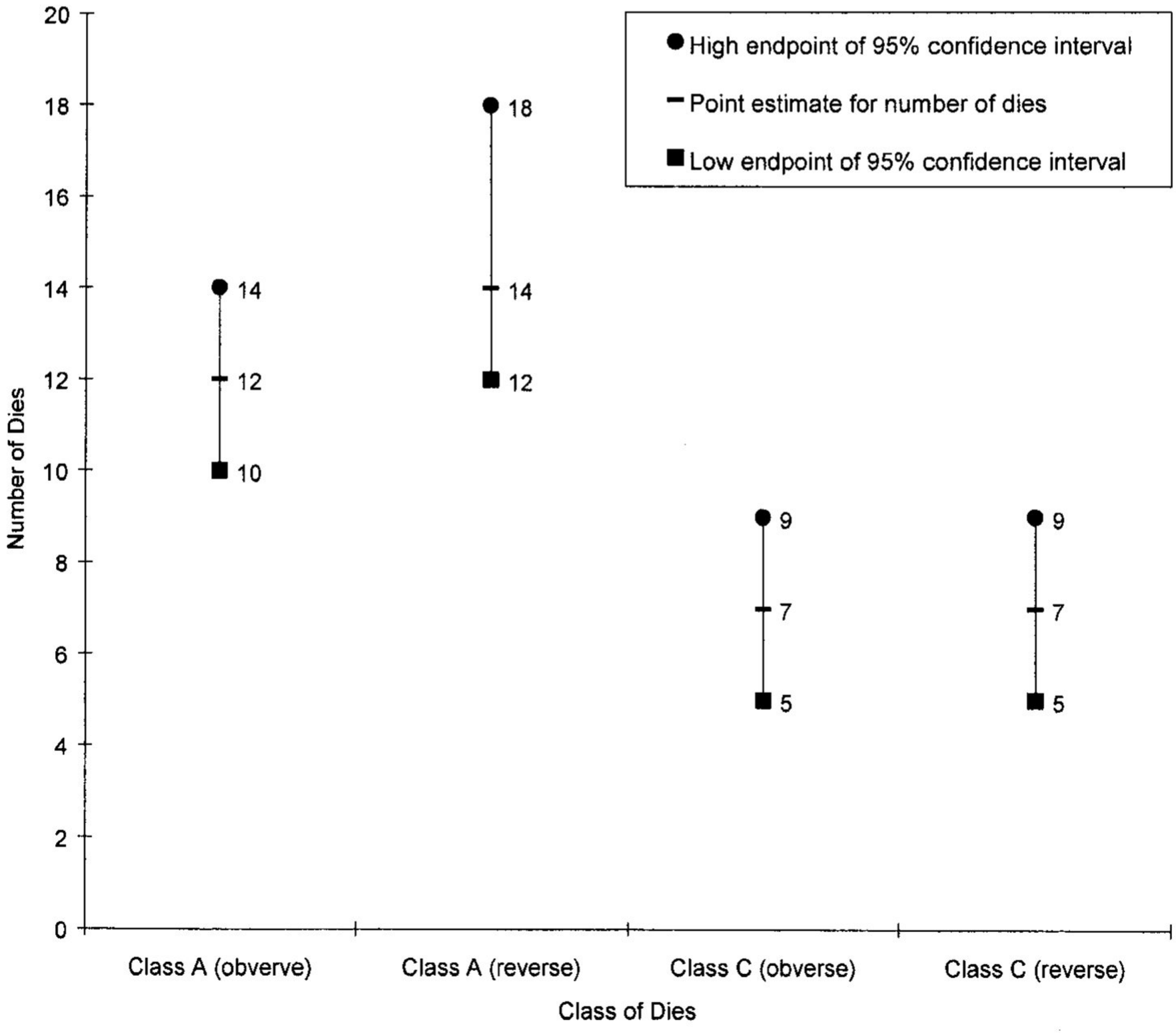


Figure 3.5. Obverse and Reverse dies: results of the point estimates for the number for each class with the respective high and low end points of the 95% confidence interval.

3.4.2. Endorsement of Martin Allen's estimated number of dies for the period of the recoinage of 1158–*c*.1160 during Class A

It is important to distinguish estimates for numbers of dies derived from comprehensive die-studies from estimates derived from statistical methodologies that analyse published catalogues of major public collections. Some large museum collections have been formed over centuries, but are not comprehensive owing to the select retention of hoard material, the sale or exchange of items, and individual donations from private collections. Many private collections have been formed according to demanding criteria, such as condition, and although a few private collections have aimed at completeness by die-identity these usually do not pass into institutions intact.[58] Therefore, data derived from comprehensive die-studies should overrule data extracted from published catalogues of museum collections.

Martin Allen's impressively thorough study of Stephen's *BMC* type 7 and the study of the Crescents coinage of William I of Scotland presented in this thesis (Chapter 4) are akin in so far as the body of material is usefully large as well as manageable (377 and 354 coins respectively). In contrast a complete die-study of the Cross and Crosslets coinage is precluded by the number of coins (approximately 5,000) even before one considers the daunting condition of much of the extant material.[59] Therefore, is it legitimate to explore the basis for the estimates that have been produced for the volume of currency at the recoinage of 1158–*c*.1160 without such a comprehensive die-study having been undertaken.

For many years the only estimate for the number of dies employed to produce the Cross and Crosslets coinage was that published by Michael Metcalf in 1977 and calculated from examining *BMC*.[60] Metcalf estimated that there were 559 Class A reverse dies. However, Derek Allen noted many 'similar coin(s)' in the footnotes to the die-identified specimens in

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[58] The late F. Elmore Jones collected Cross and Crosslets pennies by die-identity. Approximately one third of his collection passed to the British Museum, but two-thirds of his collection was dispersed at auction in 1983–4, see Glendinings (London) Auction, 10 April 1984, p. **00**. Mr Alan Dawson collects the coinage by die-identity, but his collection is not as extensive at that formed by F. Elmore Jones.

[59] See Chapter 1, p. 45 note 119.

[60] D. M. Metcalf, 'An estimate of the total output of the English mints during the "Cross and Crosslets" Coinage, 1158-1180', Appendix to 'A survey of numismatic research into the pennies of the first three Edwards (1279-1344) and their continental imitations', in N. J. Mayhew, ed., *Edwardian Monetary Affairs (1279-1344): a symposium held in Oxford, August 1976* (British Archaeological Reports 36, Oxford 1977), pp. 1-31 at pp. 26-31.

BMC, because it was 'not always possible to check the die-identities of such coins'.[61] For statistical purposes Metcalf chose to assume that every 'similar coin' noted was struck from dies not represented in *BMC*. Equally troubling is Metcalf's extrapolation of his estimate for the total number of reverse dies from his estimate of the total number of obverse dies. Martin Allen rightly regarded Metcalf's figures as 'capable of improvement' and has reworked the information from *BMC*, directly calculating data for obverse and reverse dies from *only* those coins with die-identifications.[62] Allen estimated that there were *c*.336 Class A reverse dies. However, and it is worth emphasising, Allen's data is not derived from die-study and there are potential problems with using *BMC* owing to theoretical biases within the material.[63] Moreover, the British Museum's collection has been augmented since 1951 with many coins from dies not represented in *BMC*, from the collection of the late F. Elmore Jones in 1983–4 as well as hoard material, principally cut coins from the Wicklewood hoard (1989). It is important to note that Martin Allen could not have used the published images of the collection of the late F. Elmore Jones as a supplement to *BMC*, because dies are only identified according to *BMC*.[64]

A means of assessing the validity of Allen's estimates is through comparison with die-studies of individual mints. Tables 3.6–3.8 compare the die figures for Class A coins of the Northampton mint study in this thesis and those of two other published die-studies with the die-estimates provided by Metcalf (1977) and Allen (2006).[65] A cursory glance suggests that Allen's die-estimates for mints derived from analysis of *BMC* are broadly in line with the estimates produced by data derived from die-study. Careful review of the data, however, indicates that the figures produced by Allen *might* be slightly too high. With regard to Northampton Allen's point estimate for the number of obverse dies (16) is greater than the

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[61] *BMC Henry II*, p. xvi.
[62] M. Allen, 'The English coinage of 1153/4–1158', *BNJ* 76 (2006), pp. 242–311, at pp. 260–264.
[63] Discussed *BMC Henry II*, pp. xv–xvi.
[64] This important point, which continues to hamper analytical work on the coinage, is explained at length in the introduction to the corpus of Northampton coins, §8.1.
[65] In order to make the figures comparable Metcalf's published figures for 'non-singletons' have been converted to 'singletons' by subtracting the non-singletons from the number of known coins.

high endpoint of the 95% confidence interval (14) derived from die-study; this is also the case with Bury St Edmunds. However, calculations for potential volume of coinage produced use point estimates for the number of *reverse* dies. As can be seen for Northampton, Bury St Edmunds, and Lincoln the estimated number of reverse dies proposed by Allen agree with the estimates derived from die-study, although for each mint the high endpoint of the 95% confidence interval has been reduced.

The evidence suggests that Allen's figures for the estimated number of dies used in the recoinage of 1158–*c*.1160 calculated from *BMC* are commensurate with the data derived from the available die-studies. Therefore on the current available information it seems prudent to endorse Allen's estimate of potential output of the 1158–*c*.1160 recoinage. Naturally, as further intricate die-studies are undertaken and published it will be helpful to revisit the estimate proposed by Allen.

3.4.3. Output from Class C dies

As already stated (§3.4.1.), the estimated 7 Class C reverse dies might have produced approximately £250–£550 at 10,000–20,000 coins per die. Forensic numismatic analysis indicates that the C3 dies used at Northampton are anomalous (above §3.3.3.). The four known C3 reverse dies used at Northampton might have struck £150–£350 at 10,000–20,000 coins per die. It is worth considering whether the number of C3 dies is disproportionately large or small compared with the known mint activity in Class A, by comparing the ratio of Class A and Class C die estimates from published die-studies. For the purposes of this analysis it is assumed that the Northampton C3 dies were made and employed contemporaneously with regular Class C, which may not have been the case.

At Northampton the number of dies was reduced by between 25% and 75% from Class A to Class C.[66] At Bury St Edmunds no significant change appears to have occurred between Class

[66] Obverses: Class A point estimate 12 (95% confidence interval 10–14), Class C point estimate 7 (95% confidence interval 5–9); Reverses: Class A point estimate 14 (95% confidence interval 12–18), Class C point estimate 7 (95% confidence interval 5–9).

A and Class C.[67] However, the number of dies and moneyers, due to the abbatical status of the mint, are too small to draw any meaningful conclusions. Mint activity at Lincoln is comparable to Northampton, because there were no dies farmed by ecclesiastical authorities and both mint towns had a similar complement of moneyers. At Lincoln there appears to have been a reduction in obverse dies, but the number of reverse dies appears to have been maintained at roughly the same level in Classes A and C.[68]

Therefore, comparison of the ratios of Class A and Class C dies from data derived from available die-studies does not serve to illuminate the nature of the Class C3 dies at Northampton. The occurrence of the dies does not appear anomalous from the perspective of comparative mint activity.

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[67] Obverses: Class A point estimate 4 (95% confidence interval 3–5), Class C point estimate 4 (95% confidence interval 3–5); Reverses: Class A point estimate 4 (95% confidence interval 3–5), Class C point estimate 6 (95% confidence interval 5–7).

[68] Obverses: Class A point estimate 22 (95% confidence interval 17–28), Class C point estimate 16 (95% confidence interval 13–21); Reverses: Class A point estimate 20 (95% confidence interval 16–26), Class C point estimate 20 (95% confidence interval 15–25).

Table 3.6: Comparison of data concerning Class A coins minted at Northampton from die-study in this thesis with Metcalf (1977)[69] and Allen (2006).[70]

	Number of coins (n)	*Known dies (d)*	*Singletons (d_1)*	*Point estimate (D_{est})*	*95% confidence interval*
Obverse dies					
Metcalf (1977)	30	18	11	37	22–65
Allen (2006)	24	11	4	16	10–25
Crafter (2007)	48	11	1	12	10–14
Reverse dies					
Metcalf (1977)	—	—	—	—	—
Allen (2006)	24	9	3	12	8–18
Crafter (2007)	48	12	3	14	12–18

Table 3.7: Comparison of figures Metcalf (1977) and Allen (2006) concerning Class A coins minted at Bury St Edmunds with data calculated from the die-study published by Eaglen.[71]

	Number of coins (n)	*Known dies (d)*	*Singletons (d_1)*	*Point estimate (D_{est})*	*95% confidence interval*
Obverse dies					
Metcalf (1977)	7	4	0	4	2–9
Allen (2006)	13	4	2	6	4–10
Eaglen (2006)	37	4	0	4	3–5
Reverse dies					
Metcalf (1977)	—	—	—	—	—
Allen (2006)	13	3	1	4	3–6
Eaglen (2006)	37	4	0	4	3–5

Table 3.8: Comparison of figures Metcalf (1977) and Allen (2006) concerning Class A coins minted at Lincoln with data calculated from the die-study published by Mossop.[72]

	Number of coins (n)	*Known dies (d)*	*Singletons (d_1)*	*Point estimate (D_{est})*	*95% confidence interval*
Obverse dies					
Metcalf (1977)	22	13	7	24	14–44
Allen (2006)	23	13	6	22	13–38
Mossop (1970)	52	19	3	22	17–28
Reverse dies					
Metcalf (1977)	—	—	—	—	—
Allen (2006)	22	15	9	25	14–46
Mossop (1970)	52	16	5	20	16–26

[69] D. M. Metcalf, 'An estimate of the total output of the English mints during the "Cross and Crosslets" Coinage, 1158-1180', Appendix to 'A survey of numismatic research into the pennies of the first three Edwards (1279-1344) and their continental imitations', in N. J. Mayhew, ed., *Edwardian Monetary Affairs (1279-1344): a symposium held in Oxford, August 1976* (British Archaeological Reports 36, Oxford 1977), pp. 1-31 at pp. 26-31.

[70] M. Allen, 'The English coinage of 1153/4–1158', *BNJ* 76 (2006), pp. 242–311, at pp. 260–264.

[71] R.J. Eaglen, *The Abbey and Mint of Bury St Edmunds* (London: 2006), pp. 239–41.

[72] H. Mossop, *The Lincoln Mint* (Newcastle-upon-Tyne: 1970). The data presented here is not readily accessible in the study and has been extracted from it and set out in full in §8.5.

Table 3.9: Comparison of data concerning Class C coins minted at Northampton from die-study in this thesis with Metcalf (1977) and Allen (2006).

	Number of coins (n)	*Known dies (d)*	*Singletons (d_1)*	*Point estimate (D_{est})*	*95% confidence interval*
Obverse dies					
Metcalf (1977)	11	5	1	6	3–11
Allen (2006)	13	6	1	7	4–12
Crafter (2007)	24	6	1	7	5–9
Reverse dies					
Metcalf (1977)	—	—	—	—	—
Allen (2006)	11	4	1	5	3–9
Crafter (2007)	24	6	1	7	5–9

Table 3.10: Comparison of figures Metcalf (1977) and Allen (2006) concerning Class C coins minted at Bury St Edmunds with data calculated from die-study published by Eaglen.[73]

	Number of coins (n)	*Known dies (d)*	*Singletons (d_1)*	*Point estimate (D_{est})*	*95% confidence interval*
Obverse dies					
Metcalf (1977)	18	2	0	2	2–2
Allen (2006)	17	2	0	2	2–3
Eaglen (2006)	42	4	0	4	3–5
Reverse dies					
Metcalf (1977)	—	—	—	—	—
Allen (2006)	17	4	0	4	3–6
Eaglen (2006)	42	6	0	6	5–7

Table 3.11: Comparison of figures Metcalf (1977) and Allen (2006) concerning Class C coins minted at Lincoln with data calculated from the die-study published by Mossop.[74]

	Number of coins (n)	*Known dies (d)*	*Singletons (d_1)*	*Point estimate (D_{est})*	*95% confidence interval*
Obverse dies					
Metcalf (1977)	20	12	7	24	13–46
Allen (2006)	25	14	7	24	15–42
Mossop (1970)	51	14	3	16	13–21
Reverse dies					
Metcalf (1977)	—	—	—	—	—
Allen (2006)	28	15	8	27	16–44
Mossop (1970)	51	16	4	20	15–25

[73] R.J. Eaglen, *The Abbey and Mint of Bury St Edmunds* (London: 2006), pp. 239–41.
[74] H. Mossop, *The Lincoln Mint* (Newcastle-upon-Tyne: 1970). The data presented here is not readily accessible in the study and has been extracted from it and set out in full in §8.5.

3.5 Conclusion

The numismatic evidence surveyed in this chapter presents a picture of a medieval mint for which there is no prose narrative account. The pattern of die-links at the Northampton mint during the Cross and Crosslets type indicates that the majority of moneyers were working together in partnership and co-operation. The alteration of dies by moneyers in the workshop environment indicates that moneyers sought to care for their dies by improving the die-face, perhaps with the intention of extending its life of use. The different techniques employed indicate that that individual moneyers adopted different practices to counteract similar problems. A similar conclusion is gained from examining the preparation and separation of flans. Forensic analysis of the Class C3 dies used at Northampton indicates that these were prepared locally by the same hand at the same time; the dies are unconnected with the metropolitan C3 dies or other individual local dies produced at other mints. The anomalous coins of Class C3 struck at Northampton cannot presently be given a date range tighter than ten years, 1163 × 1173. The purpose for which these dies were manufactured cannot be established from the evidence presently available; the estimated four C3 reverse dies might have produced £150–£350. During the period to which these dies can be dated the borough of Northampton remained accountable to the central administration; Northampton was a location for a royal council in 1164 and the borough was attacked in 1174 by a rebel force commanded by Earl David of Scotland.

The data provided by the Northampton die-study indicates that the moneyers of Northampton might have struck £600–£1,200 from the estimated 14 reverse dies during the recoinage of 1158–*c.*1160. The estimated number of dies derived from the Northampton die-study, as well as comparison with other available data derived from mint die-studies, is concordant with Martin Allen's figures for the mint derived from calculating data from *BMC* alone. The data suggests that Allen's methodology may have yielded a slight over-estimate for the number of Class A dies, but the difference is not significant compared with the data proposed by Metcalf. Therefore, on the basis of the evidence surveyed it is prudent to endorse

Martin Allen's estimate for the output of the recoinage of 1158–*c*.1160, although it will be appropriate to re-examine Allen's data in the light of future systematic die-studies.

4. The Gayton hoard (1998–9) and its context: new evidence for monetary expansion in England 1158–80

4.1 Introduction

The coinage of Henry II provides essential evidence about the money supply. The most adequate way to understand the money supply is to understand the composition of the currency by analysing the content of hoards, which are additionally informative on mint organisation and administration. Sadly hoard evidence for late twelfth-century Britain is variable at best. Hoard evidence for the contemporary Crescents coinage of Scotland is hopelessly inadequate and has compelled analysis by die-study (see §4.1.3 and §4.7). For the coinage of England, large currency hoards of late twelfth-century coins are rare and much important information has been irrevocably lost owing to the dispersal or actual destruction of material. Approximately 90 per cent of the Tealby hoard found in 1807 was melted down, and approximately 35 per cent of the Leicester hoard found in 1927 was not retained by the British Museum.[1] Other smaller hoards have been found in the twentieth century, but are of only limited use for understanding the composition of the currency, even through many have been well catalogued.[2] Consequently, the discovery of the second largest hoard of Cross and Crosslets coins at Gayton, Northamptonshire, in 1998–9 has revitalised the possibility of understanding monetary expansion from hoard evidence. Although how representative Gayton may be can only be revealed by the discovery of more comparative material.

The Gayton hoard is the largest hoard of Cross and Crosslets coins found in the twentieth century and the second largest ever discovered. A hoard is a repository of information on the composition of the currency, but it is only by identifying the individual coins that such information can be compiled. The whole Cross and Crosslets coinage was extremely poorly struck and the material has taken eight years to organise into the Catalogue (Chapter 8).

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[1] The fate of Tealby hoard is explored by C. Sturman, 'Sir Joseph Banks and the Tealby hoard', *Lincolnshire History and Archaeology* 24 (1989), pp. 51–2. For the Leicester hoard see *BMC Henry II*, p. lix.

[2] *EMCH*, pp. 3–15. However, some small hoards can be useful as evidence for the movement of coins. An example of such a hoard is the 'near Brussels' hoard, A. Dawson and N.J. Mayhew, 'A Continental find of Tealby pennies', *BNJ* 57 (1987), pp. 113–18, at p. 113. See below, p. 133.

Readers are advised to understand the arrangement and processes involved in cataloguing before proceeding (§9.2 and §9.3).

In this chapter the fresh information from the Gayton hoard contents is subjected to analytical techniques and crucial comparative work. Individual coins of importance are singled out for particular remarks. Gayton confirms the importance of the contribution of moneyers at Ipswich proposed by my own study.[3] The content of the Gayton hoard emphasises the contribution of moneyers of Canterbury and warrants examination of the historical evidence for the activity of the moneyers. Metrological analysis is conducted and compared with the findings of the Northampton mint corpus.

[3] T. Crafter, 'A die-study of the Ipswich mint, *c.*1161/2–1180', *NC* 162 (2002), pp. 237–52.

4.2 Recovery and disposition

The hoard was discovered on 24 February 1998 by Mr Frederick Baston and Mr Kenneth Jones who were using metal-detectors on arable land in the parish of Gayton, Northamptonshire. There was no trace of a container. Further searches on the following two days recovered a total of 147 coins, after which attempts to recover further coins halted owing to the commencement of a contracted process of soil enrichment by slurry on the field. The next opportunity that Mr Baston and Mr Jones had to search in the same location was 12 April 1999, after the field had been ploughed, and over the following days they recovered a second parcel of 169 coins and fragments together with two pieces of twisted iron. The content of each parcel was consistent, indicating that both parcels belong to the same hoard. The hoard has passed into numismatic parlance under the nomenclature of the 'Gayton hoard'.[4]

Both parcels of the hoard were initially sent to the Northampton Museum and Art Gallery and were subsequently dispatched to the British Museum for examination. In June 1998 I received a letter from Dr Gareth Williams of the British Museum in which he informed me of the discovery of the hoard and invited me to identify and catalogue the contents. I was subsequently asked to arrange the second parcel of the hoard as well. As a priority I undertook much cursory identification at the British Museum in order to provide sufficient information for the assessment of the hoard at inquests convened under the provisions of the Treasure Act (1996).[5] Systematic identification and recording of the coins for the purposes of analytical work has been a more gradual process, prolonged owing to absence from England from September 1998 during my first degree.

An inquest concerning the first parcel was held on 5 February 1999 and an inquest concerning the second parcel was held on 20 October 1999. The contents of both parcels of the hoard, including the iron objects, were found to be Treasure under the Treasure Act (1996). The hoard was reported by local newspapers: in the *Evening Telegraph*, 6 February

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[4] Northamptonshire Sites and Monuments Record: SMR 8351/0/1 and SMR 8351/0/2.
[5] Brief details of the two parcels are found in the 'Coin hoards' sections of *NC* 159 (1999), p. 349, no. 46 and *NC* 160 (2000), p. 324, no 46.

1999, in the *Daventry Express*, 28 October 1999 and in the *Bicester Review*, 29 October 1999. The Ashmolean Museum, Oxford, acquired the hoard in its entirety in November 2000 and the contents of the hoard now in the collections consists of 311 individual pieces, some of which are fragments.

4.2.1. The find-spot

The hoard was found in Top Wood Field of Gayton Wood Farm (National Grid Reference SP 7110 5305) on the western side of the A43. The southern boundary of Top Wood Field, approximately 10 metres from the site of the hoard, is a green lane that runs east-west, which is the southern boundary of the parish of Gayton. The green lane was very close to the junction with the Oxenford Way, which is perhaps the boundary between the Salcey Forest and Whittlewood Forest.[6]

[6] I am very grateful to Mrs Rita Poxon, local historian of Gayton, for correspondence on the find-spot.

4.3 Content of the Gayton hoard

The latest Cross and Crosslets coins in the Gayton hoard are of Class F and these provide a *terminus post quem* of *c.*1174 for the deposit of the hoard, but it may have been deposited as late as 1180. The large number of coins of Class F (146) from a variety of different mints far from the findspot, such as Carlisle and Newcastle, suggests Class F had been issued for a time before the hoard was deposited.

Two pieces of twisted iron found with the coins are possibly to be associated with the hoard, and these were declared to be treasure along with the coins. Although the iron coils have no known precedents, it is plausible that these were used as rudimentary fasteners for a bag or cloth in which the coins were contained (**Plate 6, A and B**). There is no evidence that the coins had been contained in a solid and durable container. The contents of the hoard had been scattered by ploughing, and a number of coins are fragmentary and others show signs of plough-damage.

For newly catalogued medieval hoards from Britain it is customary to present a summary in the *Inventory* format, which provides a standardised synopsis of content for ease of reference.

A summary of the Gayton hoard in the *Inventory* format might be as follows:

GAYTON, Northamptonshire, 1998–9
315 AR English and 2 iron clips (probably associated with hoard): Deposit *c.*1180.
ENGLAND (311 pennies and fragments)
Henry II, Cross and Crosslets type: 47 Class A, 14 Class B, 54 Class C, 24 Class D, 11 Class E, 146 Class F, 13 of uncertain class, 2 Contemporary Imitations.
Bristol (6) – A, 2; F, 4: Bury St Edmunds (16) – B, 1; C, 1; D, 1; E, 1; F, 12: Canterbury (102) – A, 6; B, 5; C, 13; D, 8; E, 4, F, 65; Uncertain 1: Carlisle (4) – E, 1; F, 3: Colchester (2) – A, 1; E, 1: Durham (1) – B, 1: Exeter (2) – B, 1; D, 1: Hereford (2) – A, 1; C, 1: Ipswich (36) – B, 3; C, 8; D, 2; E, 1; F, 22: Leicester (1) – A, 1: Lincoln (15) – A, 3; B, 1; C, 4; E, 1; F, 6: London (28) – A, 12; C, 7; D, 3; E, 1; F, 4; Uncertain 1: Newcastle (5) – C, 1; D, 2; F, 2: Northampton (2) – A, 1; C, 1: Norwich (9) – A, 3; B, 2; C, 3; F, 1: Thetford (15) – A, 7; C, 2; D, 2; F, 4: Wilton (1) – A, 1: Winchester (4) – A, 2; C, 2: York (5) – A, 4: D, 1: Uncertain mint (53) – A, 3; C, 11; D, 4; E, 1; F, 23; Uncertain 11: Contemporary Imitations (2).
Discovery and Deposition: Found on farmland in the parish of Gayton by Mr K.W. Jones and Mr F.G.H. Baston using metal detectors in two parcels, 24–26 February 1998 and 12–14 April 1999. Declared to be Treasure and acquired by the Ashmolean Museum, Oxford with the assistance of the MGC/V&A fund.

4.3.1. Individual coins

A number of coins in the Gayton hoard are of individual numismatic interest and warrant particular explanations, notes or discussion.

BRISTOL

The Gayton hoard contains two die duplicates of the moneyer Rogier (**5–6**) of Class F, a moneyer previously recorded as only active up to Class E.[7] The moneyer Elaf was previously the only moneyer of Bristol recorded as active in Class F.[8]

BURY ST EDMUNDS

Two Class F die duplicates (**21–2**) firmly identify the dies as of the moneyer Raul of Bury St Edmunds, confirming the correctness of Robin Eaglen's tentative attribution.

CANTERBURY

Coins of this mint are predominant and are reserved for discussion below in §4.5, where the coins of Lambrin and Solomon are discussed (**29** and **93**).

Gayton contains very crude coins of Class F, which must be regarded as struck from dies cut later than those of any Cross and Crosslets coins hitherto encountered. The crude coins are epigraphically distinct, with rounded letter forms (CANT instead of CANT), and are known of moneyer Raul (**34**) and moneyer Ricard (**75**). A further coin of Class F with rounded C in the mint signature has a fleur-de-lis sceptre-head instead of the canonical crosslet (**120**). A parallel example in the Gayton hoard is of the Thetford mint (q.v.). The fleur-de-lis sceptre-head, a previously unrecorded variety, may be regarded as a die-sinker's error which characterises the conditions of haste and confusion that so marred the production of English currency in the latter half of the Cross and Crosslets type.

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[7] *BMC Henry II*, p. cxvi; *FEJ Photographs* 13/13.
[8] *BMC Henry II*, p. cxvi and p. clxxix.

EXETER

A mule of a Class B obverse with an irregular Class C reverse (**133**) indicates a previously unrecorded moneyer. There are two known die duplicates: *BMC* 272 (moneyer's name given as Ricard or Rainir of Exeter) and a penny from the West Meon hoard (moneyer's name given as Ricard of Exeter).[9] The three coins share the same reverse die as *BMC* 273 and another coin in the West Meon hoard and share the same obverse die as *BMC* 267*x* and *FEJ Photographs* 21/13 of the moneyer Reinir of Exeter.[10] From reading the five coins struck from the reverse die, the latter half of the legend is definitely :ON:XƧEꟻE∾:. This is an unparalleled spelling of Exeter. The coins must be regarded as genuine coins of the borough, rather than contemporary imitations, because of the obverse die-link with Rainir. The name of the moneyer, which is certainly not Ricard or Rainer, must remain uncertain; the name begins with the letter T and the third letter is probably R.

HEREFORD

A coin of Class A (**135**) is presumed to be a die duplicate of the *BMC* 292*a* of the moneyer [—]WÆRD, but it has not been possible to verify this as the current whereabouts of the specimen recorded in *BMC* is not known. The coin was noted in *BMC* as 'in an anonymous collection' and, as far as I am aware, it has not been seen since. Unfortunately the Gayton specimen does not yield the beginning of the moneyer's name, which must remain uncertain because numerous completions are possible. The moneyer was not represented in the collection of the late F. Elmore Jones, and Mr Alan Dawson informs me that he does not possess a specimen in his private collection.

LINCOLN

The Gayton hoard contains four pennies of Class F of the moneyer Andru (**175–8**). The four coins are all struck from the same reverse die, and are actually pairs of die duplicates, for two

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[9] *EMCH*, p. 5, no. 13.
[10] *EMCH*, p. 5, no. 14 . *BMC* 273 is illustrated *BNJ* 68 (1998), Pl. 6, no. 20.

dies were responsible for the obverses. There is a Class F penny of the moneyer Turstain (**187**), a moneyer not recorded for Lincoln in *BMC*, but subsequently identified on coins of Class C and Class F.[11] A penny of Class A serves to identify the moneyer as Raven on the other die duplicates previously recorded (**184**).

LONDON

Individual coins of note are of late classes, which are rare of London, but three (perhaps four) moneyers are found in Gayton. One coin (**188**) gives the moneyer's name as Ælh[——]. Known moneyers at London whose names begin with Æ are Acard and Alwine, of which the former is etymologically likely to be rendered Ælh[——], but Acard is not otherwise known to have struck after Class D, whereas Alwine in known in Class F.[12] Class F coins in Gayton are recorded for Alwine (**192**), Godefrei (**197**), and two for Lefwine (**201–2**).

NORWICH

It has often been stated that the activity of the Norwich mint ceased in Class D.[13] However, two die-duplicate Class F pennies of the moneyer Hugo are known and the Class F penny of Gillebert (**226**) shares the same obverse die.[14]

THETFORD

Four coins of Class F can be firmly attributed to this mint (**243–6**), but the names of the moneyers responsible cannot be read. Coins of Class F are known for the moneyer Willem, and Turstain is recorded as active in Class E. [15] The very short mint signature (T) on two of the coins in Gayton (**244** and **246**) indicate that the moneyer's name could be Turstain.

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[11] *FEJ Photographs*, 25/22–3; H. Mossop, *The Lincoln Mint* (Newcastle-upon-Tyne: 1970), pl. XCI, no. 10.
[12] *BMC Henry II*, p. clxxx.
[13] *BMC Henry II*, p. clxxxi; J.J. North, *English Hammered Coinage*, vol. 1, 3rd edition (London: 1994), p. 218; *EMCH*, p. 12.
[14] *FEJ Photographs*, 31/34 and *SCBI* 16 (Norweb), no. 403 = *BMC* 855*a*.
[15] *BMC Henry II*, p. clxxxii and *FEJ Photographs* 33/13–14.

UNCERTAIN MINTS

A Class C penny gives the moneyer's name Pieres (**265**). Moneyers named Pieres are known at Colchester and London in Class C, but the dies appear to be unknown. The Class F penny with the moneyer's name GO[——] (**283**), could be Goldeep or Goldhavoc at Canterbury, or Godefrei or Godwin at London.

A late coin, Class E or F, is of the moneyer Adam (**280**). Moneyers named Adam are known at Oxford in Class E and Ilchester in Class F.[16] A moneyer named Adam is known as a moneyer for Canterbury in Class A, but this seems an unlikely candidate for the Gayton coins as he is not known to have been active in any subsequent class.[17] Coins of Class F of Adam at Oxford should be expected, because he is recorded as moneyer in 1174–75 and 1176–77, each time for an encroachment on the king (*proprestura super regem*).[18]

CONTEMPORARY IMITATIONS

The hoard contains two contemporary imitations, which are different from one another. On the first **(310)**, the king's bust on the obverse and the reverse design are of a style consistent with regular coins of Class C, but the legends are blundered and some of the letters are retrograde. The overall style of the second contemporary imitation **(311)** is copied from regular coins of Class F, with the distinctive ringlet of curls, but it is atypical for the type, with very large crosslets in the reverse angles. Also, pellets in the angles of the main cross form the central star rather than wedges. The obverse legend is convincing but the form of the letter R is incorrect and the letter combination in the reverse legend RCM is not found on regular coins of this Type. The weight of this imitation (1.37 g) is consistent with many regular coins of Class F in the hoard. The intended weight standard of Cross and Crosslets coins may have been 1.42g or slightly heavier (see §5.4.1), and the imitation would not have seemed unusual to contemporaries on account of its weight.

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[16] *BMC Henry II*, p. clxxx–clxxxi.
[17] *FEJ Photographs*, 14/6–7.
[18] *PR 21 Henry II*, p. 14; *PR 23 Henry II*, p. 13.

4.4 Moneyers of Canterbury

4.4.1. Prominence of Canterbury mint coins

The importance of the Gayton hoard lies in its completeness. Analysis of the whole is not prejudiced by selective retention of material, which affects interpretation of the Leicester hoard. The Gayton hoard contains many coins that are of little individual worth, but which make an inestimable contribution in the context of the sum.

Coins of Canterbury constitute nearly 40 per cent of the identified portion of the hoard, but the coins of Class F of this mint (65) alone provide most of this number and constitute over 25 per cent of the identified portion of the whole hoard. Hoards deposited in the late thirteenth century and early fourteenth century were often composed of approximately 50 per cent London mint coins and approximately 25 per cent Canterbury mint coins.[19] The preponderance of coins of Canterbury is not peculiar to Gayton and was noted for the content of the Tealby hoard, but there are no details.[20] In the content of the Gayton hoard, the mint most proximate to Canterbury mint in Class F is Ipswich: 22 coins or 9 per cent of the identified portion of the hoard. I calculated a point-estimate of 70 reverse dies at Ipswich during Class F.[21] The number of dies used at Canterbury during Class F must have been substantially greater, based on the number of coins of that mint in the Gayton hoard.[22] Presently, the sheer volume and the extremely poor condition of the surviving material for Canterbury preclude a die-study of the Canterbury mint. One can only mourn the dispersal without photographic record of the collection of Cross and Crosslets coins of the mint

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[19] N.J. Mayhew, 'The Aberdeen, St Nicholas Street, hoards of 1983 and 1984', *BNJ* 58 (1988), pp. 40–68, at p. 49, Table 2.

[20] G.C. Brooke, *English Coins*, p. 105. Brooke does not offer a citation for his statement. The hoard was reported by T. Combe, 'A description of a large collection of pennies of Henry II discovered at Tealby, Lincolnshire', *Archaeologia* 18 (1817), pp. 1–8.

[21] T. Crafter, 'A die study of the *Cross and Crosslets* type of the Ipswich mint, *c.*1161/2–1180', *NC* 162 (2002), pp. 237–51, at p. 241, Table 2.

[22] See Table 3.4 (below). From the analytical work (§3.5.2) the hoards do not appear to be atypical. If the output of the Canterbury mint far exceeded the output of the London mint in the late 1170s (Class F) it would not be without parallel. For example, some of the earliest available English mint accounts reveal that during the period January 1220–November 1222 the output of the London mint was £9,088 while the output of Canterbury was £34,310, C. E. Challis (ed.), *A New History of The Royal Mint* (Cambridge: 1992), 'Appendix I: Mint Output', pp. 673–98, at p. 674. The supremacy of the Canterbury mint occurred on later occasions, sometimes for a number of consecutive years, such as during the reign of Edward II (1307–1327) between September 1314 and September 1320.

assembled by Christopher R. Wren with attention to die variety.[23] Nevertheless, some comment is required on the moneyers of Canterbury owing to the dominance of coins struck in the city.

Neither Canterbury nor Ipswich had moneyers active in the recoinage of 1180. Canterbury was only re-activated as a mint town by Richard I in 1189, and Ipswich in 1205 for the recoinage of that date.[24] Lord Stewartby has connected the absence of Canterbury with the loss of ecclesiastical privilege mints owing to the separation of minting and exchanging in the administrative reform that accompanied the recoinage of 1180.[25] Ipswich did not have a complement of ecclesiastical moneyers and so an alternative explanation for the suspension of minting must be sought. However, the Ipswich mint may have been partly seigniorial and perhaps two moneyers had farmed their dies on behalf of Conan IV, earl of Richmond and count of Brittany.[26]

It is worth noting that there is a disparity between the frequency with which coins of different moneyers of Canterbury are encountered. Coins of Raul, Ricard, Ricard M, and Rogier are common, whereas coins of other Canterbury moneyers are scarce or rare.

At the time Allen compiled *BMC*, some of the individuals named as moneyers in contemporary documents were unknown from coins. For example, no coins are known of the moneyer John fitz Robert who is recorded in the Pipe Rolls.[27] The rarity or deficiency of coins of certain moneyers indicate that some individuals labelled 'moneyer' were not actually heavily involved in producing coins, but concentrated on other business activities. As observed by Mayhew, 'the trades of goldsmith and moneylender went well with that of moneyer'.[28]

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[23] The Wren collection of Canterbury mint coins became available at A.H. Baldwin & Sons Ltd in 1997, see *SCBI* 56 (Mass), p. 133.
[24] *SCBI* 56 (Mass), p. 3 and p. 6.
[25] Lord Stewartby, 'Lichfield and Chichester', *NC* 161 (2001), 293–5.
[26] *BMC Henry II*, p. cxxxviii.
[27] *PR 23 Henry II*, 208; *PR 24 Henry II*, 123; *PR 25 Henry II*, 118; *PR 26 Henry II*, 145.
[28] N. J. Mayhew, 'From regional to central minting', in *A New History of the Royal Mint*, ed. C. E. Challis (Cambridge: 1992), pp. 83–178 at p. 91.

4.4.2. Identity of individual moneyers

Canterbury is unique among the places of mintage of the Cross and Crosslets coinage, because the city had moneyers farming dies for at least three authorities. Besides moneyers farming on behalf of the crown or borough, three moneyers might have been allowed to the Archbishop of Canterbury, as was the case in the Short Cross coinage according to a grant of 1189, and one to the Abbot of St Augustine's.[29] Table 4.1 shows the known activity of moneyers of Canterbury from the numismatic record with names recorded in contemporary documents.

Table 4.1. The moneyers of Canterbury recorded from Cross and Crosslets coins, the classes of coins known, and individual identifications from documentary evidence.

	Classes of Coins						
Moneyer	*A*	*B*	*C*	*D*	*E*	*F*	*Identification from documents*
Adam	+						——
Alferg	+						Elverdus Porrere. Family at 'Severlinge' (now unknown)
Goldhavoc	+	+	+	+	+	+	——
Goldeep			+		+	+	——
Lambrin						+	Lambrin Frese, a Fleming
Raulf			+	+	+	+	Raulf of Rye
Ricard	+	+	+	+	+	+	} Richard Corbeille and Richard Deudene, a Jew
Ricard M	+	+	+	+	+		
Rogier	+	+	+	+	+	+	Roger, the archbishop's moneyer
Rogier F	+						——
Rogier W	+						——
Sansum						+	Samson, a Jew
Solomon						+	Solomon, a Jew (possessed a house in Canterbury)
Willem			+				——
Wiulf	+	+	+	+	+	+	Wiulph 'the rich', son of Meiner

To deal first with the common moneyers in Gayton: Rogier, Ricard and Raul. The moneyer Roger who struck in all classes is probably the moneyer of that name identified as the archbishop's moneyer in Pipe Rolls for 1172–3 and 1174–5, who owed 3 marks for an assize on the royal demesne.[30] However, there were at least two (perhaps three) moneyers named Roger, as coins of Class A are known which read ROGIER:F and ROGIER:W, of which the

[29] *BMC Henry II*, p. cxix; G. C. Brooke, 'Chronology in the Short Cross Period', *NC*[4] 10 (1910) pp. 291–324 at pp. 310–11.

[30] *Pipe Roll 19 Henry II*, p. 87; *Pipe Roll 21 Henry II*, p. 218. William Urry muddled the moneyers names in connection with certain Pipe Roll entries; he erroneously stated that Roger the archbishop's moneyer accounts for the chattels of the Flemings and foreign merchants, *Canterbury Under The Angevin Kings* (London, 1967), p. 116.

latter is presumed to be of Canterbury.[31] The Pipe Rolls entries concerning Roger the archbishops moneyer are in the period of Classes E and F, which strengthens the view that coins of those classes reading ROGIER, without initial, are those of the archbishop's moneyer. Two moneyers named Richard are named on coins of Canterbury, one differentiated with the initials M or MR.[32] Two moneyers, Richard Corbeille and Richard Deudene, are named in the Pipe Rolls and it seems desirable to identify these men with the moneyers on coins. Allen suggested that the initials M or MR could be interpreted as Major or Magister, in which case the surnames stated in the Pipe Rolls do not aid identification.[33] Cecily Clark identified Richard Deudene as a Jew on the basis of his surname meaning 'God-given'.[34] Little can be deduced from the name Corbeille, a noun nickname meaning 'basket'.[35] Two of the four moneyers who contributed to an assize on the royal demesne in 1172–3 were Richard 'the moneyer' and Richard Deudene.[36] Theoretically the initial M could be a contraction of *monetarius*, in which case coins of RICARD M would be those of Richard Corbeille, and coins of RICARD those of Richard Deudene, who is explicitly named in the Pipe Roll. However, MR is difficult to explain as contraction of *monetarius*.

The moneyer Raul can be securely identified as Raulf of Rye who is recorded in the Pipe Roll for 1172–3 and in subsequent rolls.[37]

Turning to the coins of scarce moneyers, Alferg is represented in the Gayton hoard (**23**). Alferg is Elverdus Porrere who farmed dies on behalf of the Abbot of St Augustine's. The suppression of the abbey's mint franchise *c.*1161 has been interpreted as consistent with a

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[31] T.C.R. Crafter, 'A moneyer's initial on a Cross and Crosslets coin', *BNJ* 74 (2004), pp. 180–81.
[32] *BMC Henry II* regards the initials as representing the same individual, p. cxxii and pp. 26–28, nos. 144–158*a*.
[33] *BMC Henry II*, p. cxxii.
[34] C. Clark, 'People and languages in post-Conquest Canterbury', in *Words, Names and History: Selected writings of Cecily Clark*, ed. P. Jackson (Cambridge: 1995), 179–206, at 196.
[35] Ibid., p. 192.
[36] *PR 19 Henry II*, p. 87.
[37] *PR 19 Henry II*, p. 87; for references to Ralph of Rye in *PR 23–32 Henry II* see Table 3.4.

sustained attack on privilege mints.[38] However, I have argued elsewhere that the loss of the mint was occasioned by political manoeuvres peculiar to Canterbury.[39]

A fragment of a Class F penny in the Gayton hoard reads OMON (**93**) and has been assigned to the moneyer Solomon of Canterbury. Mr Alan Dawson possesses a Class F penny with the moneyer's name SÆLEMVN, which he has assigned to Solomon of Canterbury. 'Solomon the moneyer' appears in Pipe Rolls in the late 1170s, but no coins were recorded in *BMC*.[40] It is probable that Solomon was a Jew, based on his name and that he was initially amerced jointly with Richard Deudene in 1176–7, whose name, as stated above, identifies him as a Jew. Another Jewish moneyer was Sansum, recorded on coins of Class F.[41] The moneyer Sansum may be the Jew of that name who contributed to the Northampton Donum of 1194.[42]

The Gayton hoard contains four coins of the moneyer Wiulf (**94–7**), who can be identified as Wiulph 'the rich', son of Meiner the moneyer. Wiulph had a stone house on the corner of the street called 'The Mint' (now White Horse Lane).[43]

Four moneyers are unattested in documentary evidence: Adam, Goldhavoc, Goldeep and Willem.

4.4.3. Amercements of 1176–7

During the 1170s a number of moneyers in Canterbury were convicted of a serious offence of which we have no particulars. In 1176–7 huge sums were accounted for in the Pipe Rolls under the heading *De misericordia monetariorum Cantuarie*.[44] The individuals involved are named as John fitz Robert, Richard Corbeille, Ralph of Rye and his wife, Richard Deudene

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[38] N. J. Mayhew, 'From regional to central minting', in *A New History of the Royal Mint*, ed. C. E. Challis (Cambridge: 1992), pp. 83–178 at pp. 87–9.
[39] T.C.R. Crafter, 'Henry II, the St Augustine's dispute and the loss of the Abbey's mint franchise', in *Coinage and History in the North Sea World* c.*500–1250*, ed. B. Cook and G. Williams (Leiden: 2006), pp. 601–16.
[40] *Pipe Roll 23 Henry II*, p. 208; *Pipe Roll 24 Henry II*, p. 123; see also *BMC Henry II*, p. cxxi-cxxii.
[41] *FEJ Photographs* 18/24–25; the first coin is a crude Class F, not Class C2 as listed in the Index.
[42] Adler, p. 104. Jewish Historical Society *Miscellanies*
[43] W. Urry, *Canterbury Under the Angevin Kings* (London: 1967), p. 114.
[44] *Pipe Roll 23 Henry II*, p. 208.

and Solomon. Furthermore, it is stated that the sheriff has sureties (*plegios*) for the debts of the moneyers and ought to receive more in the county by order of the justices.[45]

The monetary penalties inflicted were amercements (*misericordia*). Previous commentators, such as Allen, Nightingale and Mayhew, have mistakenly called the penalties 'fines'.[46] Table 4.4 presents the details of the amercements and the payments towards clearing the debts recorded in the Pipe Rolls. The final outcome of each of the five cases is given in bold type: three paid off the debts and two reduced them and then defaulted.

It has not previously been commented on that the final payment of John fitz Robert's debt was collected by John fitz Vivian in 1179. John fitz Vivian held office as one of the two *prepositi*, the joint reeves of Canterbury, 1169 × 1189.[47] It is worth noting that another moneyer, Richard Deudene, also had a relationship with John fitz Vivian. Richard Deudene granted, *c.*1180, a plot on the corner of High Street and Stour Street, which he held from John fitz Vivian, to Jacob the Jew for 8½ marks and 4s 6d per annum.[48] John fitz Vivian was himself punished with an amercement of 200 marks in 1181–2 for allowing a forger to escape and for handing over a dowry without authorisation.[49] Part of Richard Corbeille's debt is accounted for by his son, John.[50]

What can be said about the moneyers who were amerced together, presumably for the same offence? Nightingale suggested that the sums involved 'reflect the opportunities open to local financiers, who had invested in profitable mints, to falsify their records and so deprive the crown of its seigniorage'.[51] If the offence was to do with the plentiful production of coins,

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[45] Ibid.
[46] *BMC Henry II*, p. cxxi. P. Nightingale, ' "The King's Profit": trends in English mint and monetary policy in the eleventh and twelfth centuries', *Later Medieval Mints: Organisation, Administration and Techniques*, ed. N. J. Mayhew and P. Spufford (Oxford: 1988), pp. 61–75 at p. 69. N. J. Mayhew, 'From regional to central minting', in *A New History of the Royal Mint*, ed. C. E. Challis (Cambridge: 1992), pp. 83–178 at p. 91.
[47] W. Urry, *City of Canterbury: The Chief Citizens of Canterbury, A List of Portreeves (Prefects, Prepositi) from AD 780 until* c.*1100* (Canterbury: 1978), p. 8.
[48] W. Urry, *Canterbury Under the Angevin Kings* (London: 1967), pp. 150–51 and pp. 424–5 and Charter XLIX.
[49] *Pipe Roll 28 Henry II*, p. 154.
[50] *Pipe Roll 25 Henry II*, p. 118.
[51] P. Nightingale, ' "The King's Profit": trends in English mint and monetary policy in the eleventh and twelfth centuries', *Later Medieval Mints: Organisation, Administration and Techniques*, ed. N. J. Mayhew and P. Spufford (Oxford: 1988), pp. 61–75 at p. 69.

then coins of all the amerced moneyers should be well represented in the numismatic record. However, while coins of Raul and Richard are common, coins of Solomon are extremely rare; no coins of John fitz Robert are known.

The amercement of the wife of Raulf of Rye strengthens the view that the misdemeanour was not directly related to coining: she could not have been a moneyer. Raulf was amerced 1,000 marks jointly with his wife for the first two years, then, without comment, his wife is no longer named in connection with the debt. The importance of moneyer's wives has often been overlooked, but their appearance in documents attests to their means and status. A case at York reinforces the view that the crown had a special concern for the wives of moneyers. In 1166–7 William Albus rendered account of 15 marks because he married the widow of a moneyer of York without the licence of the king.[52] William Albus himself was not a moneyer; he is called a clerk (*clericus*) when he acted as a witness to charters.[53] If the moneyer in question had been the king's liegeman then this entry probably indicates the crown's scrutiny of suzerainty and its concern with hereditary rights.

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[52] *Pipe Roll 13 Henry II*, p. 92; *BMC Henry II*, p. clxx.
[53] W. Farrer, *Early Yorkshire Charters*, vol 1 (Edinburgh: 1914), p. 235; vol. 2 (Edinburgh: 1915), pp. 66, 234-5 and 310; vol. 3 (Edinburgh: 1916), p. 402.

Table 4.2. Amercements (*misericordia*) of Canterbury moneyers recorded in the Pipe Rolls. Final outcomes are given in bold for each named debtor.

Date	*Named debtors*	*Account*	*Paid*	*Owing*	*Pipe Roll Reference*
1177	John fitz Robert	400 marks	—	400 marks	*23 Henry II*, 208
1178	John fitz Robert	400 marks	£186 13s 4d	£80	*24 Henry II*, 123
1179	John fitz Robert	£80	£33 6s 8d	£46 13s 4d	*25 Henry II*, 118
1180	John fitz Robert	£46 13s 4d	£46 13s 4d[1]	***Quit***	*26 Henry II*, 145
1177	Richard Corbeille	500 marks	—	500 marks	*23 Henry II*, 208
1178	Richard Corbeille	500 marks	£126 13s 4d	£206 13s 4d	*24 Henry II*, 124
1179	Richard Corbeille	£206 13s 4d	£21 6s 8d;[2] £40[3]	£145 6s 8d	*25 Henry II*, 118
1180	Richard Corbeille	£145 6s 8d	—	£145 6s 8d	*26 Henry II*, 145
1181	Richard Corbeille	£145 6s 8d	—	£145 6s 8d	*27 Henry II*, 145
1182	Richard Corbeille	£145 6s 8d	—	£145 6s 8d	*28 Henry II*, 152
1183	Richard Corbeille	£145 6s 8d	—	£145 6s 8d	*29 Henry II*, 157
1184	Richard Corbeille	£145 6s 8d	4s 9d	£145 21d	*30 Henry II*, 146
1185	Richard Corbeille	£145 21d	½ mark	£144 15s 1d	*31 Henry II*, 226
1186	Richard Corbeille[4]	£144 15s 1d	—	**£144 15s 1d**	*31 Henry II*, 226
1177	Richard Deudene[5]	300 marks	—	300 marks	*23 Henry II*, 208
1178	Richard Deudene	300 marks	£153 6s 8d	£46 13s 4d	*24 Henry II*, 124
1179	Richard Deudene	£46 13s 4d	£46 13s 4d	***Quit***	*25 Henry II*, 118
1177	Ralph of Rye and wife	1,000 marks	100 marks	£600	*23 Henry II*, 208
1178	Ralph of Rye and wife	£600	£180	£420	*24 Henry II*, 123
1179	Ralph of Rye	£420	£26 13s 4d	£393 6s 8d	*25 Henry II*, 118
1180	Ralph of Rye	£393 6s 8d	£66 13s 4d	£326 13s 4d	*26 Henry II*, 145
1181	Ralph of Rye	£326 13s 4d	—	£326 13s 4d	*27 Henry II*, 145
1182	Ralph of Rye	£326 13s 4d	—	£326 13s 4d	*28 Henry II*, 152
1183	Ralph of Rye	£326 13s 4d	—	£326 13s 4d	*29 Henry II*, 156
1184	Ralph of Rye[6]	£326 13s 4d	—	£326 13s 4d	*30 Henry II*, 146
1185	Ralph of Rye[7]	£326 13s 4d	—	£326 13s 4d	*31 Henry II*, 226
1186	Ralph of Rye[8]	£326 13s 4d	—	**£326 13s 4d**	*32 Henry II*, 188
1177	Salomon[4]	300 marks	—	300 marks	*23 Henry II*, 208
1178	Salomon	300 marks	£160	£40	*24 Henry II*, 124
1179	Salomon	£40	£40	***Quit***	*25 Henry II*, 118

Notes on Table 4.4:

1 Paid by John fitz Vivian, prepositus of Canterbury *c.*1175.
2 Paid by Richard Corbeille.
3 Paid by John, son of Richard Corbeille.
4 It is noted that Richard has nothing. The debt is repeated unchanged in subsequent Pipe Rolls until it vanishes in 2 John (1200).
5 In this year Salomon and Richard Deodat jointly owe 600 marks, which has been divided equally between them here on the justification that in the next year their debts are recorded separately and they each owe 300 marks.
6 It is noted that Ralph is dead and that the Sheriff is to inquire as to sureties.
7 It is noted that Ralph is dead.
8 It is noted that Ralph is dead and that there is nothing to provide. The debt is repeated unchanged in subsequent Pipe Rolls until it vanishes in 2 John (1200).

4.4.4. Requisite financing of Christ Church

Contemporary with the amercement of moneyers of Canterbury the new East-end of Christ Church cathedral was under construction. The reconstruction work has received considerable scholarly attention in recent years.[54] Within ten years of the fire of 1174 the external walls of the burnt-out Romanesque choir had been incorporated into a new choir with a new Trinity Chapel (technically a Retro-Choir) subjoined to accommodate a new shrine of Thomas Becket. Although much of the new East-end utilised the walls of the burnt-out Choir, the construction of the Trinity Chapel was original and required new foundations.

The speed and scale of the construction commands attention. Substantial capital was required to expedite the building program, which was motivated by political considerations.

The priority of the Cathedral chapter was to preserve its influence; its pre-eminence among English houses was derived from the anomalous situation whereby the head of the monastery was the archbishop. However, Archbishop Becket had returned from France in 1170 with definite plans for building a new church at Hackington just outside Canterbury; fortunately for the monks he was soon murdered.[55] Between the canonisation of Becket in February 1173 and the fire in September 1174 the chapter had done nothing to act on the exhortation of Pope Alexander III to translate Becket's remains to a suitable shrine.[56] Peter Kidson has speculated that the fire of 1174 was not accidental, but arson, and that the content and very existence of Gervase's account is 'a very skillful historical cover-up'.[57]

The archiepiscopal election of 1174 was extremely divisive, with various views vying for ascendancy. The chapter tried and failed to have Prior Odo elected as archbishop, as an attempt to scotch the Hackington project. Richard of Dover was elected archbishop, but the chapter appealed to Rome; Richard of Dover went to Rome to present his case in person and

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[54] P. Kidson, 'Gervase, Becket and William of Sens', *Speculum* 68 (1993), pp. 969–91. M. F. Hearn, 'Canterbury Cathedral and the Cult of Becket', *Art Bulletin* 76 no. 1 (March 1994), pp. 19–52. P. Draper 'Interpretations of the rebuilding of Canterbury Cathedral, 1174–1186', *Journal of the Society of Architectural Historians* 52:6 (June 1997), pp. 184–203 at p. 199.
[55] P. Kidson, 'Gervase, Becket and William of Sens', *Speculum* 68 (1993), pp. 969–91 at p. 974.
[56] M. F. Hearn, 'Canterbury Cathedral and the Cult of Becket', *Art Bulletin* 76 no. 1 (March 1994), 19–52 at p. 48. E.W. Kemp, 'Pope Alexander III and the canonisation of saints', *Transactions of the Royal Historical Society*, pp. 13–22 at pp. 19–20.
[57] P. Kidson, 'Gervase, Becket and William of Sens', *Speculum* 68 (1993), pp. 969–91 at pp. 970.

he received his investiture from the pope. Richard returned to England on 3 September 1174 and the fire destroyed the choir of Christ Church on 5 September. The co-incidence of the two events has led to the theory that arson was involved.

According to Kidson, the failure to have Odo elected archbishop caused the chapter to conduct a volte-face, and they fired the Cathedral Choir in order to provide space to accommodate the cult of Becket and thwart the Hackington project that way.[58] This is not the place to rehearse the complex details for the arson theory. Even if the fire was not arson, it was certainly fortuitous, for the destruction of the choir allowed expeditious construction of a building that incorporated the cult of Becket.

None of the individuals who had received amercements by Michaelmas 1177 can be connected with the construction at Christ Church. However, one moneyer, Lambrin Frese, is prominent in the records in the late 1170s and was a fugitive from justice by 1180. Circumstantial evidence indicates that Lambrin had a prominent connection with Christ Church Cathedral; his career may have been curtailed by his involvement with the foundation.

4.4.5. An agreement with Lambrin Frese

According to M.F. Hearn the election of Prior Benedict in August 1175, an ardent enthusiast for the cult of Becket, 'occurred in good time to foster the construction that was already getting underway'.[59] Construction work at the cathedral began in September 1175, once the rubble had been removed.[60] Alongside the administrative work faced by Benedict, the prior contracted a property exchange with the moneyer Lambrin Frese, whose surname 'Frese' identifies him as a Fleming.[61] We may legitimately ask whether there is a connection between the construction work and the arrangement.

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[58] Ibid., pp. 977–9.
[59] M. F. Hearn, 'Canterbury Cathedral and the Cult of Becket', *Art Bulletin* 76 no. 1 (March 1994), pp. 19–52 at p. 50.
[60] Ibid., p. 49.
[61] C. Clark, 'People and languages in post-Conquest Canterbury', in *Words, Names and History: Selected writings of Cecily Clark*, ed. P. Jackson (Cambridge: 1995), pp. 179–206, at pp. 188 and 191.

By the agreement Lambrin surrendered his holding before the Christ Church Gate, where, according to a rental compiled 1163–7,[62] he had a workshop (*fabrica*), in return for 10 marks and two adjacent holdings 'towards Hottemelne, near the ford', those of Godwin Grom and of Gerold the tanner.[63] Confirmation of the agreement was obtained from Henry II *c.*1177.[64]

Urry suggested that the chapter contracted the property exchange with Lambrin, because his workshop had been the source of the fire.[65] According to Gervase, the fire that destroyed the Cathedral choir on 5 September 1174 began in buildings (*domunculae*) beside the Christ Church Gate, and embers and sparks (*cardones et scintillae*) were blown up to the roof by a south-west wind.[66] If, however, Gervase's account is unreliable and the fire was caused by arson, Lambrin must be exonerated and an alternative explanation for the charters sought.

It is perhaps instructive that the most intensive period of construction of the new East-end was during the priorate of Herlewin (May 1177–August 1179), which lead Hearn to suggest that the prior 'must have been financially blessed'.[67] Herlewin had been the chaplain of Richard of Dover and was elected at the archbishop's urging, against the chapter's own (unnamed) candidate.[68] The election of Herlewin was subsequently described as uncanonical by his successor as prior, Alan of Tewkesbury.[69] Thus, it has been often stated that Herlewin was the instrument of Archbishop Richard, who was supplying much of the money for construction work.[70] However, it would seem a more prudent explanation that financing of the project had been secured in advance. Prior Benedict's agreement with Lambrin is perhaps evidence of such fore-planning.

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[62] W. Urry, *Canterbury Under the Angevin Kings* (London: 1967), p. 232 (Rental B [79]).
[63] Ibid., p. 199 and p. 413, Charter XXXV. The plots that Lambrin received fronted onto Stour Street and backed onto the River Stour.
[64] Ibid., pp. 414–5, Charter XXXVI.
[65] Ibid., p. 115 and p. 199.
[66] Gervase of Canterbury, *Opera Historica*, ed. W. Stubbs, vol. 1 (Oxford: 1879), pp. 3–5 (reference to sparks, p. 3.)
[67] M. F. Hearn, 'Canterbury Cathedral and the Cult of Becket', *Art Bulletin* 76 no. 1 (March 1994), pp. 19–52 at p. 51.
[68] Gervase of Canterbury, *Opera Historica*, ed. W. Stubbs, vol. 1 (Oxford: 1879), p. 263.
[69] M. A. Harris, 'Alan of Tewkesbury and his letters', *Studia Monastica* 18 (1976), pp. 77–108 and 299–351, especially letter 20.
[70] M. F. Hearn, 'Canterbury Cathedral and the Cult of Becket', *Art Bulletin* 76 no. 1 (March 1994), 19–52 at p. 51; P. Draper 'Interpretations of the rebuilding of Canterbury Cathedral, 1174–1186', *Journal of the Society of Architectural Historians* 52:6 (June 1997), pp. 184–203 at p. 199.

Lambrin is attested as one of the few gentile moneylenders of Canterbury, and he had control of stock at Goodnestone, from William, lord of that manor.[71] Moreover, on the basis of numismatic evidence Lambrin's prominence as a producer of coins must be circumscribed. Derek Allen noted the moneyer Lambrin from documentary evidence, but knew of no coin of this moneyer.[72] Subsequent to the publication of *BMC*, a Class F penny of Lambrin was recorded and illustrated by F. Elmore Jones, who exhibited the piece at a meeting of the British Numismatic Society.[73] The Gayton hoard has produced another Class F penny of the moneyer Lambrin (**29**) struck from different dies from those used for the specimen exhibited by Elmore Jones.

There is no explicit proof for the involvement of moneyers acting as financiers for Christ Church, but circumstantial evidence is suggestive. The chapter's anxiety for expeditious construction at the Cathedral to forestall a move to Hackington, and Lambrin's known role as a moneylender, seem to be conjoined in the agreement contracted between the two during the priorate of Benedict (August 1175–May 1177).

Whatever the arrangement Lambrin Frese contracted with Christ Church in the 1170s, he did not benefit from it, for Lambrin was one of the moneyers subjected to 'persecution' in 1180.

Under the year 1180 Gervase recorded:

> Persecutio gravissima facta est in trapezetas Angliæ qui monetam nimia corruperant falsitate. Qui præter alias vexationes varias, compedibus colligati, duo et duo simul in carectis ad curiam regis ducebantur.[74]

A translation:

> A serious persecution occurred of moneychangers in England who corrupted much money by counterfeiting. Beyond their other different torments, chained with shackles, they were lead two by two in carts to the court of the king.

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[71] W. Urry, *Canterbury Under the Angevin Kings* (London: 1967), p. 120. *PR 26 Henry II*, p. 148. In 1179–80 Lambrin is recorded as a fugitive and William lord of Goodnestone became responsible for the moneyer's debt of £24, which was paid off by 1185.
[72] *BMC Henry II*, cxxii.
[73] Exhibited 28 March 1951; recorded *BNJ* 21 (1949–51), p. 357 and Pl. A (facing p. 346), no. 13.
[74] Gervase of Canterbury, *Opera Historica*, ed. W. Stubbs, vol. 1 (Oxford: 1879), p. 294.

Urry stated that the passage referred to 'persecution of moneyers'.[75] However, the noun used by Gervase is not *monetarius* but *trapezetas*, which can be interpreted as moneylenders or moneychangers, but certainly implies more than simply coining.

In 1180–81 the sheriff accounted 11*s* of the chattels of Lambrin Frese and 65*s* 7*d* for the chattels of Solomon the moneyer.[76] Solomon had cleared his debt for the amercement in 1178–9 and he was obviously convicted of a new offence, as judicial measures superseded amercements in 1180. Urry assumed that Solomon was executed, an assertion repeated by Mayhew, but that is nowhere explicitly stated and must not be assumed.[77] The properties of both Solomon and Lambrin were in the hands of the crown in the mid 1180s. In 1184–5 the wife of Solomon paid 10 marks to receive her husband's confiscated house from the crown.[78] Adam of Charing, Becket's enemy, took over the house of Lambrin Frese.[79] Nevertheless, Lambin Frese remained at large for over ten years and redeemed himself by compounding for his offences at 20 marks (*pro pace Regis habenda et pro habendo regressu in Angliam*).[80]

Gervase records that by 1183 construction work at Christ Church had to be suspended for an entire building season owing to lack of funds (*nonus annus vacavit ab opere ob defectum expensarum*).[81] It is possible that if Lambrin Frese and other moneyers had been underwriting work at Christ Church, the judicial measures against moneyers in 1180 had a direct impact on the progress of construction work. In a wider sense, the amercements of 1176–7 and subsequent judicial procedures initiated in 1180 attest to royal oversight of affairs in Canterbury. It is tempting to link the amercements with the visit of Henry II to Christ Church during Holy Week in 1177, ostensibly to renew the Christ Church charters.[82]

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[75] Urry, p. 117.
[76] *Pipe Roll 27 Henry II*, p. 151.
[77] W. Urry, *Canterbury Under the Angevin Kings* (London: 1967), p. 117. N. J. Mayhew, 'From regional to central minting', in *A New History of the Royal Mint*, ed. C. E. Challis (Cambridge: 1992), pp. 83–178 at p. 91.
[78] *Pipe Roll 31 Henry II*, p. 233.
[79] Ibid.
[80] *Pipe Roll 2 Richard I*, p. 151; *Pipe Roll 4 Richard I*, p. 311.
[81] Gervase of Canterbury, *Opera Historica*, ed. W. Stubbs, vol. 1 (Oxford: 1879), p. 29.
[82] Gervase of Canterbury, *Opera Historica*, ed. W. Stubbs, vol. 1 (Oxford: 1879), 261–2.

4.5 The Gayton hoard as evidence for the currency in England.

Hoard evidence for the Cross and Crosslets coinage is to a large extent deficient. The last substantial hoard that was retained intact prior to the Gayton hoard was found in 1854. Therefore, given the limited hoard evidence for the currency between 1158 and 1180, the Gayton hoard provides a valuable body of new evidence.

4.5.1. Comparable Cross and Crosslets hoards

For the purposes of analytical work the Gayton hoard may be compared with the two other large and well-recorded hoards, which allow statistical comparisons. The two other hoards are those found at Lark Hill (Worcestershire) in 1854 and Leicester (Leicestershire) in 1927. The location of the hoards is shown in Figure 3.5.

The Lark Hill hoard was retained in its entirety by the British Museum and contained 208 Cross and Crosslets pennies, 18 deniers from north-western France, 2 Scottish coins, and 8 pieces of jewellery.[83] Cook resisted the temptation to regard the Lark Hill hoard 'as an aberrant collection of material', and is attentive to the parallel of a small hoard deposited at Abbey Cwmhir, Powys, Wales, in the late twelfth century which consisted exclusively of French deniers.[84]

Only part of the Leicester hoard was retained by the British Museum and there are problems working with figures for the contents published in *BMC*.[85] There exists a published account of the discovery that is more detailed than that published in *BMC*:

> 'During excavation for a new house at Marlborough Road, Leicester just beyond the city boundary, a workman's pick struck and shattered an earthenware vase, containing a number of coins. Careful search resulted in the discovery of about 240 silver pennies minted in the reign of Henry II'.[86]

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[83] *BMC Henry II*, pp. liv- lv.
[84] J.D. Brand, 'A find of late 12th century French coins at Abbey Cwmhir in Mid-Wales', *Bulletin de la Société Française de Numismatique* 33 (1978), pp. 372–4. B. Cook, 'Foreign coins in medieval England', in *Local Coins, Foreign Coins: Italy and Europe 11th–15th Centuries*, ed. L. Travaini (Milan: 1999), pp. 231–84, at pp. 238–9.
[85] *BMC Henry II*, p. lix.
[86] *Spink's Numismatic Circular*, 25:3 (March 1927), reproduced from the *Birmingham Mail*, 19 January 1927.

In *BMC*, Derek Allen stated that there were 238 coins in the hoard, of which 160 were retained by the British Museum. In fact 158 coins were retained by the British Museum, which is the sum of coins given in the breakdown by mint, where he additionally states that there are 80 coins not in the British Museum, producing a total of 238 coins in the hoard.[87] The totals given for the mints are also incorrect, but this does not effect the total: there are 2 (not 1) coins of Exeter; and 16 (not 17) uncertain coins. The principal errors occur in the analysis by class. The totals for classes B, C, E and F are incorrect and the total number of coins retained from the hoard is erroneously stated as 160 coins. The figures given here for the Leicester hoard in Table 4.1 and Table 4.2 are different from those published by Archibald and Cook, which were based on the summary in *BMC*.[88] The evidence provided by the portion of the Leicester hoard retained by the British Museum must be used with caution, because the portion that is unaccounted for would probably alter the hoard profile.

A revised summary of the Leicester hoard in the *Inventory* format might be as follows:

LEICESTER, Leicestershire, 1927
238 AR English and pottery (probably associated with hoard): Deposit *c*.1180.
ENGLAND (238 pennies)
Henry II, Cross and Crosslets type: 25 Class A, 6 Class B, 40 Class C, 15 Class D, 11 Class E, 59 Class F, 80 of uncertain class.
Bristol (1) – A, 1: Bury St Edmunds (9) – A, 2; B, 2; E, 1; F, 4: Canterbury (36) – A, 4; B, 1; C, 9; D, 1; E, 6, F, 15: Carlisle (1) – D, 1: Colchester (3) – A, 2; C, 1: Durham (1) – A, 1: Exeter (2) – A, 1; C, 1: Gloucester (2) – A, 2: Ilchester (1) – D, 1: Ipswich (21) – B, 1; C, 3; D, 1; F, 16: Leicester (1) – A, 1: Lewes (1) – F, 1: Lincoln (16) – A, 2; B, 1; C, 5; D, 3; E, 1; F, 4: London (26) – A, 3; C, 8; D, 1; E, 1; F, 11; Uncertain 2: Newcastle (1) – E, 1: Northampton (4) – A, 2; C, 2: Norwich (7) – A, 3; C, 3; D, 1: Thetford (3) – C, 1; D, 2: Winchester (1) – C, 1: York (5) – A, 1: D, 4: Uncertain mint (96) – B, 1; C, 6; E, 1; F, 8; Uncertain 80.
Discovery and Deposition: Found by a workman digging foundations in Marlborough Road, Leicester, who shattered the earthenware pot in which the coins were contained. 158 coins were acquired by the British Museum.

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[87] *BMC Henry II*, p. lix.
[88] *EMHC*, p. 16.

4.5.2. Monetary expansion in the English coinage 1158–1180?

Before exploring the possible usefulness of the evidence supplied by the fully catalogued content of the Gayton hoard as evidence for the behaviour of the currency of England 1158–1180 it is necessary to survey the current understanding of the increase in the volume of coinage and associated issues.

In Chapter 3 it was suggested (p. 97) that the data derived from the available die-studies is consistent with Martin Allen's estimate of the potential volume of coinage produced by the *c.*384 Class A reverse dies (£16,000–£32,000) derived from a statistical methodology. It is possible that Allen's methodology may have produced a slight overestimate of the number of dies (see pp. 96), and it may be appropriate to re-examine Allen's estimates as further die-studies are published, but currently it is reasonable to accept the estimate.

To provide an estimate of the size of the currency in 1180, Allen combined two estimates to provide an 'aggregate range' estimate of *c.*£15,000–£60,000.[89] Allen's estimate of the size of the currency in 1158 (*c.*£15,000–£30,000) is within (though at the lower end of) the aggregate range estimate for 1180.[90] However, the rise in the underlying estimates of the reverse dies from Allen's figure of *c.*384 in Cross and Crosslets Class A to 801 in 1180–2 suggests that the size of the currency increased between 1158 and 1180.[91] Moreover, while Allen suggests that 'normal non-recoinage output' was substantially greater in 1182–c.1190 than in the 1170s, Allen carefully qualifies his statements and concedes that 'the rise in the underlying estimates for reverse dies...suggests that the size of the currency increased between 1158 and 1180'.[92] Allen draws attention to non-numismatic evidence which indicates a recorded growth

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[89] M. Allen, 'The quantity of money in England 1180–1247: new data', *BNJ* 75 (2005), pp. 44–49, at p. 45. The estimates are *c.*£30,000–£60,000 derived from the old currency, but using Metcalf's estimates, which Allen subsequently revised, and £15,000–£30,000 in 1182–1190.

[90] M. Allen, 'The English coinage 1153/4–1158', *BNJ* 76 (2006), pp. 242–302, at p. 261.

[91] M. Allen, 'The quantity of money in England 1180–1247: new data', *BNJ* 75 (2005), pp. 44–49, at p. 45. Allen used Metcalf's estimate of Class A reverse dies (559) in this paper, which Allen subsequently revised to produce a lower estimate (*c.*384), M. Allen, 'The English coinage 1153/4–1158', *BNJ* 76 (2006), pp. 242–302, at pp. 260–63. Latimer estimated that the size of the currency in 1158 was £20,000–£50,000, P. Latimer, 'The quantity of money in England 1180–1247: a model', *Journal of European Economic History*, 32 no. 3 (Winter 2003), pp. 637–59, at p. 643.

[92] M. Allen, 'The quantity of money in England 1180–1247: new data', *BNJ* 75 (2005), pp. 44–49, at p. 45.

in governmental revenues in the 1160s and 1170s, which 'may also indicate that the currency was increasing'.[93]

Tackling the nature and extent of the increase between 1158 and 1180 is problematic, because no recoinages occurred between these dates. Consequently, the rate of consumption of dies or the use of hoard evidence to better understand the composition of the circulating currency are both challenging methods by which the issue may be approached. Estimating the rate of consumption of dies requires an adequate chronological framework and, without a recoinage, it is possible that earlier dies continued in use, a possibility confirmed by the existence of mules concerning Class F.[94] Equally the use of hoard evidence as a guide to the currency must always be qualified by an awareness that the content of an individual coin hoard is not necessarily an accurate sample of the currency in circulation at the time at which the hoard was deposited.

Martin Allen has adopted an extremely useful method of analysing the content of hoards by region, listing mints by county and grouping the counties into six regions.[95] Allen's regional methodology has been adopted and appropriately revised for the mints active during the Cross and Crosslets coinage; Table 4.3 lists the mints by county and by region. Table 4.4 lists the number and percentage of coins of each mint in the identifiable portions of the three large well-recorded hoards, and the percentages by region of identifiable coins in each hoard is presented in Table 4.5.

The period of issue of the Cross and Crosslets type was lengthy compared with earlier coinages which were of shorter duration owing to frequent periodic recoinages (see p. 29). We might reasonably expect full and uniform integration of the coins of each region into the national currency. However, the analysis of the hoards in Table 4.5 suggests that there is some

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[93] Ibid., p. 45, and citing (note 16) J.H. Ramsey, *A History of the Revenues of the Kings of England* (Oxford: 1925), vol. 1, pp. 64–196.

[94] Crafter, 'Re-examination', p. 47: Lincoln F/C; London D/F (possibly). If matching dies of earlier classes continued to be used during the period of Class F we would not be able observe them.

[95] M. Allen, 'The English coinage of 1153/4–1158', *BNJ* 76 (2006), pp. 242–311, at pp. 246–8 and p. 253. One might take issue with Allen's regional groupings, but these have been retained for present purposes to demonstrate that the groupings have not been manipulated by the current author.

local bias in the three hoards. The largest percentage of coins from south-western mints is in the Lark Hill hoard, which is perhaps unsurprising for a hoard deposited in Worcestershire. Also the Lark Hill hoard has the lowest percentage of coins from mints in the East Anglian region. It might also be suggested that the higher proportion of coins from East Anglian region mints in the contents of the Leicester and Gayton hoards reflects some local bias. Despite the probably slight regional biases in the three hoards, all have relatively similar percentages of coins from mints in the south east region, approximately 45%–50%. None of the hoards was deposited in the south east region. The data might suggest that coins from mints in the south east region constituted approximately half of the currency in other regions, with the remaining half of the currency composed of coins from the remaining five regions. It must be stressed that the total numbers of coins considered is not the complete contents of the hoard owing to the volume of unidentifiable or lost material.

The prominence of coins from the mints in the south east region is perhaps consonant with the view, explored in Chapter 1, that minting activity was largely driven by continental silver entering Britain in trade (see pp. 33–41). Without detailed studies of the late classes of the Cross and Crosslets coinage it is impossible to know whether output fell from mints outside the south east region so that the aggregate volume of currency volume remained constant. To address the issue it would be necessary to conduct die-studies of late material, but the possibilities are inimical.[96] For the moment understanding the aggregate volume is better approached by other analytical techniques.

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[96] The extremely poor physical condition of the coins and the biases within institutional collection of material of late classes does not provide favourable prospects for conducting die-studies without the dedication of private collectors of individual mints. For the poor condition of the material see p. 45, note 119 (above); for the biases in institutional collections see above, p. 95. My die-study of coins of the Ipswich mint was made possible by the assistance of a private collector, Mr John Sadler, who had spent over 25 years conscientiously and methodically noting the existence of coins of Ipswich mint; T. Crafter, 'A die-study of the Ipswich mint, *c.*1161/2–1180', *NC* 162 (2002), pp. 237–52. The possibilities of a die-study of Canterbury mint were greatly set back by the dispersal of the collection of C.R. Wren in 1997, see above p. 112–3 and note 23.

Table 4.3. Geographical distribution of Cross and Crosslets mints, based on regional areas of used by Allen.[97]

Area/County	*Mints*
1. South east	
Essex	Colchester
Kent	Canterbury
Middlesex	London
Surrey	—
Sussex	Lewes
2. South west	
Cornwall	Launceston
Devon	Exeter
Dorset	—
Hampshire	Winchester
Somerset	Bristol; Ilchester
Wiltshire	Salisbury; Wilton
3. West	
Gloucestershire	Gloucester
Herefordshire	Hereford
Shropshire	Shrewsbury
Worcestershire	—
Wales	Pembroke
4. Midlands and north west	
Bedfordshire	Bedford
Berkshire	—
Buckinghamshire	—
Cambridgeshire	—
Cheshire	Chester
Cumberland	Carlisle
Derbyshire	—
Hertfordshire	—
Huntingdonshire	—
Lancashire	—
Leicestershire	Leicester
Northamptonshire	Northampton
Nottinghamshire	—
Oxfordshire	Oxford; Wallingford
Rutland	—
Staffordshire	Stafford
Warwickshire	—
5. East Anglia	
Norfolk	Norwich; Thetford
Suffolk	Bury St Edmunds; Ipswich
6. North east	
Lincolnshire	Lincoln
Northumberland	Durham; Newcastle
Yorkshire	York

[97] M. Allen, 'The English coinage of 1153/4–1158', *BNJ* 76 (2006), pp. 242–311, at p. 248.

Table 4.4. Number and percentages of coins by mint in three major Cross and Crosslets hoards.

Mint	*Lark Hill (1854)*		*Leicester (1927)*		*Gayton (1998-9)*	
	No.	*%*	*No.*	*%*	*No.*	*%*
Bristol	2	1.2	1	0.7	6	2.3
Bury St Edmunds	7	4.2	9	6.3	16	6.3
Canterbury	43	25.7	36	25.4	102	39.7
Carlisle	3	1.8	1	0.7	4	1.6
Chester	2	1.2	–	–	–	–
Colchester	1	0.6	3	2.1	2	0.8
Durham	2	1.2	1	0.7	1	0.4
Exeter	3	1.8	2	0.7	2	0.8
Gloucester	–	–	2	1.4	–	–
Hereford	3	1.8	–	–	2	0.8
Ilchester	1	0.6	1	0.7	–	–
Ipswich	10	6.0	21	14.8	36	14.0
Leicester	1	0.6	1	0.7	1	0.4
Lewes	–	–	1	0.7	–	–
Lincoln	14	8.4	16	11.3	15	5.9
London	32	19.2	26	18.3	28	10.9
Newcastle	2	1.2	1	0.7	5	2.0
Northampton	6	3.6	4	2.8	2	0.8
Norwich	10	6.0	7	4.9	9	3.5
Oxford	3	1.8	–	–	–	–
Salisbury	1	0.6	–	–	–	–
Thetford	8	4.8	3	2.1	15	5.9
Wilton	1	0.6	–	–	1	0.4
Winchester	8	4.8	1	0.7	4	1.6
York	4	2.4	5	3.5	5	2.0
Total number of coins considered	167	100	142	100	256	100

Table 4.5. Regional Analysis of three large Cross and Crosslets hoards of coins identified by mint.

Region	*Lark Hill (1854)*		*Leicester (1927)*		*Gayton (1998–9)*	
	No.	*%*	*No.*	*%*	*No.*	*%*
South east	76	45.5	66	46.5	132	51.6
South west	16	9.6	5	3.5	13	5.1
West	3	1.8	2	1.4	2	0.8
Midlands and north west	15	9.0	6	4.2	7	2.7
East Anglia	35	21.0	40	28.2	76	29.7
North east	22	13.2	23	16.2	26	10.2
Total number of coins considered	167	100	142	100	256	100

Applying the same analytical technique to smaller hoards might provide important additional evidence. Percentages by region of identifiable coins in four small hoards (less than 70 Cross and Crosslets coins) are presented in Table 4.6.

Table 4.6. Regional Analysis of four small Cross and Crosslets hoards of coins identified by mint.

Region	*Awbridge (1903)*		*'Near Brussels' (before 1984)*		*Norton Subcourse (1987–90)*		*West Meon (1992)*	
	No.	*%*	*No.*	*%*	*No.*	*%*	*No.*	*%*
South east	34	52.3	5	41.7	10	34.5	8	33.3
South west	4	6.2	0	0	5	17.2	3	12.5
West	4	6.2	0	0	0	0	0	0
Midlands & north west	5	7.7	0	0	2	6.9	1	4.2
East Anglia	11	16.9	7	58.3	8	27.6	10	41.7
North east	7	10.8	0	0	4	13.8	2	8.3
Total number of coins considered	65	100	12	100	29	100	24	100

The Awbridge hoard provides useful data for comparison with the three large hoards, because the content of the Awbridge hoard terminates in Cross and Crosslets Class C (*c.*1163–*c.*1167).[98] Although coins of the south east region dominate the content that is available for analysis (over 50%), analogous to the large hoards, the numbers of coins of the East Anglia region are significantly lower. We may tentatively suggest that output of mints in the East Anglian region may have been higher in the 1170s than in the 1160s. There is a certain amount of evidence from die-studies of coins of Ipswich and Bury St Edmunds to support this interpretation and the (albeit limited) hoard data may suggest that the output of mints in the East Anglia region did proportionately increase.

It is difficult to draw many conclusions from the 'near Brussels' hoard and the Norton Subcourse hoard owing to the small numbers of coins. The dominance of coins minted in the south east and East Anglia regions in the 'near Brussels' hoard may suggest the importance of trade between these areas and the Low Countries, which has been discussed as a possible source of monetary expansion in Britain (p. 34–8). The 'near Brussels' hoard contained 60 to

[98] *BMC Henry II*, pp. lvi–lvii. The number of coins of each mint in the Norton Subcourse and West Meon hoards is summarised by Table B, *EMCH*, p. 16.

70 coins and the majority were *deniers* of Amiens and pfennigs of Aachen and Cologne.[99] Another hoard of apparently similar composition was found at Beveren, Belgium, *c.*1894, but unfortunately no substantial details were recorded.[100] Hoard evidence from France is problematic, but it is certainly slight and as one commentator has suggested 'the absence of Henry II's first coinage-issue [Cross and Crosslets type] from the mainland hoards is very noticeable'.[101] Hoard evidence does not provide comprehensive evidence for the movement of the currency abroad, but it may be supplemented with documentary evidence analysed by Cook that suggests that English coins were being exported to north-western France before 1180.[102]

The Norton Subcourse (Norfolk) hoard[103] has, unsurprisingly, a percentage of coins minted in the East Anglian region similar to the Leicester and Gayton hoards, although as a percentage it contains a greater number of coins minted in the south west. Conversely the West Meon (Hampshire) hoard appears to have large proportion of coins minted in East

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[99] A. Dawson and N.J. Mayhew, 'A Continental find of Tealby pennies', *BNJ* 57 (1987), pp. 113–18, at p. 113. Number 8 and number 15 are coins of Ricard at Canterbury.

[100] Two hoards were found at Beveren in the 1890s. The first was predominantly composed of Flemish petit deniers and contained German *pfennigs*, but with no English element, was published, A. De Witte, 'Trouvaille de Beveren (six milles deniers flamands et allemands du XII^{e} siècle', *Revue Belge de Numismatique* (1892), pp. 211–44. The second hoard had a very similar composition to the first, but with the addition of English coins, A. De Witte, 'Les relations monétaires entre la Flandre et l'Angleterre jusqu'au XVII^{e} siècle', *Révue de Droit International et de Législation Comparée* 17 (1894), pp. 75–94, at p. 76.

[101] B. Cook, '*En monnaie aiant cours*: The monetary system of the Angevin Empire', in *Coinage and History in the North Sea World c.500–1250*, ed. B. Cook and G. Williams (Leiden: 2006), pp. 617–686, at p. 630, and note 42, where with regard to the hoard from Corné, Indre-et Loire, *c.*1930, Cook rightly suggests 'the status of the hoard is somewhat dubious'. F. Elmore Jones, 'A parcel of "Tealby" type pennies from France', *Spink's Numismatic Circular* 75 (1966), pp. 125–6; J. Duplessy, *Les trésors monétaires médiévaux et modernes découverts en France*, vol. 1 (Paris: 1985), p. 53, no. 107. For example, a parcel of coins in the Musée des Antiquités, Rouen, of unknown origin contained a Cross and Crosslets penny of Canterbury. J.C. Moesgaard suggested the parcel could be from a hoard discovered in the Rue Beauvoisne, Rouen, J.C. Moesgaard, 'Trouvailles haut-normandes de deniers esterlins des XII^{e}–XIII^{e} siècles', *Bulletin de la Société Française de Numismatique* 47–9 (1992), pp. 441–7, at p. 442, no. 1c. Subsequently Moesgaard suggested that the parcel could be also have come from the Vaudreuil, Eure, hoard or some other source, 'Coin circulation in Plantagenet north-west France (1154–1204) in the light of new evidence from Upper Normandy', *Proximus* 2, pp. 129–35, at p. 134, note 11.

[102] B. Cook, '*En monnaie aiant cours*: The monetary system of the Angevin Empire', in *Coinage and History in the North Sea World c.500–1250*, ed. B. Cook and G. Williams (Leiden: 2006), pp. 617–686, at p. 628; L. Deslisle, 'Des revenues publics en Normandie au douzième siècle', *Bibliothèque de l'École des Chartes* 10 (1848–9), pp. 173–210, at p. 190.

[103] *EMCH*, pp. 12–15.

Anglia, and Marion Archibald has suggested that the content of the hoard may have originated from Norfolk.[104] The Norton Subcourse hoard and West Meon hoard indicate the difficulties of analysing hoards with small numbers of coins, and, in contrast, the benefits of large hoards such as the Gayton hoard.

There are a number of hoards, large and small, that are characterised by a *terminus post quem* of Class E (*c.*1170–74), the deposit of which *may* be associated with the rebellion against Henry II in 1173–4, but the details are insufficient to draw any firm conclusions.[105] However, the content of all the hoards deposited in the last decade that the coinage was in issue suggests that earlier coins continued to circulate in the last period that the final class of the coinage, Class F, was in issue.

Table 4.7 gives the percentages of each Class in three major Cross and Crosslets hoards, and the content by class for each hoard is presented in pie-charts, Figures 4.1–4.3.

Table 4.7. Number and percentage of the coins by class in four Cross and Crosslets hoards.

Hoard ends in Class	*Awbridge (1903)*		*Lark Hill (1854)*		*Leicester (1927)*		*Gayton (1998–9)*	
	C		*F (few)*		*F (many)*		*F (many)*	
Date of deposit	*c.1163–c.1167*		*c.1174?*		*c.1174–c.1180*		*c.1174–c.1180*	
Class	*No.*	*%*	*No.*	*%*	*No.*	*%*	*No.*	*%*
A	40	61.5	77	37.6	25	16.0	47	15.9
B	5	7.7	14	6.8	6	3.8	14	4.7
C	20	30.8	39	19.0	40	25.6	54	18.3
D	—	—	43	21.0	15	9.6	24	8.1
E	—	—	30	14.6	11	7.1	11	3.7
F	—	—	2	1.0	59	37.8	146	49.3
Total number of coins considered	65	100	205	100	156	100	296	100

[104] *EMCH*, pp. 3–6, for suggestion regarding deposit see p. 4.
[105] Thorpe Thewles (1932), T. Crafter, 'Twelve pennies of Henry II from the Thorpe Thewles hoard', *BNJ* 75 (2005), pp. 169–72 at p. 170; Brackley (1986–7), *EMCH*, p. 8; Wicklewood (1989), M. Allen, 'The English coinage 1153/4–1158', *BNJ* 76 (2006), pp. 242–302, at p. 251 and *pers comm.* Marion Archibald.

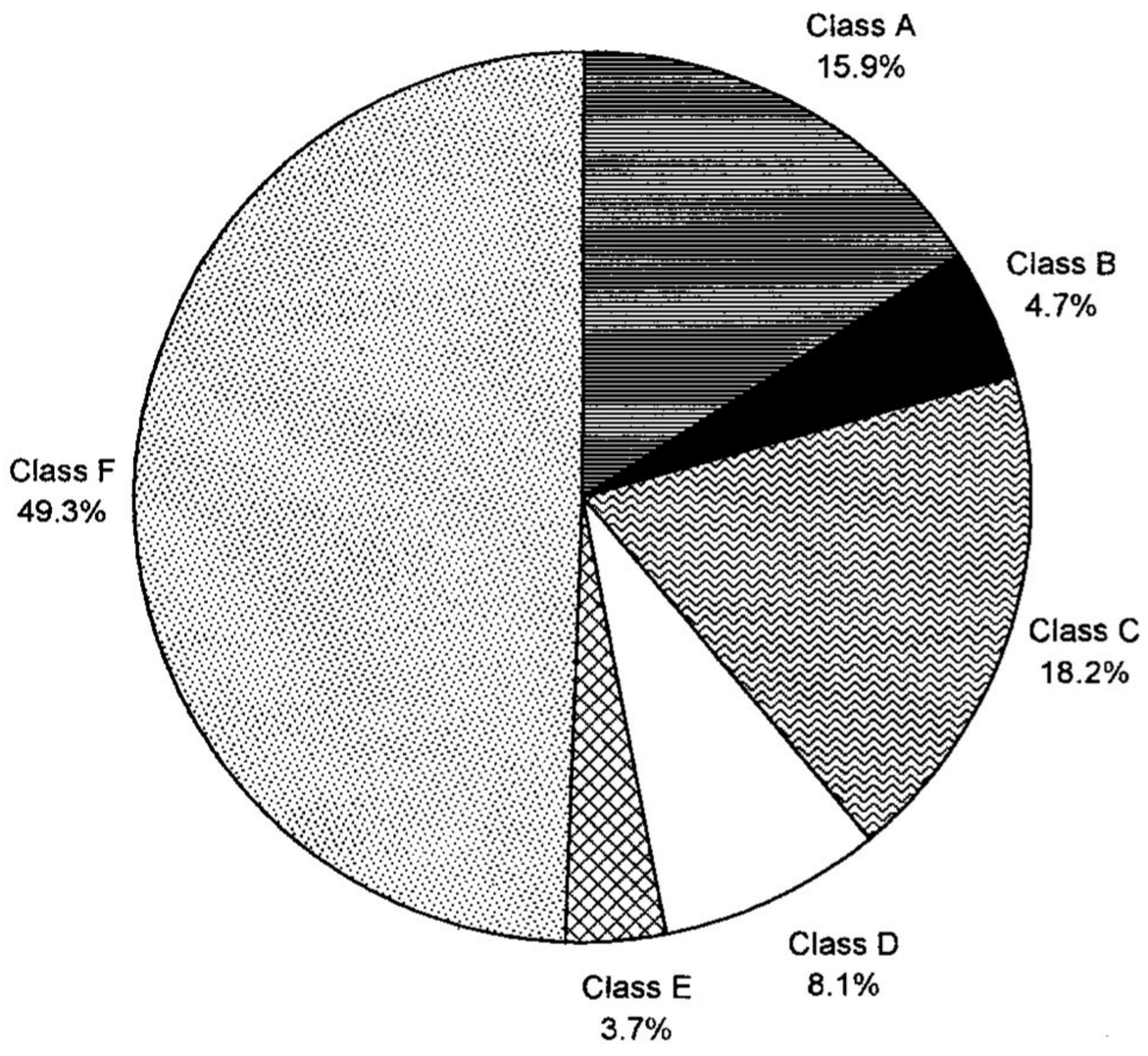


Figure 4.1. Pie chart of classes represented in the Gayton hoard (1998–9).
(Sample size: 296 of 311 coins in hoard)

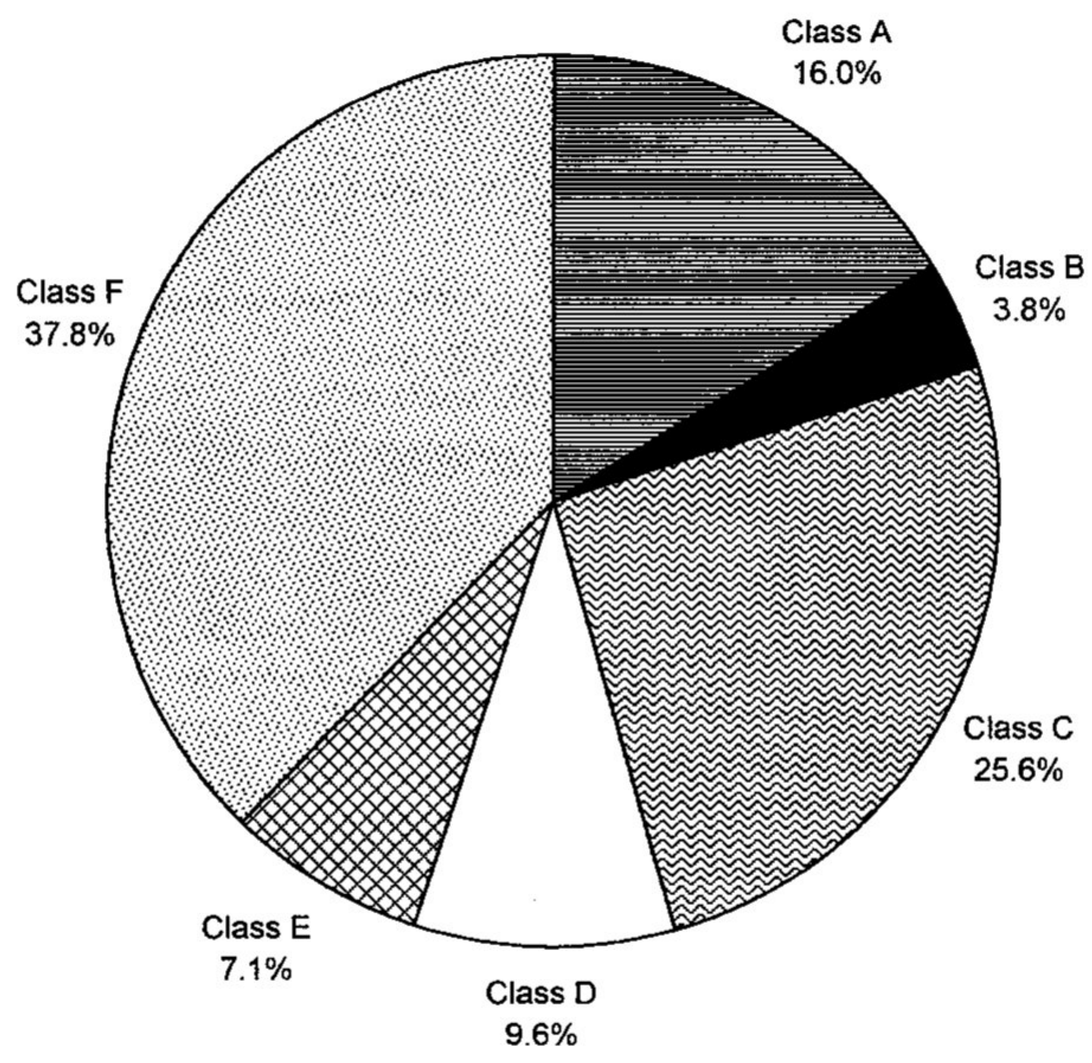


Figure 4.2. Pie chart of classes represented in the Leicester hoard (1927).
(Sample size: 156 of 238 coins in hoard)

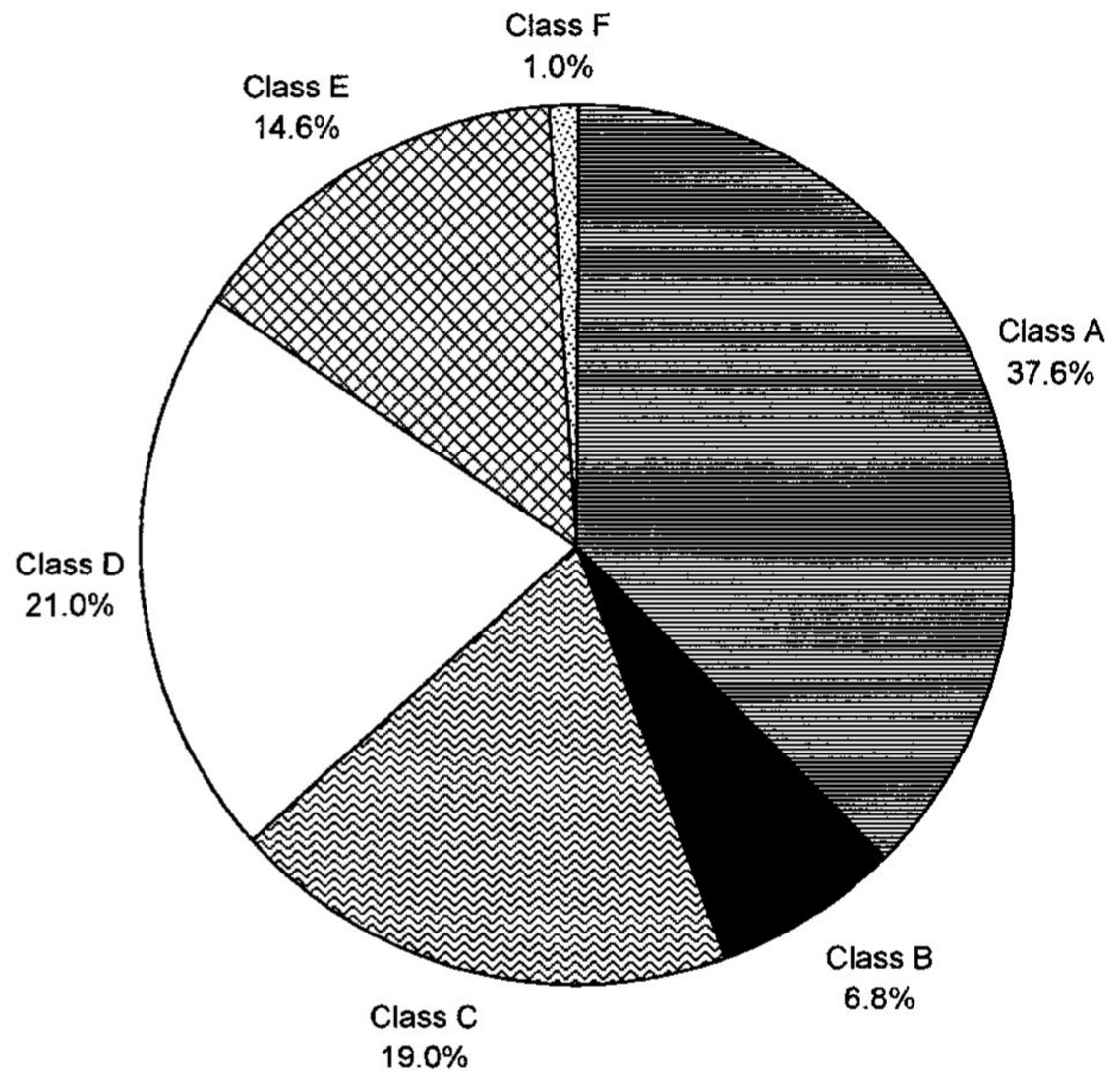


Figure 4.3. Pie chart of classes represented in the Lark Hill hoard (1854).
(Sample size: 205 of 238 coins)

Although the content of the Lark Hill hoard is similar to that in the Gayton and Leicester hoards when analysed by region (Table 4.5), that profile is entirely different when analysed by class (Table 4.7 and Figure 4.3). The small percentage of coins of Class F (1%) may suggest that the hoard was concealed just as Class F came into issue, consequently the date of deposit given is '*c*.1174?' in Table 4.5. If it is accepted that the Gayton and Leicester hoards were concealed later than the Lark Hill hoard it is possible, using the Awbridge hoard, to analyse the wastage of Class A from circulation. It must be emphasised that the hoards may not be representative and further recoveries of hoard material may provide revisions. However, it seems reasonable to utilise the best available evidence that we possess.

Allen's tentative estimate for the potential volume of currency produced by the *c*.384 reverse dies of Class A is £16,000–£32,000.[106] The data in Chapter 3 from the available die-studies has not been found to be inconsistent with the estimate provided by Allen (p. 97). If the hoard evidence is representative (and it may not be) we might suggest that the output from Class A dies, as a proportion of the circulating currency, was approximately 60% by *c*.1163–*c*.1167, approximately 40% by *c*.1174, and approximately 15% in the period *c*.1174–*c*.1180. Aside from the question whether the hoards are representative – other classes, notably C, do not demonstrate the same successive and proportionate reduction (unless there is an over-representation of Class C in the Leicester hoard) – it is difficult to assess the extent to which the reduction of Class A coins in the currency was due to wastage or the augmentation of the currency stock in later classes. The strongest evidence comes from comparison of the content of the Gayton hoard or the Leicester hoard. The content of both hoards indicates that towards 1180, during the issue of Class F, coins of Class A constituted approximately 15% of the currency.

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[106] M. Allen, 'The English coinage 1153/4–1158', *BNJ* 76 (2006), pp. 242–302, at p. 261.

It is possible to use Martin Allen's reverse die estimates to provide a theoretical model of the cumulative contribution of each class to the currency, as a percentage, to the total number of dies (Table 4.8).[107] The method does not take account of wastage and assumes that the output of all dies was similar. For example, Table 4.8 illustrates the theoretical potential effect of new output on Class A as a percentage, but without taking account of wastage from circulation. Owing to wastage from circulation as the coinage progressed, we must assume the earlier classes would constitute a lower proportion of the currency than the model suggests.

Table 4.8. Theoretical or anticipated cumulative contribution to the currency of each class, as a percentage, to the total number of reverse dies at the end of Classes B–F, assuming no wastage occurred, based on reverse die estimates by M. Allen (2006).

Currency at close of Class	B	C	D	E	F
Approximate date	c.1163	c.1167	c.1170	c.1174	c.1180
Aggregate estimated reverse dies	450	720	820	923	1210
Class (estimated rev dies, Allen)	*%*	*%*	*%*	*%*	*%*
A (384)	85.3	53.3	46.8	41.6	31.7
B (66)	14.7	9.2	8.0	7.2	5.5
C (270)	—	37.5	32.9	29.3	22.3
D (100)	—	—	12.2	10.8	8.3
E (103)	—	—	—	11.2	8.5
F (287)	—	—	—	—	23.7
Total	100.0	100.0	100.0	100.0	100.0

As stated the model does not take account of wastage, but can be used for comparative purposes. It is clear that some coins were removed from the currency of England. Single finds, such as those in the corpus of Northampton mint coins, are evidence of casual losses from circulation, and the 'near Brussels' hoard demonstrates that some coins were exported.[108] The extent of wastage is impossible to quantify. The model also assumes that the currency was composed entirely of Cross and Crosslets coins, but it is impossible to know the comprehensiveness of the recoinage of 1158–*c.*1160. The Lark Hill, Leicester and Gayton

[107] This methodology, which examines the disparity between known or estimated mint output and hoards, has a precedent in N.J. Mayhew, 'Numismatic evidence and falling prices in the fourteenth century', *Economic History Review*, new series, 27:1 (February 1974), pp. 1–15, at pp. 5–7.
[108] See p. 87, note 45, and p. 133.

hoards certainly seem to indicate that by the mid-1170s the English currency was devoid of earlier English coins. In his study of the previous coinage, Allen suggested that 'the type was effectively removed from circulation, although not from reserves and savings, during the recoinage of 1158–*c*.1160'.[109]

Figure 4.4 reproduces the data for Classes C–F in Table 4.8 in graphical form, which can be compared with Figure 4.5 which reproduces the percentages of coins in the four hoards given in Table 4.7.

The figures suggest that a high proportion of Class A coins had wasted from the currency by the period of Class F, as the percentage of Class A in a the three hoards concealed in the period of Class F (Lark Hill, Leicester, and Gayton) have percentages of Class A coins substantially lower than the model, which assumes no wastage. However, the model is problematic for Class F. We have observed substantially greater numbers of coins of Class F in both the Gayton hoard and the Leicester hoard than the model would lead us to anticipate. Because these hoards were concealed while Class F was in issue, we might expect that wastage of Class F would not be a factor, but this does not explain the discrepancy. As already discussed, the Gayton and Leicester hoards are similar in terms of their regional composition and also, while we must acknowledged some degree of difference due to local bias, similar to the Lark Hill hoard. Also, it cannot be known precisely when an individual hoard was deposited; it has been suggested that the Lark Hill hoard may have been deposited soon after Class F was in issue *c*.1174, but, of course, the hoard may have been deposited later. There is no reason to suggest that the content of the three hoards is atypical, although it is impossible given the current amount of evidence to eliminate the possibility entirely. Therefore it seems legitimate to ask why the contents of the Gayton hoard and Leicester hoard are at such variance to the model.

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[109] M. Allen, 'The English coinage 1153/4–1158', *BNJ* 76 (2006), pp. 242–302, at p. 252; Allen suggested, pp. 252–3, that of the two hoards concealed during the period 1158–80 which contained BMC type VII, 'the Wicklewood hoard shows evidence of the retention of old coins as savings in a much more extreme form than the Awbridge hoard, as it included 312...coins struck before 1154, or 65 percent of the total.'

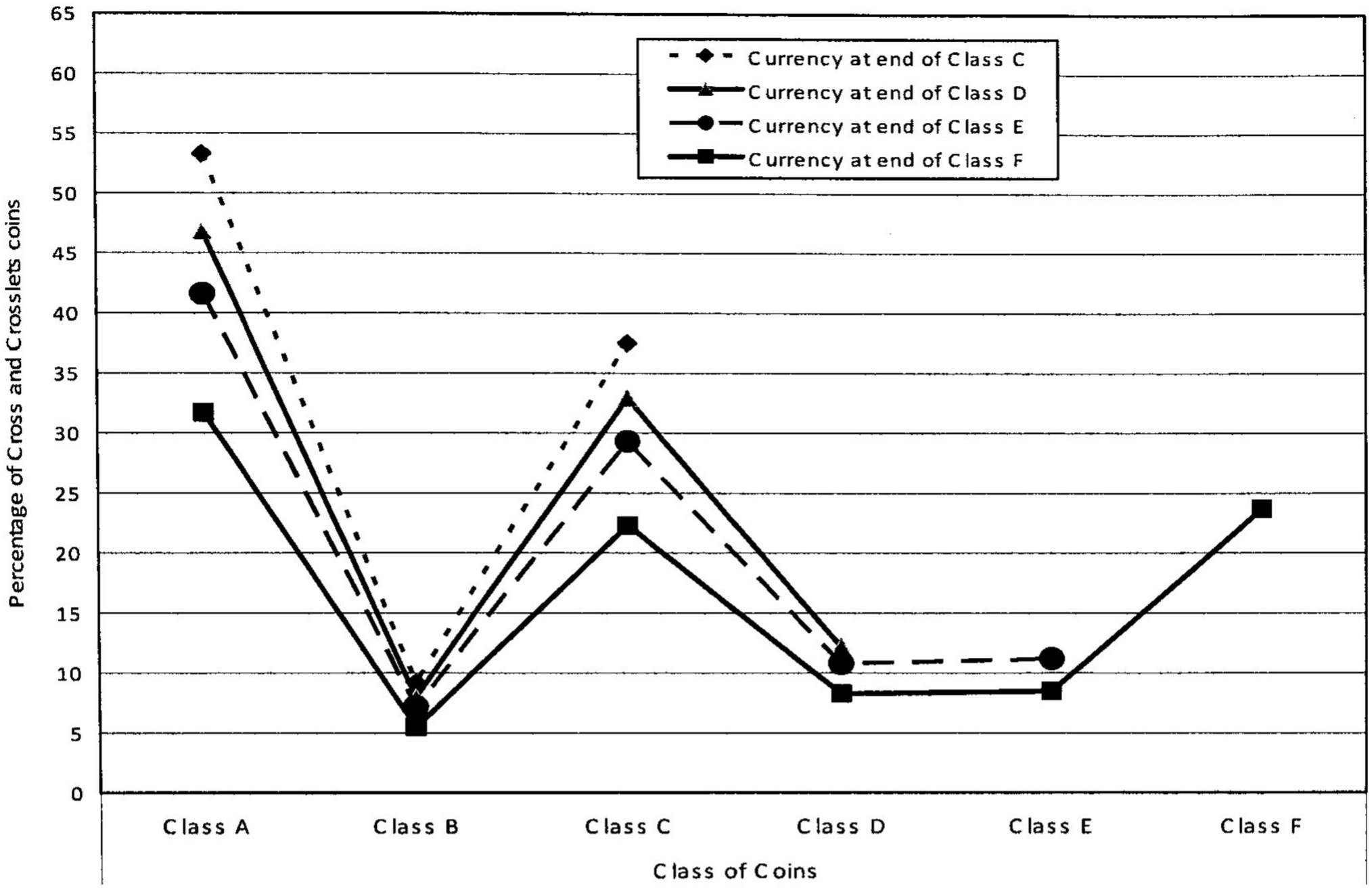


Figure 4.4. Theoretical or anticipated cumulative contribution of each class to the currency, as a percentage, to the total number of reverse dies at the end of Classes C–F, assuming no wastage occurred, based on reverse die estimates by M. Allen (2006).

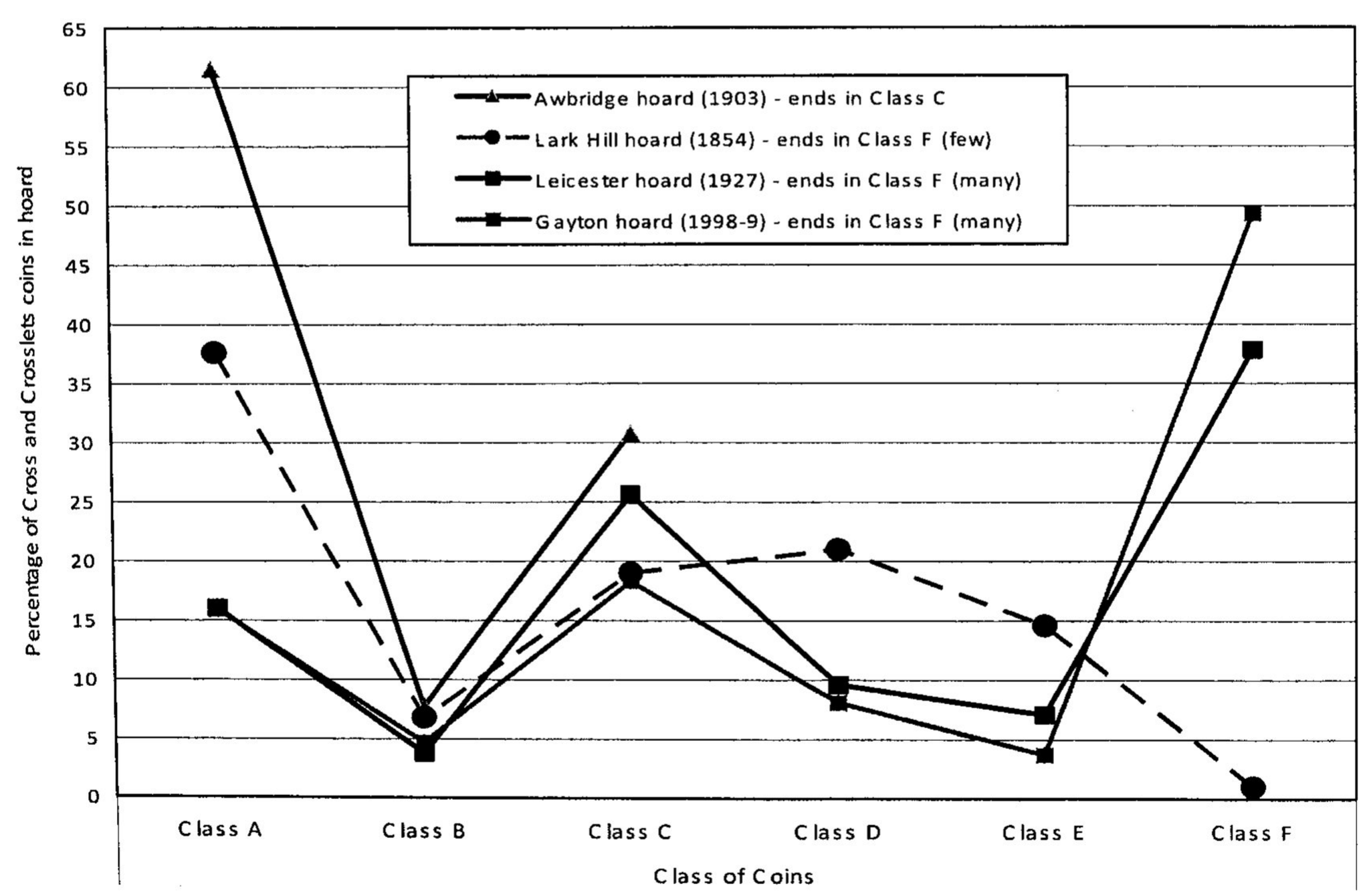


Figure 4.5. Actual percentage of the coins of each class in four large hoards containing Cross and Crosslets coins.

It is possible that the number of dies used in Class F has been *underestimated* by Allen (and earlier by Metcalf). Allen's estimate for the number reverse dies used in Class F (287) provides an estimated annual rate of consumption of 50 dies over the period that the class was in issue, based on the chronology presented in Table 1.1. For Class A the rate of consumption of reverse dies (559) was approximately 110 per annum, although we may suggest that the rate of consumption was not constant over the whole coinage, for Class A dies used in the recoinage (1158–*c*.1160) might have been consumed at a greater rate than dies engaged in ordinary coining. Nevertheless, the evidence would suggest that mint output per annum during Class A was more than twice that during Class F.

Allen suggested, from my own published analysis of Metcalf's die-estimates, that annual output, based on the rate of consumption of dies, 'was at or about the same level from *c*.1167–1180', and Allen's subsequent revision of Metcalf's die estimates has not altered this view.[110] However, Allen has also suggested that 'the figures for 1182–*c*.1190 seem to indicate a substantial increase in normal non-recoinage output from the 1170s'.[111] Moreover, much criticism can be made of the methodology used by Metcalf to produce the die estimates (explored above, pp. 95–6) upon which Allen bases his understanding. Allen has produced a revised estimate for the number of Class F reverse dies of 287, which is larger than the 238 reverse dies estimated by Metcalf, but it should be emphasised that neither Metcalf's estimate nor Allen's estimate is derived from die-study.[112] Due to the fact that Allen's (and Metcalf's) data is derived from *BMC* rather than die-study, it is possible that the data concerning the later

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[110] M. Allen, 'The quantity of money in England 1180–1247: new data', *BNJ* 75 (2005), pp. 44–49, at p. 45, and citing Crafter, 'Re-examination', pp. 55–6. Allen's revisions of Metcalf's data in M. Allen, 'The English coinage 1153/4–1158', *BNJ* 76 (2006), pp. 242–302, at pp. 260–63.
[111] Ibid. Allen's estimate for the output from mints 1182–*c*.1190 is £74,000–£148,000.
[112] M. Allen, 'The English coinage 1153/4–1158', *BNJ* 76 (2006), pp. 242–302, at pp. 261–2; D. M. Metcalf, 'An estimate of the total output of the English mints during the "Cross and Crosslets" Coinage, 1158-1180', Appendix to 'A survey of numismatic research into the pennies of the first three Edwards (1279-1344) and their continental imitations', in N. J. Mayhew (ed.), *Edwardian Monetary Affairs (1279-1344): a symposium held in Oxford, August 1976* (British Archaeological Reports 36, Oxford 1977), pp. 1–31 at pp. 26–31.

classes is less exact than that for Class A, owing to biases in the material. *BMC* acknowledges that there may be an under-representation of later classes compared with earlier classes.[113]

The available published die-studies do not support such a hypothesis, however. The implication of the studies is that, as with Class A, Allen's methodology may have yielded a slight *overestimate* of the number of dies.

Tables 4.9–4.11 compare the die figures for Class F coins of three mints (Bury St Edmunds, Ipswich and Lincoln) with the die estimates provided by Metcalf (1977) and Allen (2006).[114]

A cursory glance suggests that Allen's die-estimates for mints derived from analysis of *BMC* are greater than those derived from die-study. Allen's data for Class F coins minted at Lincoln is unacceptable, because the data yields a point-estimate of an infinite number of dies for the mint, within an infinite 95% confidence interval. This fact raises some interesting questions over the legitimacy of Allen's methodology: when the data is unacceptable for an individual mint, is that same data acceptable when it is subsumed into an aggregate of all mints? I would suggest that it is not, because the sum of results generated for mints individually is *not* the same as the results for the entire coinage.[115]

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[113] Of the *c.*6,000 coins in the Tealby hoard (1807) all but approximately 750 were melted down for bullion (see p. 103 and note 1 above). The majority of the pieces in the British Museum and Royal Mint collections that are known to have come from the Tealby hoard are from the earlier classes, *BMC Henry II*, pp. xlviii–xlix. There are many other coins in the British Museum that are suspected to have come from the Tealby hoard, *BMC Henry II*, p. xv. The criterion for retaining coins from the Tealby hoard was the legibility of the mint name, a principle which would favour the better struck coins of earlier classes, see R.H.M. Dolley and F. Elmore Jones, 'A parcel of Cross and Crosslets pence from the Tealby hoard', *BNJ* 29 part 1 (1958), pp. 82–6, at p. 82.

[114] In order to make the figures comparable Metcalf's published figures for 'non-singletons' have been converted to 'singletons' by subtracting the non-singletons from the number of known coins.

[115] A sample with a large number of singletons is problematic for calculating an estimate for the number of dies. This can be most clearly seen in analytical work on Crescents coinage (see p. 182, below) where the aggregate of the estimated number of dies for a class by mint is *not* equal to the estimated number of dies for that class for the whole coinage. Therefore, it seems prudent for the monetary historian to seek to observe any potentially misleading data within a given sample, and comparison of the aggregate of the estimates by mint with that of the class would seem to be a prudent methodology. This issue is explored further for the Crescents coinage of Scotland.

Table 4.9: Comparison of figures Metcalf (1977) [116] and Allen (2006) [117] concerning Class F coins minted at Bury St Edmunds with data calculated from the die-study by Eaglen.[118]

	Number of coins (n)	*Known dies (d)*	*Singletons (d_1)*	*Point estimate (D_{est})*	*95% confidence interval*
Obverse dies					
Metcalf (1977)	17	10	4	16	9–29
Allen (2006)	15	8	4	14	7–26
Eaglen (2006)	48	11	4	14	11–18
Reverse dies					
Metcalf (1977)	—	—	—	—	—
Allen (2006)	15	10	6	22	11–49
Eaglen (2006)	48	13	5	17	14–31

Table 4.10: Comparison of figures Metcalf (1977) and Allen (2006) concerning Class F coins minted at Ipswich with data calculated from the die-study published by Crafter.[119]

	Number of coins (n)	*Known dies (d)*	*Singletons (d_1)*	*Point estimate (D_{est})*	*95% confidence interval*
Obverse dies					
Metcalf (1977)	37	26	17	64	37–115
Allen (2006)	33	22	16	58	33–109
Crafter (2002)	89	33	16	50	40–62
Reverse dies					
Metcalf (1977)	—	—	—	—	—
Allen (2006)	33	26	21	100	51–224
Crafter (2002)	89	44	20	70	54–91

Table 4.11: Comparison of figures Metcalf (1977) and Allen (2006) concerning Class F coins minted at Lincoln with data calculated from the die-study published by Mossop and including the numismatic material in the Gayton hoard (see §7.5).[120]

	Number of coins (n)	*Known dies (d)*	*Singletons (d_1)*	*Point estimate (D_{est})*	*95% confidence interval*
Obverse dies					
Metcalf (1977)	2	2	0	2	2–10
Allen (2006)	5	4	3	14	15–73
Mossop (1970)	10	7	5	19	10–57
Mossop + Gayton	16	8	3	12	7–21
Reverse dies					
Metcalf (1977)	—	—	—	—	—
Allen (2006)	3	3	3	∞	∞–∞
Mossop (1970)	10	6	3	11	5–25
Mossop + Gayton	16	7	3	10	6–18

[116] As in note 112, p. 140 (above).
[117] M. Allen, 'The English coinage of 1153/4–1158', *BNJ* 76 (2006), pp. 242–311, at pp. 260–264.
[118] R.J. Eaglen, *The Abbey and Mint of Bury St Edmunds* (London: 2006), pp. 249–53.
[119] T. Crafter, 'A die-study of the Ipswich mint, *c.*1161/2–1180', *NC* 162 (2002), pp. 237–52.
[120] H. Mossop, *The Lincoln Mint* (Newcastle-upon-Tyne: 1970). The data presented here is not readily accessible in the study and has been extracted from it and set out in full in §7.5.

4.6. Conclusion

The content of the Gayton hoard provides a valuable body of new evidence. The difficult numismatic material from the hoard has been painstakingly identified by mint, moneyer and class as far as the material allows and has been catalogued accordingly. While the hoard contains some individual coins of individual significance, it has also been possible to analyse the statistical data of the sum of the hoard in comparison with other well-recorded hoards.

As already explored, Martin Allen has suggested, with careful qualification, that there was growth in the volume of the currency between 1158 and 1180.[121] Allen's suggestion is based on comparison of the estimated number of reverse dies, the possibility that 'normal non-recoinage output' was substantially greater in 1182–c.1190 than in the 1170s, and (non-numismatic) evidence that implies growth in the revenue accruing to the royal government.[122]

The nature and extent of the growth is difficult to assess. The evidence of well-recorded hoards suggests that coins from mints in the south-east region dominated currency towards the close of the coinage. Furthermore, the hoards suggests that coins of Class F dominate the currency to a far greater extent than the model based on the estimated number of reverse dies would lead us to expect. The evidence of hoards must overrule the model, with the qualification that the hoard evidence may not be representative, although the regional breakdown of the three large hoards with a *terminus post quem* of 1174 suggests they are similar despite some regional bias. When compared to the model, the hoard evidence might suggest that the Allen underestimated the number of Class F reverse dies, but the available die-studies do not suggest that – in fact the die-studies suggest that Allen's methodology may have yielded an overestimate. However, there may be individual mints (perhaps Canterbury) that have not been subjected to die-study that may have had a number of dies far greater than the number estimated by Allen. Both the Gayton hoard and the Leicester hoard suggest the prominence of coins of Class F minted at Canterbury in the currency of England, and some

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[121] See p. 127 and references.
[122] M. Allen, 'The quantity of money in England 1180–1247: new data', *BNJ* 75 (2005), pp. 44–49, at p. 45.

possible reasons for increased mint activity at Canterbury have been suggested (pp. 120–24, above). While acknowledging that the content of the hoards has some regional bias, overall the regional composition of the content of the Gayton, Leicester and Lark Hill hoards does not suggest that the hoards are atypical.[123]

The Gayton hoard and Leicester hoard suggest the relatively high frequency of Class F coins minted at Canterbury, and in particular of certain moneyers of that city (Raul, Richard, and Rogier). The amercement of a number of Canterbury moneyers in 1176–7 indicates a common transgression. Some of the amerced moneyers are not known from the numismatic record, so it is unlikely that the punishment they received related directly to coining, whether corruption or excessive profit.

There is no direct evidence for the involvement of moneyers acting as financiers for Christ Church in the late 1170s, but the cumulative circumstantial evidence is suggestive. The agreement between Prior Benedict and Lambrin Frese may be evidence that Lambrin was a financier of the construction work. Gervase's record of a persecution of moneychangers or moneylenders – his use of the noun *trapezetas* is suggestive – in 1180 is supported by evidence of judicial process in the Pipe Rolls concerning the moneyers Lambrin Frese and Solomon. After a period of intense construction at Christ Church, work was halted altogether in 1183 owing to lack of funds, as Gervase records.[124] Clearly financing construction work became difficult after only a few years. It is tempting to speculate that there was a causal link between the financial difficulties and the suppression of the *trapezetas* in 1180. It is possible that the royal government detected the activities of moneyers as part of a general scrutiny of affairs at Canterbury in the 1170s, connected with the development of the cult of Becket and the construction of the new Trinity Chapel at Christ Church to accommodate it.

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[123] See pp. 128–9 (above).
[124] Gervase of Canterbury, *Opera Historica*, ed. W. Stubbs, vol. 1 (Oxford: 1879), p. 29.

5. The Crescents coinage: evidence for monetary expansion in Scotland *c.*1170–1195

5.1 Introduction

The coinages in issue prior to 1195 are the most complex and challenging in the Scottish series and potentially the most rewarding for the historian. Independent Scottish coinage had only been issued for approximately thirty years at the time of William I's accession in 1165. King David I (1124–1153) had invaded Cumberland in 1136, ostensibly in support of his niece Matilda's claim to the English throne, and initiated a coinage in his name after his forces captured Carlisle with its mint. The general outline 1136–1195, which is known as 'the early sterling period', is clear enough. Sporadic and intermittent coinages give way under William I (1165–1214) to the Crescents coinage, the first Scottish coinage of uniform type, during which Roxburgh emerged as the principal mint of the kingdom. The Crescents coinage was in turn superseded by the Short Cross and Stars coinage in 1195.

Assessing the monetary development of Scotland during the late twelfth century is a formidable task. This chapter subjects the Crescents coinage to analytical techniques to seek to address the basic questions of monetary history: the pattern of mint activity, circulation, weight standards, metallurgy, chronology and volume of the coinage. The purpose is to understand the important developmental phase of Scottish coinage, which additionally provides a useful comparative tool for the contemporaneous English coinage, which was long established but in a period of flux.

Detailed and extensive treatment of the coinage has been largely precluded in modern times by the small size of holdings of individual institutions. No single institution has a collection strong enough to provide an adequate overview of the coinage.[1] The primary task was to search for all extant specimens of the coinage and incorporate these into a unified Catalogue (Chapter 10) and proceed to a die-study. In a die-study, great importance may attach to single specimens and hence single specimens from local museums have been actively sought and

[1] The largest institutional collection is that of the National Museums of Scotland which contains 87 coins. Many of the coins are handsome specimens, but key varieties are not represented.

included. The most comprehensive collection is that formed by Lord Stewartby over many years and with special attention to die-combinations; its existence is of the highest importance for the study of the coinage.

In what follows, the structure of the coinage has been derived from its own internal evidence according to an analytical framework. Subjective judgements concerning the impact of contemporary events on the coinage have not been allowed to influence the assessment of the structure. Consideration of the effect of historical circumstances has been relegated to the section on chronology (§5.10), where such discussion is appropriate.

5.1.1. Research history

Edward Burns laid the foundations for modern study of the Crescents coinage in the late nineteenth century.[2] Burns pioneered modern techniques of die-study in medieval numismatics, which are applied in expansive form in this thesis: the collation and comparison of specimens from different sources to establish legend readings and die movements.[3] Despite the supremacy of Burns, earlier works remain important. Adam de Cardonnel penned a contemporary description of the circumstances surrounding the discovery of the Dyke hoard, and catalogues published in 1845 and 1865 illustrate a large number of specimens, albeit as line drawings.[4] Work on Scottish coins largely abated in the face of the monumental scale of Burns's work in the succeeding fifty years. However, mention must be made of the important paper on die movements by Colin Dakers, a student of the Scottish coinage whose work was prematurely cut short by his death in action in 1942.[5]

The principal post-war contributor to the early sterling period is Ian Stewart, ennobled as Lord Stewartby in 1993, in which name his later publications have appeared. The Crescents

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[2] E. Burns, *The Coinage of Scotland* (Edinburgh: 1887), vol. 1, pp. 48–63.
[3] I. Stewart, 'Two centuries of Scottish numismatics', *The Scottish Antiquarian Tradition*, ed. A. S. Bell (Edinburgh: 1981), pp. 227–65 at pp. 242–3.
[4] A. de Cardonnel, *Numismata Scotiæ* (Edinburgh: 1786), p. 3 and Plate 1, nos. 1–15. J. Lindsay, *View of the Coinage of Scotland* (Cork: 1845). J. Wingate, *Illustrations of the Coinage of Scotland* (Glasgow: 1868).
[5] J.D. Bateson, 'Scotland and Ireland: A century of progress in coinage studies', *BNJ* 73 (2003), pp. 137–47. Obituary of Capt. C. H. Dakers in *BNJ* 3[4] (1941–4), p. 211.

coinage received his discerning attention in his seminal paper 'Scottish mints' of 1971.[6] Stewart's earlier work, *The Scottish Coinage* (1955), was largely based on Burns, but with reappraisals warranted by evidence discovered in the intervening period, and is essentially a summary of the state of knowledge at that time.[7] In recent years Lord Stewartby has further advanced the study of the coinage with a paper on a new methodological approach and the publication of a purse hoard discovered in the nineteenth century.[8] In sum, Lord Stewartby's published work provides the point of departure for work on the coinage. Moreover, I am extremely grateful to Lord Stewartby for sight of his published notebooks and card indices, which contain important details concerning the pedigree of a number of specimens.

Resurgent interest in the historical context of the Crescents coinage has been prompted most recently by the work of Ian Blanchard. Blanchard has made grandiose claims for the influence of silver from mines in Cumberland on the coinage of Scotland.[9] However, Blanchard's understanding of numismatic material is inadequate and he is seemingly unaware of the important advances made by Stewart since 1970.[10] Blanchard's presentation of the structure of the Crescent coinage is based on Burns, but is disingenuous in his work, with reckless fictional interpolations on the careers of moneyers. Blanchard's use of single specimens as an indication of weight standards and weight reductions is foolhardy in the extreme. Blanchard's work amounts to a misrepresentation of what is an undoubtedly an important coinage.

The interest in the coinage is how much it can tell us about the impact of the 'mine of Carlisle' as a spur to the Scottish coinage and the relative volume of the currency at this time,

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[6] I. Stewart, 'Scottish Mints', *Mints, Dies and Currency*, ed. R.A.G. Carson (London: 1971), pp. 165–289 at pp. 197–202.
[7] I. Stewart, *The Scottish Coinage*, second edition (London: 1967), pp. 9–12.
[8] Lord Stewartby, 'Surface reduction of medieval coin dies', *Moneta Mediævalis* (Warsaw: 2002), pp. 279–82 and Pl. 16. Lord Stewartby, 'The 1834 Baddinsgill find of Crescent sterlings', *NC* 165 (2005), pp. 223–5 and Pl. 27.
[9] I. Blanchard, *Mining, Metallurgy and Minting in the Middle Ages*, vol. 2, *Afro-European Supremacy, 1125-1225* (Stuttgart: 2001), especially pp. 656–66. See also: I. Blanchard, 'Lothian and beyond: the economy of the 'English empire' of David I', in *Progress and Problems in Medieval England*, ed. R. Britnall and J. Hatcher (Cambridge: 1996), pp. 23–45.
[10] Ibid. Blanchard records Stewart's paper of 1971 in the bibliography, albeit with an incorrect title, but does not utilise it in the discussion of the coinage.

relative to England. The extent of the impact of bullion from ore mined in England is reserved for Chapter 6, where the results of metallurgical analysis by Electron Probe Microanalysis (EPMA) are explored at length.

5.1.3. Aim and Method

In the absence of documentary evidence, the monetary historian seeks to deduce economic effects from understanding the production and volume of the coinage. These are both aspects of mint activity to be revealed by understanding the structure of the coinage, which is deduced by applying technical methodologies to an adequate corpus of numismatic material.

A comparative analysis of the content of hoards is usually a principal key for unlocking the structure of a coinage. However, hoard evidence is sadly deficient in the case of the Crescents coinage. Very few hoards have contained Crescents coins and all of these were discovered before the middle of the nineteenth century, prior to the advent of systematic recording. The method employed is, of necessity, primarily analytical based on surviving coins. More complex than hoard comparisons, the method involves a die study in order to trace the use and movement of dies.

Statistical methods allow an assessment of how comprehensive knowledge of the coinage can be from the evidence available at the present time. Metrological data is explored for the first time in relation to the coinage alongside metallurgical analysis.

5.2 Classification

A classification is the rational presentation of the structure of a coinage. Chronologically significant stylistic developments in die cutting serve as the basis for the division of coinage into classes. The individuals who produced the dies would not have consciously produced a distinct 'class' of dies, but were responsible for the stylistic development of the design. Coins struck from two dies of different classes, known as 'mules', are often found in the Crescents type; such coins cannot have been struck earlier than the later class.

The classification system elucidated in this section is derived from the analysis of the material in the Catalogue and has no antecedent. The classification is established rationally in §5.4 'Die-Study: Structural'. However, in order to make what follows intelligible the classification is presented here as though it is *a priori*.

Burns recognised that the different sceptre-heads on the coinage were chronologically significant. Three different types of sceptre-head are now known: cross potent, cross pommée and fleur-de-lis, of which the first two were known to Burns. The Short Cross coinage, which has a cross pommée sceptre-head, was introduced in England in 1180 replacing the Cross and Crosslets coinage, which has a cross potent sceptre-head. Burns reasoned that the change in England in 1180 was reflected on the Scottish coinage, which, he reasoned, was in issue before and after this date.[11] Stewart added a proviso, quite correctly, that although all cross pommée coins may be later, all coins with the cross potent sceptre are not necessary earlier.[12] Stewart's caution has been justified by the present analysis. A few examples of the last class, E, have the cross potent sceptre-head and one die has a fleur-de-lis sceptre-head, unknown to Burns. The variety of sceptre-heads in Class E parallels late coins of the Cross and Crosslets coinage that have a fleur-de-lis instead of a cross potent sceptre-head and which were unknown prior to the Gayton hoard (cf. §4.3.1).

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[11] Burns, *Coinage*, vol. 1, pp. 50–51; Burns arranged the illustrations by sceptre-head, vol. 3, Pl. IV.
[12] Stewart, 'Scottish mints', p. 198. The division of the coinage into two groups based on the sceptre-head has been maintained. SCBI 35 (Oxford/Glasgow), p. xi and J.D. Bateson, *Coinage in Scotland* (London: 1997), p. 41.

5.2.1. General description

Usually commencing at about 1 o'clock, the legend in Latin or Anglo-Norman French encircles a bust of a bearded king. The king's head is in profile left with his bust turned three-quarters left. The only hair in evidence is depicted on some coins by a strand or two strands falling from the rear edge of his crown to his neck. Behind the king's head are one or more crescents, which often enclose a pellet. On earlier coins the king wears an elliptical jewelled collar around his neck, which on later coins is often reduced to lines or a line; no other drapery is shown. A jewelled sceptre is shown before the king's face surmounted by either a cross potent, cross pommée or fleur-de-lis. A beaded circle surrounds the king's bust, but is broken by the fleur-de-lis of the crown, which penetrates the legend. The legend begins with a cross, usually placed between the front and middle fleur-de-lis of the crown. A beaded circle surrounds the whole design including the legend.

The reverse is dominated by a large solid cross potent, in each angle of which there is often a small pellet set tight in the angle and a crescent enclosing a pellet set diagonally to the cross potent with its points facing the edge of the coin. Often a stalk (two on coins of Perth) attaches the pellet within the crescent to the beaded circle that surrounds this design and divides it from the legend. The legend commences with a cross potent initial mark, normally placed immediately over one arm of the cross. Another beaded circle surrounds the whole design. The legend records the name of the moneyer, with or without a mint name.

5.2.2. Classes

Class A

Cross potent sceptre-head. The diagnostic feature of this class, which initiated the coinage, is the colons that appear between each letter of the legends. The obverse legend gives the king's title in Latin form as RЄX or RX. Distinctive letter forms are found on this class: the calligraphic X, square M, large A with oblique ends to the bottom of the uprights, and open Є with serifs (Figure 5.1). The king's neck appears as a square within the collar. The king's face has a double line to the cheek and the outer line merges with the high back of the king's

jewelled collar. Two lengths of hair flow from the rear of the crown; crescents appear below the lines of hair. The reverse legends consist of letters, again interspersed with colons. The central cross tapers towards its centre.

The double cheek line is a direct stylistic link between the Crescents type and the extremely rare multiplicity of types in issue prior to it in William's name.[13] The use of the calligraphic ꝯ suggests that the die-cutter was aware of calligraphic forms or was copying the legend reading from a written source. The form of ꝯ found on the coins is that peculiar to mid-twelfth-century diplomatic.[14]

Class B

Cross potent sceptre-head. Coins of class B have a strong sense of homogeneity. The legend is changed for the first time into Anglo-Norman French: +RЄIWILLÆMЄ. The king's neck appears as a square within the collar; double cheek. Pellets are often found scattered in the obverse and reverse legends, singularly or as colons. One length of hair flows from the rear of the crown, behind and above which are crescents. The letter Є is distinctive and differs from Class A. The Є is open but is reduced in size and only the central bar has a serif, with the effect that it can appear closed on worn specimens (Figure 5.1). Other letters are very similar to Class A, with the square M and Æ with oblique ends to the bottom of the uprights. The reverses have a thick cross potent, with no tapering. Crescents are large and end with sharp points pointing in parallel. Large pellets are within the crescents and are attached with minute stalks to the inner circle (i.e. the pellets are attached not the crescents).

The change in the royal style that occurs with Class B is interesting. The style adhered to by royal clerks was *Willelmus rex Scottorum*.[15] The royal style in vernacular is preserved in the poem of Jordan Fantosme and is variously *li rei d'Escoce*, *li reis Willame*, and once as *le rei d'Aubanie*.[16]

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[13] N.J. Mayhew, 'An early coin of William the Lion', *BNJ* 65 (1995), pp. 219–20. Cf. Burns, *Coinage*, vol. 3, Pl. III, figs. 25C, 25D and 26.
[14] C. Johnson and H. Jenkinson, *English Court Hand AD 1066–1500* (Oxford: 1915), p. 53 and fig. 2.
[15] *RRS* II (William I), p. 75.
[16] *Jordan Fantosme's Chronicle*, ed. and trans. R.C. Johnston (Oxford: Clarendon Press, 1981), ll. 425ff. and ll. 7, 321, 1338.

Class C

Cross pommée sceptre-head. Dramatic change from the preceding classes in design and epigraphy. The king's face is longer with the implication that the crown is pushed higher into the legend and the collar filled by the chin. The legend is expanded to read: +LЄRЄIWILLAOЄ. The round O makes its first appearance as do the closed C and Є (Figure 5.1). Along with the change in sceptre-head the letter forms also appear to follow the regular coinage of Henry II. The majority of Class 1 Short Cross coins have the letter forms found on the Crescents coins.[17] The reverses of this class are distinctive with small crescents cupping pellets that are attached to the inner circle by long thin stalks. The cross potent is thin and has a tendency to taper towards the centre of the cross.

Class D

Cross pommée sceptre-head. No neck, collar consisting of two lines sweeping underneath the king's cheek with few or no jewels. The basic criterion of Class D is that coins are of a smaller format than Class C from dies of a reduced diameter. The reverse cross potent is once again thick without any tapering, and each crescent enclosing a pellet is large, cupping the pellet so well that the whole looks like a circle. Large well-spread lettering; the letter A is often found barred with a crescent; rarely square M (Figure 5.1).

Class E

Class E coins are very crude and exhibit a high degree of variation. The cross pommée sceptre-head is usual, but is occasionally a cross potent and in one known instance a fleur-de-lis. No neck, collar consisting of a single line sweeping underneath the king's cheek. The class betrays a high degree of confusion in epigraphy and legend readings; the letter N is found reversed (И). Class E is the most difficult class to work on, owing to the inferiority of production compared with other classes and its under-representation in the surviving material. As a provisional organisation of this difficult material, the coins are arranged in the Catalogue

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[17] *SCBI* 53 (Mass), p. 20. The design and lettering of Short Cross coins became standardised in Class 1b.

according to the degeneration in the obverse legend from +LEREIWILLAO/E into a multiplicity of forms.

Perth (P)

The coins of the Perth mint are a separate series within the coinage. The reason for the separation is that the Perth dies come from a different source from those used at other mints, which is termed throughout as 'the Perth die-cutting workshop' (abbr. PDW). The chief diagnostic feature of coins of Perth is the two stalks that attach each of the reverse pellets to the inner circle. If a specimen does not have this feature it is not from a PDW reverse die. All obverses have a cross potent sceptre-head. Stewart observed that unlike other cross potent obverses the legend is +LEREIWILLAO/,[18] and to this can be added that the Perth obverses do not show the king's neck within the collar and the preposition in the reverse legend is always DE. Some epigraphical features are distinctive. PDW dies have the round O/, closed E, A with upper-bar (Figure 5.1). One early obverse die (1^{P}) has a calligraphic K and square M.

[18] Stewart, 'Scottish mints', p. 199.

Class A	 Calligraphic Χ	 Square Μ	 Α with oblique ends to uprights	 Open Ε
Class B	 Open Ε with serif on central bar.			
Class C	 Round Ꝺ	 Closed ɑ	 Closed ɛ	
Class D	 Square Μ	 Crescent-barred Α		
Perth	 Round Ꝺ	 Closed ɛ	 Α with upper-bar	

Figure 5.1. Important epigraphical forms on Crescents sterlings.

5.2.3. Summary of classification points

Owing to the high frequency of mules, the class of obverse and reverse must be identified separately for each specimen of the coinage. The summary presented here employs five general categories: diagnostic, usual, frequent, occasional, exceptional (also preposition for the reverse).

Class	*Obverse*	*Reverse*
A	*Diagnostic:* Cross potent sceptre-head; colon between each pair of letters in the legend; double cheek; calligraphic Ꝛ; square M; neck square within collar.	*Diagnostic:* Colon between each pair of letters in the legends. Wide crescents with sharp points, large pellets, short tails.
B	*Diagnostic:* Cross potent sceptre-head; obverse legend ꟻREIWILLAM; single check line; neck square within collar.	*Diagnostic:* Wide crescents with sharp points that point in parallel; large pellets; short thin tails (if any). *Preposition*: ON *Usual*: Pellets scattered in legend.
C	*Diagnostic:* Cross pommée sceptre-head; legend ꟻLEREIWILLAO; Closed C and E	*Diagnostic:* Small crescents cupping pellets; long, thin tails. *Preposition*: DE (usual); ON, OF (exceptional)
D	*Diagnostic:* Cross pommée sceptre-head; obverse legend ꟻLEREIWILLAO; smaller dies than Class C, collar without jewels. Large well-spread lettering.	*Diagnostic:* Large crescents cupping the pellets so tightly that the whole looks like a circle; no tails. *Preposition*: ON
E	Single line of collar. Very crude bust. *Usual*: Cross pommée sceptre-head, degenerate legend reading. *Occasional:* Cross potent sceptre-head. *Exceptional:* Fleur-de-lis sceptre-head.	*Diagnostic:* Crude crescents that have an elongated horseshoe shape; short/no tails. *Preposition*: ON (usual); DE (exceptional) *Usual*: Pellets scattered in legend.
Perth	*Diagnostic:* Cross potent sceptre-head; no neck square within collar. *Usual:* legend ꟻLEREIWILLAO *Exceptional:* Initial cross in legend is a cross pommée.	*Diagnostic:* Two stalks to each pellet forming a V shape. *Preposition*: DE

5.3 Mints and moneyers

5.3.1. Named mints

Five mints are named on Crescents sterlings, but not all coins have place-names and mint activity in additional places cannot be ruled out. Coins of class A and a series of coins in classes C and E have the names of moneyers only, without any indication of a place of mintage.

The longest form of various mint signatures found on the coins is given after the modern place-name. The common feature of the five attested mint towns is their importance as administrative centres each being the seat of a sheriff in the reign of William I. The burgh of Stirling has been given as a mint for this coinage, but this should be expunged from the list of mints (see §5.3.2.).

A greater number of mints were in operation under David I, including Aberdeen[19] and St Andrews, where a moneyer was active on behalf of the bishop.[20] The ecclesiastical dispute 1178–1189 over the bishopric of St Andrews may explain why the mint was inactive for the Crescents coinage.

Berwick (BEREWIC; BERV)

A burgh situated on the small coastal peninsular on the northern bank of the River Tweed. Berwick was captured and burned by the barons of Northumberland during the war of 1173. Berwick was the most important port in Scotland in the twelfth century.[21]

Dunfermline (DVN)

Numerous places in Scotland begin with the syllable 'Dun'. I have followed Stewart's analysis in assigning the extremely rare coins from the one reverse die with this mint signature to Dunfermline.[22] Dunfermline was already an important royal centre by the late

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[19] There are unpublished coins of Aberdeen in the collection of Lord Stewartby, noted by D.M. Metcalf, 'An annotated bibliography of Scottish coin hoards, *c.*1100-1600', *CIMS*, pp. 22–54, at p. 24 no. 2 'Stewart parcel' of coins of David I.
[20] J. E. L. Murray and I. Stewart, 'St Andrews mint under David I', *BNJ* 53 (1983), pp. 178–80.
[21] See J. R. Hunter, 'Medieval Berwick-upon-Tweed', *Archaeologia Aeliana*[5] 10 (1982), pp. 67–124.
[22] Stewart, 'Scottish mints', p. 202 note 38.

twelfth century and the Abbey was a royal mausoleum of Canmore kings. Dunfermline was the seat of one of the sheriffs of Fife.

The coins with this mint signature are extremely rare and were unknown to Burns. The first sterling was published in 1955 and attributed to Dunbar, an attribution later repudiated by the same author.[23] Nevertheless, Blanchard has maintained the attribution to Dunbar.[24]

DVN is found as a mint signature on coins of Alexander III, which are associated with those of FRES through an obverse die-link.[25] The two names have thus a right to be considered as the two elements of Dumfries, a burgh situated at the lowest point at which the River Nith was bridgeable in the medieval period. William I gained possession of Dumfries in 1185, and founded a burgh there *c.*1187.[26] Although the burgh of Dumfries was founded in the period of the Crescents coinage, the coins of DVN of William I are dated 1170 × 1180 on the grounds of chronological framework (§5.10, below). Similarly the chronology precludes Dundee, a burgh founded 1180 × 1220 by William I's brother, Earl David.[27]

Edinburgh (EDENEBVR; EDAN)

Principally a defensive position, a castle atop a volcanic crag. David I established the burgh on the steep slope of the crag to the east of the castle. In 1128 David I founded Holyrood Abbey, later allowing its monks to have a separate burgh, known as Canongate.[28]

Barrow speculated that the moneyer Adam at Edinburgh may be Adam son of Serlo, an Edinburgh burgess of some note.[29]

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[23] B. H. I. H. Stewart, 'Some unpublished Scottish coins: II', *NC*[6] 15 (1955), pp. 11–20, at p. 11–12 and Pl. III, no. 2. Stewart, 'Scottish mints', p. 202 note 38.
[24] Blanchard, *Mining, Metallurgy and Minting*, p. 660. From this fallacious attribution, Blanchard attempts to demonstrate the significance of minting in eastern ports.
[25] Stewart, 'Scottish mints', p. 276, no. 9.
[26] *RRS* II (William I), p. 14.
[27] *RRS* II (William I), p. 69. K. Stringer, *Earl David of Huntingdon* (Edinburgh: 1985), p. 74 and note 83.
[28] G.W.S. Barrow, *Kingship and Unity* (London: 1971), p. 87.
[29] *RRS* II (William I), p. 17; G.W.S. Barrow, 'A twelfth century Newbattle document', *Scottish Historical Review* 30 (1951), pp. 41–49 at pp. 47–8. Grant by Adam of six acres of land in Gorgin, *Liber Cartarum Sancte Crucis* (Bannatyne Club: 1840), p. 29 no. 34. If this Adam is the moneyer, it is tempting to identify the moneyer Hugh of Edinburgh as Hugh of Dodingstone who witnessed the grant. Serlo witnessed two acts of the king: a confirmation addressed the burgesses of Inverkeithing (Clackmannan, 1165 × 1172), RRS II (William I), p. 191, and a confirmation of the privileges and possessions of Holyrood Abbey (Edinburgh, probably 1165 or 1166), RRS II (William I), p. 149.

Perth (PЄRT)

A burgh strategically placed at the farthest point downstream that the River Tay was bridgeable in the medieval period. The land route from the Fife, the heart of the Scottish kingdom in the twelfth century, to the north-east coast passed through Perth, circumventing the Sidlaw Hills and passing through the Vale of Strathmore. The burgh is associated with Scone, site of the investiture of kings of Scotland.

Roxburgh (ROCЄBVRЄ; ROCAS)

Roxburgh controlled the crossings of the Rivers Tweed and Teviot close to their confluence. It seems that Roxburgh became the most important mint of the Scottish kingdom after Malcolm IV was compelled to cede Carlisle and the rest of Cumberland south of the Solway, along with Northumberland, to Henry II of England at Chester in July 1157.[30] Roxburgh was an important commercial centre and the annual Roxburgh fair held in July attracted traders from across Europe.[31]

5.3.2. Coins without place names

Coins of class A have colons between each pair of letters of the reverse legends, a feature without parallel in early medieval British coinage. Owing to the interspersion of the colons, the moneyers name occupies all of the available space and no place-name is given. The moneyers are Ailbode, Folpolt, Raul Der, and Willame.[32] Further series of coins in Classes C and E present more numerous problems and require treatment at length.

Coins of classes C and E have the legend ꟻRÆVLDERLIG. That the legend is two personal names is confirmed by two dies that further end BЄR or RO indicating Berwick and Roxburgh (**11–12, 127–8**). A further reverse die legend ends FL (**137**). FL is difficult to interpret as a place name and it has been suggested that it is a contraction of *filius*.[33] It is possible that FL is

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[30] I. Stewart, 'Some German coins overstruck with sterling types', *Lagom: Festschrift für Peter Berghaus* (Münster: 1981), pp. 205–210.
[31] Ibid., p. 207.
[32] On the possibility of interpreting the legend of Raul and 'de Roxburgh' see §5.4.3, Die 1^{A}.
[33] I. H. Stewart, *The Scottish Coinage*, (second edition, London: 1967), p. 192.

a contraction of *Flandrensi*, indicating Raul Derlig the Fleming, because some twelfth-century moneyers known from documentary sources appear to have been Flemings (see §5.10.2). The moneyer Raul Derlig is either the same man as Raul of Roxburgh or another individual who used a second name to distinguish himself. Burns chose to regard Raul and Raul Derlig as the same moneyer, but the evidence of the die-study demonstrates that the latter was a separate individual who does not appear to have had a professional relationship with Raul of Roxburgh (see §5.4.3).[34]

The attribution of coins to Sterling has its origins in the work of Cardonnel, who regarded DЄRLIG as a mint signature of that burgh rather than a personal name.[35] John Jamieson corrected Cardonnel's error, but perpetuated the attribution of coins to Sterling through his contention that a partly legible coin reading ЄTЄR in fact read STЄR, which he regarded as a mint signature of Sterling.[36] Jamieson recognised that Cardonnel had engraved the coin he knew of, which was then in the possession of 'an antiquarian friend'. Burns maintained the attribution to Sterling based on the same unique coin. The coin is presently in the collection of Lord Stewartby (**141a**). Although Burns correctly read the coin ЄTЄR, he suggested that because the letter S is unknown on the coinage, the Є should be so regarded.[37] The letter S does, however, appear on late coins of Class E of the moneyer Radulfus, which were unknown to Burns (**142–7**). Like many past attributions, the assertion that Sterling is a mint for the coinage has become canonical and has been repeated most recently by Blanchard.[38]

Stewart recognised that 'Ster' is not an acceptable etymological rendering for Sterling, which in the twelfth century is given as *Striuelin*.[39] Attributing the coin reading ЄTЄR has remained a major difficulty, however, and Stewart recorded a suggestion made by G.W.S. Barrow and M. Dolley that the letters signified Etherdouer, the contemporary name of

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[34] Burns, *Coinage*, vol. 1, p. 57.
[35] A. de Cardonnel, *Numismata Scotiae* (Edinburgh: 1786), p. 3 and p. 41, nos. 9–10.
[36] J. Jamieson, 'Remarks on the antiquity of the earliest Scottish coins now extant', *Transactions of the Royal Society of Literature* II (1832), pp. 304-21 at p. 317. A. de Cardonnel, *Numismata Scotiae* (Edinburgh: 1786), Pl. 1, no. 12.
[37] Burns, *Coinage*, vol. 1, p. 62.
[38] Blanchard, *Mining, Metallurgy and Minting*, p. 656 and p. 662.
[39] Stewart, 'Scottish mints', p. 200. Cf. *RRS* II (William I), p. 333, no. 325.

Redcastle on the Black Isle. Stewart himself suggested a blundering of the mint signature PЄRT for Perth.

A coin discovered in the collection of the Society of Antiquaries of Newcastle-upon-Tyne during preparation of the Catalogue advances this subject further. The coin (**142a**) reads ✚WÆLTЄRBV[ ] and is struck from the same obverse die as the coin known to Burns. The obverse die-link indicates that the reverses may be regarded as of the same moneyer. The Society possesses two coins and both were present by December 1929 when a full listing of the British coins was published. Two coins of William I are listed and are additionally described as of Crescents type.[40] From the Society's listings of donated articles I have discovered that Mr H.B. Lupton presented a 'Silver penny of William the Lion' to the Society on 5 November 1851.[41] As the Society's collection has no specimens of the later Short Cross and Stars coinage, this entry must refer to one of the two Crescents sterlings. Although it is not possible to know which of the two sterlings Mr Lupton donated, this information is nevertheless significant as it confirms that the coins entered the collection at different times and from different sources.[42] The presence of this coin at an early date in a non-Scottish collection accounts for why Burns and his contemporaries were unaware of it.

There are no possible place-names for twelfth-century Scotland commencing with the syllable 'BU'. It is surely correct to read the reverses of the two sterlings of Walter together as Walter Bueter or Buieter, as double names of one moneyer. These coins then parallel the dies of Raul Derlig. If the reverse readings of both coins consist of personal names, no mint is precluded from consideration. The fact that the obverse die does not link beyond these reverses of Walter, and that the moneyer is otherwise unknown, suggests that these dies were used in isolation. Walter is known as a moneyer in Phase A of the Short Cross and Stars

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[40] J. D. Cowen, 'The Society's collection of coins, catalogue of the British section', *Proceedings of the Society of Antiquaries of Newcastle-upon-Tyne* 4[4], no. 8 (December 1929), pp. 111–117 at p. 115.
[41] *Archaeologia Aeliana* IV, part IV (1855), 'Donations to the Society' (separate section), p. 15.
[42] The two Scottish sterlings along with the rest of the Society's Scottish and Irish coins should have been included in *SCBI* 48 (Northern Museums), but are inexplicably omitted. In that volume the Crescents sterlings should have appeared after no. 1899.

coinage at Perth.[43] Since Walter is known as a moneyer of Perth in Phase A of the Short Cross and Stars coinage, it is possible that this coin is also of Perth, but quite why the mint should go unnamed is unclear.

Coins of class E have the name of the moneyer Radulfus with the preposition ON, but do not have a mint name. These coins are undoubtedly products of late mint activity at Roxburgh, where minting late in the coinage was almost entirely confined. There are also a very few coins of Raul Derlig without mint name of Class E.

5.3.3. Summary of mint activity

Table 5.1 provides a summary of the pattern of mint activity, as revealed by the classification of extant coins. References are provided to the Catalogue, which has a different arrangement of material from the Table.

Table 5.1. Table of mints, moneyers and classes for the Crescents coinage of William I (M = Class only known to occur as mule.)

Mint	*Class of coins* A	B	C	D	E	*Catalogue references*
BERWICK						
Adam			+			**10**
Raul Derlig			+			**11–12**
Willam	M		+		M	**13–21**
DUNFERMLINE						
Raul		+				**22**
EDINBURGH						
Adam		M	+	+		**23–32**
Hue			+			**33**
PERTH						
Folpolt	*Not applicable (Perth dies)*					**34–51**
ROXBURGH						
Raul	M	+	+	+	+	**52–126**
Raul Derlig			+			**127–128**
WITHOUT MINT NAME						
Ailbode	*Not applicable (Perth dies)*					**1–4**
Folpolt	M	M				**5–7**
Radulfus					+	**142–7**
Raul Der	+					**8**
Raul Derlig			+		+	**129–139, 148–152**
Walter Bueter			+			**140–141**
Willame	+					**9**

[43] *SCBI* 35 (Oxford/Glasgow), nos. 50–53.

5.4 Die-Study: Structural

Discussion of the structure of the coinage assumes an understanding of the referencing systems applied to the material in the Catalogue and the chart indices of dies, to which explanation the reader is hereby referred (§10.2 and §10.4). The die references are used throughout the following discussion.

The structure of the coinage has been elucidated through refining the arrangement of the material to the state that it appears in the Catalogue. If considered in isolation many die-links provide only limited or inadequate evidence. Helpfully, conclusions from particularly expansive or important die-chains elaborate the sequence, location or order of coins of an entire class. Thus it is possible to examine one die-link or die movement to deduce the correct locale of a large body of material and from a series of die-links and die movements the structure of the coinage is revealed. Which particular die-links are consequential and which profitless is not immediately apparent from the material. Some considerable time has been expended examining the material and arranging the chart indices of dies, hence the numeration of the dies and the order of the Catalogue, in accordance with the rules stated in §10.4.

Before embarking on discussing particular instances of the die-links that reveal the structure of the coinage, it is prerequisite to present some detail of the methodological techniques employed.

5.4.1. Die-links

Die-links are frequently found in the Crescents coinage, typically when one obverse die is found used with two or more reverse dies. Inter-moneyer die-links are frequently encountered and there are a number of inter-mint die-links. Through analysing the die-links alongside surface reduction it is possible to use both devices to elucidate structure.

The die-links of most interest are those involving coins that are mules. Mules are coins struck from two dies of different classes, hence the dies do not form a correct pair, but testify

to the concurrent use of dies of different ages: one die was older than the other. For mules that occur between two distinct types, for example at a recoinage, the general rule is that the obverse is usually the earlier die.[44] Unfortunately, no such rule may be applied to a coinage of immobilised type such as Crescents: mules *may* occur at a change of *class*, but either the obverse or the reverse may be the earlier die.[45]

It is self-evident that, as the product of two separate dies, one coin proves that those dies were present together at one point in time. It follows, therefore, that dies of one kind that are die-linked are likely to be associated closely together. On the chart indices of dies (Figures 10.1–10.7) numbers found within the heavy-lined boxes are die-combinations of a true class; numbers that are without are mules.

Inter-mint die-links present additional problems. C.H. Dakers proffered four reasons for the transfer of dies from mint to mint.[46] Dakers's first reason, concerning the movement of the royal court, may be omitted. Dakers's three other explanations remain germane, and may be reformulated as

1) the opening or re-opening of a mint, to which were transferred dies already in use elsewhere;
2) the closing of a mint, from which used dies were sent to a mint in continued operation;
3) moneyers move between mints, taking dies with them.

Dakers recognised the possibility of the transfer of reverse dies but regarded tracing the transfer of reverse dies as an impossible task. However, there is reason for understanding that some of the die-links may be the result of the movement of reverse dies. The central, but unanswerable, question concerns how dies are moved and where they were produced. Either

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[44] Because of the greater potential for survival of the (lower) obverse die. See G. C. Brooke, *A Catalogue of English Coins in the British Museum: The Norman Kings* (London: 1916), vol. 1, p. xxxviii and note 2.
[45] Known mules for the Cross and Crosslets coinage are listed by Crafter 'Re-examination', p. 47, Table 4. The table indicated that while often the obverse is the earlier die, there are many exceptions. Therefore it is prudent not to assume a rule for the Crescents coinage.
[46] C. H. Dakers, 'Die interchanges between Scottish mints', *PSAS* 70 (1936), pp. 202–8.

dies were moved by moneyers or dies were moved by an administrative distribution system independent of the moneyers.

The chart indices of dies (Figures 10.1–10.7) give a fairly accurate overview of mint activity. If an obverse die and reverse die were used alone as an isolated pair and subsequently replaced with a new isolated pair, the line of die numbers would run exactly diagonally top-left to bottom-right. Dies were not used in this way. Some dies survived longer than others and were paired off differently in the workshop environment, but the scenario just outlined may be regarded as the exemplar. The attempt must always be made to arrange the die numbers into a line roughly imitating the exemplar, a line running diagonally top-left to bottom-right. From Figure 10.7 of Raul of Roxburgh we can see that groups of die combinations **62–81** and **88–97** indicate periods of a large number of dies in use together contemporaneously, from which high output can be inferred. In contrast, die combinations **81–87** are generally isolated groupings in Class C, indicating a more depressed period of activity. Group **62–81** involves B/C mules and may be associated with the commencement of minting at Roxburgh in Class C; group **88–97** involves C/D and D/C mules.

5.4.2. Die renovation and re-use

The most consequential methodological tool for understanding the structure of the coinage is noting the surface reduction of dies. Lord Stewartby penetratingly appraised surface reduction in connection with the Crescents coinage in order to demonstrate its profitable use for establishing the order in which a die was used.[47]

Surface reduction was an attempt to renovate used dies. Rather than improving the die-face by the more ubiquitous route of re-cutting, the whole superficial layer of damaged surface was removed. As the same die was used to produce many specimens, the state of the die can be observed from different specimens and in combination with different dies. It is unlikely that die renovation resulted from necessity – from lack of access to new dies – because

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[47] Lord Stewartby, 'Surface reduction of medieval coin dies', *Moneta Mediævalis* (Warsaw: 2002), pp. 279–82 and Pl. 16.

reverses were produced; rather it probably resulted from expediency. The obverse die has the more intricate design and was more time-consuming to produce and so the advantage of prolonging its life of use is clear. Die renovations did not result from aesthetic considerations.

Theoretically, a die could be treated in three ways: it could be left to deteriorate or it could be renovated by either re-cutting or by surface reduction. No re-cut dies have been observed from Crescents sterlings, but re-cutting was certainly used in England and is found at Northampton where surface reduction has also been noted. The identification of dies that have undergone surface reduction can be difficult owing to the material change in design by having its relief lowered, a problem intensified when too few products from a die are extant. Two coins of Northampton once considered struck from different obverse dies in fact share the same obverse die, but a radical change in the state of the die caused the previous inaccurate judgement (see §3.2.2 for a detailed technical analysis of surface reduction).

The wear of the die may not have been even and is thus unpredictable. The die-axis is recorded against each specimen in the Catalogue, where it is an additional adjunct to identification of particular specimens. The recorded die-axes attest to irregularity, from which we may conclude that the dies were not placed in blocks to fit together properly – that is, the face of the dies were not locked flat to each other before striking. If the hand-held die was placed obliquely, the pressure exerted would pass through a smaller area.

5.4.3. Obverse dies: specific cases

In the following analysis particularly important evidence for the structure of the coinage is examined through die-links and surface reduction. Deterioration and/or renovation of the dies as observed from the coins allow the sequence of use to be established, the progression indicated by → in the following analyses. Stewart published four of the nine die chains/movements discussed here.[48] For the sake of clarity, discussion of each is divided

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[48] Die 2^{A} = Stewart 2; Die 10^{B} = Stewart 3; Die 20^{A} = Stewart 4; Die 30^{D} = Stewart 5. I. Stewart, 'Obverse die-links between Scottish mints', Appendix to 'Scottish Mints' in *Mints Dies and Currency*, ed. R.A.G. Carson (London: 1971), pp. 165–289, at pp. 275–89.

between 'Descriptive' and 'Analytical'. On occasion the evidence warrants discussion of some die-chains together and where this occurs it has been noted.

Die 1^{A}	Raul Der →	Roxburgh, Raul	
	8	**52**	

Descriptive: The coins of ✝:R:A:V:L:D:E:R: are the original die pairing and the obverse was subsequently used with Class B reverses of Raul at Roxburgh. Stewart observed that ✝:R:A:V:L:D:E:R: could either be read as Raul Der(lig) or as Raul de R(oxburgh) and suggested that since no mint is named on other colon reverses the former interpretation is preferable.[49] I concur with this assessment. If the interpretation of the reading is correct, this is the only known die-link between Raul Derlig and Raul of Roxburgh, but in classes A and B it is possible that these named moneyers are the same individual; in Class C they can be conclusively identified as separate individuals.

Analytical: The question this die-chain poses is whether Raul Derlig and Raul at Roxburgh should be regarded in this instance as the same individual.

Die 2^{A}	Willame →	Roxburgh, Raul →	Berwick, Willam
	9	**53, 54**	**13, 14**

Descriptive: The coins of the moneyer Willame are the original die pairing, with colons between the letters of the legend on both dies. The obverse was subsequently muled with Class B reverses of Raul at Roxburgh and reverses of Class C and E of Willam at Berwick.

Analytical: The progressive surface reduction of this die places the Berwick strikings last in the sequence and the die was probably used at the end of mint activity there, being muled with the only Class E reverse die of Berwick. This is the only A/E mule known and by the time it was used the obverse die was in a terrible state. The coins of Class C of Willam of Berwick form a distinct group unlinked to the rest of the coinage. It is highly probable that the moneyer Willame in Class A is the same individual as Willam of Berwick. It cannot be

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[49] Stewart, 'Scottish mints', p. 199.

inferred, however, that the Class A coins were themselves minted at Berwick, because the die was subsequently used with Class B reverses of Raul at Roxburgh. Therefore, it is plausible that Class C was the first class of coins to be minted at Berwick.

Die 10^{B}	Dunfermline, Raul → **22**	Edinburgh, Adam → **24**	Roxburgh, Raul → **62, 64, 63, 68c**	Edinburgh, Adam → **23**	Roxburgh, Raul **68b**

Descriptive: This die-chain was given as the example in Lord Stewartby's important paper on surface reduction, but the chain is expanded here to include important extra movements. Moreover, the development in the die-chain has led to the surmise that the movement of reverse dies may go a long way to resolving this puzzling die-chain.

The single known sterling reading +RAVL:ON·DVN was first published by Stewart in 1955, remains the only die-combination for this mint, and was the first striking from this obverse die.[50] These factors indicate that the Dunfermline reverse is the true class associated with it, Class B.

The most prolific use of die 10^{B} occurred in combination with reverses of Raul of Roxburgh, preserved by surface reduction, muled with Class C reverses. The obverse die also occurs with two different die combinations with reverses of Adam of Edinburgh. Lord Stewartby recorded the B/C mule (**23**); the B/D mule (**24**) was discovered during the course of this thesis and is illustrated as Figure 5.2. Interestingly, from observing the degree of surface reduction to the obverse die, it is possible to conclude that the B/D mule was struck before the B/C mule.

Analytical: Class B/C mules of Roxburgh are only known from obverse 10^{B} which came from Dunfermline. It is probable that the moneyer Raul at Dunfermline is the same individual as either Raul at Roxburgh or Raul Derlig and he physically transferred from Dunfermline to Roxburgh. The obverse is only known to have been used with a Class B reverse at Dunfermline.

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[50] B.H.I.H. Stewart, 'Some unpublished Scottish coins: II', *NC*[6] 15 (1955), pp. 11–20, at p. 12

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Figure 5.2. Crescents sterling B/D mule (**24**): Obverse 10^{B} and Class D reverse of Adam of Edinburgh. (Image reproduced by kind permission of York Coins Inc.)

Negative evidence in this case is compelling. Neither Roxburgh reverse dies of Class B nor obverse dies of Class B are found muled with dies of Class C, indicating that these were not extant in the period of Class C. The survival of die 10^{B}, achieved with the aid of surface reduction, is anomalous. Moreover, the B/C mules involving die 10^{B} (**62–68**) have created the impression of continuous mint activity at Roxburgh, but there is a clear break between the coins of Class B and Class C at Roxburgh, once the intrusion of this die from Dunfermline is recognised. This is particularly clear from examining the chart index of dies, Figure 10.7.

The obverse die chain presented here is expanded from that published by Stewart and is now rather bizarre. The implication is that the obverse dies moved between Roxburgh and Edinburgh twice. For the reasons explained, obverse die 10^{B} certainly moved once, from Dunfermline to Roxburgh. The die-chain is also explicable by postulating the movement of reverse dies of Adam of Edinburgh *to* Roxburgh. If the movement of reverse dies can be countenanced, the structure of the coinage becomes more interesting and perplexing.

The only two B/C mules at Edinburgh are known from this die (**23–24**). Other Class C obverses used at Roxburgh are known to have been used with Edinburgh reverses, but these

are found muled with Class D reverses, indicating late use of the die with Edinburgh mint-signed reverses.

THE FOLLOWING THREE DIE-CHAINS ARE DEALT WITH TOGETHER

Die 11^{C}	Berwick, Adam → **10**	Raul Derlig → **129–32**	Raul Derlig Roxburgh **127**
Die 25^{C}	Raul Derlig → **133**	Raul Derlig Berwick **12**	
Die 26^{C}	Raul Derlig → **134–137**	Raul Derlig Berwick **11**	

Descriptive: The first strikings from the obverse 11^{C} are those of Adam at Berwick, which was subsequently used by Raul Derlig without mint name and Raul Derlig at Roxburgh. Obverse 25^{C} is used in combination with a two reverses of Raul Derlig, one naming Berwick (**12**) and one without mint name (**133**). Obverse 11^{C} was first used by Adam of Berwick (**10**) and was subsequently used with a reverse die of Raul Derlig naming Roxburgh (**127**) and others of Raul Derlig without mint name (**129–132**).

Analytical: Die-link evidence for the activities of Raul Derlig is highly equivocal. A majority of the reverse dies of Raul Derlig do not have a mint name, although two burghs are named. All die combinations of Raul Derlig in Class C have been organised together in one chart index of dies (Fig 10.5). From the chart index of dies it is clear that Raul Derlig's dies form a coherent whole and are only linked to one other moneyer, Adam of Berwick by obverse 11^{C}, and from the apparent surface reduction Raul Derlig clearly inherited the die. The absence of any link with the huge number of dies of Raul of Roxburgh is conspicuous. One must conclude that Raul Derlig's operation was independent and that he is a different individual from Raul of Roxburgh, and dissent from the view of Burns.

Similarly, Burns tentatively proffered the view that the moneyer Adam of Edinburgh was the same man as Adam of Berwick.[51] Stewart followed Burns and suggested that Adam

[51] Burns, *Coinage*, vol. 1, p. 52.

moved from Berwick to Edinburgh.[52] Blanchard's view is confused and unsustainable; he writes 'the death of Willame caused Adam to be transferred to Berwick leaving Hue at Edinburgh'.[53] There is no evidence for the lives of moneyers, let alone their deaths, and the analytical evidence from the coins in no way supports this view. However, if the moneyer Adam of Edinburgh was Adam son of Serlo, as Barrow has suggested, the admittedly meagre evidence suggests that the moneyer came from a burgess family in that burgh.[54] Raul Derlig's 'inheritance' of obverse 11^{C} and the absence of Edinburgh–Berwick die-links does not lend support to a transference of the moneyer Adam, when we know dies did move between mints. There is a temptation for conjecturing that there was a single moneyer Adam and that he moved, as this would aid understanding of the opening of the Edinburgh mint in Class C.

Returning to Raul Derlig, interpretation of mint activity is affected by in how many mint places one assumes Raul Derlig to have been operating. Either the coins without mint name were minted at Roxburgh or Berwick, or the dies with mint signatures are specifically to denote mint activity away from a primary (unnamed) mint. As already discussed the reverse legend that ends FL could perhaps be an abbreviation of *Flandrensi* (§5.3.2).

It is somewhat surprising that the coins of Raul Derlig at Berwick are not from obverse 11^{C}, previously used by Adam of Berwick, but from obverses 25^{C} and 26^{C}. Moreover, obverse 26^{C} was also used with a Raul Derlig at Roxburgh reverse ($RRD2^{C}$); obverse 25^{C} was also used with a Raul Derlig without mint name reverse ($RD5^{C}$) which links with obverse 11^{C}. The discovery of die-combination **12** in the Royal Mint Museum during preparation of the corpus is important, because it establishes that two obverse dies were used with the single known Raul Derlig at Berwick reverse.

Overall the die-link evidence must be regarded as complex and contradictory. It is highly probable that movements of dies have created the indeterminacy in the evidence. From the die-link evidence alone it is extremely difficult to interpret the pattern of activity and state

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[52] Stewart, 'Scottish Mints', p. 200.
[53] Blanchard, *Mining, Metallurgy and Minting*, p. 662.
[54] See §5.3.1 above.

with any certainty where the coins without mint name were produced. Nevertheless, metallurgical analysis can be shown to further our understanding of the activities of Raul Derlig. While it does not specifically solve the question of where his coins were struck, it goes a long way to aid our understanding of his activity.

Figure 5.3 is a matrix plot of two of the significant minor elements, gold and bismuth (in order to compare Scottish and English coins, gold content must be expressed as Au per 100 parts Ag, see §5.3.2). Unsurprisingly, two coins of Raul Derlig without mint name, one of Class A (**8a**) and one of Class C (**135a**), fall adjacent to the logarithmic trendline of Berwick, Edinburgh and Roxburgh. Evidence discussed concerning Die 1^{A} (above) indicated that die combination **8** was produced at Roxburgh, and the EPMA data does not conflict with this conclusion. One Class C sterling of Raul Derlig without mint name (**128a**) could be associated with either trendline. It should be noted, however, that both coins **128a** and **135a** are struck from obverse die 26^{C}, a reason for associating the coins. The most interesting feature is that the coin of Raul Derlig Berwick (**11a**), which is also struck from obverse die 26^{C}, clearly belongs to the logarithmic trendline of Carlisle and Newcastle. The mints of Carlisle and Newcastle are associated with the 'mine of Carlisle' and the elemental signature of coins is gold below 0.15% and bismuth below 0.40%. The analogous levels of gold and bismuth in coin **11a** indicate that Raul Derlig received ore or bullion from the mines in England. Coin **132a** from obverse die 11^{C} does not fit with any trendline. Crescents coins are characterised by low levels of bismuth below 0.3%, but this coin has a bismuth content in excess of 0.55%. This figure could be expressing some incorporation of silver from the Oriental world, however ancient. Silver with low-level bismuth cannot derive from an original high-bismuth source, because a 'floor' level exists below which bismuth cannot be removed by cupellation.[55]

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[55] H. McKerrell and R.B.K. Stevenson, 'Some analyses of Anglo-Saxon and associated Oriental coinage', in *Methods in Chemical and Metallurgical Investigation of Ancient Coinage*, ed. E. T. Hall and D. M. Metcalf (1972), pp. 195–209 at p. 198. The same conclusion was reached independently by E. Pernicka and H.-G. Bachmann, 'Archäometallurgische Untersuchungen zur antiken Silbergewinnung in Laurion III: Das Verhalten einiger Spurenelemente beim Abtreiben des Bleis', *Erzmetall* 36 (1983), pp. 592–6. I am grateful to Professor Pernika for his thoughts on Bismuth.

Prima facie some of Raul Derlig's coins adhere to the standard logarithmic trendline of mints of southern Scotland, but others do not. The disparity in the alloys is clearly caused by the use of bullion or ore that expresses different characteristics, hence ultimately from different sources. What this means for the activities of Raul Derlig is problematic, but some tentative conclusions may be stated. Raul Derlig may have been coining (possibly at Berwick) from metal imported from mines in England. Raul Derlig appears to have been involved in minting from bullion with a typical southern Scotland profile (possibly at Roxburgh). Some minting by Raul Derlig involved silver without a typically English or Scottish profile, which probably had some oriental origin, however ancient.

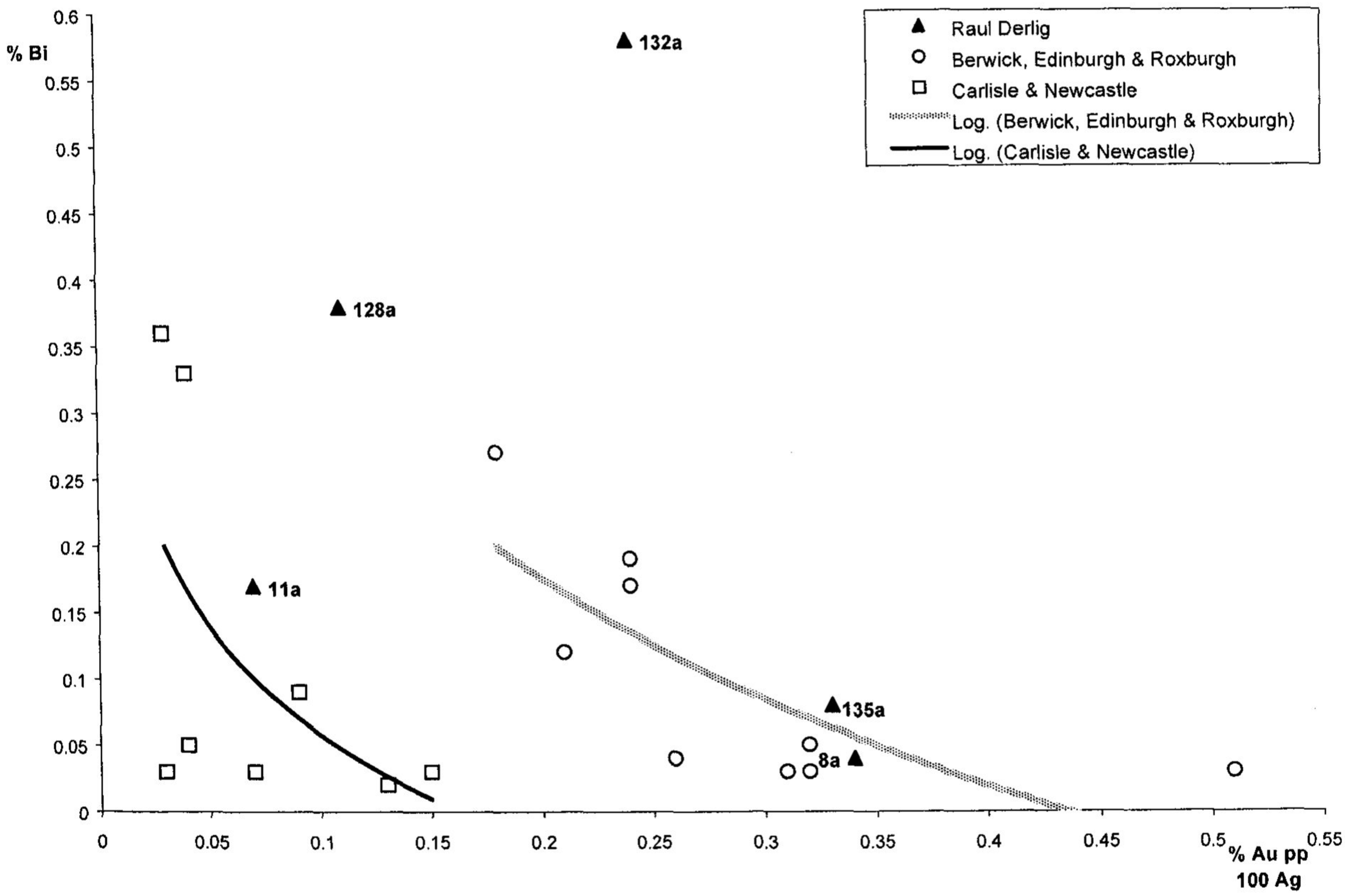


Figure 5.3. Matrix plot of Au pp 100 Ag content to Bi content, showing coins of Raul Derlig in relation to logarithmic trendline of Berwick, Edinburgh and Roxburgh and logarithmic trendline of Carlisle and Newcastle. The coins of Raul Derlig are labelled with their catalogue numbers and these are referred to in the text.

Raul Derlig is the most interesting moneyer of the Crescents coinage precisely because his coins have left us with a complex web of die-link and intrinsic evidence. The variation in the

alloy of his coins is valuable, particularly owing to the failure of die-link evidence to explain his activities. I am confident that the true pattern of minting by Raul Derlig will only be elucidated if a substantial number of extant coins are subjected to EPMA.

THE FOLLOWING FOUR DIE-CHAINS ARE DEALT WITH TOGETHER

Die 20^{C}	Edinburgh, Adam → **28**	Roxburgh, Raul **82, 83**	
Die 19^{C}	Roxburgh, Raul → **81**	Edinburgh, Adam **32**	
Die 24^{C}	Roxburgh, Raul → **88, 89**	Edinburgh, Adam **31**	
Die 30^{D}	Edinburgh, Hue → **33**	Edinburgh, Adam → **30, 29**	Roxburgh, Raul **98**

Descriptive: The four die-chains demonstrate that Raul of Roxburgh and the moneyers of Edinburgh are connected. The clearest deterioration is die 30^{D} that received extensive use at both Edinburgh and Roxburgh. From the numerous extant specimens, it appears that the strikings by Hue of Edinburgh (**33**) are the earliest, then it passed to Adam and was latterly use by Raul of Roxburgh. The extant specimens of the other dies are few, but from the condition of the dies it appears certain that Raul of Roxburgh first used both dies 19^{C} and 24^{C} before they were employed by Adam of Edinburgh, while specimens of die 20^{C} indicate the opposite scenario.

Analytical: These four die chains indicate that obverse dies passed between Roxburgh and Edinburgh in both directions. However, it is substantially more difficult to establish the nature of the connection between the places of mintage, especially if the movement of reverse dies has confounded the picture.

Beginning from first principles, the four die chains must result from some movement of dies (whether obverse, reverse or both); the movements could not have occurred by accident. Therefore, one may detect an intention to achieve a purpose. Consequently, these die chains

can be examined according to the three re-formulated propositions of Dakers for die movements (cf. §5.4.1).

The first proposition states that the opening or re-opening of a mint would occasion the transfer of dies already in use elsewhere. If minting of Crescents sterlings at Edinburgh began only after 1186, when William received Edinburgh castle as dower for Ermengarde de Beaumont, it is plausible that obverse dies were dispatched to Edinburgh from Roxburgh. The second proposition states that at cessation of minting activity in a given place, dies were sent to a mint in continued operation. The activity of the Edinburgh moneyers is slight compared with Roxburgh (cf. §5.5.2. below) and is only known for Classes C and D. If Edinburgh ceased activity then obverse dies could have been transferred to Roxburgh. The third proposition is the most complex and intangible: moneyers move between mints, taking dies with them. The first and second propositions may only be allowed to concern obverse dies, but in this third scenario the reverse dies, particularly connected with individual moneyers, would be moved (presumably with obverse dies as well). Combinations of the three propositions are possible, which would further conceal the precise nature of the die transits.

The four die chains warrant examination in the context of die 10^{B}, previously discussed. To recapitulate, it is certain that obverse die 10^{B} was first used at Dunfermline and was subsequently employed at Roxburgh. Whether die 10^{B} was ever present at Edinburgh is at least questionable. Therefore it is legitimate to question whether the conjectured die movements occurred by the movement of reverse dies.

The starting point must be die 30^{D}, which was used by both moneyers of Edinburgh, Hue and Adam – indubitable evidence that the die began at Edinburgh and was only subsequently used by Raul of Roxburgh. Therefore, in this case the obverse die certainly moved from Edinburgh to Roxburgh.

The indeterminacy of the evidence for obverse die transfers from Roxburgh to Edinburgh, when it is indubitable that opposite movement occurred in the case of die 30^{D}, makes it legitimate to ask whether Adam of Edinburgh transferred, with his dies, to Roxburgh. This would account for the die-chains involving 10^{B}, 19^{C}, 24^{C}, 20^{C}, 30^{D}. This is a tentative

hypothesis. Hopefully further specimens that exhibit die combinations as yet undiscovered will augment our knowledge and allow the die-chains to be satisfactorily explained. The die-chains reveal that, whatever actually occurred, Adam of Edinburgh and Raul of Roxburgh had a professional relationship. This fact is noteworthy because, as has been shown, Raul of Roxburgh did not have a relationship with Raul Derlig, who was at work at Roxburgh.

Die 1^P	Ailbode →	Perth, Folpolt
	1	**34–37**

Descriptive: Dies used at by moneyers at Perth are quite distinctive. Given any sample of the coinage, Perth mint coins are easily identifiable from the two stalks that extend from the pellets on the reverse. The dies are so distinctive that a separate source must be postulated, called the 'Perth die-cutting workshop' (PDW). It follows that the potential significance of the mint only striking coins with the cross potent sceptre-head must be disregarded: the die cutters never moved on to using cross pommée. The sterlings struck by Ailbode can be safely ascribed to Perth on two grounds, the basis of PDW style and the link to reverses of Folpolt at Perth.

Analytical: Burns regarded the initiation of minting at Perth as having occurred from the transference of Folpolt to Perth as reaction to the loss of Roxburgh to English domination in 1174. Burns stated that 'possibly Folpolt's sterlings without mint may have represented the earliest of his Perth issues'.[56] I do not concur with this view on two grounds. Firstly, Perth is now known to have been a place of mintage for sterlings of David I.[57] Secondly, Folpolt's sterlings without mint signature are Class B/A mules from regular dies, indeed the only coins of Folpolt not from PDW dies, and the obverses were not subsequently used. I assert that Folpolt began minting elsewhere and subsequently moved to Perth, where he used the Perth obverse die 1^P used by Ailbode. The dies used at Perth are illustrated as a chart index of dies (Figure 10.6) where die 1^P has been placed out of sequence, because although it appears to be

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[56] Burns, *Coinage*, vol. 1, p. 54.
[57] See below p. 200 and note 159.

the earliest die with the legend reading +WILLAME:REX it survived to be used by Folpolt at Perth.

5.4.4. Class E

As a whole Class E presents great difficulties, owing to the under-representation of the class in the extant material and the wretched dies and production to which extant coins attest. Consequently, Class E cannot be adequately elucidated from die-link evidence. Nevertheless, for once in the Crescents coinage hoard evidence comes to the rescue, justifying placing coins of Class E late in the coinage. Lord Stewartby has identified a parcel of coins in his possession as the content of a find made at Baddinsgill in 1832, with varieties of Crescents coins unknown to Burns.[58] The hoard contains an English Short Cross penny of Class 1b providing a *terminus post quem* of the 1180s. Although our present knowledge of Class E is poor, coins of this class constitute the majority of single finds. Hence, Class E is the last phase of the coinage, and further discussion is found in the context of single find evidence (§5.8, below).

5.4.5. Summary of structure

From the die-links discussed in the previous section it is possible to summarise the structure of the coinage found from observing surface reduction.

1. In Class A, Willam and Raul Der are to be safely identified with the moneyers Willam who coined at Berwick and Raul Derlig in Class C. Willam may have begun minting at Roxburgh in Class A and subsequently moved to Berwick.
2. Folpolt moved to Perth shortly after the beginning of the coinage.
3. The dies used by Folpolt at Perth come from a separate source, termed the Perth Die-cutting Workshop (PDW), from those used at other mints. The coins without mint name

[58] Lord Stewartby, 'The 1834 Baddinsgill find of Crescent sterlings', *NC* 165 (2005), pp. 223–5 and Pl. 27.

of the moneyer Ailbode were struck from dies from the same source, from which evidence we may infer that Ailbolde was a moneyer at Perth.

4. An obverse die (10^{B}) was transferred from the mint of Dunfermline to Roxburgh. The same obverse die was either subsequently transferred to Edinburgh or was used at Roxburgh with Edinburgh reverse dies.
5. Minting at Berwick may not have begun until Class C.
6. There was a break in minting at Roxburgh between Classes B and C.
7. Raul Derlig and Raul of Roxburgh are different individuals.
8. To some extent Raul Derlig's activities appear to have been directed to coining bullion from England. Such coins can be identified by a specifically Carlisle–Newcastle metallurgical signature. Metallurgical analysis suggests that Raul Derlig was also coining bullion that had an ultimately oriental origin.
9. Adam of Berwick is probably not the same individual as Adam of Edinburgh.

Perth constitutes a separate group within the coinage, owing its separate source of dies. The other named mints, Berwick, Dunfermline, Edinburgh and Roxburgh, are connected by die-chains. One obverse die (10^{B}) is used with reverse dies of three named mints. Raul of Roxburgh is by far the most prominent moneyer during the Crescents type and, as is to be expected, most of the die-links involve links between the dies of Raul of Roxburgh alone, or Raul linked with those of Edinburgh.

Classes A and B are closely associated by die-links, as are Classes C and D. Class E is underrepresented but is largely unlinked to any of the classes that preceded it. These groups of classes constitute the primary (A+B), secondary (C+D) and tertiary (E) phases of the Crescents coinage.

5.5 Die-Study: Statistical

5.5.1. Estimated number of dies

Providing an estimate for the number of dies used for a coinage is precursory to suggesting the potential volume of the coinage (dealt with in §5.9). The methodology employed here is that outlined in Chapter 1 (pp. 41–49). The construction of the Catalogue involved the location of all extant specimens in minor collections with the effect that in a majority of cases the number of die-duplicates has increased and singletons have been eliminated. In consequence the statistical view of the numbers of dies is much more balanced than would otherwise be the case.

The sample is sufficiently large to calculate an estimate of coverage (C_{est}) with the 95% confidence interval given by the final equation in §1.5.1 (p. 49), where it is also explained that coverage is between 0 and 1, with 1 representing completeness, and that C_{est} is an estimate of C which is unknown. It must be emphasised that coverage is a property of the *sample* of coins in the die-study not the *population*, which in this case would be the coin issue. The equation uses the four sets of data given under 'Total' in Table 5.2 for obverse and reverse dies separately. To two decimal places the estimate of coverage (C_{est}) for the obverse dies is 0.93, with a 95% confidence interval of 0.89–0.96; the coverage of the reverse dies is 0.90, with a 95% confidence interval of 0.86–0.95.[59] Therefore, we may confidently expect that given a new sample of coins, such as might appear with the discovery of a hoard, approximately 90% of the obverse and reverse dies observed in a new sample would be represented in the sample catalogued in this thesis.

Whole coinage (obverse dies: $n = 351$, $d = 73$, $d_1 = 26$, $d_2 = 9$; reverse dies: $n = 351$, $d = 118$, $d_1 = 34$, $d_2 = 14$)

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[59] To six decimal places the estimate of coverage (C_{est}) of the obverse dies is 0.925926; low endpoint of 95% confidence interval is 0.888966; high endpoint of 95% confidence interval is 0.962886. To six decimal places the estimate of coverage (C_{est}) of reverse dies is 0.903134; low endpoint of 95% confidence interval is 0.859476; the high endpoint of 95% confidence interval is 0.946792.

Table 5.2. Basic data from the Catalogue concerning obverse and reverse dies.

Class	*Coins (n)*	*Known Dies (d)*	*Singletons (d_1)*	*Dies that struck two coins (d_2)*	*Non-Singletons*
Obverse figures					
A	25	3	0	0	25
B	38	7	1	2	37
C	137	19	2	1	135
D	49	3	0	0	49
E	44	31	22	5	22
Perth	58	10	1	1	57
Total	351	73	26	9	——
Reverse figures					
A	15	5	0	2	15
B	29	7	1	1	28
C	173	48	4	7	169
D	30	8	1	0	29
E	46	33	24	3	22
Perth	58	17	4	1	54
Total	351	118	34	14	——

Table 5.3. Basic data from the Catalogue concerning reverse dies – breakdown by mint, classes A–D and Perth.

Class	*Mint*	*Coins (n)*	*Known Dies (d)*	*Singletons (d_1)*	*Non-Singletons*
A	Without mint name	15	5	0	15
B	Dunfermline	4	1	0	4
B	Roxburgh	25	9	1	24
C	Berwick	28	8	0	35
C	Edinburgh	33	5	1	32
C	Roxburgh	66	20	0	66
C	Raul Derlig	44	13	1	43
C	Walter Bueter	2	1	0	2
D	Edinburgh	7	2	0	7
D	Roxburgh	23	6	1	22
—	Perth	58	17	4	54

Notes on arrangement of data in Table 5.2:

- Perth is all coins struck from PDW dies, thus numbers include coins of Ailbode without mint name.
- Raul Derlig is all coins of this moneyer whether with mint signature for Berwick or Roxburgh or without mint name. Mint signed coins of Raul Derlig are excluded from totals for those mints accordingly.
- Consequently, Class C of Berwick is all coins of the moneyers Adam and Willam; Class C of Roxburgh is all coins of Raul of Roxburgh.

Table 5.4. Comparison of the actual dies in the catalogue with the estimated numbers of obverse dies, together with the high and low endpoints of the 95% confidence interval of the point estimate.

Class	*Number of dies in Catalogue*	*Low endpoint of 95% Confidence Interval*	*Point estimate of number of dies*	*High endpoint of 95% Confidence Interval*
Obverse Dies				
A	3	2	3	4
B	7	6	8	9
C	19	18	20	22
D	3	3	3	3
E	31	49	84	148
Perth	10	9	11	13
Total	73	86	93	100
Reverse Dies				
A	5	3	5	8
B	7	8	11	15
C	48	46	51	58
D	8	7	9	12
E	33	55	94	167
Perth	17	16	20	25
Total	118	135	149	165

Table 5.5. Comparison of the actual dies in the catalogue with the estimated numbers of reverse dies (breakdown by mint, classes A–D and Perth) together with the high and low endpoints of the 95% confidence interval of the point estimate.

Class	*Mint*	*Number of dies in Catalogue*	*Low endpoint of 95% Confidence Interval*	*Point Estimate of number of dies*	*High endpoint of 95% Confidence Interval*
A	Without mint name	5	3	5	8
B	Dunfermline	1	1	1	2
B	Roxburgh	9	7	10	14
C	Berwick	8	6	8	11
C	Edinburgh	5	5	6	7
C	Roxburgh	20	17	20	24
C	Raul Derlig	13	11	14	18
C	Walter Bueter	1	1	1	3
D	Edinburgh	2	1	2	3
D	Roxburgh	6	5	7	9
—	Perth	17	16	20	25

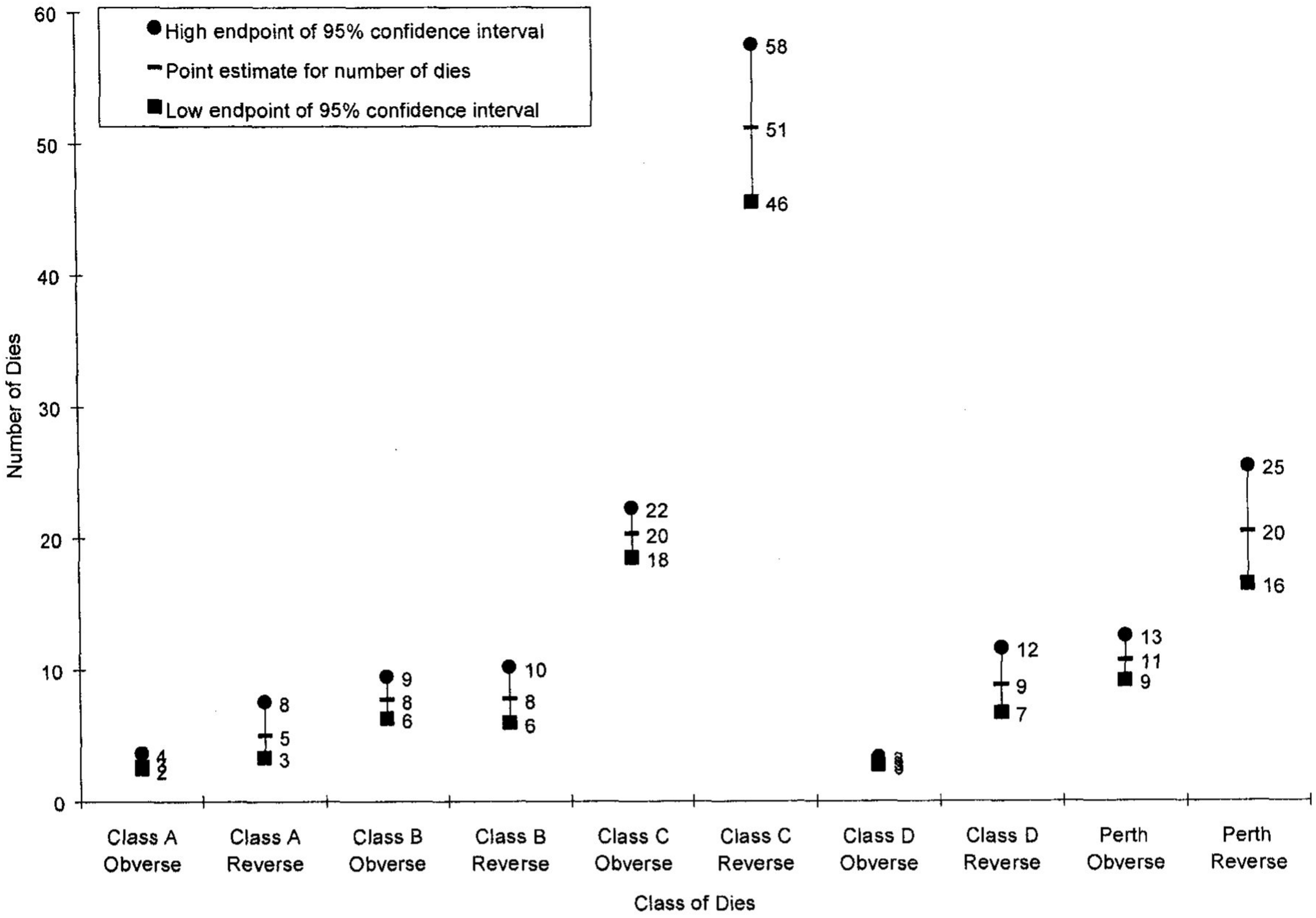


Figure 5.4. Obverse and Reverse dies: results of the point estimates for the number for each class with the respective high and low end points of the 95% confidence interval (Class E excluded).

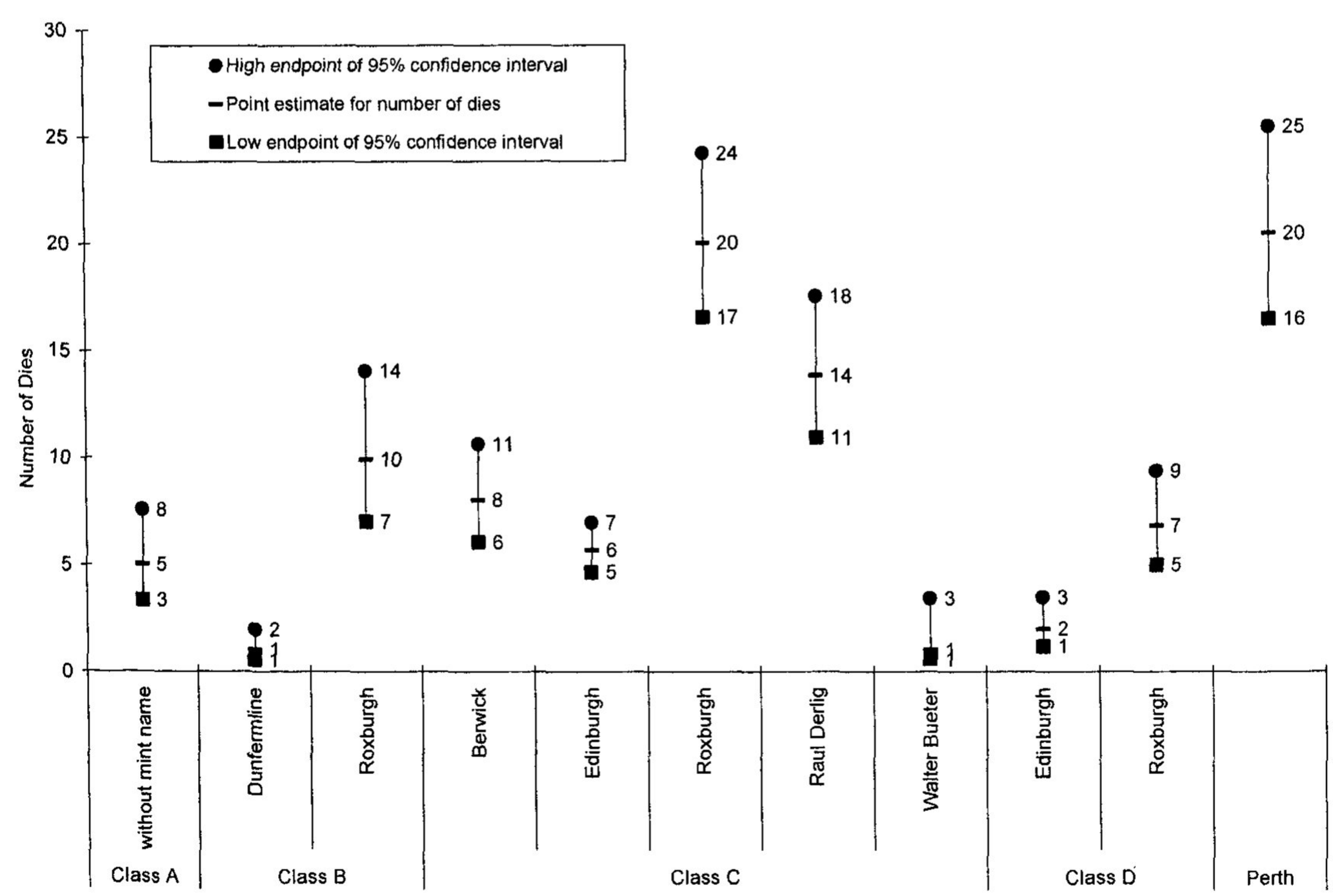


Figure 5.5. Reverse dies: results of the point estimates for the number of dies arranged by class and mint with the respective high and low end points of the 95% confidence interval. (See 'notes on arrangement' beneath Table 5.3).

5.5.2. Discussion

The results of the point estimate of the number of dies and the 95% confidence interval are given in Tables 5.4 and 5.5. These results indicate that for all classes A, B, C, D and Perth the extant sample of the coinage is representative, and hence our knowledge of the coinage is very good. Figure 5.4 illustrates the results in Table 5.4 and Figure 5.5 illustrates the results in Table 5.5. The confidence intervals for Class E are thoroughly uninformative and so vague that one is forced to conclude that our understanding of the end of the coinage is limited by the lack of a suitable sample of the coinage. Nevertheless, the number of *known* dies is larger than from any other class and it is likely that coinage of Class E was substantial. Our knowledge of Class E will remain restricted until such time as a large hoard from the end of the coinage is found. The results for Class E have accordingly been excluded from Figure 5.4 and Figure 5.5. Along with Class E the greatest number of reverse dies occurs in Class C, which is interesting.

When dealing with an entire coinage struck at a number of mints, the data can be arranged in a manner that either gives class or mint primacy. Point estimates for the number of dies cannot be simply 'totalled up', but will necessarily be approximately similar. For example, the point estimate for reverse dies of Class B is 8, but when split between mints the estimate is 1 for Dunfermline and 10 for Roxburgh, an aggregate of 11 dies. It is worth emphasising that one estimate is no more *true* than another, but a different result generated by choice of data arrangement. However, comparison of the results generated by the different arrangements of data may be used as a control for detecting potential biases within the original sample.

Because of the movements of obverse dies between mints it would not be appropriate to deal with these on a mint-by-mint basis, owing to the problems of duplication. Reverse dies, however, do lend themselves to interpretation on a mint-by-mint basis. Even through it is theoretically possible for the dies to move (and the evidence is rather equivocal on whether they did), one must assume that all dies began at the place named on the die and that there was no deliberate intention to deceive. Moreover, examination and illustration of the numbers of reverse dies by mint and class (Figure 5.5) is useful in understanding relative mint activity

at different periods. In principle a mint would have no more dies than it actually needed, that is to say that there would have been no spare capacity. The exceptional breakage of a reverse die would cause the manufacture of a new one, so it is difficult to infer relative mint outputs. For all intents and purposes, coins of Raul Derlig have just claim to be regarded as products of a separate 'mint' – his activities were certainly a homogeneous, unlinked whole – and are treated as such for the statistical exercise.

It is possible to state some conclusions. The complexities of primary data allow different arrangements of it that usefully allow comparative assessment of accuracy. The ratio of estimated reverse dies of Roxburgh to Edinburgh in classes C and D is 4:1. The estimated reverse dies for Perth in total is equal to those of Roxburgh in Class C alone. The estimated reverse dies for Roxburgh Class C is double that of Class B.

5.6. Metrology

5.6.1 Empirical data

The number of well-preserved examples is sufficiently large to allow some tentative conclusions to be drawn as to the intended weight of Crescents sterlings. The weight distribution of the sterlings listed in the catalogue (cut coins are excluded) is illustrated by Figure 5.6. Approximately half of the sterlings are in the 1.44–1.48g range. Of the 150 sterlings in the range 1.43–1.66g, the mean weight is 1.48g with a standard deviation of only 0.077375. This evidence suggests the Crescents sterlings attained a standard weight of 1.48g or slightly heavier, but usually no more than 1.50g.

Some explanation is required for the treatment of the weight distribution. Owing to the high frequency of mules, for the purposes of weight distribution the latest class of die is regarded as the class of that coin. Cut coins and those obviously underweight owing to damage, clipping or excessive wear are excluded. The weights of such coins have been placed in square brackets in the corpus. Class E as whole is also excluded owing to the poor state of preserved examples.

5.6.2 Analysis of weight standard

To recapitulate, the empirical data from the corpus suggests that the mean weight was 1.48g with a standard deviation of 0.077375. Although there is a break in minting between classes B and C, one must conclude that resumption of minting with Class C brought no change in weight standard, as there are not two peaks on the graph and the sequences A–B and C–D are evenly spread. The cumulative data presented here demonstrates that there was one weight standard throughout classes A–D.

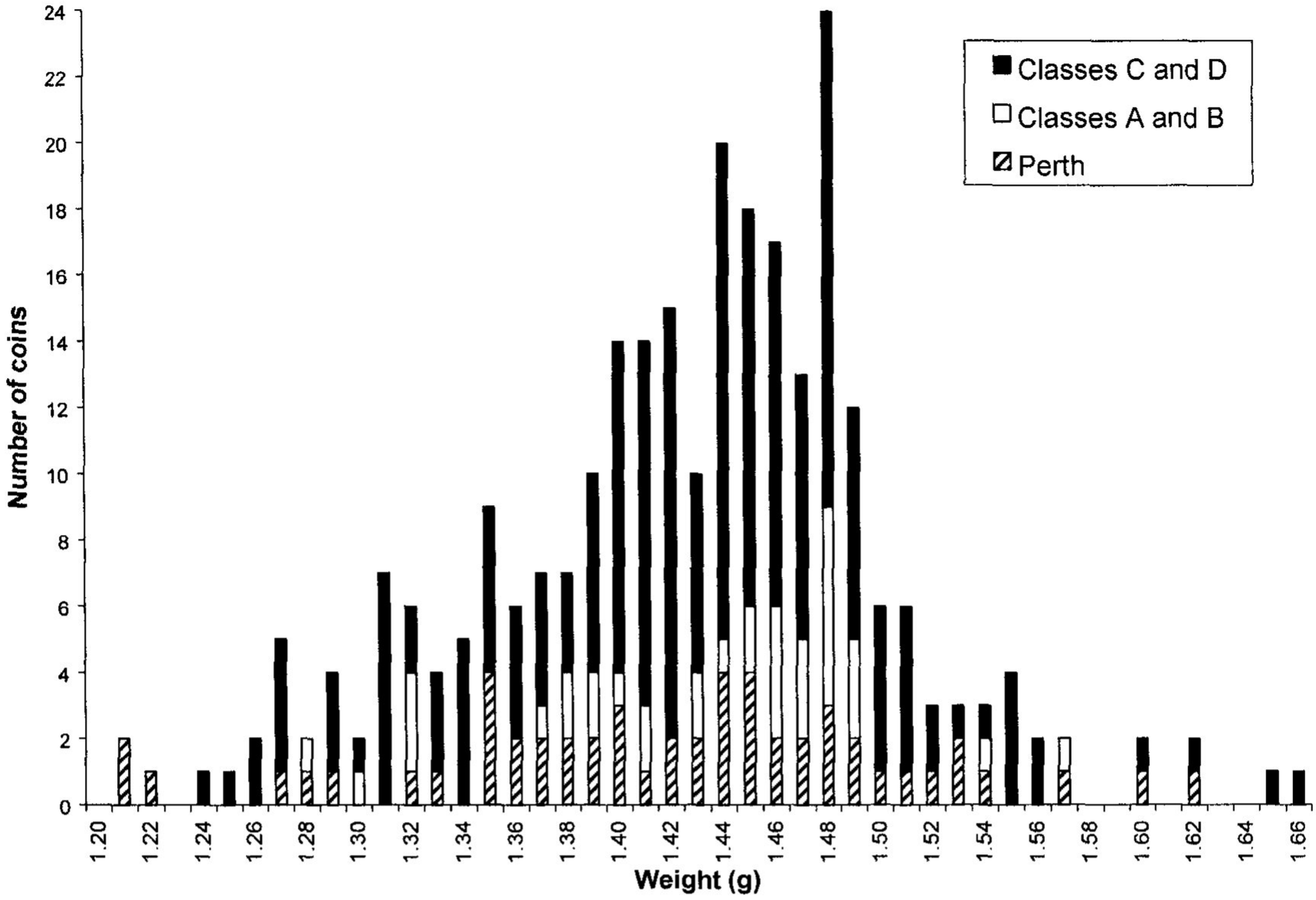


Figure 5.6. Weight distribution of Crescents sterlings in Catalogue, Classes A–D and Perth (273 coins).

The empirical data contradicts the assertions of Blanchard concerning changes in standard during the Crescents coinage. Blanchard regarded single specimens as indicative of consistent standards, an inappropriate methodology for medieval coinage. For example, from single specimens Blanchard states that 'when minting recommenced in 1189 [Roxburgh] produced distinctly light-weight coins'.[60] Blanchard's most fantastical assertion is that, although Hue of Edinburgh attempted to maintain 'his earlier standard', his coins were clipped owing to 'the high price of silver then current in the ports'.[61] In fact Hue of Edinburgh was only active once with one set of dies, none of his coins display any evidence of clipping, and there is no evidence for the price of silver in Scotland in the late twelfth century, let alone fluctuations.

However unacceptable, Blanchard's work serves to emphasise that the subject of weight-standards may only be approached with an expectation that a rigid standard could not be achieved in the twelfth century. Even today weighing extant coins to one-hundredth of a gram

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[60] Blanchard, *Mining, Metallurgy and Minting*, p. 660.
[61] Ibid., p. 662.

requires the use of precision scales. A more nuanced interpretation is to appreciate that coins attempted to encompass a particular weight range with an acceptable margin of error. The method employed in this thesis is to use the mean with standard deviation in order to suggest the tolerances within which coins may have been produced to the pound weight. How these tolerances were achieved raises questions. How were the coins produced? For what purpose was the standard intended and by whom? The production of the coins was necessarily carried out in workshops equipped for the task, but that the standards were achieved at places of mintage widely distributed indicates the design of central authority: the exchequer. The purpose of the coinage was primarily to satisfy the exchequer of account. The degree of control is to be explained by the unusual nature of the development of a coinage for Scotland, as a royal initiative during the reign of David I.

Analysis of metrology cannot be divorced from considerations of metallurgy, and this is particularly well illustrated from the Crescents sterlings. The conclusion from the empirical data is that the Crescents sterlings are heavier than English coins. Such a conclusion is, however, misleading because weight is but one of two aspects of the intrinsic content of coinage; the other aspect is fineness. Allen recently explored the weight standards of English coinage by comparing mean weights of coins in hoards, but without understanding the metallurgy of the issues.[62] The metallurgy of English and Scottish coins is dealt with fully in Chapter 5, principally from the point of view of bullion flows to and within Britain. Here it is salient to note certain aspects of metallurgy that have a direct bearing on the creation of an adequate understanding of metrology of both Scotland and England.

Without documentary evidence, the coins themselves are the sole repository of information. In order to know how many coins were produced from a weight of silver, one has to know what proportion of silver the coins themselves contain. Barrie Cook took the view that 'until the mid-fourteenth century Scottish issues usually matched English ones for weight and

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[62] M. Allen, 'The weight standard of the English coinage 1158-1279', *NC* 165 (2005), pp. 227–33. Allen's mean weight of 1.42g for the Cross and Crosslets coinage is accepted and used in the calculations which follow, along with 1.48g for the Crescents coinage.

fineness'.[63] The findings on the present study demonstrate that for the late twelfth century this assessment is erroneous.

Figure 5.7 and Figure 5.8 are matrix plots of weight with what mint technicians regarded as 'silver' (Ag + Au + Pb) for English and Scottish coins. Figure 5.8 clearly shows that English coins are clustered in ranges of 1.35–1.45g and 95–6% 'silver'. For Scottish coins (Figure 5.7) the picture is more ambiguous, primarily owing to the smaller number of coins subjected to EPMA. Coins of Edinburgh achieve 95% 'silver'. Coins of mints other than Edinburgh appear to be clustered in ranges of 1.45–1.50g and 92–4% 'silver'.

The difference between Scottish and English may appear slight on the basis of individual coins, but is clear when large sums are accounted for *numero* or blanched. For example the sum of £10 in English coin would have weighed 3408g at a mean of 1.42g per coin, but at 95% fine the aggregate would have contained 3237g 'silver'; in Scottish coin the same sum would have weighed 3552g at mean of 1.48g per coin but the aggregate would have contained 3268g 'silver' at 92% fine. The empirical results from EPMA do not show this theory conclusively. However, it can be stated definitely that the intrinsic content of Scottish Crescent coins was different from that of English Cross and Crosslets coins. Future analyses could now be directed to follow up the work of the analyses presented here.

Even if the Crescents coinage did *not* have parity with its English counterpart in intrinsic value (weight and metal content), the Scottish coins were certainly heavier but baser. Why should this different have occurred?

The difference can be usefully examined by reassessment the so-called assize of David I.[64] Burns assumed that the ounce of David I was the same as the tower ounce of 450 grains.[65] However, the divisions of the pound of David are borrowed from a revised late Anglo-Saxon weight standard. Stewart Lyon has convincingly argued that the pound weight of David I of 15 ounces and 300 sterlingweights was influenced by Æthelred II's English pound of fifteen

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[63] B. Cook, 'Foreign coins in medieval England', in *Local Coins, Foreign Coins: Italy and Europe 11th–15th Centuries*, ed. L. Travaini (Milan: 1999), pp. 231–84, at p. 240.
[64] *Acts of the Parliaments of Scotland*, ed. T. Thomsen and C. Innes, I (Edinburgh: 1814), 673–4.
[65] Burns, *Coinage*, vol. 1, p. 4.

oras. An English ora was originally divided into 16 heavy pennyweights, but was re-divided after the Norman Conquest into 20 lighter sterlingweights.[66]

Lyon has hypothesised that 'the heavy pennyweight of Æthelred II's time would have equalled 1¼ sterlingweights, equivalent to thirty Tower grains, forty wheat grains, or 28½ grains troy'.[67] The lighter sterlingweight introduced after the Conquest may be expressed as equally two-fifths of the heavy pennyweight of Æthelred II's time, equivalent to 24 Tower grains or 32 wheat grains. A Scottish pound of 15 ounces contained 9,600 wheat grains or 300 sterlingweights. It is plausible that moneyers of twelfth-century Scotland reckoned to produce 25 shillings from the equivalent aggregate weighing one pound of 15 ounces, with each individual coin aiming to achieve 32 wheat grains.

The assize of David I indicates that the Scottish coinage employed weight standards derived from England, but empirical data of the weights of extant coins indicate that the Scottish coinage was distanced from English standards to a degree hitherto unappreciated. Scottish sterlings are certainly heavier and baser than English pennies. Whether Scottish moneyers intended Scottish coins to have an intrinsic parity must be left undecided. However that may be, it appears that Scottish moneyers aimed to maintain the Scottish sterling at or close to sterlingweight of 32 wheat grains – simply, the expectation that a sterling should weigh a sterlingweight. The mean weight of Crescents sterlings is 1.48g, which is almost the sterlingweight of 32 wheat grains (1.55g), a weight that some of the coins certainly do achieve or exceed.

E. Gemmill and N. J. Mayhew had expressed scepticism both concerning the supposed antiquity of the assize of David I and that the Scottish coinage ever achieved a sterlingweight standard.[68] The empirical evidence of the Crescents coins indicates that the coinage did aim to achieve such a standard in the late twelfth century and, therefore, vouches for the assize

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[66] S. Lyon, 'Silver weight and minted weight in England *c.*1000–1320, with a discussion of Domesday terminology, Edwardian farthings and the origin of English Troy', *BNJ* 76 (2006), pp. 227–241, at p. 236 and 239–40.
[67] *Ibid.*, p. 236.
[68] E. Gemmill and N. J. Mayhew, *Changing Values in Medieval Scotland* (Cambridge: 1995), pp. 114–5, note 113.

dating from the reign of David I. Moreover, Gemmill and Mayhew regarded the assize and testimony to a troy standard because 32 wheat grains corresponds with a troy pennyweight of 24 barley grains.[69] The assize itself, however, does not mention barley grains of troy weights, and in the light of Stewart Lyon's work it is unnecessary to impose an alien standard on what was clearly a monetary system adapted from an English system that can be traced back to late Anglo-Saxon standards.

In large sums the discrepancy between the face value and intrinsic value of Scottish coinage would have been all too apparent. Such discrepancies lead one to suppose that the Scottish exchequer accepted payment *numero* tested by weight (*ad pensum*), but did not subject payments to blanching. From the intrinsic content of the sterlings, the discrepancy between *numero* and blanched payments would be exorbitant, creating a shortfall substantially greater than that demanded by the English exchequer from its sheriffs. Secondly, the *Dialogus* states that the farms of Cumberland and Northumberland were paid *numero* in any available coins, provided 'they were silver and of good weight' (*argentei essent et ponderi legitimo*).[70] From the Pipe Rolls, it is demonstrated that from 1156 all shire farms were accounted for blanch except the two northern counties which are accounted for *numero* throughout Henry II's reign.[71] Clearly, in a region where Scottish coinage was expected to contribute to the currency, it would have been unfair to subject farms to blanching. Thus, the passage in the *Dialogus* may imply an awareness at the English exchequer that Scottish coinage adhered to a different standard. It is possible that Scottish sterlings were produced at a heavier weight to encourage the acceptance of them in England, where they would soon have been eliminated from the circulating medium.

The difference between the Crescents and Cross and Crosslets coinages emphasises that a degree of monetary sophistication, hitherto unappreciated, existed in the moneyers' workshops. Nevertheless, the evidence implies that in practice the elaborate intrinsic standard

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[69] E. Gemmill and N. J. Mayhew, *Changing Values in Medieval Scotland* (Cambridge: 1995), p. 114.
[70] *Dialogus*, p. 9 and p. 43.
[71] White, *Restoration and Reform*, p. 147.

for the coinage was found wanting. As will be shown (below, §5.8), the absence of finds of Crescents from England is conspicuous, implying that the coins did not circulate there.

The policy of aligning the overall standard of Scottish coinage with that of England but based on different weight and fineness ultimately failed. Through the recoinage of 1195 the weight standard of Scottish coins was aligned with England.[72] Probably metallurgical examination of the Short Cross and Stars coinage would demonstrate that the 'silver' content was raised and aligned too.[73] If this hypothesis is confirmed it is reasonable to contemplate an exchequer reform in 1195, accompanying the recoinage of 1195, at which a system of blanch payments was instituted as the previous discrepancy between weight and intrinsic content would be largely eliminated. Certainly other important administrative reforms occurred in 1195 with the introduction of dating by day of the month in royal acts and, by implication, the retention of rolls of acts issued under the king's seal.[74] Against this must be placed the continuation of payments *numero* from the northern counties beyond the middle of the thirteenth century.

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[72] There is no definitive data, but the majority of the coins published in *SCBI* 35 (Oxford/Glasgow) weigh less than the mean weight of the Crescents coinage.

[73] Using XRF, which is not as dependable as EPMA, D. M. Metcalf found that the standard of Scottish coinage was improved to 94–95% 'silver' (Ag + Au + Pb) in Short Cross and Stars coinage from 93–94.5% in Crescents coinage; 'The quality of Scottish sterling silver 1136–1280', *CIMS*, pp. 73–84 at p. 79–80.

[74] *RRS* II (William I), p. 82.

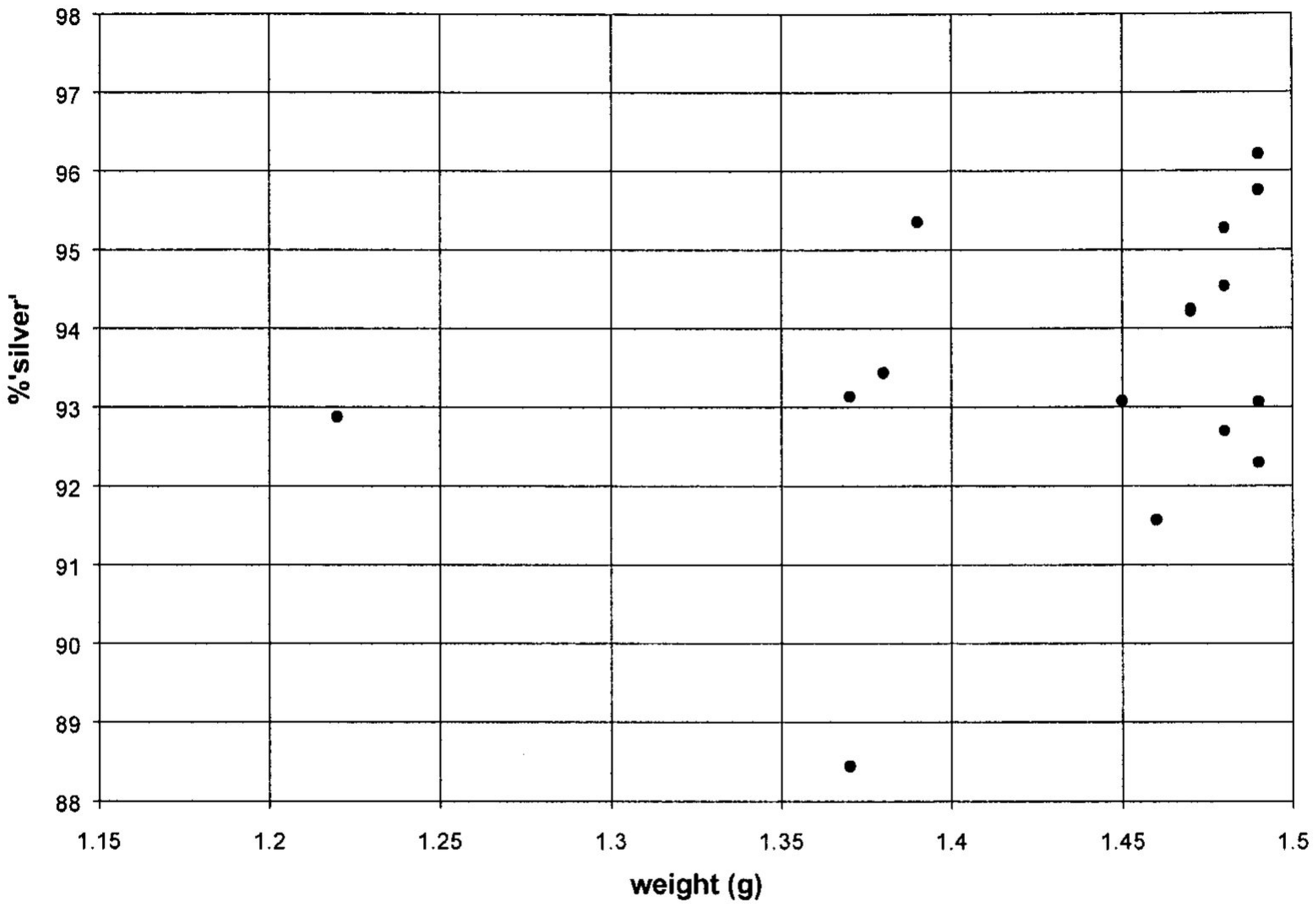


Figure 5.7. Matrix plot of 'silver' (Ag + Au + Pb) and weight of Crescents sterlings of Scotland. (one excessively base coin excluded).

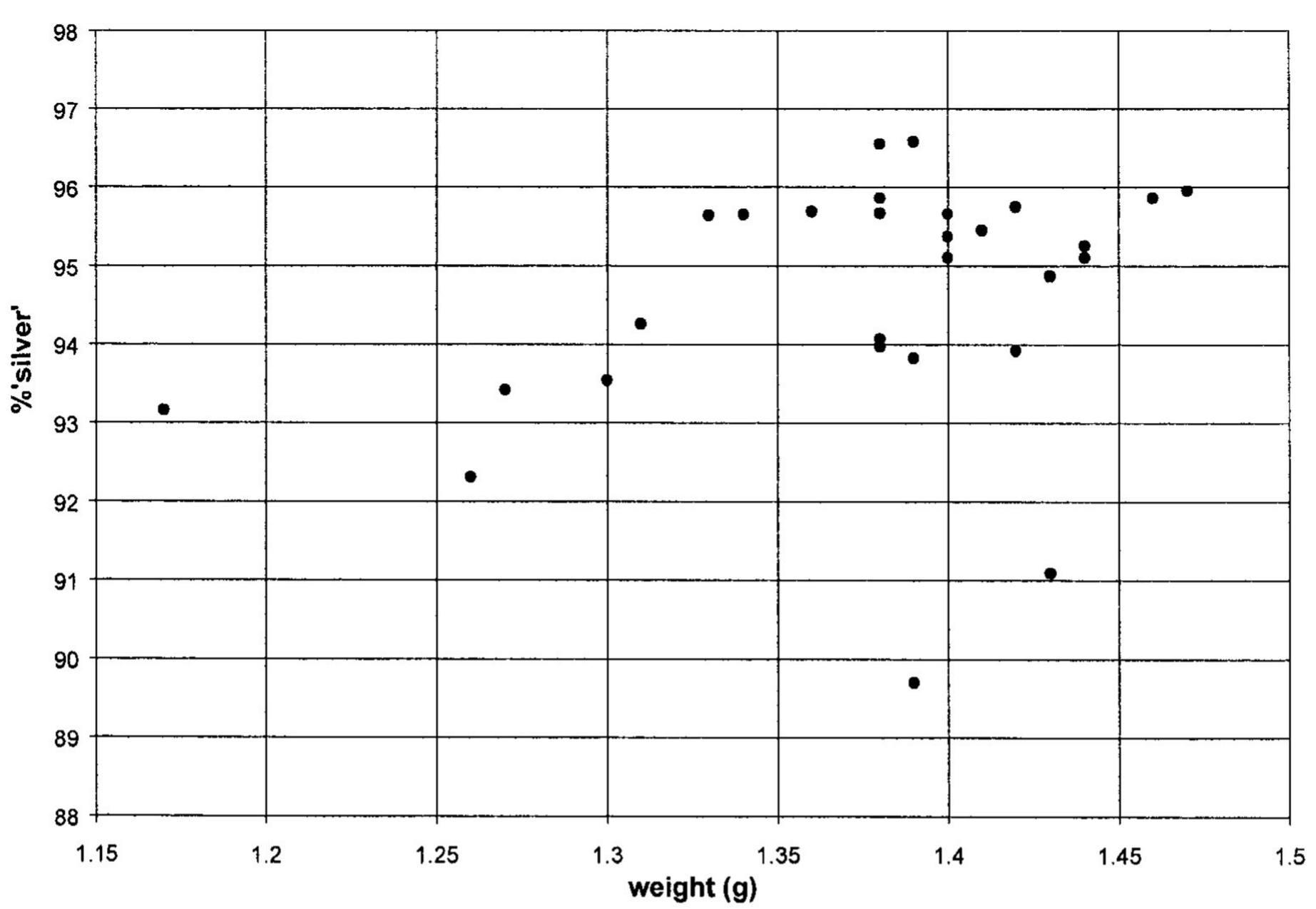


Figure 5.8. Matrix plot of 'silver' (Ag + Au + Pb) and weight of Cross and Crosslets pennies of England.

5.7. Hoards

Analytical work on the structure of coinages has often been facilitated by the content of hoards. For the Crescents coinage, however, hoard evidence is slight. The majority of the surviving material undoubtedly comes from the Dyke hoard, which was found too early to have been systematically recorded.

The scattered references concerning hoards of certain, possible or discredited content are collated here. The aim is a rounded view of the circumstances of discovery, the context and numismatic content of each find. Particular specimens listed in the Catalogue with a certain provenance are noted.

Isle of Man, before 1769

Thomas Snelling first described this hoard, which he regarded as consisting of coins struck by Norwegian kings of Man.[75] Stewart has elucidated the true character of the deposit.[76] The single Crescents sterling provides a *terminus post quem* for the hoard, which, from the line-drawings published by Snelling, is known to have contained five earlier Scottish types and an Awbridge type penny (*BMC* type VII) of King Stephen of England.

Dyke, Morayshire, 1780

The vast majority of extant Crescents sterlings undoubtedly come from this substantial hoard that was found by workmen digging the foundations for a new church at Dyke in 1780.[77] According to Cardonnel, the workmen were exclusively interested in the coins as bullion and consequently melted down a large proportion of the hoard.[78] The discovery soon came to the attention of James Brodie of Brodie who reclaimed the remainder and deposited ninety-eight

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[75] T. Snelling, *View of the Coins Struck in the Isle of Mann* (London: 1769), pp. 40–41.
[76] I. Stewart, 'An eighteen century Manx find of early Scottish sterlings', *BNJ* 33 (1964), pp. 48–56.
[77] NMRS: NH95NE 1. *Inventory*, no. 150 (and no. 273 (duplication)). D.M. Metcalf, 'An annotated bibliography of Scottish coin hoards, *c.*1100-1600', *CIMS*, pp. 22-54, no. 7.
[78] A. de Cardonnel, *Numismata Scotiae* (Edinburgh: 1786), p. 3 and Plate 1, 1–15.

coins with The Society of Antiquaries of Scotland.[79] John Grant recorded that that the hoard was contained in 'an earthen wear pot' and also contained coins of Henry II.[80] John Lindsay wrote that the hoard 'chiefly consisted of coins of William the Lion'.[81] There is no indication as to whether the coins of Henry II were Cross and Crosslets coins or Short Cross coins, or both.

The first references to the hoard predate Cardonnel and appear in *The Gentleman's Magazine* as correspondence written by 'G.P.' in Edinburgh in 1783 and 1784, and accompanied by line drawings of coins. 'G.P.' can be identified as Mr. George Paton, who donated a Crescents sterling to the Society of Antiquaries in February 1782, mistakenly believing it to be a coin struck by an English king in Normandy.[82] Evidently, Paton realised soon after this donation the true identity of the coin. In his letters Paton's object was to combat scepticism that the coins were Scottish. In his first letter he correctly identified Roxburgh as a mint;[83] in the second he identified Perth, proving the coins to be Scottish.[84]

Dyke is now a small village, but in the twelfth century it was a place of great importance as a thanage. It has been suggested that the thanages represent the establishment of a royal presence long before 1130. It is evident that the site at which the coins were concealed was very ancient by the late twelfth century. Besides the hoard a Class 2 Early Christian Monument was unearthed on the site; this now stands in the grounds of Brodie Castle and is known as Rodney's Stone.[85] The evidence for the distribution of the thanages of Moray, in the lower Spey and Findhorn valleys, suggests that they first ringed comital lands.[86] The comital

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[79] *Archaeologia Scotica* 3 (1831), Appendix, list II, p. 33.
[80] J. Dunbar, 'Parish of Dyke, including the annexed parish of Moy', in J. Grant, *A Survey of the Province of Moray: Historical, Geographical, and Political* (Aberdeen: 1798), pp. 179–80. The description published by Grant was copied verbatim into J. Sinclair, *The Statistical Account of Scotland, Drawn up from the Communications of the Ministers of the Different Parishes*, vol. 20 (1799), pp. 224–5.
[81] J. Lindsay, *A View of Scottish Coinage* (Cork: 1845), p. 261.
[82] Burns, *Coinage*, vol 1, p. 49.
[83] *The Gentleman's Magazine*, 53 (1783), p. 728 (September) and plate facing p. 760.
[84] Ibid., 54 (1784), p. 258 (March) and plate facing p. 257.
[85] NMRS no. N95NE 3. J.R. Allen and J. Anderson, *The Early Christian Monuments of Scotland* (Edinburgh: 1903), pp. 132–5.
[86] A. Grant, 'Thanes and thanages, from the eleventh to the fourteenth centuries', *Medieval Scotland: Crown, Lordship and Community*, ed. A. Grant and K. Stringer (Edinburgh: 1993), pp. 40–81 at p. 46–7 and p. 72 no. 7.

demesnes were subsequently used to endow new settlers, after the forfeiture of the earldom in 1130.[87]

Dyke persisted as an important centre of royal authority into the late twelfth century. William I led an expedition to Moray in the summer of 1187, but unfortunately the sources do not provide a clear itinerary.[88] However, the presence of the king in northern Scotland was exceptional and the expedition may be regarded as a personal espial of the thanages. Particular concern with Dyke is perhaps indicated by William I's grant 1189 × 1195 of the church of Dyke to the bishop of Moray.[89] Moray itself was not the king's objective in 1187, but it was an area at peace through which the army had to pass on its way to defeat Donald MacWilliam north of the Inverness-Beauly Firths.

Whether the deposition of the Dyke hoard may be associated with these events must remain undecided. All that can be stated positively is that the coins were placed in a pot, an act that indicates care and deliberation in the concealment of the hoard, as does the site of its burial in a churchyard. Lord Stewartby has observed that it seems likely that the deposit at Dyke predates the Baddinsgill find, because in the late nineteenth century Burns was unaware of the final phase of the coinage.[90] The Baddinsgill find and the majority of single finds consist of the coins of Class E. It may tentatively strengthen the argument for the deposit of the hoard some time before the termination of the Crescents coinage in 1195.

One coin in the Ashmolean Museum from the collection of Christ Church, Oxford, is accompanied by an early ticket stating that the coin was 'found in the burial place of the family of Brodie' (**35a**). The reverse of the sterling of Walter illustrated by Cardonnel at Plate

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[87] G.W.S. Barrow, 'Badenoch and Strathspey, 1130-1312, 1: Secular and political', *Northern Scotland* 8 (1988), pp. 1–15 at pp. 2–3.

[88] The only three contemporary sources for these events are: *A Scottish Chronicle known as the Chronicle of Holyrood*, ed. M.O. Anderson (London: 1936), p. 171. *Chronicle of Melrose*, facsimile ed. A.O. Anderson and M.O. Anderson (London: 1936), p. 46. Roger of Howden, *Gesta Regis Henrici Secundi*, ed. W. Stubbs, vol. 2 (London: 1867), p. 318. According to Barrow, RRS II (William I), p. 98, the king was at Crail in early March and at Inverness by July.

[89] RRS II (William I), no. 360-1, pp. 355–6.

[90] Lord Stewartby, 'The 1834 Baddinsgill find of Crescent sterlings', *NC* 165 (2005), p. 224.

1 no. 12 can be identified as one of the extant coins of this moneyer (**141a**), indicating its provenance as Dyke.

Outchester, Northumberland, 1817

There has never been any prior suggestion that this large and significant hoard, of which only the most rudimentary details are known, contained Crescents sterlings.[91] It is recorded that the hoard was found at Outchester in February 1817 and contained 'nearly 1,000 coins'.[92] The hoard was found on land that constituted part of the Northern Estates of Greenwich Hospital. Some portion of the hoard was seized by the Hospital, as parallel donations by the Secretaries of Greenwich Hospital to the British Museum are of coins of this hoard.[93] Mr J. Dyer (d. 1819) donated seventeen coins to the British Museum in 1819 and Edward Hawke Locker (1777–1849) donated fifteen coins in 1827 (Secretary, 1819–29, Commissioner 1829–1844).

A Cross and Crosslets penny of Class E from the hoard in the British Museum provides a *terminus post quem* of 1170.[94] Hitherto no modern commentators have suggested that this hoard contained Crescents coins. However, J. Jamieson stated that a hoard found in Northumberland 'near the border' contained a large number of coins of William the Lion that were struck at Berwick, Edinburgh, Roxburgh and Perth.[95] Jamieson gives hand-drawn legend readings of Roxburgh as ROC·, ROCA, ROCЄ, ROCЄB, ROCЄBV, ROCЄBVR and states that there were variations made by the insertion of pellets between distinct letters. The mint signatures are found on Crescents coins and are unlikely to be from Short Cross and Stars coins, which have shorter mint signatures.

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[91] Northumberland Sites and Monuments Record: N5123. *Inventory*, no. 299.
[92] J. Sykes, *Local Records or Historical Register of Remarkable Events which have occurred in Northumberland and Durham, Newcastle-upon-Tyne and Berwick-upon-Tweed* (Newcastle: 1866), p. 104.
[93] It has often been repeated that the Commissioners of Greenwich Hospital donated the coins to the British Museum, but this governing body was established in June 1829.
[94] *BMC Henry II*, p. xlix–lii.
[95] J. Jamieson, 'Remarks on the antiquity of the earliest Scottish coins now extant', *Transactions of the Royal Society of Literature* 2 (1832), pp. 304–21 at p. 318.

Against this notion that the Outchester hoard contained Crescents sterlings, it must be stated that that none of the sterlings currently known have the distinctive black patina of coins with a certain Outchester provenance. Jamieson was an antiquarian of note and his work is usually reliable. Therefore one must conclude that if the Outchester hoard did not contain the coins of which Jamieson writes, there was another hoard from the border area that contained Crescents coins from a location now unknown.

Baddinsgill, Peebleshire, 1834

Lord Stewartby has recently published the majority of coins from this small find.[96] He identified a group of late coins that he acquired in the late 1960s with the details of the hoard as recorded by Lindsay.[97] The extant group consists of seven Crescents sterlings of Class E of Raul at Roxburgh (**111c, 118a, 119a**) and Radulfus (**147a, 143b, 142a, 142b**) and one penny of the English Short Cross coinage. The English coin provides a *terminus post quem* of the late 1180s or early 1190s. Lord Stewartby observed that the context of the deposit of the purse hoard was the drove road through the Cauldstane Slap in the Pentland hills.

Daeli, Hedmark, Norway, 1840

This hoard was found in May 1840 by Anders Anderson when he was removing a pile of rocks on his farm at Daeli. The *terminus post quem* for the concealment of the hoard is 1194 based on a *pfennig* minted for Archbishop Ludolf of Magdeburg (1194–1209).[98] The coins are now held by the University Museum of Cultural Heritage in Oslo.

The hoard contained three Crescents coins, a sterling without mint name (**7a**), a cut halfpenny of Roxburgh (**127a**) and cut farthing of Raul Derlig at Berwick (**11e**). H. Holst

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[96] Lord Stewartby, 'The 1834 Baddinsgill find of Crescent sterlings', *NC* 165 (2005), pp. 223–5 and Pl. 27.
[97] J. Lindsay, *A View of the Coinage of Scotland* (Cork: 1845), p. 268. *Inventory*, no. 304.
[98] H. Holst, 'Funn av myntskatter i Norge inntil slutten av 19. arhundre', *Nordisk Numismatisk Årsskrift* (1936), pp. 5–26, at p. 14, § B1.

published the British coins from this hoard in 1939, but only listed the sterling.[99] The English coins, five Cross and Crosslets pennies (plus possibly four fragments that may have come from this find) and three Short-Cross pennies were listed in *BMC Henry II*.[100]

Barnsley (near), Yorkshire, 1856

Elizabeth Pirie tentatively assigned this provenance to three Crescents sterlings in the Yorkshire Museum.[101] I remain unconvinced by Pirie's reasoning, which relies on patination, a notoriously unreliable guide. The near Barnsley hoard consisted of twelve or more English Short Cross pennies of Class 5, the latest known of class 5b (*c*.1205-7).[102] Of the numerous Short Cross hoards found in England, none is known to have contained Crescents sterlings, but they often contain the contemporaneous Short Cross and Stars coinage of Scotland. If the hoard did contain three coins of William I it is probably that these were Short Cross and Stars sterlings. There are coins of this type in the Yorkshire Museum with no recorded provenance.

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[99] H. Holst, 'Mynter og myntilignende metallpreg fra de Britiske Oyer i norske funn, nedlagt etter ar 1100', *Nordisk Numismatisk Årsskrift* (1939), pp. 103–24, at pp. 110–12.
[100] *BMC Henry II*, p. liii–liv.
[101] *SCBI* 21 (Yorkshire), pp. xli–xlii and nos. 1509 (**117a**), 1510 (**148b**), and 1512 (**86g**)
[102] See M. Allen, 'Hoards and circulation of the Short Cross coinage', *SCBI* 56 (Mass), p. 112–30 at p. 118 no. 14 and J.D. Brand and R.H.M. Dolley, 'Two 'new' Yorkshire hoards of Short Cross pennies', *BNJ* 32 (1966), pp. 94–8 at pp. 96–8.

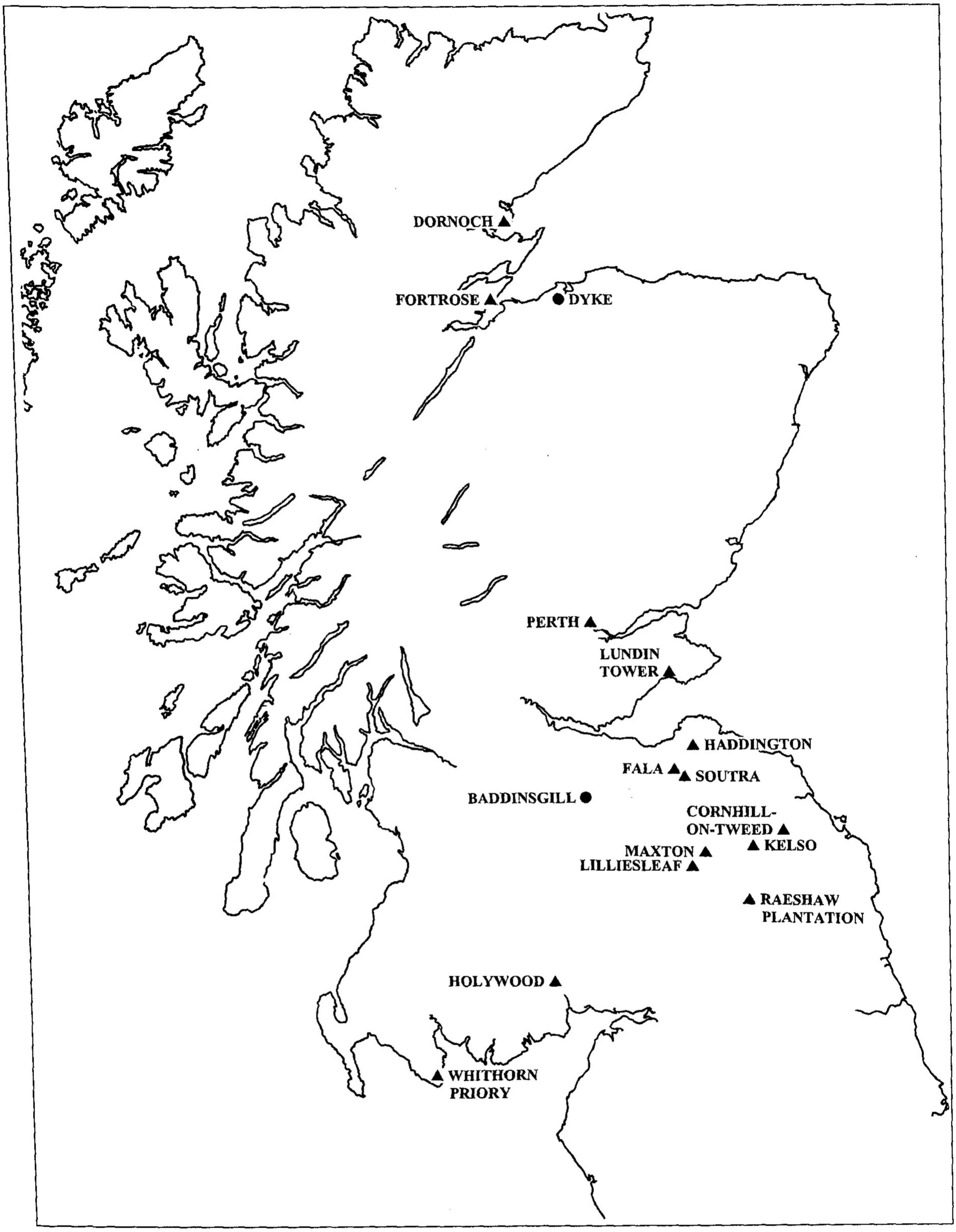


Figure 5.9. Map of hoards containing Crescents coins and single finds from archaeological excavations and other sources from Scotland. Key: ● = hoard; ▲ = single-find.

5.8 Single finds

The corpus of single finds is the first complete listing to date for coins of the Crescents type. Single finds represent accidental losses from the circulating medium and the recovery of such wasted coins is largely an occurrence of the last twenty-five years with the advent of metal-detectors. The sterling recovered from the excavations at Perth High Street was the only single find of a twelfth-century Scottish coin known to Stuart Rigold in the 1970s, although there is reason to surmise that some coins in old collections come from such sources.[103]

Nicholas Holmes noted a total of ten coins, which have been found since 1978 in his review of single find evidence for the circulation and use of coins in medieval Scotland.[104] In fact there are seventeen single finds. The finds made in Scotland are mapped (Figure 5.9).

5.8.1. Corpus of finds

The finds are listed below in alphabetical order of the modern locality of recovery, with a number preceded by an S, to be distinguished from Catalogue numbers. None of the single finds have been illustrated in any publications. Of the seventeen single finds, ten are included in the Catalogue from sight of the specimens or photographs retained with the written record. The information has been conscientiously collated and provides full details of each find, such as a map reference, current location of the specimen, references to secondary literature and named institution where a full record is held. Additionally the Scottish excavations, from which three of the coins are derived have a National Monuments Record of Scotland (NMRS) reference number and this is given under each relevant entry. Legend readings are not repeated here and readers are referred to the Catalogue entries, which are cross-referenced.

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[103] S. Rigold, 'The evidence of the site-finds and stray losses for the currency of medieval Scotland', *CIMS*, pp. 61–4, at p. 62. For example, the single sterling of Adam of Berwick in the McManus Galleries, Dundee (**10a**) was accessioned in 1966 from the museum's stores; it is in such poor condition that a local source may be surmised. If provenance is not preserved with a coin, it is often irrecoverably lost, but it is to be noted that numerous finds of coins are recorded in the *Dundee, Perth and Cupar Advertiser*.

[104] N. M. McQ. Holmes, 'The evidence of finds for the circulation and use of coins in medieval Scotland', *PSAS* 134 (2004), pp. 241–80.

S1 **CORNHILL-ON-TWEED, ROXBURGHSHIRE**

OS Grid Ref.: NT 807 388
Description: Sterling, Class ?, Roxburgh mint, moneyer Raul.
Weight: 1.10g
Source: Found by a metal-detectorist, 2003 (?).
Disposition: Returned to finder after record was made.
Record: National Museums of Scotland, Edinburgh (without photograph).

S2 **DORNOCH, SUTHERLAND**

OS Grid Ref.: NH 79 89
Description: Cut halfpenny, Class C, D, or E (cross pommée sceptre), Roxburgh mint, moneyer Raul.
Weight: 0.42g
Catalogue: **126a**
Source: Found by a metal-detectorist, 2004.
Disposition: Returned to finder after record was made.
Record: National Museums of Scotland, Edinburgh. Photograph retained (36573-1 and -2).

S3 **FALA, MIDLOTHIAN**

OS Grid Ref.: NT 43 61
Description: Sterling, Class C, D, or E (cross pommée sceptre), Roxburgh mint, moneyer Raul.
Weight: 1.15g
Catalogue: **125a**
Source: Found by a metal-detectorist, 1993.
Disposition: Returned to finder after record was made.
Reference: J. D. Bateson and N. M. McQ. Holmes, 'Roman and medieval coins found in Scotland, 1988-95', *PSAS* 127 (1997), pp. 527-61 at p. 543.
Record: National Museums of Scotland, Edinburgh. Photograph retained.

S4 **FORTROSE, ROSS & COMARTY**

OS Grid Ref.: NH 73 57
Description: Sterling, Class C, D, or E (cross pommée sceptre), Roxburgh mint, moneyer Raul.
Weight: 1.11g
Catalogue: **112b**
Source: Found by a metal-detectorist, 2004.
Disposition: Returned to finder after record was made.
Record: National Museums of Scotland, Edinburgh. Photograph retained (X.1B 344 and 358).

S5 **HADDINGTON, EAST LOTHIAN**

OS Grid Ref.: NT 52 74
Description: Sterling, Class ?, Roxburgh mint, moneyer Raul.
Weight: 1.11g
Source: Found by a metal-detectorist, 2000.
Disposition: Returned to finder after record was made.
Reference: J. D. Bateson and N. M. McQ. Holmes, 'Roman and medieval coins found in Scotland, 1996-2000', *PSAS* 133 (2003), pp. 245-76 at p. 259.
Record: National Museums of Scotland, Edinburgh (no photograph).

S6 **HOLYWOOD CHURCH, DUMFRIESSHIRE**

OS Grid Ref.: NX 949 796
Description: Cut halfpenny, Class B/A, moneyer Folpolt.
Weight: 0.61g
Catalogue: **6d**
Source: Found by a metal-detectorist, 1989.
Disposition: Returned to finder after record was made.
Reference: J. D. Bateson and N. M. McQ. Holmes, 'Roman and medieval coins found in Scotland, 1988-95', *PSAS* 127 (1997), pp. 527-61 at p. 544.
Record: Hunterian Museum, Glasgow (with photograph).

S7 **KELSO (SPRINGWOOD PARK), ROXBURGHSHIRE**

OS Grid Ref.: NT 7207 3340
NMRS No.: NT73SW 55
Description: Cut farthing, uncertain mint and moneyer, incomplete and broken in two.
Weight: — [incomplete and coated]
Catalogue: **153a**
Source: Found in excavations undertaken by the Border Burghs Archaeology Project, 1986.
Disposition: Scottish Borders Council Museum Service, KEL KM: D001.
References: (1) J. D. Bateson, 'Roman and medieval coins found in Scotland, to 1987', *PSAS* 119 (1989), pp. 165-188 at p. 175. (2) J. D. Bateson, 'Coins' in P. Dixon, 'A rural medieval settlement in Roxburghshire: excavations at Springwood Park, Kelso, 1985-6', *PSAS* 128 (1998), pp. 671-751 at p. 705 number 4.
Record: Hunterian Museum, Glasgow (with photograph).

S8 **LILLIESLEAF, ROXBURGHSHIRE**

OS Grid Ref.: NT 537 253
Description: Cut halfpenny, Class A, B, or E, mint and moneyer uncertain, cross pattée sceptre-head.
Weight: 0.55g
Source: Found by a metal-detectorist, date uncertain.
Disposition Returned to finder after record was made.
Record: National Museums of Scotland, Edinburgh (no photograph).

S9 **LLANFAES, ANGLESEY**

OS Grid Ref.: SH 60 77
Description: Fragment of sterling, Class ?, Roxburgh mint, moneyer Raul.
Weight: 0.39g
Catalogue: **154a**
Source: Found by a metal-detectorist, 1994.
Disposition: Returned to finder after record was made.
Reference: E. Besly, 'Short Cross and other medieval coins from Llanfaes, Anglesey', *BNJ* 65 (1995), pp. 46-82, at p. 75 no. 554.
Record: National Museum & Galleries of Wales, Cardiff (with photograph).

S10 **LUNDIN TOWER, FIFE**

OS Grid Ref.: NO 390 030
Description: Cut halfpenny, Class ?, Roxburgh mint, moneyer Raul.
Weight: 0.66g
Source: Found by a metal-detectorist, 2000.
Disposition: Returned to finder after record was made.
Reference: J. D. Bateson and N. M. McQ. Holmes, 'Roman and medieval coins found in Scotland, 1996-2000', *PSAS* 133 (2003), pp. 245-76 at p. 262.
Record: National Museums of Scotland, Edinburgh (no photograph).

S11 **MAXTON, ROXBURGHSHIRE**

OS Grid Ref.: NT 615 302
Description: Sterling, Class C, D, or E (cross pommée sceptre-head) Roxburgh, moneyer Raul.
Weight: 1.29g
Source: Found by a metal-detectorist, uncertain date prior to May 1996.
Disposition: Returned to finder after record was made.
Reference: N. M. McQ. Holmes, 'The evidence of finds for the circulation and use of coinage in medieval Scotland', *PSAS* 134 (2004), pp. 241-80 at p. 274.
Record: National Museums of Scotland, Edinburgh (no photograph).

S12 **MAXTON, ROXBURGHSHIRE**

OS Grid Ref.: NT 615 302
Description: Sterling, Class C, D, or E (cross pommée sceptre-head) Roxburgh, moneyer Raul.
Weight: 1.09g
Source: Found by a metal-detectorist, uncertain date prior to May 1996.
Disposition: Returned to finder after record was made.
Reference: N. M. McQ. Holmes, 'The evidence of finds for the circulation and use of coinage in medieval Scotland', *PSAS* 134 (2004), pp. 241-80 at p. 274.
Record: National Museums of Scotland, Edinburgh (no photograph).

S13 **MAXTON, ROXBURGHSHIRE**

OS Grid Ref.: NT 615 302
Description: Cut halfpenny, Class C, D, or E (cross pommée sceptre-head) Roxburgh mint, Raul.
Weight: 0.62g
Source: Found by a metal-detectorist, uncertain date prior to May 1996.
Disposition: Returned to finder after record was made.
Reference: N. M. McQ. Holmes, 'The evidence of finds for the circulation and use of coinage in medieval Scotland', *PSAS* 134 (2004), pp. 241-80 at p. 274.
Record: National Museums of Scotland, Edinburgh (no photograph).

S14 **PERTH (HIGH STREET)**

OS Grid Ref.: NO 1188 2366
NMRS No.: NO12SW 103
Description: Sterling, Class C, moneyer Raul Derlig. Fragment missing and edge chipped.
Weight: 0.69g
Catalogue: **129b**
Source: Found in excavations undertaken by N. Bogdan, 1975–6.
Disposition: Perth Museum and Art Gallery, SMC 639.
References: (1) N. Q. Bogdan and J. W. Wordsworth, *The Medieval Excavations at the High Street, Perth 1975-6* (Perth: 1976), p. 24. (2) J. D. Bateson, 'Roman and medieval coins found in Scotland, to 1987', *PSAS* 119 (1989), pp. 165-188 at p. 177. (3) J. D. Bateson 'Coin found in Perth High Street excavation', in N. Q. Bogdan (ed.), *The Perth High Street Excavations 1975-78, The Metalwork Fascicule*, forthcoming.

S15 **RAESHAW PLANTATION, ROXBURGHSHIRE**

OS Grid Ref.: NT 785 136
Description: Sterling, Class E, Roxburgh mint, moneyer Raul.
Weight: 1.17g
Catalogue: **111a**
Source: Found by a metal-detectorist, 2002.
Disposition: Hawick Museum, HAKMG: 06.0074.
Record: National Museums of Scotland, Edinburgh (no photograph).

S16 **SOUTRA, MIDLOTHIAN**

OS Grid Ref.: NT 45 59
Description: Sterling, Class E (with large fleur-de-lis sceptre), Roxburgh mint, moneyer Raul.
Weight: 1.41g
Source: Found by a metal-detectorist, 2000.
Catalogue: **124a**
Disposition: National Museums of Scotland, K.2002.228.
Reference: J. D. Bateson and N. M. McQ. Holmes, 'Roman and medieval coins found in Scotland, 1996-2000', *PSAS* 133 (2003), pp. 245-76 at p. 265.
Record: National Museums of Scotland, Edinburgh.

S17 **WHITHORN, WIGTONSHIRE**

OS Grid Ref.: NX 4447 4031
NMRS No.: NX44SW 5
Description: Sterling, Class C, Roxburgh mint, moneyer Raul.
Weight: 1.16g
Catalogue: **76b**
Source: Found in excavations undertaken by the Whithorn Trust, 1986–91.
Disposition: Stranraer Museum, WIWMS Whit 91/13418.
Reference: N. Holmes, 'The later Medieval and Post-Medieval coins' in P. Hill, *Whithorn and St Ninian, The Excavations of a Monastic Town 1984-91* (Stroud: 1997), pp. 345-51 at p. 347 no. 2.

5.8.2. Circulation

The value of single find evidence for monetary history relies on the theory that single finds represent the recovery of random losses from circulation. Such coins that were 'wasted' from the currency should reflect the volume of coins that were in circulation and the duration of the issue. The premise that single finds are coins that were randomly lost from circulation is credible, but the character of recovery probably introduces bias. The majority of single finds have been made by metal-detectorists and hence the single find evidence is dependent on their prevalence and location and the declaration of finds for recording purposes.

The limitations of single find evidence need to be stated. The evidence does not reflect the volume of mint output, because mint output and circulation do not have a direct correlation. Single find evidence relies on *how* coins are being used.[105] For example, as coins of Class E dominate the finds record one would be tempted to speculate that this is evidence of increased mint output. However, the single finds may indicate that the economy was becoming increasingly monetised with coinage employed in the smallest transactions. Conversely, if coins were demanded as a means of storing of wealth and hoarded, mint output might increase while circulation volume and velocity contract. Therefore single find evidence is a social and economic phenomenon and must be treated with due caution.

In simple terms of numbers, the principal conclusion from the evidence must be that the coinage would be practically unknown if the Dyke hoard had not been found in 1780. The corpus is relatively small compared to those of twelfth-century English coins: ten sterlings, a fragment of a sterling, five cut halfpennies, and one cut farthing. The limited evidence implies a concentration of accidental losses from circulation south of the firths of Clyde and Forth, but this is undoubtedly accounted for by a bias in the recovery of material.

Analysis of the location of the seventeen Crescents single finds is informative despite the relatively small number. Moreover, in a number of instances additional information can augment the relevance of each find by highlighting the context of the find. The seventeen

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[105] The use of money in early medieval Scotland has been usefully explored by W.W. Scott, 'The use of money in Scotland, 1124-1230', *Scottish Historical Review* 58 (1979), 105–131.

single finds are widely distributed (Figure 5.9) and this distribution provides important information on the geographical extent of circulation.

The analysis of the Catalogue has demonstrated that the cut halfpenny recovered at Holywood (S6) was not struck at Perth but possibly in the Borders region, from dies which did not carry a mint name.[106] Similarly, the sterling of Raul Derlig found in the excavations in the High Street, Perth (S14) was probably struck in the Borders region at Roxburgh or Berwick. Both of these finds imply that the coins were dispersed into circulation and were lost far from the burgh in which they were minted.

Three of the finds probably belong to a commercial setting associated with fairs held in the vicinity of religious foundations. The two pennies found at Fala (S3) and Soutra (S16) in Midlothian can be associated with the monastic hospital complex on Soutra Hill, which was certainly in existence in the middle of the twelfth century.[107] At Holywood in Dumfriesshire, where the cut halfpenny of Folpolt was found (S6), there was a house of Premonstratensian Canons; the history of the house is obscure and cannot be traced back beyond the second quarter of the thirteenth century.[108] Conversely, the single find from Raeshaw Plantation (S15) does not appear to be associated with any settlement, but the location is close to the point at which Dere Street descends from the massif of the Cheviot Hills. The find from Raeshaw Plantation on a known path parallels the context of the Baddinsgill hoard.

The three coins recovered in excavations have precise information concerning context. The finds from Perth (S14) and Kelso (S7) were lost in domestic situations. The sterling at Perth was found in a wattle fence in a trench overlain by or in association with a midden.[109] The cut farthing from Springwood Park, Kelso, was recovered from the base of the primary layer of

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[106] See discussion in §5.4.3 under Die 1^{P}.
[107] *RRS* I (Malcolm IV), pp. 244–5, no. 216. I.A. Cowen and D.E. Easson, *Medieval Religious Houses, Scotland* (London and New York, 1976, second edition), p. 192.
[108] I.A. Cowen and D.E. Easson, *Medieval Religious Houses, Scotland* (London and New York, 1976, second edition), p. 102.
[109] Details of the numismatic material will appear in J. D. Bateson, 'Coins found in Perth High Street excavation', in N. Q. Bogdan (ed.), *The Perth High Street Excavations 1975–8* (forthcoming).

the cobbled floor in a building and provides a *terminus post quem* of 1200 for the floor.[110] At St Ninian's Priory, Whithorn, associated deposits indicate that the sterling (S17) may have been present as bullion associated with fine metalworking.[111] The wattle fence at Perth has been dated to the first half of the thirteenth century and the area known as 'the outer zone' at Whithorn is dated to before *c.*1260.

The sterling recovered at Whithorn parallels the fragment from the productive site at Llanfaes, Anglesey, (S7) insofar as it was probably present as scrap silver.[112] Thus two finds may attest to the use of coins as bullion rather than as monetary units for transactions. Moreover, the specimens recovered from Llanfaes and Whithorn indicate that the Crescents coinage penetrated the Irish Sea area. Supplementary to these finds, it is recorded that the Isle of Man hoard contained one such coin. Further a heavily clipped-down sterling of Folpolt of Perth has been shown to me, which was recovered from 'the Dublin area'.[113] The presence of these finds is additionally interesting insofar as the King of Scotland claimed authority over Galloway, but suzerainty was kept by feudal settlement and by force when that was renounced.[114]

In spite of the apparent circulation of the Crescents coinage in the Irish Sea area, there are no recorded finds from England, either single finds or in hoards. This suggests that there was no commingling of the coinages in circulation, as occurred between the coinage of England and Scotland in the late thirteenth century. The Scottish component of English coinage in the twelfth century has been rather overstated by Cook[115] and Allen.[116] No Crescents sterlings

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[110] P. Dixon, 'A rural medieval settlement in Roxburghshire: excavations at Springwood Park, Kelso, 1985-6', *PSAS* 128 (1998), pp. 671–751 at p. 691.
[111] P. Hill, 'Distribution and economic implications' in P. Hill, *Whithorn and St Ninian, The Excavations of a Monastic Town 1984-91* (Stroud, 1997), p. 211 and p. 356.
[112] E. Besly, 'Short Cross and other medieval coins from Llanfaes, Anglesey', *BNJ* 65 (1995), pp. 46–82, at p. 59.
[113] Metal-detectoring in the Republic of Ireland is illegal and hence this find has not been properly reported.
[114] *RRS* II (William I), p. 8. The Gallovidians renounced alliance to William I after his capture in 1174; consequently William led an army into Galloway against Gilbert, son of Fergus lord of Galloway, in 1175.
[115] B. Cook, 'Foreign coins in medieval England', in *Local Coins, Foreign Coins: Italy and Europe 11th–15th Centuries*, ed. L. Travaini (Milan: 1999), pp. 231–84, at pp. 240–41.
[116] M. Allen, 'The volume of the English currency, 1158–1470', *Economic History Review* 54:4 (November 2001), pp. 595–611 at p. 599, note 33.

appear in English hoards; coins of David I appear only rarely in hoards and those that may have at least a partial savings element.[117] There are, however, seven finds of the contemporaneous English Cross and Crosslets coins attested in Scotland.[118] Metrological analysis has demonstrated that the Crescents coinage was heavier than its English counterpart. Despite the relative baseness of the coinage (which would not, of course, be obvious), it is plausible to expect that, owing to their weight, Crescents coins would have been eliminated from circulation in England. English coins would not have been removed from the circulation in Scotland. Applied conversely, the same reasoning suggests that the sterling in the Daeli hoard (**7a**) was preserved precisely because of its substantial weight. Thus, the penetration of English coinage into Scotland may be explained by the relative size of the coinage, but also in terms of its relatively light weight.

Finally, the two finds from northern Scotland are important. In the late twelfth century the defeat of Donald MacWilliam in 1187 facilitated an intensive process of internal colonisation.[119] William I constructed castles and established feudal land tenure. The cut halfpenny from Dornoch (S1) and the sterling from Fortrose (S4) are both coins of Class E and can perhaps be dated to the period sometime after *c.*1185; the finds demonstrate a burgeoning monetary economy and hence the success of the policies of the king in the 1190s.

The clearest testaments to the movement of money in medieval Europe are those coins that are overstruck. Rather than re-minting imported foreign coins by blanching, the coins were treated as blanks and overstruck with Scottish dies. The original impression protrudes through the later striking.

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[117] Wicklewood 1989: 'Introduction' to Christies (London) Auction 15 May 1990. Lark Hill (Worcester), 1854: Thompson, *Inventory*, no. 381. On the Lark Hill hoard as consisting of at least a partial saving element see Crafter 'Re-examination', pp. 58–9.
[118] Aberlady, East Lothian, penny: National Museums of Scotland, K.2002.221. Eyemouth, cut halfpenny: *SCBI* 51, 380; P. Dixon, *Excavations in the Fishing Town of Eyemouth, 1982-1984*, (1986), p. 00. Jedburgh Abbey, two pennies: *SCBI* 51, 356 and 383. Luffness, East Lothian, cut farthing: National Museums of Scotland, (Q) 1992.313. Maxton, Roxburghshire: *PSAS* 2004, p. 274. Springwood, Roxburghshire: *PSAS* 2004, p. 276.
[119] *RRS* II (William I), p. 12.

Stewart published a sterling overstruck on a *pfennig* in the name of Emperor Frederick I (1152-1190) of the Duisburg mint (**127b**) and discussed the importance of trade with Scotland.[120] A cut halfpenny from the Daeli hoard is struck from the same dies as the coin discussed by Stewart and has the same undertype as the sterling (**127a**), indicating that it belongs to the same batch of overstriking. The halfpenny was initially minted in the Rhineland, overstruck at Roxburgh in the Scottish Borders, cut in half, and finally deposited in a hoard in central Scandinavia. Other coins are overstruck, but the undertypes are unclear (**71b, 76a, 130b**). Overstriking has only been noted for coins of Class C of Raul Derlig.

Aside from the movement of coins, overstriking testifies to administrative and working practices of moneyers, for which there is no documentary evidence. Overstriking indicates that the validation of alien coins was necessary. The coins were not accepted in Scotland without re-minting and moneyers were prepared to do this. Furthermore, overstruck coins indicate that Scottish moneyers were not striking in hot metal, which is easier.

[120] I. Stewart, 'Some German coins overstruck with sterling types', *Lagom: Festschrift für Peter Berghaus* (Münster: 1981), pp. 205–10.

5.9 Volume of the coinage

Although single finds indicate how and where coins were used, and might indicate relative changes over time, single find evidence is wholly uninformative of the volume of the coinage. Estimates for the volume of currency can be derived from three sources: mint output recorded in documents, coin hoards and known values for the number of dies responsible for a coinage. For twelfth-century Scotland, mint records do not exist and hoard evidence is deficient, but the number of dies for the Crescents coinage can be estimated.

From the point estimates for the number of dies in §5.5 it is possible to estimate the output, hence the volume of the Crescents coinage, but not of the whole currency. The reason is that finds in Scotland of English Cross and Crosslets coins indicate that English coins formed a proportion of the circulating medium.[121] The lack of adequate hoard evidence is again frustrating. It is recorded that the Dyke hoard contained coins of Henry II, but of which coinage and how many coins we do not know. Moreover, the survival and circulation of early coin types is moot. The point-estimate of the number of dies for Class A does not suggest that the Crescents coinage was introduced to initiate a recoinage. The Outchester hoard, *terminus post quem* 1170, contained sterlings of David I; again the evidence is insufficient to know whether the hoard represents savings or a representative sample of the circulating currency at that date.

The only previous estimate for the volume of the Crescents coinage is that proposed by Stewart in 1977. Stewart provisionally estimated output of about one million sterlings, or £4,000, from 55 obverse dies at an average of 15,000–20,000 coins per die.[122] The range of coins per die used by Stewart was arbitrary and I here employ the range of 10,000–20,000 coins per die for the reasons detailed in Chapter 1 (pp. 41–48).

Using the multiplier of 10,000–20,000 coins per die, the estimated 149 reverse dies might have struck about £6,000–£12,500. To put these figures in perspective, using the same

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[121] N. M. McQ. Holmes, 'The evidence of finds for the circulation and use of coins in medieval Scotland', *PSAS*, pp. 241–80 at p. 243.
[122] I. Stewart, 'The volume of early Scottish coinage', *CIMS*, pp. 65–72 at p. 68.

methodology and estimate of number of coins per die Allen estimated that 520 reverse dies of the 1153/4–1158 English coinage might have produced at £20,000–£45,000 and the output of from the estimated 384 Class A Cross and Crosslets reverse dies might have been £16,000–£32,000.[123] Thus the *potential* output of the Class A dies, which included the 1158–*c*.1160 recoinage, was approximately more than twice that of the *potential* output of all dies of the Crescents coinage. Again it must be stressed that the actual mint output is unknown. The extensive use of Scottish obverse dies as well as surface reduction has been used to understand the structure of the coinage, but in a more basic sense the deterioration and renovation of dies indicates the extensive use of those dies and, therefore, perhaps high output from them. However, the possibility of technical deficiencies of Scottish die production must be accepted, but cannot be explored, as no twelfth-century Scottish dies are extant.

Analysis of the structure of the coinage has revealed three consecutive class groups, which constitute the primary (Classes A and B), secondary (Classes C and D) and tertiary phases (Class E) of the Crescents coinage. The point estimates for the number of obverse dies can be used to understand output over these phases in the coinage, by employing the multiplier 10,000–20,000 coins per die to the estimated number of reverse dies.

The 16 Class A and B reverse dies might have struck £700–£1,300. The 60 Class C and D reverse dies might have struck *c*.£2,500–£5,000. The estimated 94 Class E reverse dies might have struck *c*.£4,000–£8,000. There is a greater degree of uncertainty concerning Class E, because of the difficulties associated with the sample from which the point estimates for dies are generated (see §5.5.3). However, there is no reason to accept that the methodology has necessarily produced an exaggerated estimate for the number of dies. Only in the case of Class E is the low endpoint of the 95% confidence interval for the estimated number of dies substantially greater than the number of known dies (see Table 5.4). Even taking the low endpoint for the 95% confidence interval, 49 dies, the potential output might been *c*.£2,000–£4,000.

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[122] M. Allen, 'The English Coinage of 1153/4–1158', *BNJ* 76 (2006), pp. 242–302, at p. 260 and 261.

Figure 5.10 is a graphic representation of the estimated outputs of the three phases of the coinage, based on the ranges of potential output from estimated numbers of dies. There was undoubtedly a general growth in mint output during the Crescents coinage. The growth in output from Scottish mints in the late twelfth century can be easily observed because the data reflects a 'natural' rise in output, as opposed to an 'artificial' rise in output as a consequence of a recoinage. The number of Class A dies does not indicate that a recoinage occurred on the introduction of the Crescents coinage, and therefore we must be mindful that the Scottish currency was probably composed of many earlier sterlings as well as contemporaneous English pennies.

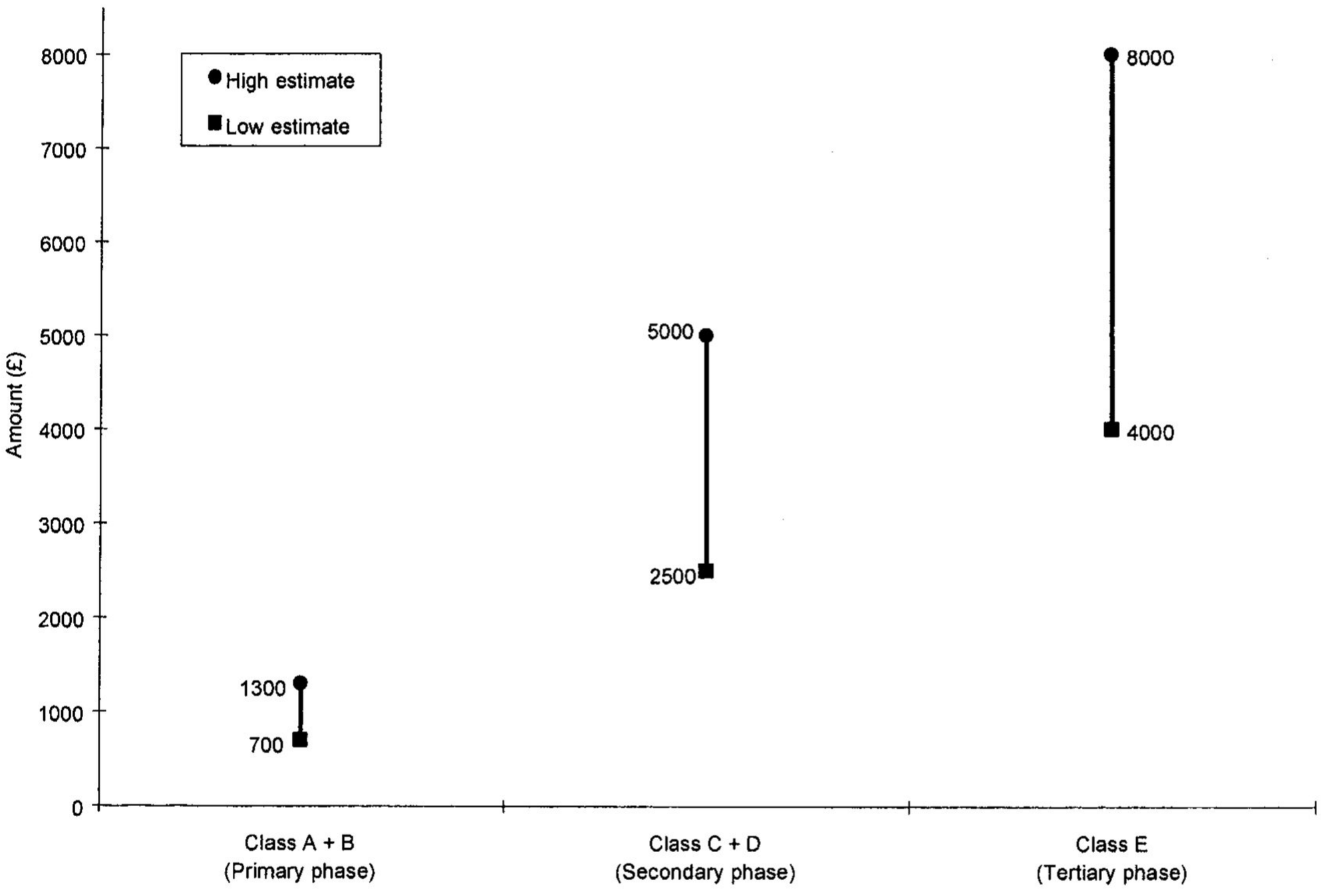


Figure 5.10. Volume of the coinage based on point estimates for primary, secondary and tertiary phases of the Crescents coinage.

It is worth mentioning the ransom of 10,000 marks paid by William I for cancellation of the settlement of Falaise by the Quitclaim of Canterbury (1189),[124] because Barrow tentatively

[124] *Chronicle of Melrose*, facsimile ed. A.O. Anderson and M.O. Anderson (London: 1936), p. 47 states that it was paid 'in gold and silver'.

linked the 1195 recoinage with strained sterling resources after payment of the ransom.[125] Reckoned in sterlings, this sum is 1,600,000 coins, but to what extent the sum was paid in Scottish coins is unknown and it is difficult to infer anything about the volume of the currency from it. Burns was critical of Cardonnel for assuming that the sum was paid in coin and he advanced the opinion that the sum was paid by weight in the form of uncoined bullion, ornaments and gold bezants (Byzantine coins).[126] Certainly David I had some income in gold for he was able to grant a portion to Dunfermline Abbey.[127] Although no gold was coined in northern Europe during the twelfth century, records show that bezants were used in England and that the English Exchequer was prepared to receive gold, whether as bezants or as bullion.[128] On the matter of uncoined bullion, silver ingots were part of the Pimprez hoard (2002) deposited during the 1140s.[129]

The manner in which the sum itself was raised suggests that at least a moiety of the redemption was paid in coins. William I exacted an aid (*auxilium*) through a council held at Musselburgh at the end of 1189 or early 1190.[130] If the king received monies from his subjects, payment in coin would be expeditious, whether that coin was Scottish, English or other. It is interesting to note that William of Newburgh, by his use of a transitive verb, at least imagined that sum was paid in coin: 'returning to his own land, King William scraped together (*corrasit*) that sum from his subjects by the presence of his royal authority'.[131] However, it is recorded that Alexander II paid the aid of 1216 partly in hides, which clearly shows that even non-metallic, but readily marketable, commodities could be reckoned in lieu

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[125] *RRS* II (William I), p. 17.

[126] Burns, *Coinage*, vol. 1, pp. 53–4; A. de Cardonnel, *Numismata Scotiæ* (Edinburgh: 1786), p. 39.
[127] G. W. S. Barrow, *The Charters of David I* (Woodbridge: 1999), pp. 120–21 no. 140.
[128] B. J. Cook, 'The Bezant in Angevin England', *NC* 159 (1999), pp. 255–75 at p. 257.
[129] Spink (London) Auction, 6 October 2004, lots 487–92. One of the ingots is now is the possession of the Ashmolean Museum, Oxford, but has not yet been subjected to metallurgical analysis.
[130] An act of the king specifically links the fact that men have fled the land of Scone on account of the aid, *RRS* II (William I), no. 326; the extraordinary taxation is there specifically called *auxilium*.
[131] William of Newburgh, *Historia Rerum Anglicarum*, ed. R. Howlett in *Chronicles of the Reigns of Stephen, Henry II, and Richard I*, vol. 1 (London: Rolls Series, 1884), p. 304.

of coins.[132] In sum, little can be inferred about the volume of the coinage from historical sources that provide details about the size of the ransom.

From the evidence surveyed the conclusion is that the total volume of currency circulating in Scotland escapes view, but the mint output of the Crescents issue can be estimated at £8,000–£16,000. The volume of output was substantially smaller than England's coinage, but significant considering that Scotland had produced no coinage before *c.*1130 and that the region was virtually 'coinless'.[133]

It is tempting to envisage that the recoinage of 1195 in Scotland resulted from monetary pressures. The point estimate for the number of dies of Class E indicates a large output in this class, contemporaneous with the steep rise in output that occurred during the Short Cross coinage. Frequently, the last phase in a medieval coinage is rather obscured as the window for the concealment of hoards of such coins is limited. It has been tentatively suggested that the recoinage of 1195 may have been a part of a series of administrative reforms at that date and designed to align the weight and standard of Scottish coinage with that of England (§5.6.2). For a better understanding of the condition and composition of the Scottish currency that immediately preceded the recoinage of 1195 we must await the discovery of a substantial hoard concealed during the tertiary phase of the Crescents coinage.

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[132] *RRS* II (William I), p. 25 note 79.

[133] Holmes has examined the evidence of finds and suggested that the English coinage of the Norman kings did not penetrate Scotland. N. M. McQ. Holmes, 'The evidence of finds for the circulation and use of coins in Medieval Scotland', *PSAS* 134 (2004), pp. 241–80, at p. 243.

5.10 Chronology

The division of the coinage into classes that are chronologically significant necessarily allows us to date mint, and therefore monetary, activity. For the Crescents coinage the issue of chronology has remained problematic. In the overview of the arrangement of Scottish coinages in the last major catalogue, the uncertainties surrounding the chronology were acknowledged, but not addressed.[134]

The only documentary evidence for dating relates to the termination of the coinage. The Melrose Chronicle records under the year 1195 that '*Willelmus Rex Scottorum innovavit monetam suam*'.[135] This is universally understood to refer to the introduction of the Short Cross and Stars coinage, a belated parallel of a similar change made in England in 1180.[136] The reliability of this date has never been examined, which is surprising owing to the tendency of a number of chronicles to supply different dates for a single coinage reform.[137] The probity of the date is, however, attested by the editors' contention that the bookhand responsible for the section covering the years 1171–1197 was early and that various features of the version transmitted in the extant manuscript indicate that it was probably copied from a contemporaneous draft.[138]

No other documentary evidence exists for the Crescents coinage. The occupation *monetarius* is not found to designate any individual in *acta*, royal, ecclesiastical or lay, nor can any individual be identified with those named on the coins.

The absence of documentary evidence does not, however, preclude the establishment of an internal chronology. The Crescents coinage is a single immobilised substantive type and the classification has been derived from the die-study. The classification allows the coins to be

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[134] *SCBI* 35 (Oxford/Glasgow), p. x.
[135] *Chronicle of Melrose*, facsimile ed. by A.O. Anderson and M.O. Anderson (London: 1936), p. 49.
[136] J. Lindsay, *View of the Coinage of Scotland* (Cork: 1845), p. 10. Burns, *Coinage*, vol. 1, pp. 50–51 and p. 63. I. Stewart, 'Scottish Mints', pp. 202–3. Hoard evidence places the Short Cross and Stars coinage after the Crescents coinage, see I. Stewart, 'Volume of the early Scottish coinage' in *CIMS*, pp. 65–72 at pp. 68–9.
[137] Chroniclers give the date of introduction of the Cross and Crosslets coinage in England as 1156 or 1158. The latter date was only proved correct by comparison with Pipe Roll entries, see *BMC Henry II*, pp. lxiv-lxv.
[138] *Chronicle of Melrose*, facsimile ed. by A.O. Anderson and M.O. Anderson (London: 1936), pp. xliii–xliv.

arranged sequentially and consequently cycles of mint operation to be discerned. The proposal of dates must always, however, be based on an external source. Thus, internal chronology is to be sought by examining the structure of the coinage in the context of the historical record.

5.10.1. Previous surveys

It is instructive to examine the two earlier appraisals of the Crescents coinage, in order to contextualise the discussion of the internal chronology: those of Burns and Stewart.[139] Both surveys are sufficiently detailed to enable the extraction of an internal chronological framework for the duration of mint activity. Table 5.6 presents the mint activity as proposed by Burns and Stewart, together with that proposed in the present thesis.

Table 5.6. Dating evidence for the chronology of mint activity during the Crescents coinage.

Mint or moneyer (Classes(Crafter))	*E. Burns, 1887*	*I. Stewart, 1971*	*Crafter preferred*
Without mint name (A)	1174–1189	'*early*'	*c.*1170–*c.*1174
Berwick, ✣ potent (A, B)	1189–1195	*c.*1170 × 1174	*c.*1170–*c.*1174
Berwick, ✣ pommée (C)	1189–1195	1189? – ?	1180 × 1190
Dunfermline (B)	——	'*early*'	1175 × 1180
Edinburgh (C, D)	1186–1195	1186–?	1180 × 1190
Perth (—)	1174–1189	*c.*1175– ?	1175 × 1195
Roxburgh, ✣ potent (A, B)	1189–1195	1174 × 1189–1195	*c.*1170–*c.*1174
Roxburgh, ✣ potent die 10^{B} (B)	——	——	Early 1180s
Roxburgh, ✣ pommée (C, D)	1189–1195	1180 × 1189–1195	1180 × 1190
Roxburgh, ✣ pommée (E)	1189–1195	1180 × 1189–1195	1185 × 1195
Raul Derlig (C, D, E)	1189–1195	'*late*'	1180 × 1195

Since the first survey by Cardonnel, the structure of the Crescents coinage has been viewed through the prism of the 'treaty' of Falaise (1174).[140] Cardonnell conflated the settlement with the subsequent redemption (1189). As a consequence, Cardonnel mistakenly believed that a ransom was paid for William the Lion's freedom and that 'foreign artificers' were sent to coin

[139] Burns, *Coinage*, vol. 1, pp. 48–57; I. Stewart, 'Scottish Mints', pp. 198–201.
[140] The document is canonically referred to as a 'treaty'. G. W. S. Barrow refers to it as a 'submission', a word laden with undue negativity. I have chosen to designate it as a 'settlement' as, I hope, a suitably neutral rendering of the self-referential *convencio* in the first line of the document, *Anglo-Scottish Relations: Selected Documents*, ed. and trans. E. L. G. Stones (London: 1965), p. 1.

money for this purpose in the castles surrendered to the English 'in pledge until the sum was paid'.[141]

The most consequential observation made by Edward Burns was that the two different types of sceptre-head found on the Crescents coinage, cross potent and cross pommée, reflect the change made on the English coinage in 1180.[142] This enabled Burns to understand the production of the coinage as having occurred in two distinct phases, corresponding with the implications of the 'treaty' of Falaise (1174) and its subsequent annulment (1189).

Burns assumed that mints were located in castles and he states that 'there is considerable reason to doubt that William the Lion would have placed his mints in strongholds given up to the English'.[143] Burns abjures the possibility that the coins with cross-potent sceptre were in issue prior to 1174 at Roxburgh and Berwick as he could not countenance a fifteen-year gap between that date and 1189. These predicates lead Burns to two conclusions: All Crescents coins of Berwick and Roxburgh were minted after 1189 and of Edinburgh after 1186; the first issue of Crescents must have been prior to 1180.[144]

Burns defines the first issue as the sterlings of the moneyers Ailbode, Folpolt and Willame without mint name and contends that these must have been struck at places unknown which were substituted for Berwick, Edinburgh and Roxburgh.[145] Similarly, Burns finds corroborative evidence in the existence of sterlings of Perth struck by the moneyer Folpolt, who, he asserts, moved to that place from Roxburgh Castle. Consequently, Burns conjectures that the sterlings of Folpolt without mint name 'may have represented the earliest of his Perth issues'.[146] Burns recognises that the existence of coins of Berwick and Roxburgh with the cross-potent sceptre-head is contra to his interpretation and he accounts for these coins by the movement of old obverse dies to these mints. Burns contends that in 1189 Willame arrived at Berwick with his old dies and dies were brought from Perth to Roxburgh on the death or

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[141] A. de Cardonnel, *Numismata Scotiæ* (Edinburgh: 1786), p. 39–40.
[142] Burns, *Coinage*, vol. 1, p. 51.
[143] Ibid., vol. 1, p. 52.
[144] Ibid., vol. 1, p. 56.
[145] Ibid.
[146] Ibid., vol. 1, p. 54.

resignation of Folpolt.[147] In his concluding remarks, Burns concedes that mints may have been active in the castles surrendered to the English but he regards this as 'highly improbable'.[148]

As with the greater part of *The Coinage of Scotland*, Burns's analysis of the Crescents coinage is a coherent whole and not amenable to selective redaction. Burns's objective was to rationalise the Crescents coinage according to his interpretation of the historical record. In this regard he succeeded. In such an undertaking, however, there are in all likelihood shortcomings resultant from the necessity of moulding numismatic evidence around preconceptions.

Stewart's approach to the coinage is, by comparison, judiciously cautious.[149] The great strength of Stewart's survey is his recognition of the indeterminacy of the evidence; he readily described the problems of reconstructing the structure of the coinage as 'formidable'.[150]

The possibility of a fifteen-year gap in minting at Berwick and Roxburgh, rejected by Burns, remains germane and Stewart rightly asseverated die-link evidence towards detecting any break between the cross-potent and cross-pommée coins. Stewart concluded that minting at Berwick may be regarded as discontinuous and that Perth may have opened as a reaction. Stewart found 'no obvious sign of a gap' within the numismatic evidence from Roxburgh.[151]

5.10.2. The settlement of Falaise and ramifications for minting

Cardonnel and Burns both explored minting activity based on preconceptions, counterpoising the deficiency in information concerning minting activity and the effects of the settlement. In contrast, the structure of the coinage, researched independently, is likely to be more informative about the settlement than the settlement is about the coinage. As discussed above, the first commentator on the coinage who acknowledged the intricacies of the

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[147] Ibid., vol. 1, p. 57.
[148] Ibid.
[149] I. Stewart, 'Scottish Mints', pp. 198–201.
[150] Ibid., p. 198.
[151] Ibid., p. 201.

historical issues was Stewart in his seminal paper on Scottish mints.[152] It is somewhat unfortunate, therefore, that the most recent survey by Blanchard relies so slavishly on Burns, seemingly unaware of the important advances made by Stewart; his analysis is consequently confused.[153]

Simply stated, the significance of the settlement of Falaise for the coinage is contingent both on its effects and on the location and function of moneyers.

For early commentators, the location of a mint was often equated with its function. Cardonnel understood that the entire coinage resulted from mints that were established in castles held by the English in order to pay a ransom.[154] Conversely, Burns's understanding of the coinage was informed by his view that the mints were located within castles and that William I would not have placed his mints in castles that were garrisoned by English forces.[155] These categorical assertions may be tempered with an analysis of minting activity during the twelfth century.

The location of any mint is dictated by its function. In Britain in the twelfth century coining was a supervised function of the nation-state, devolved to individual moneyers working on a commercial basis. Moneyers were the conduit through which amorphous bullion was transformed into a standardised means of exchange. Hence moneyers touted for business in a commercial environment, profiting from a seignorage charge – an exchange levy. In such circumstances, moneyers were active within burghs rather than castles.

As previously stated, there is no documentary evidence for the moneyers of the Crescents coinage, but two earlier moneyers are identifiable. In the reign of David I Mainard the Fleming, a former burgess of Berwick, was the moneyer at St Andrews.[156] According to the Black Book of St Andrews, Mainard occupied three tofts '*a vico burgendi usque ad rivum*

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[152] Ibid., pp. 198–201.
[153] Blanchard, *Mining, Metallurgy and Minting*, pp. 656–63. The chronological framework is set out in Table 2B/3 on p. 656, where the coinage is uncanonically designated Class II, consisting of Type 1 and Type 2. Blanchard's inclusion of the mints of Dunbar and Stirling for the coinage is erroneous.
[154] A. de Cardonnel, *Numismata Scotiæ* (Edinburgh: 1786), pp. 39–40.
[155] Burns, *Coinage*, vol. 1, p. 54.
[156] G.W.S. Barrow, *The Charters of David I* (Woodbridge: 1999), p. 165, no. 242 (lost act).

prioris'.[157] Veronica Smart identifies Mainard's property with a plot fronting on to modern South Street and extending back along Abbey Street; this on the opposite side of the medieval town to the castle.[158] Sterlings of Perth of David I are known of the moneyer Baldwin and Lord Stewartby equates the moneyer with Baldwin the Lorimar, who is recorded in *acta*.[159] On the basis of this limited evidence, it is probable that the situation of Scottish moneyers was analogous to the situation in Winchester in the twelfth century prior to 1180, where moneyers were concentrated in properties located on the busiest street in the city.[160] From the foregoing analysis it is reasonable to assume that the moneyers coining the Crescents type were men of burgess rank working in burghs. Yet even if the mints were not located in castles, the argument shifts as to whether coining took place in burghs attached to castles occupied by the English. This necessitates examination of the status of the burghs between 1175 and 1189.

The settlement of Falaise specifically identifies the surrender of castles (*castellum*).[161] According to Barrow, William I nevertheless regarded the burghs adjacent to the castles occupied by the English as 'outwith his power for as long as they were dominated by Angevin garrisons'.[162] In support, Barrow cites three *acta*, two of which concern revenue. The king granted alternative sources of income to Kelso Abbey, in exchange for the revenues formally derived from Roxburgh.[163] The act itself does not elaborate on why the revenue is not forthcoming, but Barrow regards the grant as a transaction forced on William I by the

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[157] V. Smart, *The Coins of St Andrews* (St Andrews: 1991), p. 17.
[158] Ibid., pp. 15-17. For the coins of David I minted in the name of Mainard see J.E.L. Murray and I. Stewart, 'St Andrews mint under David I', *BNJ* 53 (1983), pp. 178–80.
[159] Unpublished information from correspondence with Lord Stewartby. Coins of David I of the Perth mint were unknown until the discovery of the Prestwich hoard (1971), which contained eight specimens; see *Coin Hoards* 1 (1975) p. 92 no. 360. In the mid-1970s Ian Stewart acquired a parcel of David I sterlings from an old find, which included sterlings of Perth; see *Coinage in Medieval Scotland* (1100-1600), ed. D.M. Metcalf (British Archaeological Report 45) (Oxford: 1977), p. 24. The publication of the Prestwich hoard by M. M. Archibald is forthcoming. One sterling of David I of Perth mint in Blackburn Museum from the Prestwich hoard was published *SCBI* 48 (Northern Museums), no. 1899; the note states that Lord Stewartby reads the moneyer's name as Baldwin. G. W. S. Barrow, *The Charters of David I* (Woodbridge: 1999), pp. 140–41, no. 176; *RRS* I (Malcolm IV), pp. 186–7, no. 121.
[160] M. Biddle (ed.), *Winchester in the Middle Ages* (Oxford: 1976), p. 400.
[161] *Anglo-Scottish Relations: Selected Documents*, ed. and trans. E. L. G. Stones (London: 1965), p. 3.
[162] *RRS* II (William I), p. 8.
[163] Ibid., p. 244, no. 188.

settlement of Falaise.[164] Similarly, William I made provision for Holyrood Abbey 'in exchange for the alms they lost through the *castellani*'.[165] Through the instrument of the third act cited by Barrow, the king seized into his own hands a hall built by the monks of Melrose 'at the time Geoffrey de Neville had custody of my castle of Berwick'.[166] The evidence for administrative continuity is, however, more equivocal than these three *acta* suggest.

It must be conceded both that the settlement of Falaise was a 'hugely demeaning agreement' and that the itinerant royal court avoided the castles garrisoned by the English.[167] Nevertheless, it seems that William I took corresponding measures to strengthen his administrative hold on Roxburgh and Berwick. Shrievalties were closely associated with royal castles and burghs and the king still had sheriffs in the occupied places.[168] Although there is a dearth of information for the attitude of William I immediately following the settlement of Falaise, the career of Walter Corbet is salient. Walter Corbet held the shrievalty of Roxburgh 1177 × 1189, during the English occupation.[169] The Corbets were one of the key families in the frontier region whose familial loyalties were divided by their 'Anglo-Scottish proprietorship'.[170] In Pipe Roll 22 Henry II (1175-6) Walter Corbet rendered account of 20 marks specifically so 'that he and his men may not be accused of being the king's [Henry II's] enemies in the time of the war'.[171] It is not unreasonable to contend that William I's appointment of Walter Corbet to the shrievalty of Roxburgh was conciliatory: a man proven in his adeptness in handling both crowns. More circumstantial evidence for the continuation of Scottish administration is provided by a quitclaim, placed-dated at Selkirk and dated by Barrow to 1173 × 1177, in which William I allowed Coldingham Priory the 2*s*. demanded by

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[164] Ibid., p. 245.
[165] Ibid., p. 253, no. 199.
[166] Ibid., p. 311, no. 288.
[167] R.R. Davies, *The First English Empire: Power and Identities in the British Isles* (Oxford: 2000), p. 14. *RRS* II (William I), p. 28. Suggestion of G. W. S. Barrow recorded by I. Stewart, 'Scottish Mints', p. 200.
[168] *RRS* I (Malcolm IV), p. 337.
[169] *RRS* II (William I), p. 64, note 90.
[170] K.J. Stringer, *Earl David of Huntingdon* 1152-1219 (Edinburgh: 1985), p. 199 and p. 202. The phrase is Stringer's title of the relevant chapter.
[171] *Pipe Roll 22 Henry II*, p. 140.

his serjeants of Berwick.[172] The quitclaim proves that William I had serjeants in Berwick during that time, but it is possible that it pre-dates the settlement of Falaise.

Anglo-Scottish proprietorship extended to institutions as well as individuals and one *conventio* is pertinent to the present discussion, indicating that one of the acts cited by Barrow sought to address a heterogeneous situation. An agreement between the Augustinian priory of Brinkburn, Northumberland, and the monks of Kelso concerns rents derived from Roxburgh.[173] The act must be dated January 1179 × February 1189, the abbacy of Ernald of Melrose who was one of the abbots to whom the act is addressed; accordingly the agreement was contrived in the period of the settlement of Falaise.[174] The date places the original document infra the grant of William I, × 1178.[175] The grant may indicate that the king's intervention related to revenue lost by Kelso in a dispute with Brinkburn, rather than a lack of economic productivity caused by the English occupation or an inability to collect revenue due to it. Moreover, the agreement is testimony that ecclesiastical houses were not inhibited in disputing revenues from burghs adjacent to the castles subject to the settlement of Falaise. Thus the grant cited by Barrow is more complex than an initial reading would suggest. If, as seems likely from the foregoing discussion, William I's administration continued in the burghs, there would be no incentive to curtail the economic viability of such burghs, and individuals and institutions involved in Anglo-Scottish proprietorship had a vested interest in their prosperity.

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[172] *RRS* II (William I), no. 178, p. 238.

[173] *The Cartulary of Brinkburn Priory*, ed. W. Page (Surtees Society, vol. XC, 1892), pp. 130–31, no. 158. The agreement discussed property donated by Gilbert Fraser of Roxburgh and his wife Christina, the grant of which is preserved separately in the cartulary, ibid. no. 156. The earlier donation of Gilbert Fraser is dated 1165 × 1171 on the evidence of the witnesses: Ingram, Bishop of Glasgow 1165–1174; John, Abbot of Kelso 1160–1180; Nicholas, the king's Chancellor 1160–1171.

[174] Ernald was elected Abbot of Melrose in 1179 and elected abbot of Rievaulx 2 March 1189. *Chronicle of Melrose*, facsimile ed. by A.O. Anderson and M.O. Anderson (London: 1936), p. 42 and p. 47. D. E. R. Watt and N. F. Shead (eds.) *The Heads of Religious Houses in Scotland from the Twelfth to the Sixteenth Centuries* (Edinburgh: 2001), p. 149. D. D. Knowles, C. N. L. Brooke and V. C. M. London (eds.), *The Heads of Religious Houses, England and Wales I: 940–1216* (second edition, Cambridge: 2001), p. 140.

[175] Barrow dates the act 1175 × 1178, *RRS* II (William I), p. 244. The earlier date is constrained by his contention that the act is after the settlement Falaise, but this cannot be sustained in the context of the argument advanced here.

If revenues from the burghs occupied by the English were actually diverted from the Scottish treasury, as Barrow suggests, one would expect that they either accrued to the castellans or to the English Exchequer. In 1177 Henry II substituted all the castellans, thus suppressing their independence by reinforcing the understanding that the castles were at the disposal of the king.[176] It is unlikely, therefore, that Henry II would have privileged them to receive revenue. Yet there is no evidence that the revenue accrued to the English crown, rather the evidence indicates that the occupation of the Scottish castles was costing money. In Pipe Roll 23 Henry II (1176–7) the Exchequer paid out £40 by the king's writ for the provisioning of Roxburgh castle.[177]

The benefit that Henry II strove to secure from the occupation of the castles was strategic rather than pecuniary. The neutralisation of Berwick and Roxburgh was undoubtedly educed from the strategic importance of these places in the war of 1173–4. According to Jordan Fantosme, William I's envoys took ship from Berwick to solicit Henry the young king, and it was to Berwick that the king of Scotland's men carried their pillage.[178] Humphrey de Bohun 'accompanied by barons of Northumberland' was responsible for the burning of Berwick, described by Fantosme as a 'great hurt to the king of Scotland'.[179] Richard de Lucy merely aimed to repulse the Scots and regarded Humphrey de Bohun's actions as provocative. In both campaign seasons William I withdrew his army to Roxburgh. In 1173, William abandoned Carlisle to march 'by night to Roxburgh whence they had previously set forth'.[180] In 1174 William withdrew to Roxburgh after the unsuccessful siege of Wark castle.[181] The castles of Edinburgh, Jedburgh and Sterling are not mentioned in the Chronicle. It is clear that the English occupation was a response to a proven threat.

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[176] W. L. Warren, *Henry II* (London: 1973), pp. 141–2. According to Roger of Howden, *Gesta Regis Henrici Secundi*, ed. W. Stubbs, vol. 1 (London: 1867), I, pp. 160-1, Roxburgh went to William de Stuteville, Edinburgh to Roger de Stuteville, and Berwick to Geoffrey de Neville.
[177] *Pipe Roll 23 Henry II*, p. 123.
[178] *Jordan Fantosme's Chronicle*, ed. and trans. R.C. Johnston (Oxford: Clarendon Press, 1981), ll. 425ff. and ll. 1179ff.
[179] Ibid., ll. 791-807.
[180] Ibid., ll. 751ff.
[181] Ibid., ll. 1275ff.

Henry II behaved with generous leniency toward William I in regard to areas that were not of strategic concern. The English honours of the king of Scotland were forfeit on his attack on England in 1174, yet the Liberty of Tynedale was quickly restored. In Pipe Roll 20 Henry II (1173-4) Roger de Stuteville rendered account of £10 from lands granted in Tynedale, which the king of Scotland had (*habuit*). By Michaelmas 1175 the lands in Tynedale had been regranted to William I.[182] Restoration of the earldom of Huntingdon was delayed for ten years, but was also generously restored. The delay arose from complexity, both the contested claims to the earldom by the Senlis family and the circumstances of its passing. Roger of Howden records that, in the exigencies of 1174, Henry II told Simon (III) de Senlis that he could have Huntingdon (at that time the earldom included Northampton) if he could take it by military force, which he duly did and he held it until his death in 1184.[183] Despite lawful claimants of Senlis lineage and those who 'offered the king great and many things to have justice', Henry II restored the earldom in March 1185 to William I, who at once endowed his brother David with the honour and the title of earl.[184]

By the quitclaim of Canterbury of 5 December 1189 William I obtained his freedom and castles from King Richard I of England.[185] Chronicle sources record that the king of Scotland paid ten thousand marks in gold and silver for his release.[186]

Assessing the substantive effects of the settlement of Falaise is difficult owing to the deficiency in evidence. Yet it is precisely the deficiency that led commentators before Stewart

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[182] *Pipe Roll 20 Henry II*, p. 105; *Pipe Roll 21 Henry II*, p. 184.

[183] Roger of Howden, *Gesta Regis Henrici Secundi*, ed. W. Stubbs (London: 1867), vol. 1, pp. 70-1. It seems that Simon (III) de Senlis may have been regarded as Earl of Northampton and briefly held the honour, before the dignity was granted to King Malcolm IV of Scotland. By 1155 × 1156 Simon III de Senlis was apparently landless. See K.J. Stringer, 'A Cistercian archive: the earliest charters of Sawtry Abbey', *Journal of Society of Archivists*, 6 (1980), pp. 325-34 at p. 329 note 23. G.J. White speculated that 'the political imperative of reaching an accommodation with the Scots, and the incentive of establishing suzerainty over their king' necessitated the manoeuvring concerning these Midland earldoms in the 1150s. See White, *Restoration*, p. 108.

[184] Roger of Howden, *Gesta Regis Henrici Secundi*, ed. W. Stubbs (London: 1867), vol. 1, p. 337.

[185] *Anglo-Scottish Relations: Selected Documents*, ed. and trans. E.L.G. Stones (London: 1965), pp. 6-8. *Acta of Henry II and Richard I*, ed. J.C. Holt and R. Mortimer (List and Index Society, special series, 21, 1986), p. 189, no. 350.

[186] *Chronicle of Melrose*, facsimile ed. by A.O. Anderson and M.O. Anderson (London: 1936), p. 47 and p. 105. Willam of Newburgh, *Historia Regum Anglicarum*, ed. R. Howlett in *Chronicles of the Reigns of Stephen, Henry II and Richard I* (London: 1884), vol. 1, p. 304.

to presuppose the effects of the settlement in their analysis of minting activity. Nevertheless, the foregoing analysis has elucidated four conspicuous points. Firstly, it is more likely that moneyers were at work within burghs than castles. Secondly, continued Scottish administrative control of the burghs attached to the castles garrisoned by English forces can be detected, both in personnel and in the interests of Anglo-Scottish proprietorship. Thirdly, Henry II's aim was to maintain the territorial integrity of his kingdom, and the garrisoning of Roxburgh and Berwick was a response to a proven threat. Fourthly, the evidence does not support the notion that William I was oppressed by Henry II until he was able to obtain redemption from a new king of England. Owing to these factors, any inclination to restrict the minting activity at Berwick, Edinburgh and Roxburgh to the periods when the castles were only in Scottish possession is unwarranted.

5.10.3. Chronological structure of the coinage

Numismatic evidence examined according to a methodological framework produces dependable results. The die-study of the coinage, derived from the die-corpus based on the Catalogue, yields a number of incontestable conclusions as to the structure of the coinage, which can be used to detail the chronology (see §5.4.5)

The most important facet of the numismatic evidence indicates a distinct discontinuity in minting at Roxburgh, and possibly at Berwick as well. The die-links clearly associate Classes A and B together and Classes C and D together. Class E remains largely obscure. These consecutive class groups constitute the primary, secondary and tertiary phases of the Crescents coinage.

The abundance of mules between obverse die 10^{B} and numerous Class C reverse dies of Roxburgh has served to indicate the interruption of minting activity. The survival of obverse die 10^{B} is analomous; it was probably transferred to Roxburgh from Dunfermline, where it was first used, with the moneyer Raul. With the recognition of intrusion of die 10^{B}, the use of obverse 10^{B} is reliable evidence for both a cessation and a resumption in minting at Roxburgh.

As has been shown, the dies used to strike Crescents sterlings of the Perth mint were from a separate source from those used for the rest of the coinage, termed here products of the 'Perth die-cutting workshop' (PDW). Dies used by the moneyer Ailbode without mint name are the earliest of the PDW and die-link with coins of Folpolt of Perth. Although Folpolt is named on coins as a moneyer of Perth, coins from Class A reverse dies of the moneyer Folpolt without mint name were not struck with dies of the PDW. Thus the evidence indicates that Folpolt began minting at a place other than Perth, probably at Roxburgh where Folpolt had been a moneyer prior to the initiation of the Crescents coinage. The movement of Folpolt to Perth can be interpreted as a response to an initial reaction to the loss of Roxburgh. This indicates both that the Crescents coinage began prior to 1174 and that that Folpolt's activity at Perth was a contingency. Similarly, owing to the PDW, the activity of minting at Perth cannot be chronologically restricted: the PDW might never have progressed to use the cross-pommée sceptre-head.

Minting did not take place at Edinburgh in Classes A and B. The two die combinations involving obverse die 10^{B} with reverses of Classes C and D of Adam of Edinburgh are superficially misleading. It is possible that obverse 10^{B} was never transferred to Edinburgh, rather that the die combinations occurred owing to the movement of reverse dies of the moneyer Adam to Roxburgh. Minting at Edinburgh begins in Class C. Whether the initiation of minting at Edinburgh is to be associated with the period after 1186 when the castle was restored as dower for William I on his marriage to Ermengarde de Beaumont must remain open.

Dating the re-activation of minting in Roxburgh and Berwick is problematic. Two elements are incontestable. Firstly, the Crescents coinage must have resumed at Roxburgh after 1180 because the dies use the cross-pommée sceptre-head. Secondly, the Melrose Chronicle dates the termination of the coinage to 1195. Moreover, the coinage must have been in issue long enough to accommodate stylistic developments from classes C, D and E.

From the limited hoard evidence of the coinage (§5.6) it is plausible to date the deposit of the Dyke hoard to before the end of the coinage in 1195, because the hoard appears not to

have contained coins of Class E, which are the content of the Baddinsgill hoard. The single finds from the far north of Scotland undoubtedly belong to the period of internal colonisation of the region after the defeat of Donald MacWilliam in 1187. Both finds are coins of Class E.

The evidence surveyed demonstrates that there was certainly a break in minting at Roxburgh, which is probably to be dated to 1174, but resumption of minting occurred in or after 1180 but prior to 1189. Minting at Berwick may not have begun until Class C. The reasons for the re-opening are not recoverable: it may have been demanded by commercial traders, initiated by the Scottish royal government for its own benefit, a response to bullion flows, or a combination of these factors.

Table 5.7 arranges the dating evidence for the internal chronology of the coinage.

5.10.4. General conclusions for chronology

From Table 5.7 it is possible to conclude that, with the structure of the coinage, the chronology of the Crescents coinage may be stated as follows: Classes A and B *c.*1170–*c.*1174, Classes C and D *c.*1180–late 1180s, Class E late 1180s–1195. As discussed, the coins minted at Perth form a separate group and the activity cannot be more precisely defined than 1174 × 1195. For the sake of completeness, the unparalleled usage of obverse die 10^{B} is included in Table 5.7. This die was initially isolated at Dunfermline *c.*1175–*c.*1180, before moving south to Roxburgh in the early 1180s.

It must be stressed that these dates are only approximate, due to exegesis of the internal chronology from the structure of the coinage, in the absence of any documentary evidence. The impact of the settlement of Falaise is difficult to assess, but disruption to minting activity seems to have occurred at Berwick and Roxburgh. Mint activity appears to have been restored in the 1180s while the castles of these burghs were still garrisoned by English forces and may be related to the improving relations of William I with Henry II of England.

Table 5.7. Dating evidence for internal chronology of the classes of Crescents coinage.

Mint (Crafter Classes)	*Notes*	*Suggested dating conclusion*	*Widest possible dates for class*	*Crafter preferred*
A and B	(1)	In or before 1174	1166 × 1174	*c.*1170–*c.*1174
	(2)	In or before 1174		
Die 10^{B} at Dunfermline	(3)	In or before 1174	1166 × 1180	*c.*1175–*c.*1180
Die 10^{B} at Roxburgh	(4)	After 1174.	1180 × 1195	Early 1180s
C and D	(4)	In or after 1180	1180 × 1195	*c.*1180–late 1180s
	(5)	In or after 1180		
	(6)	In or before 1195		
	(7)	Before 1195		
E	(8)	Late 1180s/early 1190s	1180 × 1195	Late 1180s–1195
	(9)	After 1187		
	(7)	Before 1195		
Perth dies	(10)	In or before 1174		
	(11)	In or after 1174	1170 × 1195	1175 × 1195
	(12)	Before 1195		

Notes on Table 5.7.

(1) Coins of the moneyer Folpolt without mint name were not struck from dies of the PDW. They were probably not minted at Perth, but in southern Scotland (probably Roxburgh), prior to the settlement of Falaise (1174).

(2) Die-linked groups of Classes A and B dies associated both together.

(3) Coins of Dunfermline are the earliest striking of obverse 10^{B}, a Class B die which belongs to the class used at Roxburgh, which are associated with the phase of the coinage following from Class A.

(4) The use of obverse die 10^{B}, the survival of which was anomalous, in conjunction with Class C reverses and die-linked with Class C obverses occurs in conjunction with the resumption of minting at Roxburgh. Older Class B dies that were used at Roxburgh do not survive.

(5) Die linked groups of Classes C and D dies associated both together.

(6) The concealment of the Dyke hoard probably occurred before the end of the coinage. The hoard appears not to have contained the final phase of the coinage, Class E.

(7) The *Chronicle of Melrose* records that King William I renewed his coinage in 1195.

(8) The Baddinsgill hoard consists entirely of coins of Class E and an English Short Cross coin. Lord Stewartby has argued that the English coin provides a *terminus post quem* of the late 1180s or early 1190s.

(9) The two single finds of Class E found north of Inverness (S2 and S4) were probably lost from circulation during the period when the region was consolidated by settlement *after* the defeat of Donald MacWilliam in 1187.

(10) Coins without mint name of the moneyer Ailbode are the earliest from PDW dies and die-link with coins of Folpolt of Perth struck from PDW dies.

(11) The moneyer Folpolt at Perth is probably the moneyer of the same name previously using non-PDW dies without mint name. Folpolt's appearance at Perth, where he used a die previously used by Ailbode, is undoubtedly a reaction to suspension of minting in southern Scotland immediately after the settlement of Falaise (See note 1).

(12) Perth had its own die-cutting workshop and its exclusive use of the cross-potent sceptre-head does not restrict dating of the coins – the workshop did not progress to cross-pommée.

5.11. Conclusions

It is certainly right to speak of monetary expansion in Scotland during the Crescents coinage (*c.*1170–1195). The arrangement of a large body of material for the first time has allowed the internal structure of the coinage to be revealed by analytical methods and the number of dies of each class of the coinage to be explored statistically. The lack of documentary evidence requires that the internal chronology of the coinage is only approximate, and may be stated as follows — Classes A and B *c.*1170–*c.*1174, Classes C and D *c.*1180–late 1180s, Class E late 1180s–1195. As discussed, the coins minted at Perth form a separate group and the activity cannot be more precisely defined than 1174 × 1195.

The output of the coinage increased as the coinage proceeded, but in total was minuscule compared to the output in English recoinages of 1158–c.1160 and 1180–82 at approximately £8,000–£16,000. Single find evidence reveals patterns of circulation in a variety of usage. Some finds belong to commercial environments, but coins in areas outside the control of Scottish kings were being used as bullion and reveal the penetration of coinage into the far north of Scotland for the first time. The metallurgy reveals a limited impact of silver from the north of England on the coinage of Raul Derlig. The alloy of twelfth century British coinage is the subject of Chapter 5 where the metallurgy of the Scottish coinage is dealt with in context.

Understanding of the Crescents coinage remains to be advanced, particularly in regard to Class E, which is at present underrepresented in extant material. Single finds of Class E have been added to the corpus at a steady rate over recent years, but profitable comparative work will have to wait for a new hoard. The discovery of a large hoard, especially one concealed at the end of the coinage, would be greatly welcome. Over 170 years have elapsed since the discovery of the last hoard to contain Crescents sterlings, an exceptionally poor rate of discovery when compared with other coinages of the twelfth century. Let us hope that we will not have to wait as long again for a new body of material from this important coinage.

6. The metallurgy and metrology of the coinages of Britain

6.1 Introduction

The alloy of late twelfth-century British coinage has never been thoroughly studied. The absence of any earlier substantial analysis of the metallurgy of the coinages is perhaps surprising owing the unique opportunities to provide empirical data to compare with the Exchequer's handling of the coinage as detailed in the contemporary *Dialogus de Scaccario*. Furthermore, the silver alloys contain trace elements that are diagnostic of the source of bullion, which reveals the extent to which bullion flows influenced monetary expansion in the late twelfth century.

The availability in the University of Oxford's Department of Materials of facilities for Electron Probe Microanalysis (EPMA) has allowed a sample of fifty coins to be studied. The analyses have received generous financial support.[1] Rather than spread the selection evenly (and thinly) over the whole of the twelfth century and into the thirteenth in the hope of detecting chronological shifts, the decision was taken to concentrate on the two coinages that have been studied in this thesis. The analysis measured seventeen chemical elements of thirty English Cross and Crosslets coins and twenty Scottish Crescents coins, using a technique of (almost) non-destructive EPMA with wavelength dispersive spectrometry on metallographically polished areas of the coins' edges. The aim has been to detect variations within the alloys and allow detailed comparative work between the two contemporary coinages of Britain. As the two coinages are dealt with together in this chapter, specimen numbers are differentiated by 'Crescents' or 'Cross and Crosslets'.

Exploratory work on the alloy of late twelfth-century British coinage was published by D.M. Metcalf, who analysed five chemical elements using chemical analysis by X-ray fluorescence (XRF) in nine examples of the coinages under consideration in this thesis.[2] Two

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[1] The analysis was supported by grants from The Hunter Archaeological Trust, The Society of Antiquaries of Scotland, The Society of Antiquaries of Newcastle upon Tyne, and the Arnold Fund of the Modern History Faculty, Oxford University.

[2] D. M. Metcalf, 'The quality of Scottish sterling silver 1136–1280', *CIMS*, 73–84, at pp. 81–2, nos. 18–26.

of the coins analysed by Metcalf using XRF have been re-analysed using EPMA and a comparison of the results has not been encouraging (Crescents sterlings **5a** and **36a**).[3] Metcalf records values for lead at 1.02 and 1.09 per cent respectively, which have been found to be 1.53 and 1.36 per cent respectively by EPMA; Metcalf did not detect zinc, which has been detected using EPMA. A more recent study has indicated that XRF is unreliable for metallurgical investigation of coinage alloys, even for exploratory work.[4] Therefore, the analyses of chemical elements contained in this thesis may properly be regarded as having no antecedent. Conversely, the absence of any previous comprehensive metallurgical investigation means that there is, unfortunately, no theoretical base from which to build. For a majority of mints three specimens have been analysed in order to confirm that the data is typical of that mint and not anomalous. For example, one specimen of Perth (Crescents sterling **49a**) is extremely debased with copper and quite unlike the other coins of Perth or other mints.

As explored in Chapter 4, metallurgy and metrology cannot be divorced. Therefore, in this chapter the analytical work on the metallurgy and metrology are dealt with separately, but combined for the discussion of the *Dialogus de Scaccario* (§6.5). In this chapter figures expressed as 'silver' are as contemporaries would have perceived it, including the amounts of gold and lead ('silver' = Ag + Au + Pb), unless Ag alone is specified.

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[3] Ibid., p. 82 no. 24 (= *SCBI* 35 (Oxford/Glasgow), no. 15) and no. 29 (= *SCBI* 35 (Oxford/Glasgow), no. 29).

[4] D. M. Metcalf and J. P. Northover, 'Sporadic debasement in the English coinage, *c.*1009–1052', *NC* 162 (2002), pp. 217–236 at p. 225.

6.2 EPMA: Sample preparation and analysis

All the coins were weighed at the Ashmolean Museum prior to preparation for EPMA. The electron microprobe is a near-surface analysis method, owing to the low penetration of electrons, and requires a sound body of metal. The coins were prepared for metallographic study by exposing a sound body of metal. The coins were mounted on edge in groups of eight-to-ten in retainers. The retainers are machined from a 25mm diameter brass bar with a rectangular slot through the centre and two clamping screws at opposite sides. The coins at the extremity of each group were protected from the clamping screws with lead foil. The base of retainers and the edges of the coins exposed in the rectangular slot were then ground and polished to a 1 μm diamond finish, exposing a section of metal at the edge of each coin approximately 5mm in length. After polishing, the samples were ultrasonically cleaned in ethanol to remove polishing debris, including particles of brass and lead from the holders, and then inspected optically. The cut halfpennies were placed in a retainer half the height (12.5mm) of those holding the pennies.

Dr J.P. Northover undertook the analysis using the instrument currently available in Oxford, a Cameca SEMPROBE® with full stage and spectrometer automation and on-line correction. At each analysis point a 50μ square was analysed. Seventeen chemical elements were analysed.

The principle of EPMA is that X-rays generated by electron transmission in an element have energy or wavelength that is specific to that element.[5] The scanning electron microprobe uses electromagnetic lenses to focus electrons emitted from a heated tungsten filament to a narrow beam. Scan coils in the final lens deflect the beam in X and Y directions so that it covers a square raster. The interaction of the beam with the sample produces X-ray lines for microanalysis. The families of X-ray lines emitted in EPMA are the same as in XRF: K, L, and M. Results are calculated on the basis of counts per second per nanoamp (cps/nA) from current measured during each analysis, which is typically 10–50nA. The limits of detection in

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[5] For the details of the procedures of EPMA see J.P. Northover, 'Analysis in the Electron Microprobe and Scanning Electron Microprobe', *Metallurgy in Numismatics* 4, ed. W.A. Oddy and M.R. Cowell (London: 1998), pp. 94–113.

parts per million (ppm) are recorded in Table 6.1 and the limits of detection relate to the measurement time of 10 seconds on the scanning electron microprobe. The results of the Electron Probe Microanalysis are listed in Table 6.2 (foldout table, over leaf).

X-ray line	Element	Detection limit
Kα	S	100–200ppm
Kα	Al	500ppm
Kα	Si	100–200ppm
Kα	Mn	100–200ppm
Kα	Fe	100–200ppm
Kα	Co	100–200ppm
Kα	Ni	100–200ppm
Kα	Cu	100–200ppm
Kα	Zn	100–200ppm
Lα	As	100–200ppm
Lα	Sb	100–200ppm
Lα	Sn	500ppm
Lα	Ag	100–200ppm
Lα	Cd	100–200ppm
Mα	Bi	100–200ppm
Mα	Pb	100–200ppm
Mα	Au	100–200ppm

Table 6.1. The elements contained in X-ray lines, with average limits of detection.

Table 6.2. Results of Electron Probe Microanalysis. (— = not measured)

No.	*Wt.*	*Fe*	*Co*	*Ni*	*Cu*	*Zn*	*As*	*Sb*	*Sn*	*Ag*	*Bi*	*Pb*	*Au*	*S*	*Cd*	*Al*	*Si*	*Mn*	*'silver'*	*Au pp 100 Ag*	*Bi pp 100 Ag*	*Zn pp 100 (Cn+Zn)*	*Mint*/moneyer	*No*
ENGLAND: Cross and Crosslets type																								
3	1.30	0.01	0.01	0.02	6.13	0.22	0.01	—	0.00	91.74	0.04	1.29	0.51	0.01	—	0.00	0.00	0.02	93.54	0.56	0.04	3.46	Bristol	**3**
5	1.41	0.00	0.00	0.01	4.33	0.16	0.00	0.00	0.00	93.48	0.03	1.55	0.42	0.00	—	0.00	0.01	0.01	95.45	0.45	0.03	3.56	Bristol	**5**
TCRC	1.47	0.02	0.00	0.01	3.84	0.10	0.01	0.01	0.00	94.48	0.04	1.14	0.33	0.00	—	0.02	0.02	0.02	95.95	0.35	0.04	2.54	Canterbury	TCRC
42	1.38	0.04	0.01	0.01	4.07	0.12	0.00	0.00	0.00	93.92	0.05	1.37	0.38	0.01	—	0.00	0.01	0.00	95.67	0.40	0.05	2.86	Canterbury	**42**
58	1.26	0.01	0.02	0.01	7.26	0.13	0.00	0.01	0.00	90.42	0.24	1.57	0.32	0.01	—	0.00	0.00	0.00	92.31	0.35	0.27	1.76	Canterbury	**58**
78	1.40	0.01	0.00	0.01	4.35	0.10	0.00	0.00	0.00	93.46	0.14	1.48	0.43	0.00	—	0.00	0.00	0.01	95.37	0.46	0.15	2.25	Canterbury	**78**
79	1.39	0.01	0.00	0.01	3.17	0.14	0.00	0.00	0.00	95.24	0.01	0.81	0.53	0.01	—	0.01	0.05	0.01	96.58	0.56	0.01	4.23	Canterbury	**79**
83	1.39	0.01	0.01	0.02	5.98	0.02	0.00	—	0.00	91.96	0.13	1.58	0.29	0.00	—	0.00	0.00	0.00	93.83	0.32	0.14	0.33	Canterbury	**83**
AM (1)	0.80	0.00	0.00	0.01	4.39	0.06	0.01	—	0.00	93.91	0.03	1.44	0.14	0.00	—	0.00	0.00	0.00	95.49	0.15	0.03	1.35	Carlisle	AM (1)
TCRC	0.71	0.01	0.00	0.01	5.58	0.01	0.00	—	0.00	92.84	0.09	1.37	0.08	0.00	—	0.00	0.00	0.00	94.29	0.09	0.10	0.18	Carlisle	TCRC
126	1.42	0.02	0.01	0.01	5.90	0.11	—	0.00	0.00	92.20	0.05	1.68	0.04	0.00	—	0.00	0.00	0.00	93.92	0.04	0.05	1.83	Carlisle	**126**
127	1.27	0.00	0.01	0.00	6.14	0.07	0.00	0.01	0.00	92.26	0.33	1.12	0.04	0.01	—	0.00	0.00	0.00	93.42	0.04	0.36	1.13	Carlisle	**127**
AM (2)	1.38	0.01	0.00	0.01	5.76	0.05	0.01	0.00	0.00	91.79	0.07	2.00	0.28	0.00	—	0.00	0.02	0.00	94.07	0.31	0.08	0.86	Durham	AM (2)
131	1.46	0.01	0.01	0.03	3.95	0.03	0.00	0.03	0.00	93.80	0.06	1.79	0.27	0.01	—	0.01	0.01	0.01	95.86	0.29	0.06	0.75	Durham	**131**
AM (3)	1.33	0.00	0.00	0.01	4.21	0.03	0.00	0.00	0.00	94.07	0.07	1.42	0.15	0.01	—	0.00	0.00	0.00	95.64	0.16	0.07	0.71	Durham	AM (3)
AM (4)	1.40	0.02	0.00	0.02	4.08	0.13	0.00	0.00	0.00	94.32	0.01	0.87	0.47	0.01	—	0.00	0.06	0.01	95.66	0.50	0.01	3.09	Exeter	AM (4)
132	1.34	0.01	0.00	0.01	4.15	0.06	0.00	—	0.00	94.03	0.09	1.21	0.41	0.01	—	0.00	0.00	0.01	95.65	0.44	0.10	1.43	Exeter	**132**
136	1.38	0.00	0.00	0.02	5.63	0.25	0.00	—	0.00	91.80	0.11	1.74	0.43	0.00	—	0.00	0.00	0.01	93.97	0.47	0.12	4.25	Ipswich	**136**
139	1.43	0.01	0.01	0.01	8.75	0.04	0.00	0.00	0.00	88.49	0.06	2.21	0.39	0.01	—	0.00	0.00	0.02	91.09	0.44	0.07	0.46	Ipswich	**139**
164	1.39	0.02	0.02	0.01	9.78	0.31	0.00	—	0.00	87.03	0.14	2.43	0.24	0.00	—	0.00	0.00	0.01	89.70	0.28	0.16	3.07	Ipswich	**164**
190	1.42	0.01	0.01	0.02	3.95	0.06	0.00	0.00	0.00	93.71	0.07	1.74	0.30	0.00	0.00	0.02	0.11	0.01	95.75	0.32	0.07	1.50	London	**190**
197	1.31	0.01	0.01	0.01	5.33	0.10	0.01	0.00	0.00	92.95	0.14	1.03	0.28	0.00	0.02	0.02	0.10	0.00	94.26	0.30	0.15	1.84	London	**197**
212	1.44	0.01	0.01	0.01	4.46	0.14	0.00	0.00	0.00	93.13	0.04	1.70	0.42	0.00	0.01	0.01	0.05	0.00	95.25	0.45	0.04	3.04	London	**212**
AM (5)	1.36	0.00	0.00	0.01	4.24	0.02	0.00	0.00	0.00	94.20	0.02	1.37	0.12	0.00	0.00	0.00	0.01	0.01	95.69	0.13	0.02	0.47	Newcastle	AM (5)
AM (6)	1.43	0.00	0.00	0.00	4.66	0.02	0.00	0.00	0.00	94.15	0.36	0.69	0.03	0.00	0.00	0.01	0.06	0.01	94.87	0.03	0.38	0.43	Newcastle	AM (6)
216	1.44	0.00	0.00	0.01	4.72	0.06	0.00	0.00	0.00	93.60	0.03	1.47	0.03	0.00	0.00	0.00	0.05	0.01	95.10	0.03	0.03	1.26	Newcastle	**216**
219	1.17	0.00	0.01	0.01	6.63	0.12	0.00	0.00	0.00	91.63	0.03	1.47	0.06	0.00	0.00	0.00	0.02	0.01	93.16	0.07	0.03	1.78	Newcastle	**219**
222	1.38	0.01	0.01	0.00	3.92	0.13	0.00	—	0.00	94.21	0.06	1.24	0.41	0.00	—	0.01	0.00	0.00	95.86	0.44	0.06	3.21	Northampton	**222**
252	1.40	0.01	0.00	0.01	4.80	0.02	0.01	0.00	0.00	93.55	0.04	1.16	0.39	0.00	0.01	0.00	0.01	0.01	95.10	0.42	0.04	0.41	York	**252**
253	1.38	0.02	0.00	0.00	3.25	0.07	0.00	—	0.00	94.49	0.04	1.59	0.47	0.06	—	0.00	0.00	0.01	96.55	0.50	0.04	2.11	York	**253**
SCOTLAND: Crescents type																								
5a	1.49	0.01	0.01	0.01	6.85	0.04	0.00	—	0.00	91.24	0.02	1.53	0.29	0.00	—	0.00	0.00	0.00	93.06	0.32	0.02	0.58	WMN, Folpolt	**5a**
8a	1.48	0.00	0.01	0.01	5.30	0.10	0.00	—	0.00	93.29	0.04	0.92	0.32	0.01	—	0.00	0.00	0.00	94.53	0.34	0.04	1.85	WMN, Raul Der	**8a**
11a	1.37	0.01	0.02	0.01	6.58	0.08	0.00	—	0.00	91.64	0.17	1.43	0.06	0.00	—	0.00	0.00	0.01	93.13	0.07	0.19	1.20	Berwick, Raul Derlig	**11a**
15a	1.47	0.01	0.01	0.01	5.62	0.01	0.00	—	0.00	92.49	0.12	1.50	0.22	0.00	—	0.00	0.00	0.00	94.21	0.24	0.13	0.18	Berwick, Willam	**15a**
19a	1.45	0.01	0.00	0.03	6.59	0.11	0.00	—	0.00	90.86	0.19	2.02	0.19	0.01	—	0.00	0.00	0.00	93.07	0.21	0.21	1.64	Berwick, Willam	**19a**
22b*	0.80	0.01	0.00	0.02	7.76	0.05	0.00	—	0.00	89.94	0.08	1.83	0.30	0.00	—	0.00	0.00	0.01	92.07	0.33	0.09	0.64	Dunfermline, Raul	**22b**
25a	0.74	0.00	0.02	0.01	4.82	0.03	0.01	—	0.00	93.51	0.03	1.28	0.29	0.00	—	0.00	0.00	0.00	95.08	0.31	0.03	0.62	Edinburgh, Adam	**25a**
29a	1.49	0.01	0.01	0.01	4.16	0.00	0.00	—	0.00	93.64	0.05	1.81	0.30	0.01	—	0.00	0.00	0.00	95.75	0.32	0.05	0.00	Edinburgh, Adam	**29a**
33a	1.39	0.01	0.00	0.00	4.56	0.02	0.01	—	0.00	94.02	0.04	1.09	0.24	0.00	—	0.00	0.00	0.00	95.35	0.26	0.04	0.44	Edinburgh, Hue	**33a**
36a	1.51	0.00	0.00	0.01	5.18	0.03	0.00	—	0.00	93.10	0.02	1.36	0.28	0.01	—	0.00	0.00	0.01	94.74	0.30	0.02	0.58	Perth, Folpolt	**36a**
36b	1.22	0.01	0.00	0.00	7.09	0.02	0.00	—	0.00	91.74	0.00	0.83	0.30	0.01	—	0.00	0.00	0.00	92.87	0.33	0.00	0.28	Perth, Folpolt	**36b**
49a	1.35	0.00	0.00	0.02	26.41	0.01	0.02	0.04	0.00	71.77	0.00	1.39	0.30	0.01	—	0.00	0.00	0.00	73.46	0.42	0.00	0.04	Perth, Folpolt	**49a**
55a	1.38	0.01	0.01	0.01	6.42	0.02	0.01	0.01	0.00	91.02	0.03	2.12	0.29	0.00	—	0.00	0.05	0.01	93.43	0.32	0.03	0.31	Roxburgh, Raul	**55a**
60b	1.49	0.01	0.03	0.00	7.21	0.07	0.00	0.00	0.00	90.92	0.27	1.21	0.16	0.00	—	0.01	0.09	0.00	92.29	0.18	0.30	0.96	Roxburgh, Raul	**60b**
62a	1.48	0.01	0.00	0.01	4.36	0.06	0.01	0.00	0.00	94.18	0.17	0.86	0.23	0.00	—	0.01	0.01	0.01	95.27	0.24	0.18	1.36	Roxburgh, Raul	**62a**
86a	1.49	0.01	0.01	0.00	3.65	0.07	0.00	—	0.00	94.32	0.03	1.41	0.48	0.01	—	0.00	0.00	0.00	96.21	0.51	0.03	1.88	Roxburgh, Raul	**86a**
128a	1.46	0.02	0.01	0.01	7.74	0.09	0.00	0.01	0.00	90.86	0.38	0.61	0.10	0.00	—	0.02	0.02	0.02	91.57	0.11	0.42	1.15	Roxburgh, Raul Derlig	**128a**
132a	1.47	0.00	0.00	0.02	5.03	0.05	0.00	0.00	0.00	93.06	0.58	0.96	0.22	0.00	—	0.01	0.06	0.02	94.24	0.24	0.62	0.98	WMN, Raul Derlig	**132a**
135a	1.48	0.02	0.00	0.01	7.01	0.05	0.01	0.01	0.00	91.37	0.08	1.02	0.30	0.01	—	0.00	0.09	0.01	92.69	0.33	0.09	0.71	WMN, Raul Derlig	**135a**
144a	1.37	0.01	0.01	0.02	11.24	0.05	0.01	0.01	0.00	87.39	0.08	0.85	0.20	0.00	—	0.01	0.11	0.00	88.44	0.23	0.09	0.44	WMN, Radulfus	**144a**

ENGLAND. Of the 30 English coins, 28 are in the Ashmolean Museum, Oxford. Numbers in bold type are Catalogue number of specimens in the Gayton hoard (§9.4). Another six coins are in systematic collection of the Ashmolean Museum, marked AM, of which four were published in *SCBI* 12 (Oxford): (1) no. 357; (2) no. 304; (3) no. 326; (5) no. 311; (4) and (6) were acquired post *SCBI*. The two coins marked TCRC are from the collection of T.C.R. Crafter.

SCOTLAND Of the 20 Scottish coins, 19 are in the Ashmolean Museum, Oxford. All the numbers are Catalogue numbers of specimens in the Catalogue of the Crescents coinage (§10.4). Number **22b** is in the collection of T.C.R. Crafter. WMN = Without mint name.

6.3 Interpretative analyses of metallurgy

6.3.1 Cupellation and debasement of alloy

When money was recycled into a new coin type, whether during a recoinage or through normal mint activity, the existing coins were melted down and the 'silver' purified through cupellation, a process of selective oxidisation in which lead oxide is absorbed into a porous refractory hearth or burnt off. When moneyers of the medieval period considered any weight of silver they would have reckoned the aggregate as including any quantity of lead as would have remained after cupellation. Mint technicians would have been unaware of the traces of gold and bismuth, which have been assumed to enter the alloy with the silver. An approximation of what moneyers regarded as 'silver' is the combined percentage for the chemical elements Ag + Au + Pb. Bismuth could also have been included in the figure for 'silver' as it entered the alloys with Ag, but has been excluded because of the peculiar behaviour of the chemical element in silver alloys and its importance for diagnosis of bullion source (discussed below §6.3.4).

It is probable that the cupellation of the silver is responsible for the small amounts of lead detected in the coins. There is a clear inverse correlation between Ag and Pb in the Cross and Crosslets coins (Figure 6.1) and this indicates that the relative amounts of Ag and Pb were affected by the length of time allowed for cupellation – the point at which the crucible was removed from the heat source. The proportion of lead is usually between 1 and 2 per cent. The inverse correlation demonstrates that mint technicians regarded Ag and Pb as an aggregate, and hence it is correct to regard 'silver' as Ag + Au + Pb. No correlation can be observed from the data on Crescents coins, owing to the smaller sample that was subjected to analysis.

As has already been explored (§5.6.2), although Crescents sterlings are heavier than Cross and Crosslets pennies, they are also baser. In consequence, although the coins produced in each kingdom have different compositions, the two coinages have an intrinsic parity. Figure 5.8 shows that the Cross and Crosslets coins are clustered in the range of 95–6% 'silver'. Figure 5.7 shows the Crescent sterlings. Except for sterlings struck at Edinburgh, which

achieve over 95% 'silver' and indicate that moneyers seem to have produced coins with a consistently higher silver content than other mints in the Crescents coinage, sterlings from other mints are clustered in the range of 92–4% 'silver'.[6]

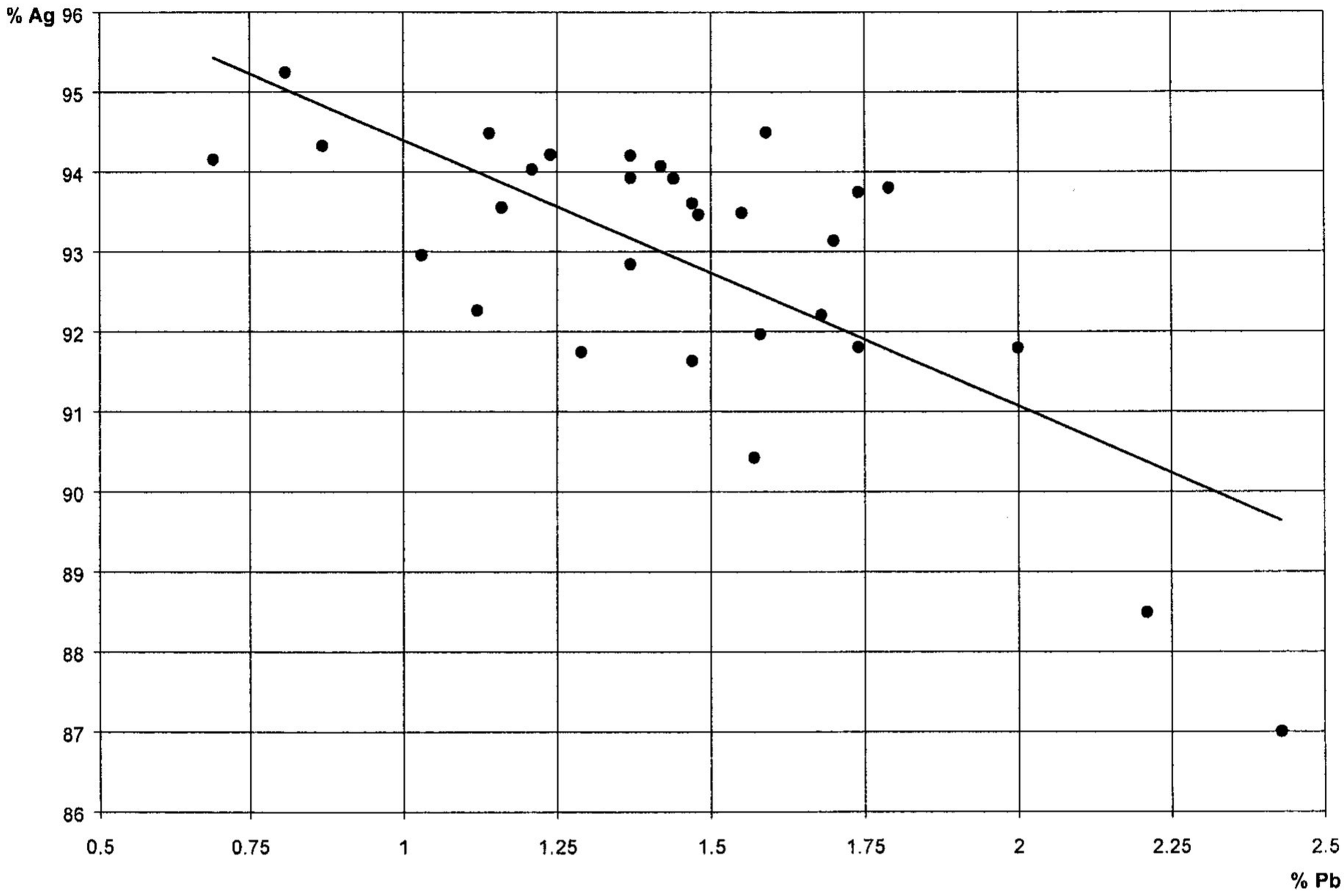


Figure 6.1. Inverse correlation of lead and silver contents of English Cross and Crosslets coins with linear trendline.

In conformity with what is known of the alloy of late Anglo-Saxon coinage, the EPMA data for late twelfth-century British coinage demonstrates that the alloy of the coins is not purified silver and contains some debasement that occurred after refinement. Moneyers compromised purity after cupellation in order to achieve a hard-wearing alloy suitable for circulating coins. In contrast to Anglo-Saxon coinage, the coinage produced in Britain in the late twelfth century was debased with copper and not brass (copper plus zinc).

No tin was detected in any of the coins analysed (i.e. if tin is present it is below the detection limit of 200ppm (0.02 per cent)), from which we may conclude that moneyers did not debase cupellated silver with bronze (copper plus tin).

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[6] Moneyers of Edinburgh made a relatively small contribution to the overall output during the coinage (see §5.5.3).

Although the coins do not contain tin, zinc does occur in varying amounts, but the evidence indicates that it did not enter the alloy as brass. Figure 6.2 presents that correlation between the quality of the brass $\left(\frac{Zn}{Cu+Zn}\right)$ and the fineness of 'silver'. Figure 6.2 demonstrates that coins from mints in northern England as well as Scottish Crescents sterlings contain zinc at less than 2.00 per 100 parts of brass, while the majority of Cross and Crosslets coins have levels of zinc at 1.50–4.50 per 100 parts of brass. The difference might have occurred if moneyers at the main mints in England alloyed cupellated silver with a low-zinc brass or used silver bullion which contained a greater proportion of zinc than mints in Scotland and northern England. Small amounts of zinc could have entered the alloy with the silver. The very clear inverse correlation between Cu and 'silver' (Figure 6.3), however, indicates that moneyers at all mints here considered added scrap copper to the alloy, rather than scrap brass.

It has been demonstrated that when moneyers of late Anglo-Saxon England produced debased coins they used a better quality of brass to compensate for the relative overall baseness of the coins.[7] (Approximately 20 per cent zinc is the maximum obtainable in brass.) There is no observable correlation between 'silver' and the quality of brass (Figure 6.2), which is indicative of the Crescents coins as intrinsically akin to their English counterparts: Scottish moneyers added copper to increase the mass of finished coins to maintain finished coins at a pennyweight-standard. The abandonment of the practice of alloying cupellated silver with brass must have occurred between 1050 and 1158, but this cannot be elucidated from the present EPMA data. The cessation of the practice of adding scrap brass, in favour of copper, is as interesting as why moneyers had alloyed cupellated silver with brass. Metcalf and Northover explored the topic and noted that brass is technically difficult to manufacture, because zinc volatilises at a temperature lower than that at which it is reduced from the ore.[8] We do not know whether the practice of adding copper was a response to the non-availability of brass or a positive decision to change to adding copper.

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[7] D. M. Metcalf and J. P. Northover, 'Sporadic debasement in the England coinage, *c.*1009–1052', *NC* 162 (2002), pp. 217–236 at pp. 227–8.
[8] Explored by H. Hamilton, *The English Brass and Copper Industry to 1800* (New York: 1967).

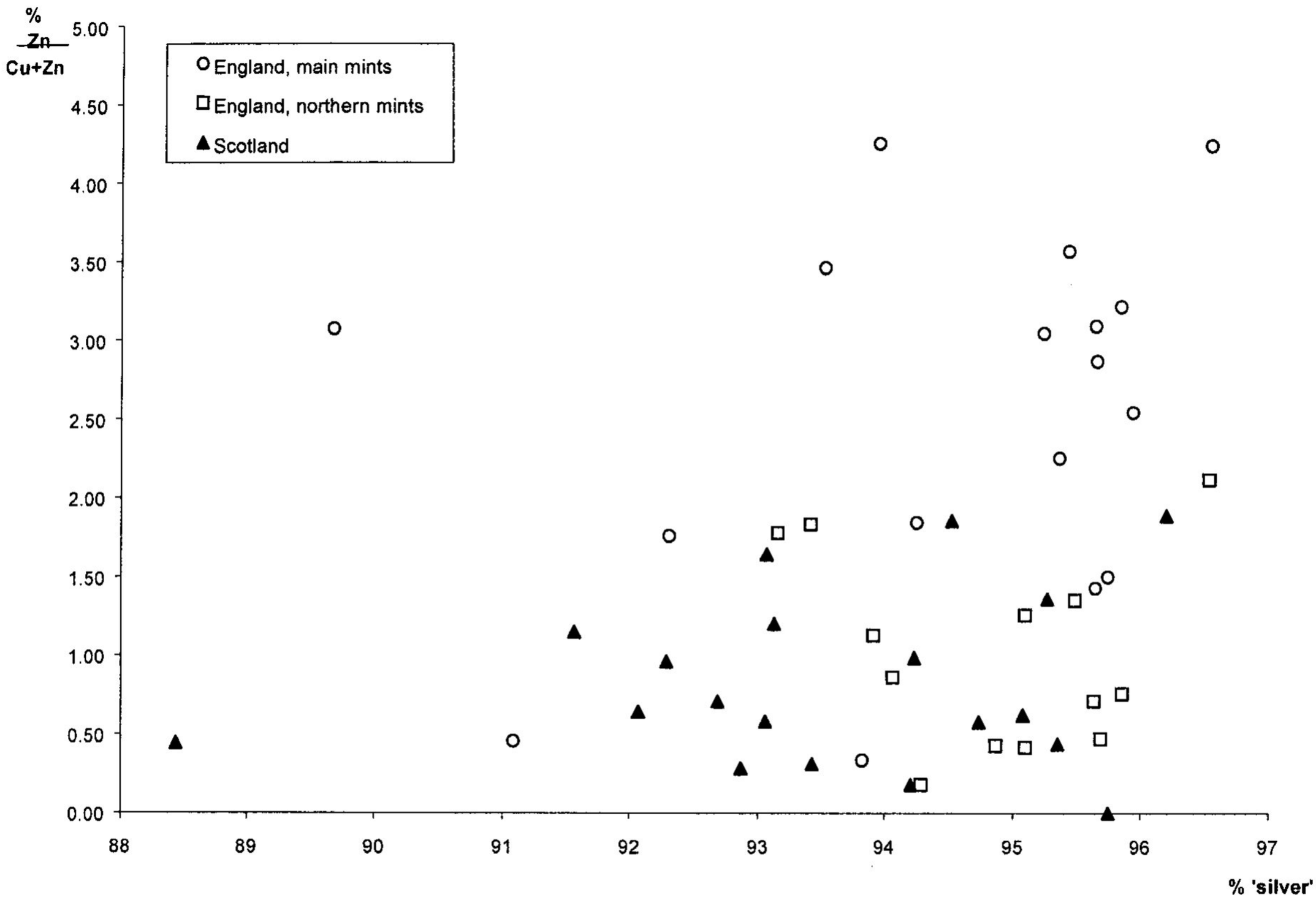


Figure 6.2. Correlation between the quality of the brass and the fineness of 'silver'.

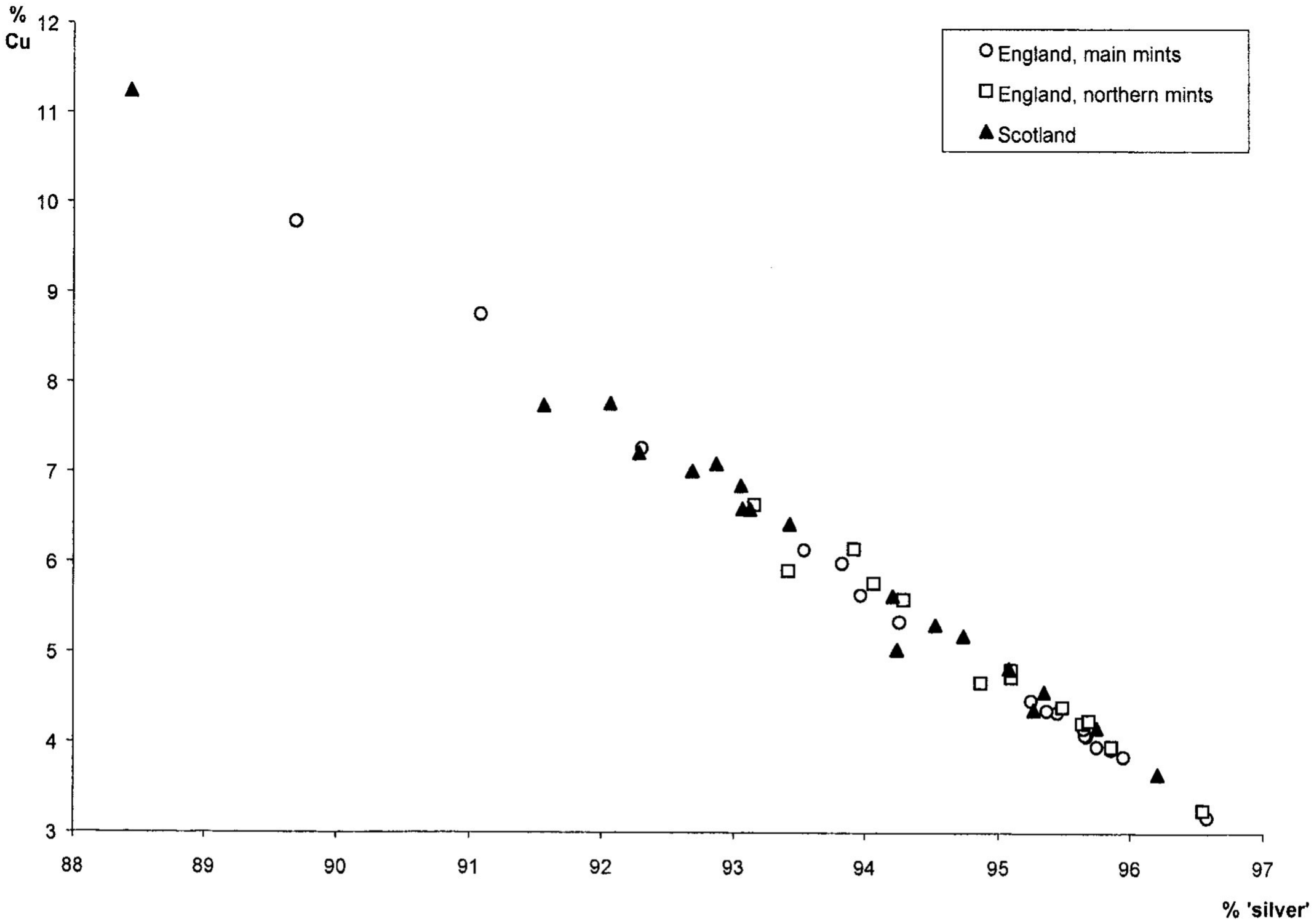


Figure 6.3. Inverse correlation between Cu and 'silver'. (One excessively base Crescents sterling excluded.)

Since moneyers had stopped adding brass to purified silver, one would expect that zinc levels would have become homogenised over successive recoinages that recycled the metal by cupellation. However, clear differences in the alloys are apparent from the analysis of late twelfth-century British coins. A majority of coins subjected to EPMA have levels of zinc within the range 0–3 per cent. We may conclude that zinc can, with caution, be used diagnostically, because the element did not enter the alloy in brass. Zinc content in excess of 3 per cent, however, probably indicates some low-quality brass. It is to the diagnostic elements that we now turn.

6.3.2 Elements diagnostic of bullion source

As already explored, zinc at levels below 3 per 100 parts Cu+Zn probably entered the alloy with Ag, rather than as brass added by moneyers; such zinc levels may be regarded as diagnostic of the source of bullion. Coins containing levels of zinc in excess of 3 per 100 parts Cu+Zn are from mints in southern England (Canterbury, etc.). Such levels could be due to the addition of some low-quality brass, but could equally be due to the incorporation of silver from a higher zinc source. Alone the zinc data is equivocal, but can be elucidated by analysing the element with gold and bismuth, which may be regarded as having entered the alloy with the silver and therefore diagnostic of source.

Gold can be used as diagnostic of bullion source because it survives cupellation with its proportion to silver unchanged. Treating gold as a proportion of Ag is particularly important for adequately comparing the coinages of England and Scotland, because English and Scottish coins have a parity of intrinsic 'silver' content; Scottish coins possess a greater mass maintained by debasement with copper. Thus figures for Au may only be compared as a proportion to Ag, not as a percentage of the total alloy. Au per 100 parts Ag is listed separately in Table 6.2.

Like gold, bismuth undoubtedly entered the alloy with Ag, from which the implication is that it too is an element useful in identifying the source of the Ag. However, diagnostic use of bismuth is complicated by the partial susceptibility of the element to cupellation in silver

alloys, of which we have limited knowledge.[9] Bismuth content can be reduced by cupellation, but only to a 'floor' level of approximately 0.2%; it cannot be removed completely. Therefore, bismuth content at levels below the cupellation 'floor' cannot derive from an original high bismuth source.[10] Whilst acknowledging the difficulties of using bismuth, it is legitimate to rely on clear differences and contrasting patterns in EMPA data. As with gold, bismuth has been calculated separately in Table 6.2 as per 100 parts Ag. Nevertheless, for the reasons stated here, it seems preferable to use per cent figures for bismuth in the whole alloy, because levels of bismuth are small and are not significantly different from Bi per 100 parts Ag.

Figure 6.4 is a matrix plot of zinc against Au per 100 parts Ag. For the sake of the analytical work of this thesis, all zinc data is included in the matrix plots, unless otherwise stated.

Does gold content elucidate the levels of zinc? In late Anglo-Saxon England gold content had become remarkably homogeneous. By *c.*1017 the English stock of silver usually had a gold content within a range 0.36 to 0.45 per 100 parts of silver.[11] The late twelfth-century English coins have levels of gold and zinc which betray a clear regional variation between the mints of northern England (Carlisle, Durham and Newcastle) and the rest of England (Bristol, Canterbury, Exeter, Ipswich, London, Northampton, York). The separation between the same regional groups is maintained when bismuth content is plotted against Au per 100 parts of Ag (Figure 6.5), which may be regarded as a control for the Au–Zn plot, and confirms that zinc content is diagnostic of source.

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[9] See D.M. Metcalf and J.P. Northover, 'Carolingian and Viking coins from the Cuerdale hoard: An interpretation and comparison of their metal contents', *NC* 148 (1988), 97–116.

[10] H. McKerrell and R.B.K. Stevenson, 'Some analyses of Anglo-Saxon and associated Oriental coinage', in *Methods in Chemical and Metallurgical Investigation of Ancient Coinage*, ed. E.T. Hall and D.M.M. Metcalf (London: 1972), pp. 195-209 at p. 198. The same conclusion was reached independently by E. Pernicka and H.-G. Bachmann, 'Archäometallurgische Untersuchungen zur antiken Silbergewinnung in Laurion III: Das Verhalten einiger Spurenelemente beim Abtreiben des Bleis', *Erzmetall* 36 (1983), pp. 592-6. I am grateful to Prof. Pernika for his thoughts on Bismuth.

[11] D.M. Metcalf and J.P. Northover, 'Sporadic debasement in the English coinage, c.1009–1052, *NC* 162 (2002), pp. 217–36, at p. 228. D.M. Metcalf and J.P. Northover, 'Interpreting the alloy of the later Anglo-Saxon coinage', *BNJ* 56 (1986), pp.35–6, at p. 45 and p. 44, fig. 14.

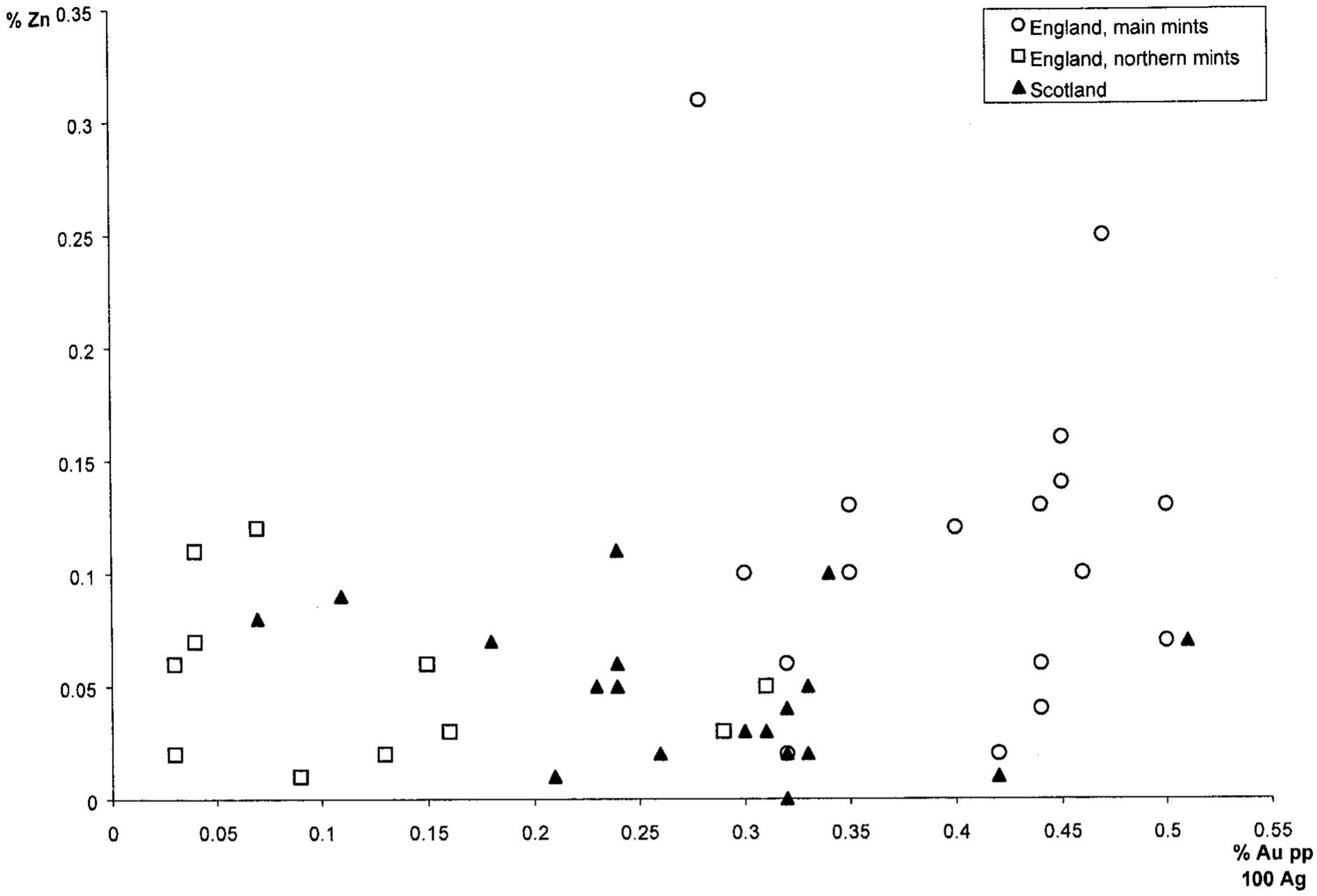


Figure 6.4. Matrix plot of Au pp 100 Ag to Zn.

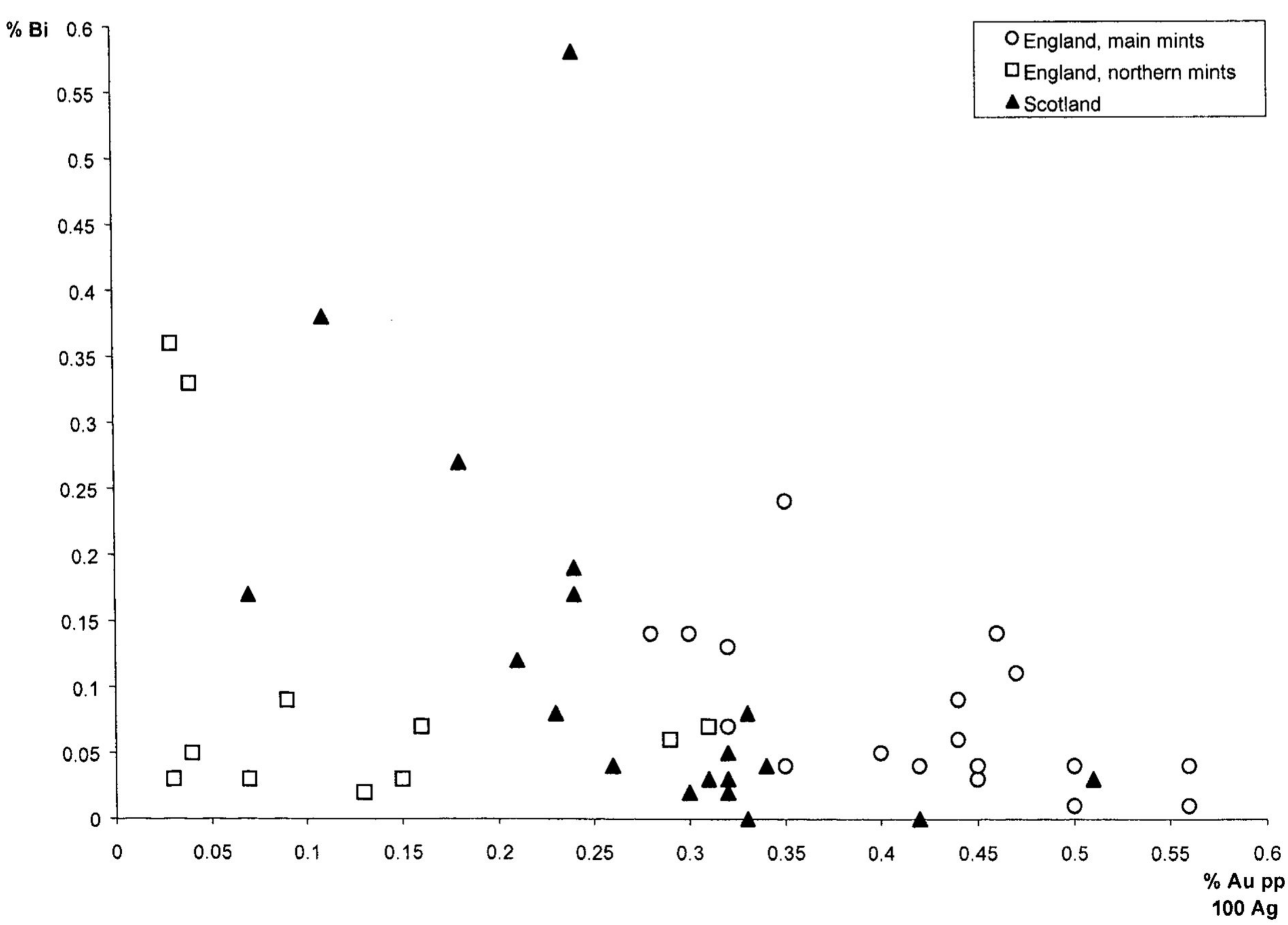


Figure 6.5. Matrix plot of Au pp 100 Ag to Bi.

The separate plots of Au per 100 parts Ag against zinc and bismuth (Figures 6.4 and 6.5) demonstrate that alloy for coinage varied by geographical region. The principal conclusion is that coins minted at the joint mints of Carlisle and Newcastle, and also Durham (England, northern mints) are completely different from coins produced at all other English mints (England, main mints). The elemental profile peculiar to most of the coins of Carlisle, Durham and Newcastle must represent the unadulterated metal from mined ore, with low levels of Au (0.03–0.30 per 100 parts of Ag). Moreover, at southern English mints gold content remained homogenous and stable from the Anglo-Saxon period, within a range 0.35–0.45 per 100 parts of Ag. Coins struck at mints in northern England contain a remarkably consistent amount of copper, 5 per cent, and it is possible to conclude that this amount of copper represents an ideal standard.

The remaining trace elements (iron, antimony, cobalt, nickel and arsenic) that were measured yielded nothing of obvious interest. The coins contain levels of the remaining trace elements at 0.03 per cent or less, and are usually close too, or below, the limits of detection. No correlation with other chemical elements has been observed.

6.3.3 Historical implications

The EPMA provides incontestable empirical data for a topic of lively historical debate: the extent to which silver from mines in northern England influenced monetary expansion in the late twelfth century. Peter Claughton thought that the growth in money supply 'can be largely accounted for from Northern Pennine production'.[12] Claughton directly, and rather rashly, added the production of the 'mine of Carlisle' in the late twelfth century, which he estimated at £72,340–£79,243, to a base volume of currency of £80,000. In consequence Claughton sought to depress the significance of the export trade in wool and textiles, as elucidated by

[12] P. Claughton, 'Production and economic impact: Northern Pennine (English) silver in the 12th century', *Proceedings of the 6th International Mining History Conference* (Akabira, Japan: 2003), pp. 146–149, at p. 148.

Harvey.[13] However, the content of the two largest currency hoards demonstrates that even by *c.*1180 the number of coins minted at Carlisle and Newcastle was relatively small: 3.6% of the identified portion of the Gayton hoard and 1.4% of the identified portion of the Leicester hoard (see Table 4.2).

Blanchard was more attentive to the numismatic evidence than Claughton, but does not give the evidence the primacy it deserves. Blanchard recognised the 'relatively small' number of known dies used at Carlisle and Newcastle in the Cross and Crosslets coinage. Rather than conclude that the total amount of silver for coinage produced by the mines was not large, Blanchard suggested 'it is doubtful whether any more than a minute fraction of the total silver production was minted at Newcastle and Carlisle'.[14] Without evidence to the fact, Blanchard proposed 'a much great proportion of the silver…after authentication at the mint, was trans-shipped in the form of ingots to more distant places'.[15] The evidence of the EPMA data demonstrates that Blanchard is patently wrong: bullion from the mines did not enter the English coinage at other mints. Even the coins of York, at which as the only mint town between Durham and Lincoln one might expect to find influence of northern silver, are consistent with the 'England, main mints' metallurgical profile.

The relative insignificance of the 'mine of Carlisle' further enhances the theory that monetary expansion occurred in England from bullion from Freiberg, brought to England as a consequence of trade in English wool and cloth. In the 1160s substantial deposits of silver ore were discovered at Freiberg, near Meissen.[16] However, the characteristics of the bullion are not known, because although German coins have been analysed, no interpretative work has been published on diagnostic elements.[17]

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[13] P.D.A. Harvey, 'The English trade in wool and cloth, 1150–1250: Some problems and suggestions' in *Produzione commercio e comsumo dei penna di lana (nei secoli XII–XVIII)*, ed. M. Spallanzani (Series II: Atti delle 'Settimane di Studio' e altri convegni) (Florence: 1976), pp. 369–76.
[14] Blanchard, *Mining, Metallurgy and Minting*, p. 645. It is worth noting that coins of Carlisle and Newcastle are over-represented in the surviving numismatic material, because they are attractive and atypically round due to employment of a superior striking technique. See *BMC Henry II*, p. xliv.
[15] Blanchard, *Mining, Metallurgy and Minting*, p. 645.
[16] P. Spufford, *Money and its Use in Medieval Europe* (Cambridge: 1998), pp. 110–14.
[17] L. Ilisch (et al.), *Dirham und Rappenpfenning* (Bonn: 2003). Coins analysed: nos. 4473–4534.

Both Claughton and Blanchard thought that bullion from the ore mined in the north of England had a significant influence on Scotland.[18] However, the EPMA demonstrates that the majority of Scottish coins have an alloy that has a consistent metallurgical profile, distinct from both England, northern mints, and England, main mints. Only one Crescents sterling of Raul Derlig probably contains unadulterated bullion from the mines in northern England (Crescent: **11a**). The majority of Crescents sterlings contain zinc, bismuth and Au per 100 parts of Ag at levels midway between the two distinct groups in the English material. It is important to stress that the metallurgy of the Crescents sterlings cannot be explained as bullion from ore mined in the north of England cupellated with an equal amount of material from other English mints. In view of the number of mints and consistency of the data-array, moneyers would have had to achieve the equal blend routinely. We can dismiss this situation without further consideration. Moreover, the higher levels of bismuth in some Crescents sterlings are conspicuous and indicate that the source of the bullion was not English ore or circulating coinage from England at all.

Certainly one would have expected that bullion from ore mined in the vicinity of Carlisle entered Scottish coinage when Carlisle and its mine was under Scottish control, *c.*1136–1157. The number of dies used for the Crescents coinage does not suggest that any class represented a recoinage (see §5.9), but indicate a 'natural' increase in output volume for the duration of the coinage. It is conceivable that earlier Scottish sterlings of David I and Malcolm IV continued to circulate until the recoinage of 1195. If so, an unknown proportion of the bullion from the mines of Carlisle would not have recycled into the Crescents coinage. As previously explored (§5.7) coin hoard evidence for late twelfth-century Scotland is deficient, with the consequence that it is impossible to know the composition of the currency during the Crescents coinage. Moreover, no EPMA has been conducted on coins of David I and Malcolm IV, or indeed on Short Cross and Stars coins introduced by the recoinage of 1195.

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[18] P. Claughton, 'Production and economic impact: Northern Pennine (English) silver in the 12th century', *Proceedings of the 6th International Mining History Conference* (Akabira, Japan: 2003), pp. 146–149, at p. 146. Blanchard, *Mining, Metallurgy and Minting*, p. 658.

Until the deficiencies in evidence for Scotland are resolved by the discovery of new hoards, it seems prudent to expound the Crescents coinage as a metallurgical profile different and distinct from those of England. It is possible that the sterlings derived from a high bismuth source, reduced by cupellation, were produced from silver articles regarded as a store of value, which might have been ancient by the twelfth century.

6.3.4 Oriental silver

A matrix plot of Bi–Au has already been used to illuminate the activities of the Scottish moneyer Raul Derlig (§5.4.3 and Figure 5.2), when die-link evidence was demonstrated to be equivocal. Analogous levels of gold and bismuth indicate that Raul Derlig received some ore or bullion from the mines in England, from which he was producing coins, possibly at Berwick. Raul Derlig also appears to have been involved in minting (possibly at Roxburgh) from bullion with a Bi–Au profile typical of mints in southern Scotland. Some minting by Raul Derlig involved silver without a typically English or Scottish profile, which probably had some Oriental origin, however ancient.

Oriental silver coins were reaching northern Europe in the ninth and tenth centuries in vast numbers in exchange for goods.[19] The dirhams reaching northern Europe in the tenth century were primarily minted at al-Shãsh (Tashkent) and Samarqand from silver mined in the Jaxartes provinces.[20] E. Kraume and V. Hatz speculated that oriental silver might be distinguished from Rammelsberg silver in the tenth or eleventh century by analysing the proportions of gold and bismuth.[21] Significantly for the present analysis, oriental coins (Abbasid and Samanid dirhams) have been found in Scotland and some of those have been

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[19] For the export of goods, see Th.S. Noonan, 'The tenth century trade of Volga Bulgharia with Samanid Central Asia', *Archivum Eurasiae Medii Aevi* 11 (2000–01), 167–194. The extensive numismatic evidence will appear Th.S. Noonan, *Dirham Hoards from Medieval Western Eurasia, c.700–c.1100* [Commentationes de Nummis Saeculorum IX–XI in Suecia Repertis. Nova series 13] (forthcoming).

[20] R. Kovalev, 'The mint of al-Shãsh: The vehicle for the origins and continuation of trade relations between Viking-Age Northern Europe and Samanid Central Asia', *Archivum Eurasiae Medii Aevi* 12 (2003–03), pp. 47–79, at pp. 66–7.

[21] E. Kraume and V. Hatz, 'Silberanalysen deutscher Münzen des 10. Jahrhunderts, *Hamburger Beiträge zur Numismatik* 7 (1967), 35–8.

analysed using atomic absorption spectrometry (AAS).[22] The dirhams analysed by AAS are from the hoards of Talnotrie, Dumfries and Galloway, deposited *c*.875,[23] Storr Rock, Skye (also known as Trotternish), deposited *c*.935,[24] and Skaill, Orkney, deposited *c*.950.[25] The data from AAS undertaken by McKerrell and Stevenson is reproduced in Table 6.3, but figures for Au per 100 parts Ag have been calculated. All of the dirhams (and fragments) analysed by McKerrell and Stevenson are published in *SCBI* 6 and the reference numbers are given in Table 6.3. The content of the oriental dirhams is presented in conjunction with the EPMA data in this thesis in Figure 6.6.

McKerrell and Stevenson conducted the analyses of the oriental dirhams 'in view of the possible use of such silver by…English moneyers of the time', but found a clear difference between oriental and contemporary Anglo-Saxon silver.[26] The dirhams are generally characterised by low levels of gold (0.09–0.32 Au per 100 parts Ag) and variable levels of bismuth, some of which are high (0.2–1.3 per cent Bi). The findings of McKerrell and Stevenson have been supported by subsequent studies.[27] The distribution of the dirhams analysed by McKerrell and Stevenson roughly matches the negative correlation distribution of the Crescents sterlings (Figure 6.3). The data suggests that the influence of oriental silver that McKerrell and Stevenson expected but failed to detect in the Anglo-Saxon coinage is to be found in the late twelfth-century Scottish coinage.

Various components of brooches from the Skaill hoard have been analysed by Paul Wilthew using XRF.[28] The mean figures have been calculated and are presented in Table 6.4,

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[22] H. McKerrell and R.B.K. Stevenson, 'Some analyses of Anglo-Saxon and associated oriental coinage', in in *Methods in Chemical and Metallurgical Investigation of Ancient Coinage*, ed. E.T. Hall and D.M.M. Metcalf (London: 1972), pp. 195–209.
[23] *SCBI* 6 (Edinburgh), p. xxiii. *Inventory* 349.
[24] J. Graham-Campbell, *The Viking-Age Gold and Silver of Scotland* (Edinburgh: 1995), p. 28. *SCBI* 6 (Edinburgh), p. xxiii. *Inventory* 312.
[25] J. Graham-Campbell, *The Viking-Age Gold and Silver of Scotland* (Edinburgh: 1995), 34–48. *SCBI* 6 (Edinburgh), p. xxii. *Inventory* 322.
[26] H. McKerrell and R.B.K. Stevenson, pp. 195 and pp. 202–203
[27] N. M. Lowick, 'An early tenth century hoard from Isfahan', *NC*[7] 15 (1975), 110–54; M. R. Cowell and N. M. Lowick, 'Silver from the Panjhir mines', *Metallurgy in Numismatics* vol. 2, ed. W. A. Oddy (London: 1988), 65–74.
[28] Paul Wilthew, 'Notes on the composition of Viking-age silver brooches , arm- and neck-rings from the Skaill (Orkney) hoard', Appendix I of J. Graham-Campbell, *The Viking-Age Gold and Silver of Scotland* (Edinburgh: 1995), 63–71.

divided between 'Thistle brooches'[29] and other ball-type brooches. The mean is based on the brooch as currently composed, except where separated objects are known to belong together or current composition is known to be improper.[30] References to the brooches given in Table 6.7 are by National Museums of Scotland registration number, used by Wilthew, and by the number of James Graham-Campbell's catalogue.[31] Wilthew observed that the 'Thistle' brooches are clearly a separate group with such homogeneous content that a single source must be posited.[32] The other ball-type brooches betray the same pattern of distribution as the oriental dirhams, although with lower bismuth levels, and also fit the general trend of inverse correlation between Bi–Au per 100 parts Ag found for the Crescents sterlings (Figure 6.7).

From the metallurgical evidence it is probable that oriental coins, or objects and ingots made from them, persisted in Scotland as a store of wealth from when the country was 'coinless' (pre-1130s). The metal of some Crescents sterlings shares characteristics with oriental silver and suggests that Viking-age bullion was recycled into coins in the late twelfth century as the kingdom experienced monetisation. The oriental dirhams contain the highest levels of bismuth, followed by the ball-type brooches, with Crescents sterlings containing lower but still substantial levels. The trend may be chronological, with successive reductions of bismuth in cupellation.

It must be stressed that silver with a high-bismuth content from Samanid Central Asia cannot serve to explain fully all mint activity during the Crescents coinage. As already discussed (§5.8.2), the existence of Crescents sterlings overstruck on pfennigs from Rhineland mints attests to the penetration of silver coins from Germany.[33] However, it is most difficult to assess the extent and affect of German silver on the Scottish coinage, because no interpretative work has been carried out on the metallurgy of the German coins.

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[29] 'Thistle brooches' are ball-type brooches with criss-cross 'bambled' decoration on the ball-shaped terminals, see J. Graham-Campbell, *The Viking-Age Gold and Silver of Scotland* (Edinburgh: 1995), 34.

[30] Wilthew adopted the methodology outlined here, but did not publish his figures for the mean of brooches, hence they have been recalculated from the published primary data.

[31] J. Graham-Campbell, *The Viking-Age Gold and Silver of Scotland* (Edinburgh: 1995), 108–127.

[32] Ibid., 65.

[33] I. Stewart, 'Some German coins overstruck with sterling types', *Lagom: Festschrift für Peter Berghaus* (Münster: 1981), pp. 205–210.

Table 6.3: Ag, Au and Bi composition of Oriental dirhams found in hoards in Scotland analysed by (AAS). (Source: H. McKerrell and R.B.K. Stevenson, 'Some analyses of Anglo-Saxon and associated Oriental coinage', in *Methods in Chemical and Metallurgical Investigation of Ancient Coinage*, ed. E.T. Hall and D.M.M. Metcalf (London: 1972), p. 209.)

SCBI *6, no.*	*Hoard*	*Identification*	*Au*	*Bi*	*Ag*	*Au pp 100 Ag*
694	Talnotrie	Abbasid: mint, date uncertain (mid C9th)	0.09	1.30	97	0.09
697	Storr Rock	Samanid: al-Shãsh, AH 286 (AD 899–900)	0.10	0.30	98	0.10
698	Storr Rock	Samanid: al-Shãsh, AH 286 (AD 899–900)	0.10	0.40	97	0.10
708	Storr Rock	Samanid: Samarqand, AH 286 (AD 899–900)	0.20	0.20	97	0.21
711	Storr Rock	Samanid: Samarqand, AH 319 (AD 931–32)	0.20	0.20	95	0.21
713	Storr Rock	Samanid: Samarqand?, AH ? (AD 913 × 942)	0.04	8.70	91	0.04
719	Skaill	Samanid: al-Shãsh, AH 308 (AD 920–21)	0.04	1.00	97	0.04
721	Skaill	Samanid: mint uncertain, AH 320 (AD 932–3)	0.10	1.20	93	0.11
722	Skaill	Samanid: Samarqand, AH 309 (AD 921–2)	0.20	0.70	95	0.21
726	Skaill	Abbasid: Baghdad, AH 317 (AD 929–30)	0.10	0.20	97	0.10
729	Skaill	Unattributed, probably Samanid	3.80	1.30	95	4.00
731	Skaill	Unattributed, probably Samanid	0.20	1.30	92	0.22
732	Skaill	Unattributed, probably Samanid	0.20	0.80	92	0.22
733	Skaill	Unattributed, probably Samanid	0.30	0.50	95	0.32

Table 6.4: Ag, Au and Bi composition of ball-type brooches in the Skaill hoard analysed by XRF. (The data has been calculated from Paul Wilthew, 'Notes on the composition of Viking-age silver brooches , arm- and neck-rings from the Skaill (Orkney) hoard', Appendix I of J. Graham-Campbell, *The Viking-Age Gold and Silver of Scotland* (Edinburgh: 1995), 63–71.)

Registration. Number	*Catalogue Number*	*Areas analysed (no. of analyses on each area)*	*Au*	*Bi*	*Ag*	*Au pp 100 Ag*
1. 'THISTLE' BROOCHES						
IL3 (+IL841)	24, 3 (+24, 113)	H (2), T1 (3), T2 (2), PH (4).	0.53	0.10	92.90	0.54
IL4	24, 4	H (3), T1 (3), T2 (3), PH (3)	0.45	0.10	95.13	0.48
IL5	24, 5	T1 (3)	0.50	0.20	95.40	0.51
IL6	24, 6	PH (3), P (3)	0.45	0.15	95.10	0.44
IL7	24, 7	H (3), T1 (3), T2 (3), PH (3).	0.43	0.13	95.08	0.43
IL59	24, 60	PH (3)	0.40	0.10	95.70	0.43
2. OTHER BALL-TYPE BROOCHES						
IL1 (+IL63)	24, 1 (+24, 64)	H (4), T1 (6), T2 (5), PH (3), P (3), Terminal of IL63 (3)	0.37	0.13	95.68	0.38
IL2 (+IL61)	24, 2 (+24, 62)	H (2), T1 (3), T2 (3), PH (3), PH of IL61 (3)	0.24	0.40	95.92	0.24
IL60	24, 61	PH (3)	0.10	0.90	95.30	0.10
IL62	24, 63	PH (3)	0.20	0.30	97.40	0.18
IL64	24, 65	External surface (4)	0.10	0.70	96.40	0.09
IL65	24, 66	PH (3)	0.30	0.60	95.60	0.27
IL100	24, 101	PH (4)	0.30	0.20	95.50	0.36
IL102	24, 103	Pin-head (3)	0.50	0.10	95.20	0.49
IL742	24, 111	H (3), T1 (3), T2 (3), PH (3), P (3).	0.22	0.24	94.82	0.24

Areas of Analysis: H = Hoop, T1, T2 = Terminals 1 and 2, PH = Pin-head, P = Pin.

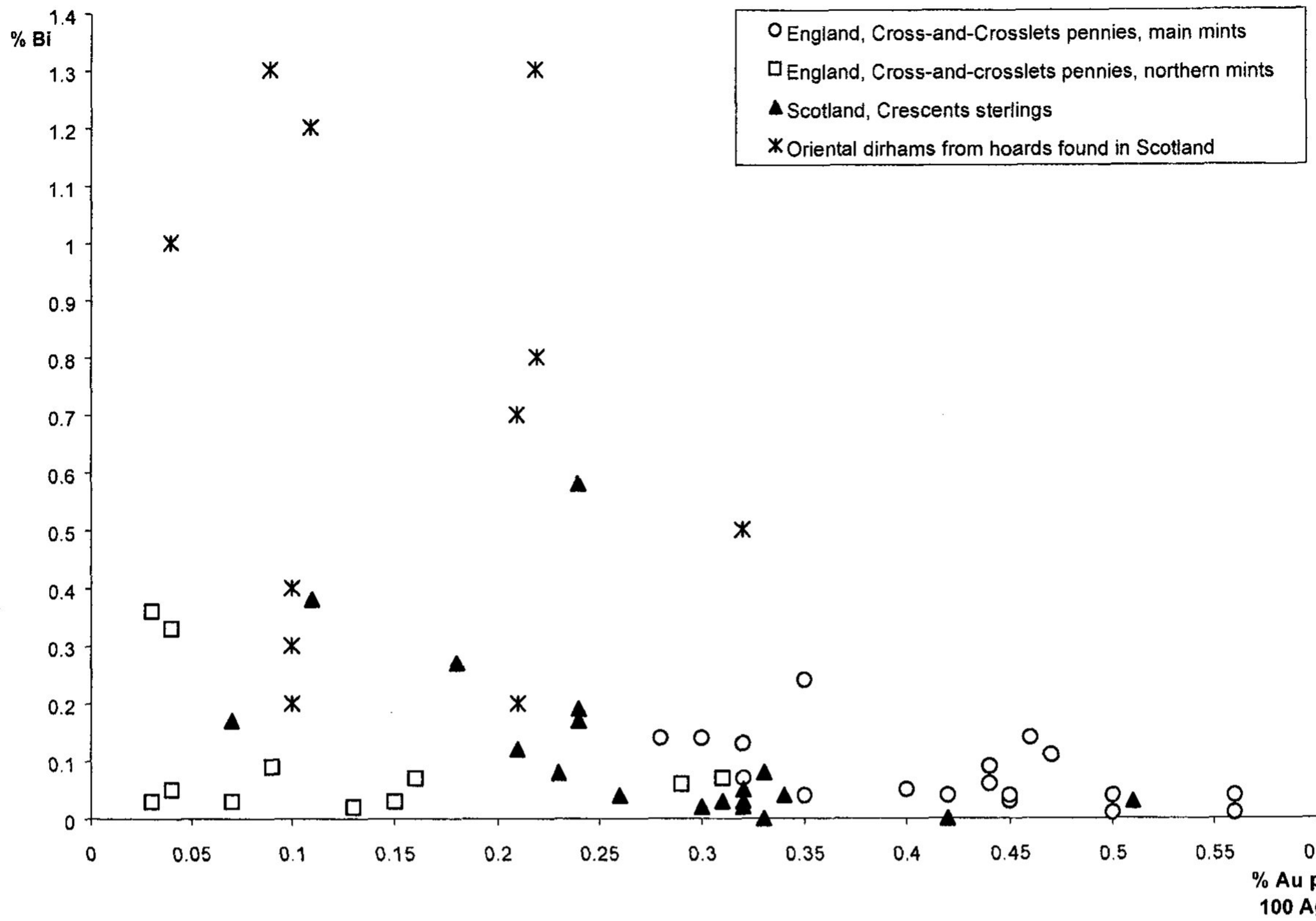


Figure 6.6. Matrix plot of Au pp 100 Ag to Bi from coinage (EPMA) and Oriental dirhams found in Scotland (AAS).

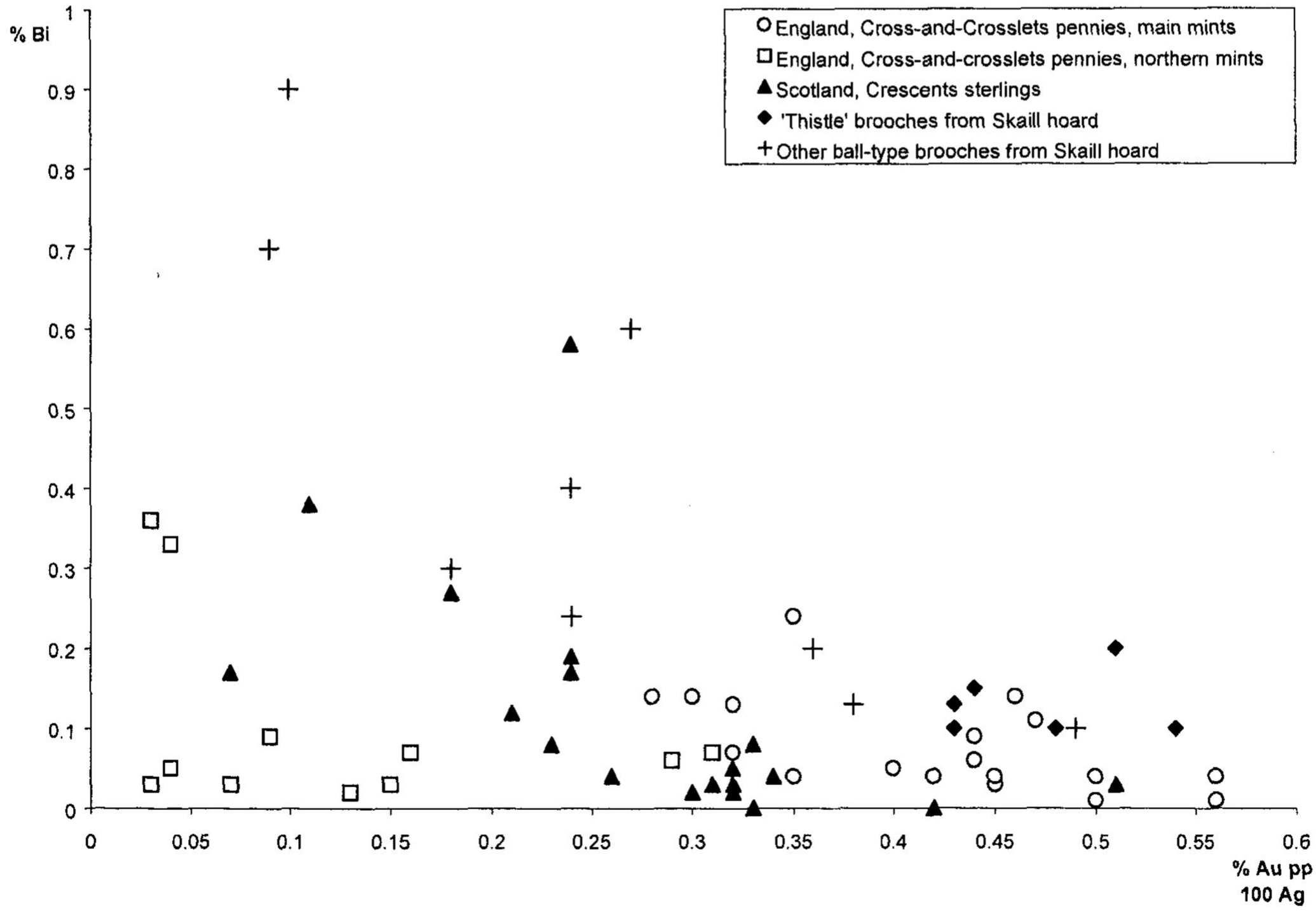


Figure 6.7. Matrix plot of Au pp 100 Ag to Bi from coinage (EPMA) and brooches from the Skaill hoard (XRF).

6.3.5 Conclusions

Analysis of the metallurgy indicates that monetary expansion caused by bullion flow cannot be easily generalised; there is distinct regional variation in the alloys of the coins minted in twelfth-century Britain.

From the EPMA data we can conclude that both Claughton and Blanchard over-estimate the importance of the bullion from mines for the coinage of England and hence mistakenly attribute monetary expansion to the output of the mines. Bullion from the mines does not appear to have entered the coinage anywhere other than at the mints in its immediate vicinity. Even Scottish coinage does not seem to have been influenced, but it would be useful to have EMPA of earlier Scottish sterlings to assess the impact of the mines when they were in the possession of David I. The study has been instructive. Historians must make a greater effect to engage forensically with numismatic evidence as a source of metallurgical data, while numismatists need to be more attentive to development of bullion sources that underpin the coinages they study.

The Gayton hoard reveals that by *c.*1180 a majority of the English currency was composed of pennies minted at Canterbury and Ipswich, which belong to the metallurgical profile of 'England, Main'. On current empirical evidence it is difficult to assess the diffusion of the Freiberg silver in English coinage. Eventually one would hope to triangulate EPMA of coins, mineralogical data and lead isotope analysis. The data included in this thesis demonstrates that the metallurgy of the late twelfth-century British coinage is suitably diverse to warrant further analytical work.

The metallurgical data for the Crescents coinage indicates that monetary expansion in Scotland in the late twelfth century was not caused by an influx of bullion mined in northern England. Nor is the Crescents coinage similar to the coinage of England, which had maintained a relative metallurgical homogeneity since the Anglo-Saxon period. It appears that stocks of silver of an ultimately oriental origin that had been in Scotland from the Viking period were transformed into coinage. Therefore, it is legitimate to conclude that bullion flows did not cause monetary expansion in Scotland, rather existing bullion stocks were

coined in response to demand for coinage, whether as a new and convenient form of wealth-storage or as a means of exchange.

The EMPA data indicates that bullion from the 'mine of Carlisle' has only a peripheral influence on Scottish coinage. Trace elements in the alloy indicate that Scottish coins were made from bullion that had been in Scotland since the Viking Age, and ultimately derived from Samanid Central Asia. Metallurgical analysis indicates that monetary expansion occurred in Scotland in the late twelfth century when coinage was perceived as useful; it was not specifically caused by a mineralogical discovery of silver.

6.4 Metrology

6.4.1. England: Empirical evidence from the Gayton hoard

The methodology for the weight distribution employed for Gayton is the same as used for the Crescents sterlings (§5.6.1). For mules the latest class of die is regarded as the class of that coin. Cut coins and those obviously underweight owing to damage, clipping or excessive wear are excluded. The weights of such coins have been placed in square brackets in the corpus.

The number of well-preserved examples is sufficiently large to allow some tentative conclusions to be drawn as to the intended weight of Cross and Crosslets pennies. The weight distribution of the pennies listed in the catalogue is illustrated by Figure 6.8. Approximately one third of the pennies (94) are in the 1.37–1.45g range. Of the 109 pennies in the range 1.37–1.55g, the mean weight is 1.42g with a standard deviation of 0.035676. This evidence suggests that the Cross and Crosslets pennies attained a standard weight of 1.42g or slightly heavier, but usually no more than 1.45g. Overall the evidence of the Gayton hoard reveals that a substantial number of coins in circulation were under 1.30g by 1180.

6.4.2. England: Empirical evidence from the Northampton corpus

The number of well-preserved examples in the Northampton corpus (§7.4) is sufficiently large to allow a useful comparison with the evidence from the Gayton hoard. Moreover, the Northampton corpus consists entirely of coins of classes A and C.

The weight distribution of the pennies listed in the catalogue (cut coins are excluded) is illustrated by Figure 6.9. Approximately half of the pennies are in the range 1.41g–1.44g. The 13 pennies weighing less than 1.38g are obviously underweight and most of these show signs of wear or having been clipped. Of the 42 pennies in the 1.38–1.47g range, the mean weight is 1.42 with a standard deviation of only 0.024711. This evidence suggests that the pennies attained a standard weight of 1.42g or slightly heavier, but usually no more than 1.45g.

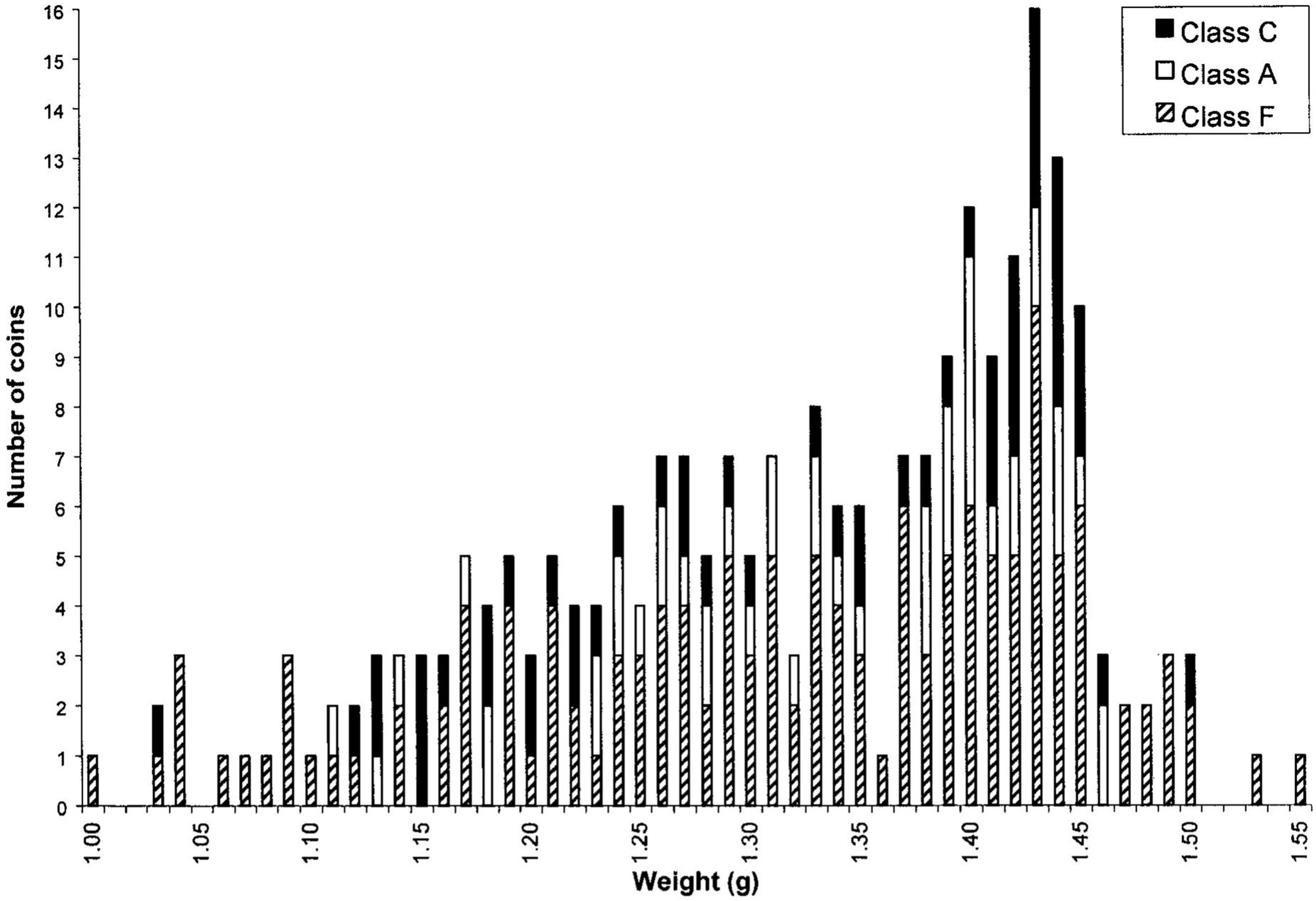


Figure 6.8. Weight distribution of Cross and Crosslets pennies in the Gayton hoard, Class A, Class C, and Class F. (240 coins)

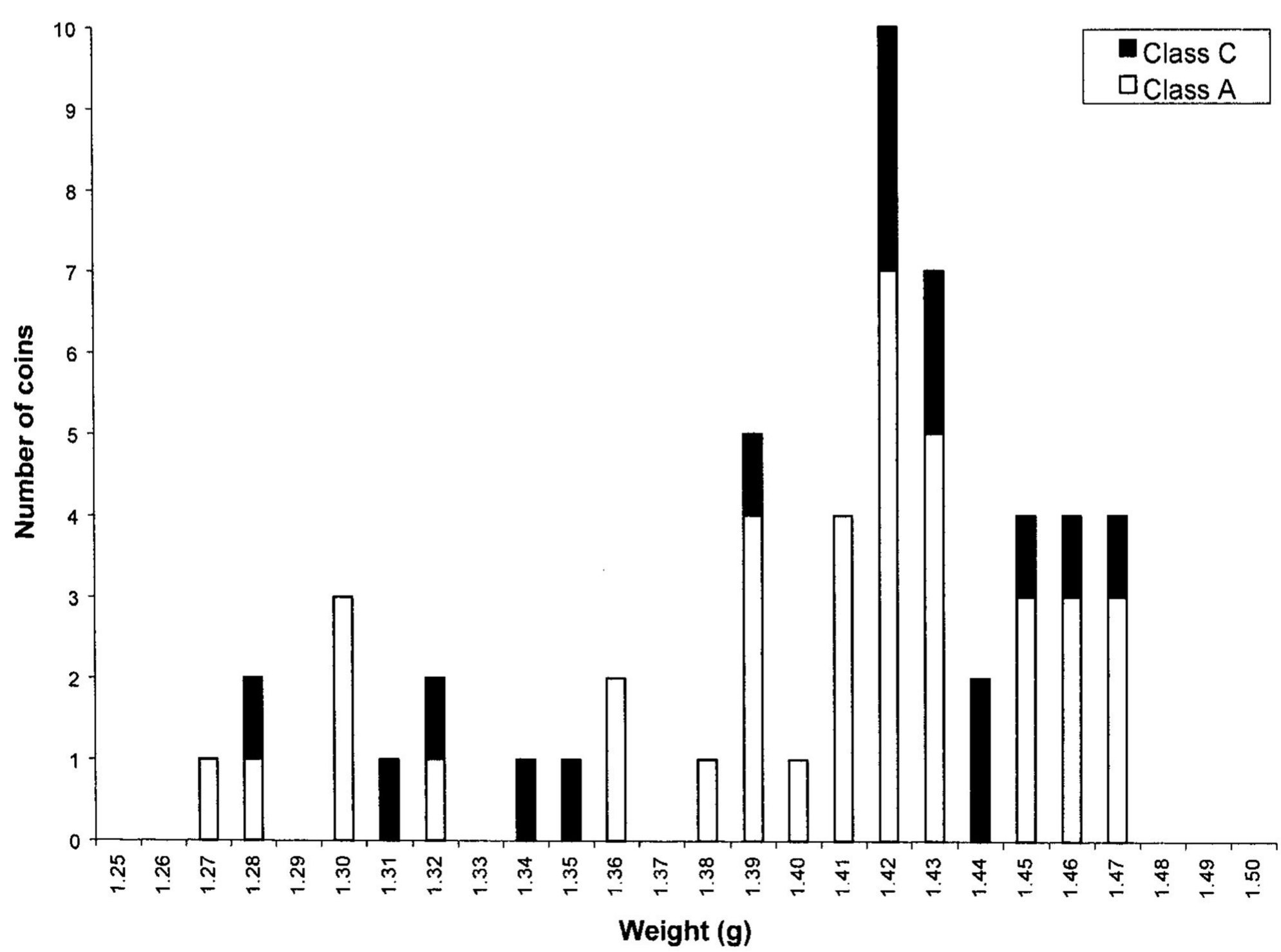


Figure 6.9. Weight distribution of Cross and Crosslets pennies of the Northampton mint (55 coins).

6.4.3. Scotland: Empirical evidence from the Catalogue

The empirical data from the Catalogue of Crescent sterlings (§9.4) has been explored (§5.6.1). Figure 5.5 presents the weight distributions of the sterlings listed in the catalogue (cut coins are excluded). Approximately half of the sterlings are in the 1.44–1.48g range. Of the 150 sterlings in the range 1.43–1.66g, the mean weight is 1.48g with a standard deviation of only 0.077375. This evidence suggests the Crescents sterlings attained a standard weight of 1.48g or slightly heavier, but usually no more than 1.50g.

6.4.4. Discussion

The results from analysis of the corpus show a considerable difference from previously expressed interpretations of the intended standard weight of pennies of the Cross and Crosslets coinage.

Pamala Nightingale interpreted the statistical data in *BMC Henry II* as evidence that the weight of the penny was increased in 1158 to 1.46g. She regarded the increase in weight as an attempt to reconcile the English currency with continental weight standards and harmonise the number of coins with the accounting weight of bullion.[34] Nightingale suggested that when the equivalent of 12 pennies was subtracted from a troy pound of bullion, a tower pound was produced from which 240 pennies were struck for the customer, the shilling retained corresponding to the seignorage levied at the mint.

Although Nightingale presents a coherent theory, it relies on an overly optimistic standard weight for the penny.[35] She based her analysis on the weight of the Anglo-Norman penny having been stated to be approximately 21.5 grains (1.39g).[36] However, Mark Blackburn demonstrated that Henry I raised and stabilised the weight standard at *c*.22 grains (1.43g) in

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[34] P. Nightingale, 'The evolution of weight standards and the creation of new monetary and commercial links in northern Europe from the tenth century to the twelfth century', *Economic History Review*, 2nd Series 38:2 (May 1985), pp. 192–209 at p. 205.

[35] Ibid., p. 205 and footnote 70, citing *BMC Henry II*, p. xli where Allen states that 'the commonest weight of fine specimens in all classes is between 22.1 and 22.5 grains and that coins over weight are not infrequent. There can be no doubt that the traditional weight of 22½ grains Troy was the correct weight for Cross-and-Crosslets coins'.

[36] Ibid, p. 205

1125 and that the regular (royal) issues of Stephen's reign approximate to *c*.21 grains (1.36g).[37] If the weight of the penny was raised in 1158 that action may be regarded as a restoration of the standard of Henry I.

Martin Allen tentatively suggested that the weight standard of the Cross and Crosslets coinage was heavier than that of the Short Cross coinage.[38] Allen states 'it is certainly plausible that the standard of 1158–80 was 240*d.* per tower pound'.[39] However, he makes no attempt to address the metallurgy of the coins, which has been seen to be important. Do Short Cross pennies adhere to the same portion of 'silver' as the Cross and Crosslets coinage? No EPMA has been yet been conducted, so the question is presently unanswerable. Moreover, Allen makes no attempt to address issues raised by cupellation. Allen suggests that 'copper could not be added to silver of the same debased 'sterling' fineness as the coinage'.[40] However, after cupellation the alloy would be purified 'silver' and it would be necessary to add copper to restore the alloy to a 'sterling' standard.

The empirical evidence indicates that the weight standard of Cross and Crosslets coins was 1.42g or 22 grains, but that coinage in circulation did not achieve this standard. The abandonment of the practice of recycling the currency by frequent periodic recoinage meant that coins remained in circulation for longer. Consequently coins were exposed for a greater length of time to diminution by wear or clipping.[41] B.J. Cook suggested that from the reign of Henry II, when frequent recoinages were abandoned, tackling forgers and clippers became a priority.[42]

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[37] M. Blackburn, 'Coinage and currency under Henry I: a review', *Anglo-Norman Studies* 13, pp. 49-81 at p. 52. Blackburn, 'Coinage and currency', *The Anarchy of King Stephen's Reign*, King, E., ed., (Oxford: OUP, 1994), Chapter 5, pp. 146-205 at p. 169-172.
[38] M. Allen, 'The weight standard of the English coinage, 1158–1279', *NC* 165 (2005), pp. 227–33, at p. 232.
[39] Ibid.
[40] M. Allen, 'Henry II and the English coinage', in *Henry II: A New Interpretation*, ed. C. Harper-Bill (Woodbridge: 2007 (forthcoming)).
[41] Ibid.
[42] B.J. Cook, 'Crimes against the currency in twelfth- and thirteenth-century England', *Bulletin of the John Rylands University Library of Manchester* 83.1 (Autumn 2001), 51–70.

6.5 Comparison of empirical findings with the *Dialogus de Scaccario*

6.5.1. Coinage in exchequer payments

Ostensibly the procedures of the Exchequer safeguarded income from corrupt coinage. The *Dialogus* informs us that coins may be corrupt in weight, in alloy, in dies.[43] Moneyers could be responsible for coins issued of wrong weight or wrong alloy. Official coins could also have their weight reduced by public acts of clipping, in which excess metal was removed from the flan. A contemporary reference confirms that clipping occurred, for in 1179–80 a woman named Ydonée was levied with an amercement for clipping.[44] Coins that were struck from incorrect dies must be contemporary forgeries, of which two are present in the content of the Gayton hoard (§4.3.1). Despite Richard Fitz Nigel's explanation in the *Dialogus* the institution of the assay is a deception, which nevertheless aided monetary expansion in the late twelfth century.

The *Dialogus* informs us that payments made into the Exchequer could accept sums in three ways: by *numero*[45], by weight, by assay. Payments made from the Exchequer appear from Richard's account to be provided *numero*.[46]

When the lower exchequer, the Exchequer of Receipt, received payments not subject to assay, they were assessed by weight. First the coins offered in payment were thoroughly mixed then a sample of 20*s* was placed in a scale-pan and weighed against the exchequer pound weight. Further pennies were added to the scale-pan containing 20*s* until the scales balanced. If the total number of sample coins required to balance the scales exceeded 20*s* 6*d* the entire payment was rejected.[47] Thus 20*s* 6*d* was the officially acceptable low end-point of the weight-range. The mean weight of each penny was 1.42g, which suggests this and supports the metrological evidence derived from the Northampton corpus. Further on in the *Dialogus* Richard states that: 'There were those who held (and I do not disagree) that the

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[43] *Dialogus*, p. 12. Cf. *BMC Henry II*, p. cx–cxi.
[44] *Pipe Roll 26 Henry II*, p. 154.
[45] The word *numero* is translated by Johnson as 'by tale', but the latin word has been retained in this discussion for clarity.
[46] *Dialogus*, p. 10.
[47] *Dialogus*, p. 11.

money of this realm is not lawful if the pound, when tested, falls short by more than sixpence from its proper weight'.[48]

Payments on account of farm, including the majority of shire farms, were subjected to assessment by assay. The coins offered in payment were thoroughly mixed and a sample of 44*s* was taken and placed in a purse and sealed by the Sheriff.[49] From this sample 20*s* was cupellated into an ingot, which was weighed against the exchequer pound weight and pennies were added to balance the scales – pennies that the pound was assumed to have lost in the fire. The ingot received the name 'assay' when it was marked with chalk with the agreement of the county sheriff with the name of the county and the number of pence lost in the fire.[50] If the sheriff challenged the assay the procedure was conducted again and another 20*s* taken from the purse was cupellated into an ingot. When the assay was agreed each £1 *numero* on account of farm was reckoned as equivalent of the assay, creating a shortfall on the total offered in payment of the farm. The sheriff then paid the shortfall that was called combustion.

Richard Fitz Nigel informs us that assay was established at the Exchequer by his father, because although 'the *numero* and the weight might be correct, the standard might not'.[51] Richard describes that the assay was established 'to protect the king and the public', because the Exchequer might not receive a pound of silver even when 20*s numero* weighed a pound, 'for it might be alloyed with copper or bronze of some kind, seeing that no assay was taken'.[52]

As explored in Chapter 4 the intrinsic analysis of the Crescents coinage indicates that the Scottish Exchequer did not blanch shire farms (§5.6.2), but that the Scots may have adopted the practice in 1195 and reformed the coinage accordingly.

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[48] *Dialogus*, p. 39.
[49] *Dialogus*, p. 11.
[50] *Dialogus*, p. 37.
[51] *Dialogus*, p. 42.
[52] *Dialogus*, p. 43.

6.5.2. The purpose of the assay

The *Dialogus* states that the assay is necessary 'because of forgers and clippers of coin'.[53] However, the evidence of the *Dialogus* indicates that the assay was a mechanism designed to benefit the Exchequer and an impost on the sheriffs.

A serious problem with Richard's account in the *Dialogus* is his ignorance of metallurgy, which he confesses in regard to the process of cupellation.[54] Richard appears to acknowledge that the coinage produced by moneyers should not consist of purified silver, because he states that one of the outcomes of assay is that the sheriff makes sure that 'the moneyers who work under him do not exceed the established proportion of alloy'.[55] When fabricating the ingot the Melter (*fusori*), Richard writes, must strive 'not to overheat the silver, but only to make it pure'.[56]

No tin was detected in the coins using EPMA (see §6.3.1), which demonstrates that moneyers were not alloying with bronze (copper plus tin). The moneyers were, however, deliberately adding copper to purified 'silver' in order to create an alloy suitable for circulation. The alloy in the coinage was not due to forgery. Typically, Richard Fitz Nigel fails to provide details of 'the established proportion of alloy', but EPMA indicates that the 'silver' content of Cross and Crosslets coins was usually 95–6%. The particular metallurgical profile of Cross and Crosslets coins from the mints of northern England indicates that they are struck from bullion derived from local ore. The 95% 'silver' content of the coins may be regarded as the ideal proportion of alloy for English coinage, because the coins were not produced from recycled coins.

The purpose of the assay was to cupellate 240 pennies into 'silver'. Even when the coins were a low endpoint of the accepted weight standard and of suitable alloy, an assayed pound lost one shilling in the fire. If 240 pence (20*s*) with a mean of 1.42g were 95% 'silver' the ingot which received the name assay would be equivalent of 228 pence (19*s*). The assay was

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[53] *Dialogus*, p. 39.
[54] *Dialogus*, p. 40.
[55] *Dialogus*, p. 43.
[56] *Dialogus*, p. 37.

an ingot unrepresentative of the alloy of the coinage in circulation. Importantly, payments credited to the sheriff's account were reckoned as blanched at one shilling in the pound.[57] Therefore, we may be sure that when a sheriff submitted to the trial by assay he was content with an assayed pound that lost less than one shilling. The assay was not the deception it appears to be, rather it is a game of chance on which the sheriff wagered his farm.

Graeme White noted that the recording of payments entered as 'blanch' does not mean that such payments had been subjected to assay, but were payments *ad scalam*, which were sums on which a standard addition of one shilling in the pound was charged.[58] White believed that the stability of *numero* and blanch sums at one shilling in the pound prior to 1163 was indicative that the assay had not been re-established.[59] The first surviving combustion is from 1163 and is direct evidence for the use of assay; the combustion demonstrates wide variation in the quality of coin received by the Exchequer.[60]

6.5.3. The assay and monetary expansion

It is probable that the introduction of the assay is associated with coinage reforms that contributed to monetary expansion in Britain in the late twelfth century.

By 1180 the English Cross and Crosslets coinage had been in issue for twenty-two years, a duration without precedent in the previous two hundred years. Late Anglo-Saxon coinage was frequently and periodically recycled into a new coin type. Moneyers farmed dies on behalf of the king or ecclesiastics, whom they paid out of income generated by levying a seignorage charge on customers.

Individuals who required bullion to be coined or coins recycled had to pay a seignorage charge, which is recorded as 6*d* in the Pipe Roll for 1189–90.[61] Martin Allen inferred from later evidence that mint technicians supplemented this disclosed seignorage fee with a concealed charge of 6*d* derived from the substitution of six pennyweights of copper in each

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[57] *Dialogus*, p. 125.
[58] White, *Restoration and Reform*, p. 148.
[59] Ibid.
[60] Ibid.
[61] *Pipe Roll 2 Richard I*, p. 9; see 'Introduction' by Doris M. Stenton, p. xxiii.

pound of bullion.[62] However, the addition of copper cannot be regarded as a concealed adjunct to the seignorage fee, because coins that needed to be recycled already contained copper, which was reduced by cupellation, and scrap copper was subsequently added to maintain the uniformity of alloy.

Pamela Nightingale suggested that the introduction of long-lasting coin types, such as the Cross and Crosslets coinage, was linked to the introduction of blanch payments to the Exchequer.[63] In the assay the government had found a way of exploiting the coinage without recycling it through frequent periodic recoinages. The assay had the potential to be profitable to the Exchequer, but the burden fell on sheriffs. The assay may be regarded as evidence for strong royal government, for only a strong government could enact a system that had such punitive potential.

Blackburn wrote that 'we should be prepared to consider more complex arguments than those reflected in the literary sources'.[64] The coincidence of the assay and the introduction of non-changing coin types is noteworthy. Importantly the assay did not fall on the common people – it removed a burden from the common people and the tax fell elsewhere, though no doubt sheriffs exacted more from the people to cover the costs of the assay.

6.5.4 Coinage in the monetary economy

The procedures adopted by the Exchequer could be applied to substantial payments, but an equipoising view is required of how coins were perceived and used for transactions in the mercantile environment.

The public paid a real economic price for the stabilisation of the weight of the English penny at 1.42g (approximately 22 grains) in 1158. The stabilisation increased the value of

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[62] M. Allen, 'Henry II and the English coinage', in *Henry II: A New Interpretation*, ed. C. Harper-Bill (Woodbridge: 2007 (forthcoming)).
[63] P. Nightingale, ' "The King's Profit": trends in English mint and monetary policy in the eleventh and twelfth centuries', *Later Medieval Mints: Organisation, Administration and Techniques*, ed. N. J. Mayhew and P. Spufford (Oxford: 1988), pp. 61–75 at p. 65. N. J. Mayhew, 'From regional to central minting', in *A New History of the Royal Mint*, ed. C. E. Challis (Cambridge: 1992), pp. 83–178 at p. 90.
[64] M. Blackburn, 'Coinage and currency under Henry I', *Anglo-Norman Studies* 13, p. 75.

silver bullion to the benefit of the Exchequer.[65] As a direct consequence obligations assessed in sums of money, such as taxes and fee-farms, would have become more valuable in real terms to the Exchequer. The consequent effects on the economy would have been deflationary because the prices of commodities would have fallen relative to the increased intrinsic value of silver pennies, which would have induced a fall in incomes derived from the sale of goods. Thus weight-stabilisation of the penny would have caused a short-term recessionary impact, offset over the long-term (unlike an increase in direct taxation assessed in fixed sums).

There is reason to believe that in small transactions the superficial appearance of the currency was important, an aspect which did not concern the Exchequer. Low-value transactions must have taken place *numero* in the absence of any means of accurately assessing weight or intrinsic content of an individual penny or cut fraction. Class A occurs with most frequency among recovered cut fractions and *BMC* notes 'there is a noticable absence of cut halfpence and farthings in the late classes'.[66] The striking technique employed during the first coinage of Henry II is extremely poor in comparison with other English medieval coinages and has been universally condemned by modern commentators.[67] Contemporaries would not have distinguished a Class A penny from one of Class F, but would have differentiated a round and a square coin. Thus the predominance of Class A among cut fractions indicates a preference for equal fractions hewn from round coins.

Incompetence of moneyers or their mint technicians can be dismissed as an explanation for poor striking, as they were capable of employing skilled techniques when they treated dies or prepared flans (§2.2.2 and §2.2.3). Nevertheless, most surviving Cross and Crosslets coins have only a proportion of the design struck up, because the dies were not brought into contact squarely to one another.[68] By misaligning the dies the surface areas brought into contact were

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[65] Especially if a substantial proportion of those coins recoined in 1158-1160 were underweight coins of the civil war period of Stephen's reign. Although Nightingale interprets the increase in the weight of the penny from 1158 as a policy aimed at the synchronicity of weight-standards, it is inexplicable that she does not discuss the economic effects of this policy.

[66] *BMC Henry II*, p. clxxvii.

[67] For references see Chapter 1, footnotes 13–16.

[68] I concur which Allen's assessment at *BMC Henry II*, p. xliii.

reduced and, consequently, less force was required to strike a coin. Striking coins in this manner was insouciant and therefore symptomatic both of the lack of regulation and of a mint system overwhelmed by demand.[69]

Paul Latimer connected the decline in the popular credibility of English currency of the late twelfth-century to inflation.[70] Nevertheless, Latimer only tangentially discusses the reforms of the 1180 in relation to the Cross and Crosslets coinage and proffers a summary of Nightingale's assessment of the king's motivations: that the reform is concerned with the administration and crown revenue, 'rather than serious worries about the state of the currency'.[71] The evidence of cut fractions contradicts the assessment of Nightingale and Latimer and indicates that the coin-using public was attentive to the condition of the currency. Importantly, the chronicler Ralph de Diceto noted not only that a new coinage was introduced in 1180, but that the new coins were round (*nummus in forma rotunda commerciis hominum passim est per regnum expositus*).[72]

The introduction of a non-changing coin type in 1158 was facilitated by the development of the assay as a means of generating revenue, but affected how coins were used. Deposit banking did not exist in twelfth-century England and savings meant the physical retention of coins. Coins were literally hoarded for future use. In this process coins could be selected based upon objective criteria. Moreover, if coin-using public assessed that coinage decreased in value over time they might have, in Latimer's words, 'the desire to hold less of a suspect coinage'.[73] The view that a coin would be more valuable in the short-term if exchanged for goods would lead directly to an increase in the velocity of circulation.

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[69] The number of Class F dies used at Canterbury and Ipswich is indicative of severe demand, see §4.4.4 and T. Crafter, 'A die-study of the Ipswich mint, *c.*1161/2–1180', *NC* 162 (2002), 237–52.
[70] Paul Latimer, 'The English inflation of 1180-1220 reconsidered', *Past and Present* 171, number 1 (May 2001), pp. 3–29, see especially pp. 16–17.
[71] Ibid., p. 18 provides a useful summary of the views of expressed by P. Nightingale, ' "The King's Profit": trends in English mint and monetary policy in the eleventh and twelfth centuries', *Later Medieval Mints: Organisation, Administration and Techniques*, (eds.) N. J. Mayhew and P. Spufford. BAR international series 389 (Oxford, 1988), pp. 61–75 at pp. 69–70.
[72] Ralph de Diceto, *Opera Historica* vol. 2 (Rolls Series: 1876), p. 7.
[73] Paul Latimer, 'The English inflation of 1180-1220 reconsidered', *Past and Present* 171, number 1 (May 2001), pp. 3-29 at p. 19.

7. Conclusion

The growth of the medieval English economy occurred as result of a complex series of conditions, among which sustained population expansion between Domesday and the Black Death was probably the driving force. The growth in population both necessitated and facilitated increased agricultural production and, without a concurrent advance in farming technology, new areas of land were brought under cultivation. Demographic pressure on food supply is very difficult to assess, but is suggested by, for example, the ascendancy of the ox over the afer, reflected in the price-data in the late twelfth century (see p. 20).

While it must be acknowledged that the majority of individuals remained engaged in agricultural production, it is widely recognised that the period of population growth was characterised by commercialisation of the economy. More individuals were occupied in making or trading specific products predominantly manufactured in towns based around established markets. Each town was heavily dependent not only on the continued agricultural surpluses produced in the surrounding rural hinterland, but also on the increased availability of money, because non-agrarian production required a means of exchange for transactions. Yet the viability of towns was dependent on other factors beside the increased availability of money. Britnell has rightly emphasised the transitory nature of skilled employment in the twelfth and thirteenth centuries. We must acknowledge that although the non-agrarian activities in towns could potentially absorb surplus manpower from rural areas, economic circumstances might as easily conspire to leave those same individuals destitute. Moreover, unchecked increases in money supply are potentially ruinous, because of consequent price-inflation. However, the extent and effects of inflation in the late twelfth and early thirteenth centuries remain highly contentious.

While earlier work has concentrated on the post-1180 period and it is known that monetary expansion occurred on a large scale in the thirteenth century, this thesis has explored the crucial final third of the twelfth century, and suggests that the increase began, albeit on a comparatively modest in scale, in England during the Cross and Crosslets coinage

(1158–1180) and in Scotland during the Crescents coinage (*c.*1170–1195). The lapse of frequent periodic recoinages and the creation a new monetary system in England that departed from the late Anglo-Saxon model in the twelfth century may itself indicate monetary expansion: it was no longer necessary to force silver to the national network of mints. Moreover, the introduction of long-lasting coin types probably facilitated trade as particular coin types, especially that of the Short Cross coinage after 1180, gained international recognition and reputation.

Quantification of the volume of the coinages of England and Scotland respectively is of wider, comparative interest to historians. Nevertheless, much of this thesis has, of necessity, been heavily numismatic. Without documentary evidence for mint output, historians rely on numismatists to provide estimates based on analytical studies of surviving samples of coinages. In order to suggest the parameters of monetary expansion and associated monetisation in the late twelfth century a range of forensic and analytical techniques have been brought to bear on numismatic material or data derived from carefully collated samples, and in the process a range of external archaeological and historical evidence has been encompassed.

The progress attained by earlier studies has been variable. For England the work of Martin Allen has been particularly important as a starting point; for Scotland the work of Ian Blanchard has been quite misleading. With careful qualification, Martin Allen suggested that there was growth in the volume of the English currency between 1158 and 1180.[1] Allen's suggestion was based on comparison of the estimated number of reverse dies, and (non-numismatic) evidence that implies growth in the revenue accruing to the royal government.[2] In the broadest terms, growth in volume of currency is most easily assessed by comparing potential mint output during successive periods of recoinages, whereby the larger part of the circulating currency was reminted into a new coin type.

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[1] M. Allen, 'The quantity of money in England 1180–1247: new data', *BNJ* 75 (2005), pp. 44–49, at p. 45.
[2] Ibid.

Allen tentatively estimated the total mint output in Class A of the Cross and Crosslets coinage to have been £16,000–£30,000 from *c*.384 reverse dies at 10,000–20,000 coins per die.[3] Allen's estimate of *c*.384 reverse dies for Class A was *not* based on die-study, but derived from a statistical methodology which utilised *BMC*. Therefore it has been thought prudent to use die-studies to assess the validity of Allen's estimated number of dies. The data from the Northampton mint die-study, together with the data derived from other published die-studies, harmonises with the data yielded by Allen's methodology. We can suggest that Allen's methodology may have produced a slight over-estimate for the number of Class A dies, but the difference is not significant compared with the data proposed by Metcalf. Therefore, on the basis of the current analytical work on the numismatic material, it is prudent to endorse Martin Allen's estimate for the output of the recoinage of Class A (1158–*c*.1163).

To provide an estimate of the size of the currency in 1180, Allen combined two estimates to provide an 'aggregate range' estimate of *c*.£15,000–£60,000.[4] His estimate of the size of the currency in 1158 (*c*.£15,000–£30,000) is within (though at the lower end of) the aggregate range estimate for 1180.[5] However, the rise in the underlying estimates of the reverse dies from Allen's figure of *c*.384 in Cross and Crosslets Class A to 801 in 1180–2 suggests that the size of the currency increased between 1158 and 1180.[6] Moreover, while Allen suggests that 'normal non-recoinage output' was substantially greater in 1182–c.1190 than in the 1170s, he carefully qualifies his statements and suggests that the size of the currency increased between 1158 and 1180.[7]

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[3] M. Allen, 'The English coinage of 1153/4–1158', *BNJ* 76 (2006), pp. 242–302, at p. 261.
[4] M. Allen, 'The quantity of money in England 1180–1247: new data', *BNJ* 75 (2005), pp. 44–49, at p. 45. The first estimate is *c*.£30,000–£60,000 derived from the old currency, using Metcalf's estimates, (which Allen has subsequently revised); the second estimate is non-recoinage output of £15,000–£30,000 in 1182–1190 based on the rate of consumption of dies.
[5] M. Allen, 'The English coinage 1153/4–1158', *BNJ* 76 (2006), pp. 242–302, at p. 261.
[6] M. Allen, 'The quantity of money in England 1180–1247: new data', *BNJ* 75 (2005), pp. 44–49, at p. 45. Allen used Metcalf's estimate of Class A reverse dies (559) in this paper, which Allen subsequently revised to produce a lower estimate (*c*.384), M. Allen, 'The English coinage 1153/4–1158', *BNJ* 76 (2006), pp. 242–302, at pp. 260–63.
[7] M. Allen, 'The quantity of money in England 1180–1247: new data', *BNJ* 75 (2005), pp. 44–49, at p. 45.

The content of the Gayton hoard provides a valuable body of new evidence with which, in comparison with other well-recorded hoards, to assess the behaviour of the English currency between 1158 and 1180. The evidence suggests that coins from mints in the south-east region dominated currency towards the close of the coinage. While acknowledging that the content of the hoards has some regional bias, overall the regional composition of the content of the Gayton, Leicester and Lark Hill hoards does not suggest that these hoards are atypical.

There are some inconvenient and (presently) irreconcilable conclusions from comparison of the hoard analysis with the model based on Allen's estimates for reverse dies. The hoard evidence, which must take primacy over the model, suggests that Allen may have underestimated the number of Class F reverse dies. Somewhat inexplicably the available die-studies do *not* suggest this to be the case and, conversely, suggest Allen's methodology has produced an overestimate.

Given these premises, there may be individual mints not subjected to die-study (perhaps Canterbury) that had a number of dies far greater than the number estimated by Allen. Both the Gayton hoard and the Leicester hoard suggest the prominence of coins of Class F minted at Canterbury in the currency of England, and some possible reasons for increased mint activity at Canterbury during the period of Class F in the 1170s have been suggested (§3.4).

Extraordinary mint activity at a particular mint should not be unexpected and now has a precedent. The phenomenon was encountered during the die-study of the Northampton mint, which has indicated that extraordinary mint activity using locally manufactured dies occurred 1163 × 1173, and the four known reverse dies might have produced £150–£350.

It is certainly right to speak of monetary expansion in Scotland during the Crescents coinage (*c*.1170–1195). Any understanding of the coinage of Scotland is complicated by the seeming lack of any recoinages prior to 1195 and the inadequacy of hoard evidence for the contribution of English and earlier Scottish coins to the composition the of the Scottish currency during the period in which the Crescents coinage was in issue. Consequently it is difficult to assess the difference between the currency and the estimated output during coinage.

Through structural and analytical work on the coinage it has been possible to propose the first classification and internal chronology of the coinage and estimate the number of dies used in each phase of the coinage. It has been possible to estimate that the total output of the Crescents coinage might have been £8,000–£16,000, but output was not constant over the period the coinage was in issue, rather it increased as the coinage proceeded. The estimated total output for the entire coinage, which lasted approximately twenty-five years, is minuscule compared to Allen's estimate of the output in Class A (1158–*c.*1163) alone of the English Cross and Crosslets coinage (£16,000–£32,000). Single finds of Crescents sterlings suggest that some coins circulated in commercial environments, but coins in areas beyond the authority of Scottish kings were probably used as bullion. Single finds reveal the penetration of coinage into the far north of Scotland for the first time.

The die-study demonstrates the structure of the Crescents coinage for the first time and provides new evidence for the implications of the settlement of Falaise (1174). The Crescents coinage was understood by Burns according to a set of assumptions about the structure of minting. However, when the structure is studied analytically it is a primary source which can be used to further current historical understandings. For example, the pattern of die-use indicates that there was a break in minting at Roxburgh between the Primary and Secondary phases of the coinage, but that minting was resumed in the burgh prior to 1189 while the castle was still garrisoned by English forces. It is possible that the commercial importance of Roxburgh, with its annual fair, outweighed political considerations.

It has been suggested that monetary expansion in Britain in the late twelfth century was, at least in part, caused by the importation of 'new' silver from mines in Germany, which came to England in trade via the Low Countries (§1.4). The metallurgical study does not indicate that monetary expansion was caused by an active policy of debasement, which thereby suggests that the increase in the volume of coinage must have been caused by an augmentation of the bullion circulating as coin. The evidence presented in Chapter 1 suggests that stocks of 'new' silver came to Britain in burgeoning overseas trade, especially the export of wool to the Low Countries.

Metallurgical analysis using EPMA contained in this thesis is the first attempt to understand bullion sources for the late twelfth-century coinage from the coins themselves. EPMA suggests that the contribution of silver from the 'mine of Carlisle' was minimal and was not responsible for monetary expansion in England. Hoard evidence suggests that approximately 4 per cent of the currency stock *c*.1180 was composed of coins struck at Carlisle and Newcastle. Bullion from the mines has a distinctive elemental signature and consequently it is possible to state categorically that the 'Carlisle' bullion did not enter the coinage at other mints in England or in Scotland.

Most interestingly EPMA suggests that the contribution of silver imported in trade to monetary expansion in Scotland was limited. At least some bullion utilised for Scottish coinage originated from mines in the Jaxartes provinces of Saminid Central Asia and had been in Scotland since the Viking Age. Thus it is possible to suggest that monetary expansion in Scotland was brought about by the increasing monetisation of Scottish society, rather than by a particular local argentiferous discovery. Moreover, given a greater number of results for England and parallel analysis of contemporary German coins, as well as suitable mineralogical data, ultimately it is to be hoped that Lead Isotope Analysis might be profitably used to pin-point sources of bullion precisely.

If the abandonment of frequent periodic recoinages in England may be regarded as a parallel occurrence with the development of the assay by the Exchequer, Scotland does not fit this scenario. The Crescents coinage was a long-lasting type but, owing to the intrinsic composition of the sterlings, the Scottish exchequer was probably not receiving blanch payments prior to 1195. It is known that Anglo-Saxon moneyers manufactured an alloy suitable for coinage by adding added brass to purified silver, but the metallurgical analysis in this thesis indicates that by the late twelfth century moneyers added copper. The change from adding brass to adding copper may possibly also have a connection with the introduction of the assay in England and warrants further investigation.

This thesis should be regarded as a contribution to the ongoing process of attempting to understand increases in medieval money supply. The importance of an increase in money

supply for medieval commercialisation is now accepted by the foremost historians of the medieval economy.[8] Commercialisation is a complex concept and although the growth in money supply is one contributory factor among many it should neither be overemphasised or ignored. However, historians are apt to regard the laborious but necessary structural and analytical work on individual coinages, which must occur in order to provide reliable and datable estimates for the volume of the coinage, as what Michael Metcalf referred to as 'a craft mystery'.[9] Although numismatic material is interesting in its own right, it is to be hoped that by the contributions to current historical understandings which may flow from the systematic study, it may gain wider recognition as an important tool in the canon of historical methodology.

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[8] R.H. Britnell, 'Commercialisation and economic development in England', in *A Commercialising Economy*, ed. R.H. Britnell and Campbell, pp. 12–14; E. Miller and J. Hatcher, *Medieval England: Towns, Commerce and Crafts* (London: 1995), pp. 396–7.
[9] 'Preface', *CIMS*, p. iii.

8. Catalogue: the Northampton mint corpus

8.1. Appropriateness of the sample

The Catalogue was finalised in June 2006 and is the first attempt at a die corpus for Northampton mint during Cross and Crosslets Type of Henry II. While the Catalogue has been compiled from the principal likely sources for material, it does not make pretence to be a complete record of all extant coins. The aim of the Catalogue is to be an appropriate sample of extant material for statistical purposes, and for such an objective a complete list is unnecessary as well as impracticable. Owing to the necessity of examining die-identities, as well as avoiding unwarranted duplication of specimens, the Catalogue only includes coins or photographs of coins actually seen by the author.[1] An inference can be drawn from auction catalogues that describe, but do not illustrate, coins of this type as of Northampton mint that further coins of are in existence. Moreover, there is a high degree of probability that hoards will yield further examples. Coins in important private collections have also been utilised and included in the Catalogue.

In examining *BMC* it is immediately apparent that in the case of Northampton, D.F. Allen was aware of many specimens of the mint that were in private collections.[2] In the majority of cases Allen cited 'similar coin(s)' indicating that the dies of these examples were unfortunately not verified against *BMC* specimens. As dies of Class A tend to be very similar to one another, especially in obverse legend reading, only direct comparison can yield die identities.[3] Although in the intervening fifty years since the publication of *BMC* comparatively few specimens of the Northampton mint have entered the British Museum collection, it is significant that those coins that have are from previously unrecorded dies. In response to these problems this paper adopts a rigorous focus on the provenance and

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[1] There is coin of Class C listed as Ingelram of Northampton mint in *SCBI* 26 (East Anglia), 1488. This coin is omitted from this study as it is in fact a penny of Willem of Newcastle, a die duplicate of *BMC* 588 and *FEJ Photographs* 30/6.

[2] See footnotes to *BMC* 613-637.

[3] During the course of this study all the die identities were carefully checked and it was found that the obverse die of *FEJ Photographs* 31/12 is not in fact from the same obverse die as *BMC* 634.

pedigrees of individual specimens, with a separate commentary on specimens listed in the Catalogue, in an attempt both to identify provenance and to avoid unwarranted duplication.

Here is a suitable place to mention a further coin which was acquired by the British Museum from the executors of the F. Elmore Jones estate.[4] In the photographic record of the collection formed by Elmore Jones this coin is listed as of 'uncertain mint' (*FEJ Photographs* 36/6). A ticket written by Elmore Jones that accompanies coin **13a** in the Catalogue, seen by the author, states 'cf. my uncertain coin reading PALT— which is almost certain to be of this mint' (i.e. Northampton). The obverse legend is entirely legible and reads +hENRIREXΛNGL. The reverse was poorly struck as well as slightly off-centre and consequently only the letters PΛLT are legible. This is presumably to be expanded to Waltier as this combination of letters is only known to occur in this moneyers name. Moneyers named Waltier are, however, additionally known at the mints of Durham and Pembroke, and there is the further possibility that this is a new moneyer for another mint. Elmore Jones's inclination to assign this coin to Northampton was probably based on the use of the atypical letter Wen, P, which is also found on coin **13a** of this study. Until this coin can be matched with a die duplicate that provides more of the reverse legend this coin must remain uncertain; it is reproduced here in order to facilitate this process of identification **(Plate 1, 4)**.

8.2. Aim of the catalogue

The problems of continually documenting dies in this series as 'previously unrecorded' are legion. Although the photographs of the late F. Elmore Jones's collection identify *BMC* dies, this is as far as they go. For example, *FEJ Photographs* 31/7 is listed as '621/—', indicating that the obverse die is the same as *BMC* 621 and that the reverse die is not found in *BMC*. However, the reverse is struck from the same die as that of BM 1958–11–9–6. Moreover, *FEJ Photographs* 31/5 and 31/6 (Index: —/—) share the reverse die of 31/7 and BM 1958–11–9–6, used in conjunction with an obverse not found in *BMC*. These coins are in turn a die

[4] BM 1985–7–82–275; weight 1.37g.

duplicate of BM 1958–11–9–5. Solely using *FEJ Photographs* and *BMC* indicates none of this. The new listing contained in the Catalogue of this thesis circumvents these problems: each particular die is given a reference. Thus, *FEJ Photographs* 31/7 and BM 1958–11–9–6 is listed as an example of die combination 6: 5^{A}/R1, while *FEJ Photographs* 31/5-6 and BM 1958–11–9–5 are die combination 7: 6^{A}/R1.

8.3. Conventions adopted

The Catalogue is an attempt to list all of the known die combinations for the Cross and Crosslets Type struck at Northampton. Each obverse and reverse has been assigned a reference number. The obverse die references run sequentially with a superscript suffix indicating the class of the coin, the reverse reference prefix refers to the moneyer (E = Engelram, I = Iosep, P = Pieres, R = Reimund, WL = Waltier, WN = Warnier, UN = uncertain moneyer) and the numbers run sequentially for each moneyer.

The columns of the Catalogue are arranged as follows:

running number for each die combination;
obverse die number with superscript suffix of class;
reverse die number with prefix letter for moneyer;
obverse die legend;
reverse die legend;
letter indicating specimen for each die combination;
reference for particular example;
number of catalogued examples of die combination.

The initial reference for each example is the present owner (institution or private individual) or documentary reference. The British Museum is abbreviated as 'BM', Northampton Museum and Art Gallery as 'NMAG'. When coins presently located in a particular collection have been previously published the relevant publication details follow the note of present location after the symbol =. If a part of a die legend is not provided by any specimens struck with the die [ ] will appear in the legend. When a reading is possible, but uncertain, ? appears in a legend and applies only to the preceding letter, unless it is at the end of a legend when it may indicate uncertainty as to how many letters there are at the end of the legend.

Illustrations are reproduced life size or approximately life size. Specimens illustrated on **Plates 2 and 3** are marked with an asterisk. The plate annotations follow the numeration of

the Catalogue, but when only one specimen of a particular die combination is illustrated (often because only one specimen is known) the specimen letter suffix is omitted as superfluous.

This Catalogue should be used in conjunction with Figure 8.1, which is a Chart Index of dies of the known die combinations and die-links, with the number of specimens in the right-hand column.

SUMMARY: 72 coins, 17 obverse dies, 18 reverse dies, 23 die combinations.

Dies	1^A	2^A	3^A	4^A	5^A	6^A	7^A	8^A	9^A	10^A	11^A	12^C	13^C	14^C	15^C	16^C	17^C	Specimens
E1	**1**																	4
E2		**2**																3
I1			**3**															2
P1				**4**														6
P2					**5**													9
R1					**6**													2
R2						**7**	**8**	**9**										4, 1, 6
S1							**10**		**11**									1, 2
WL1										**12**								1
WN1		**13**																1
WN2										**14**	**15**							4, 1
UN1								**16**										1
E3												**17**						4
R3													**18**					1
E4														**19**				5
I2															**20**			3
WL2																**21**	**22**	3, 5
WN3														**23**				3

Fig. 8.1: Northampton mint die combinations.

8.4. Catalogue

CLASS A (1158-*c.*1163)

1	1^A	E1	+hENRIREXANGL	+ENGELRAN:ON:NOR:	a.* *BMC* 613. b.* *BMC* 614. c.* *FEJ Photographs* 30/28. d. C. Glazebrook.	4
2	2^A	E2	+hENRIREXANGL	+ENGELRAM:ON:NOR	a.* BM 1950–5–6–15 = *BMC* 614*a*. b.* Lord Stewartby = *FEJ Photographs* 30/29. c. Noble Numismatics (Sydney) Auction, April 2005, lot 732.	3
3	3^A	I1	+hENRIREXANGL	+IOSEP:ON:NORhA	a.* *BMC* 619*x*. b.* BM 1985–7–82–255 = *BMC* 619*a* (*BMC* Additions, p. 170) = *FEJ Photographs* 30/35.	2
4	4^A	P1	+hENRIREXANGL	+PIERES:ON:NORhA:	a.* *BMC* 620. b.* C. Glazebrook = *FEJ Photographs* 31/1. c. NMAG 1986.48.2 = *FEJ Photographs* 31/2. d. *SCBI* 16, 400. e.* Ashmolean Museum, Oxford HCR2000.7.2.170. f. Fitzwilliam Museum, Cambridge CM.1990-1-826.	6
5	5^A	P2	+hENRIREXANG	+PIRES:ON:NORhA	a.* *BMC* 621. b. *BMC* 622. c. *BMC* 623. d. *BMC* 624. e. NMAG 1973.53P. f.* NMAG 1986.48.3 = *FEJ Photographs* 31/3. g. Wicklewood hoard, a cut halfpenny. h. *BNJ* 21 (1931–3), Plate VII, 5. i. Lord Stewartby.	9
6	5^A	R1	+hENRIREXANG	+REIMV[ ]N:NORh	a.* BM 1958-11-9-6. b. *FEJ Photographs* 31/7.	2

7	6^{A}	R1	+hE[ ]ΛNGL	+REIMV[ ]N:NORh	a.*	BM 1958-11-9-5.	4
					b.*	*FEJ Photographs* 31/5.	
					c.	NMAG 1986.48.5 = *FEJ Photographs* 31/6.	
					d.	Wicklewood hoard, a cut halfpenny.	
8	7^{A}	R2	[ ]IREXΛNGL	+REIMVND:ON:NORhΛ	a.*	*BMC* 627.	1
9	8^{A}	R2	+hENRIREXΛNGL	+REIMVND:ON:NORhΛ	a.*	*BMC* 628.	6
					b.*	*BMC* 629.	
					c.*	NMAG 1986.48.4 = *FEJ Photographs* 31/4.	
					d.	*SCBI* 16, 401.	
					e.	Royal Mint Museum, Hocking 322.	
					f.	A. Dawson.	
10	7^{A}	S1	[ ]IREXΛNGL	+STEF[ ]ON:NOhΛN	a.	Wicklewood hoard, a cut halfpenny.	1
11	9^{A}	S1	+hENRIR[ ]NGL	+STEF[ ]ON:NOhΛN	a.*	*BMC* 631.	2
					b.*	NMAG 1986.48.7 = *FEJ Photographs* 31/8.	
12	10^{A}	WL1	+hENRIREXΛNGL	+WALTIER[ ]R?h?	a.*	*BMC* 632.	1
13	2^{A}	WN1	+hENRIREXΛNGL	+PΛRNIER:ON:NORh	a.*	Lord Stewartby = *FEJ Photographs* 31/10.	1
14	10^{A}	WN2	+hENRIREXΛNGL	+WΛRNIR:ON:NORhΛ	a.*	*BMC* 634.	4
					b.*	*BMC* 635.	
					c.	NMAG 1986.48.6 = *FEJ Photographs* 31/11.	
					d.*	T. Crafter = *EMC* number 2001.0666.	
15	11^{A}	WN2	+hENRIREXΛNGL	+WΛRNIR:ON:NORhΛ	a.*	BM 1985-7-82-256 = *FEJ Photographs* 31/12.	1
16	8^{A}	UN1	+hENRIREXANGL	[ ]:ON:NO[ ]	a.*	T. Crafter, a cut halfpenny.	1

CLASS C2 (*c.*1163-*c.*1168) – from Metropolitan dies.

17	12^{C}	E3	+hENRIR	+INGELRAO):ON:N	a.*	*BMC* 619.	4
					b.	NMAG 1986.48.1 = *FEJ Photographs* 30/32 = *BMC* 618.	
					c.	BM 1985-7-82-254 = *FEJ Photographs* 30/33.	
					d.	Ashmolean Museum, Oxford HCR2000.7.2.170.	
18	13^{C}	R3	+hENRI:R	+REIO)VND:ON:N	a.*	*BMC* 630.	1

CLASS C3 (*c.*1163-*c.*1168) – probably from locally produced dies.

19	14^{C}	E4	+hENRIREXÆNG	+INGERÆ0):ON:NORÆ0	a.* *BMC* 615. b.* *FEJ Photographs* 30/30. c. Lord Stewartby. d. Ex Lawrence, Glendining, 28 November 1951, lot 998 (part 1). e. *EMC* number 1997.0039, a cut halfpenny.	5
20	15^{C}	E4	+hENRI:REX:ÆN	+INGERÆ0):ON:NORÆ0	a.* *BMC* 616. b.* *FEJ Photographs* 30/31. c. A. Dawson.	3
21	16^{C}	I2	+hENRIREXÆNG	+IbOSOP:ON:NORÆ0TV	a.* *BMC* 617 (listed under Ingeram). b.* Lord Stewartby = *FEJ Photographs* 30/34. c. A. Dawson.	3
22	17^{C}	WL2	+hENRI:REX:Æ:	+WÆLTERI:ON:NOR	a.* *BMC* 633. b.* NMAG 1986.48.8 = *FEJ Photographs* 31/9. c. Wicklewood hoard. d. *EMC* number 1993.0283, a cut halfpenny. e. *EMC* number 2006.0162.	5
23	14^{C}	WN3	+hENRIREXÆNG	+WÆRNIER:ON:NORÆ:	a.* *BMC* 636. b.* *BMC* 637. c. *FEJ Photographs* 31/13.	3

8.5. Notes on specimens and weights

No.	*Wt (g).*	*Notes*
1a.	1.45	British Museum, London. Illustrated by Wells, *BNJ* 21 (1931-33), Plate VII, 1.
1b.	1.28	British Museum, London, 1917–12–2–78 (British and Medieval Dept transfer). Lark Hill hoard (1854).
1c.	1.40	Current whereabouts unknown. Ex F. Elmore Jones, Glendining (London) Auction 13 April 1983, lot 1168 (part 1).
1d.	1.46	C. Glazebrook. Ex Dix Noonan Webb (London) Auction, 25th November 1998, lot 31 (there erroneously described as Norwich mint).
2a.	1.36	British Museum, 1950–5–6–15. Purchased from L.A. Lawrence. Ticket in handwriting of Lawrence with coin indicates that the coin is from the Ampthill hoard (1836).
2b.	1.41	Lord Stewartby. Ex E.J. Harris collection; ex F. Elmore Jones, Glendining (London) Auction Glendining (London) Auction 10 April 1984, lot 1458 (part 1). This coin probably from the Tealby hoard (1807), see *BNJ* 29 (1958-59), p. 84 number 22.
2c.	—	Noble Numismatics Ltd (Sydney) Auction, April 2005, lot 732.
3a.	1.45	British Museum, 1935–6–3–78. Purchased from L.A. Lawrence. Illustrated by Wells, *BNJ* 21 (1931-33), Plate VII, 3.
3b.	1.42	British Museum, 1985–7–82–255. From the executors of F. Elmore Jones. Ex A.W. Launchbury collection.
4a.	1.45	British Museum, 1927–6–2–110. Leicester Hoard (1927), LH-Report 110. Illustrated by Wells, *BNJ* 21 (1931-33), Plate VII, 4.
4b.	1.43	C. Glazebrook. Ex F. Elmore Jones, Glendining (London) Auction 13 April 1983, lot 1169.
4c.	1.41	Northampton Museum and Art Gallery. Ex F. Elmore Jones, Glendining (London) Auction 7 October 1986, lot 1726 (part 2).
4d.	1.30	Current whereabouts unknown. *SCBI* (Norweb) 16, 400. Ex E. Norweb, Spink (London) Coin Auction, 17th June 1987, lot 1315 (part 1); ex A.H.F. Baldwin.
4e.	1.38	Ashmolean Museum, HCR2000.7.2.170. Gayton hoard (1998–9).
4f.	1.47	Fitzwilliam Museum, CM.1990-1-826. Edward Baldwin and Kevin Butcher, *Study Photographs of the C.E. Blunt Collection of British Medieval Coins* (Cambridge: Fitzwilliam Museum, 1993), Part 2 Tealby to Edward III (pre 1351), Plate 1, row 3 number 1. This specimen shows that the obverse legend has ⊼.
5a.	1.43	British Museum (no accession number). Illustrated by Wells, *BNJ* 21 (1931-33), Plate VII, 6.
5b.	1.39	British Museum, 1927–6–2–111, from Leicester Hoard (1927) LH-Report 111.
5c.	1.42	British Museum, 1917–12–2–119 (British and Medieval Dept transfer). Lark Hill hoard (1854).
5d.	1.47	British Museum, 1917–12–2–122 (British and Medieval Dept transfer). Lark Hill hoard (1854).
5e.	1.43	Northampton Museum and Art Gallery. Purchased Spink & Son Ltd, 1973.
5f.	1.42	Northampton Museum and Art Gallery. Ex F. Elmore Jones, Glendining (London) Auction 7 October 1986, lot 1727. Ex W.C. Wells collection.
5g.	[0.73]	Christie's (London) Auction 15 May 1990, lot 152 (part 3). British Museum Security Photographs R 17374.10, row 5, number 3.
5h.	—	Current whereabouts unknown. Ex L. A. Lawrence, Glendining's 14th March 1951, Lot 383 (part 1), illustrated Plate III. Illustrated by Wells, *BNJ* 21 (1931-33), Plate VII, 5.
5i.	[1.29]	Lord Stewartby.

6a.	1.42	British Museum, 1958–11–9–6. Presented by F. Elmore Jones. From Tealby hoard (1807): *BNJ* 29 (1958-59), p. 84 number 26 and Plate V, 2. Ticket with coins references 'R.L.A.' = Mr R. L. Austin of Chichester who brought the group to the attention of Michael Dolley and F. Elmore Jones.
6b.	1.43	Current whereabouts unknown. Ex F. Elmore Jones, Glendining (London) Auction 13 April 1983, lot 1170 (part 2).
7a.	1.42	British Museum, 1958–11–9–5. Presented by F. Elmore Jones. From Tealby hoard (1807): *BNJ* 29 (1958-59), p. 84 number 25 and Plate V, 1. Ticket with coin references 'R.L.A.' = Mr R. L. Austin of Chichester who brought the group to the attention of Michael Dolley and F. Elmore Jones.
7b.	1.36	Current whereabouts unknown. Ex F. Elmore Jones, Glendining (London) Auction 13 April 1983, lot 1170 (part 1).
7c.	1.27	Northampton Museum and Art Gallery. Ex F. Elmore Jones, Glendining (London) Auction 7 October 1986, lot 1729 (part 1).
7d.	[0.68]	Christie's (London) Auction 15 May 1990, lot 152 (part 4). British Museum Security Photographs R 17374.10, row 1, number 5.
8a.	[1.21]	British Museum (no accession number).
9a.	1.41	British Museum, 1915–5–7–1506. Purchased from Morgan collection, ex J. Evans. Illustrated by Wells, *BNJ* 21 (1931-33), Plate VII, 2.
9b.	1.42	British Museum (no accession number). Donated by S.S. Banks in 1818, from Tealby hoard (1807).
9c.	1.39	Northampton Museum and Art Gallery. Ex F. Elmore Jones, Glendining (London) Auction 7 October 1986, lot 1728; ex W.C. Wells; ex Carlyon-Britton, Sotheby (London) Auction 20 November 1916, lot 1523 (part 3) where moneyer's name given erroneously in catalogue as Reinaud; illustrated Plate 35.
9d.	[1.23]	Current whereabouts unknown. *SCBI* 16 (Norweb), 401 where it is erroneously identified as a die duplicate of *BMC* 627. Cited in the note to *BMC* 627. Ex E. Norweb, Spink (London) Auction 17 June 1987, lot 1315 (part 2); ex A.H.F. Baldwin. Edge chipped.
9e.	1.47	Royal Mint Museum. Hocking number 322.
9f.	1.30	A. Dawson. Ex A. Lainchbury collection. Ex Parsons, Glendining (London) Auction 11 May 1954, lot 263 (part).
10a.	[0.45]	Christie's (London) Auction 15 May 1990, lot 152 (part 5). British Museum Security Photographs R 17374.10, row 2, number 1.
11a.	1.39	British Museum (no accession number). Presented by J. Dyer in 1818. Outchester hoard (1817), see *BMC Henry II*, pp. xlix-lii.
11b.	1.42	Northampton Museum and Art Gallery. Ex F. Elmore Jones, Glendining (London) Auction 7 October 1986, lot 1730.
12a.	1.46	British Museum 1935–6–3–79. Purchased from L.A. Lawrence. Illustrated by W.C. Wells, *BNJ* 21 (1931-33), Plate VII, 7.
13a.	1.41	Lord Stewartby. Ex E.J. Harris collection; ex F. Elmore Jones, Glendining (London) Auction 10 April 1984, lot 1458 (part 2). This coin is cited *BMC*, p. cl.
14a.	1.39	British Museum 1855–4–4–8. Ticket with coin states 'found Worcester'; note to *BMC* 634 states that the coin is from the Lark Hill hoard (1854), but was not in the published report. Illustrated by W.C. Wells, *BNJ* 21 (1931-33), Plate VII, 8.
14b.	1.46	British Museum 1903–11–8–44. Awbridge hoard (1903).
14c.	1.30	Northampton Museum and Art Gallery. Ex F. Elmore Jones, Glendining (London) Auction 7 October 1986, lot 1729 (part 2).
14d.	1.32	T. Crafter. *ECM* number 2001.0666. Found by a metal-detectorist in South Kyme, Lincolnshire (map reference TF 1749), 1992.
15a.	1.43	British Museum 1985–7–82–256. From the executors of F. Elmore Jones. Ex W.C. Wells. In the Index to *FEJ Photographs* this coin is recorded as a die

duplicate of *BMC* 634. The obverse is similar to *BMC* 634, but it is not the same die. Illustrated by W.C. Wells, *BNJ* 21 (1931-33), Plate VII, 11.

16a. [0.64] T. Crafter. Purchased from Mike Vosper.

17a. 1.44 British Museum, 1935–6–3–77. Purchased from L. A. Lawrence. Ticket in handwriting of Lawrence states that the coin is from the Ampthill hoard (1836). Illustrated by W.C. Wells, *BNJ* 21 (1931-33), Plate VII, 12.

17b. 1.46 Northampton Museum and Art Gallery. Ex F. Elmore Jones, Glendining (London) Auction 7 October 1986, lot 1726 (part 1); ex British Museum. Leicester hoard (1927), LH-Report 109.

17c. 1.43 British Museum, 1985–7–82–254. From the executors of F. Elmore Jones.

17d. 1.44 Ashmolean Museum, HCR2000.7.2.170. Gayton hoard (1998–9).

18a. [1.18] British Museum, 1947–11–2–110. Purchased from L.A. Lawrence. Ex P.W.P Carlyon-Britton (see *BNJ* 1, p. 107, note 1) although not in auctions. Illustrated by N. Heywood in *BNJ* 1 (1902), plate before p. 97, number 15 (there ascribed to Godric of Norwich). Illustrated by G.C. Brooke, *Numismatic Chronicle*[5] 7 (1927), Plate XIV, 14 (obverse only).

19a. 1.31 British Museum, 1947–11–2–109. Purchased from L. A. Lawrence.

19b. 1.44 Current whereabouts unknown. Ex F. Elmore Jones, Glendining (London) Auction 10 April 1984, lot 1459 (part 1). This coin was apparently from a parcel found at Corne, near Angers, France *c.*1930. Elmore Jones purchased this coin along with fifteen other Cross and Crosslets pennies, supposedly from the same source, from Spink & Son Ltd. See F. Elmore Jones, 'A parcel of "Tealby" Type pennies from France', *Spink's Numismatic Circular* 1965, pp. 125-6; this coin is number 9 and is illustrated.

19c. 1.34 Lord Stewartby.

19d. — Current whereabouts unknown. Ex L.A. Lawrence, Glendining (London) Auction 28 November 1951, lot 998 (part 1), illustrated on Plate I.

19e. [—] *ECM* number 1997.0039. Found by a metal-detectorist in Brundish, Suffolk (map reference TM 2769), 1997. *BNJ* Coin Register 1997, number 202 (illustration on Plate 31 erroneously annotated '201'). Coin was identified in the course of the compilation of this Catalogue.

20a. 1.28 British Museum (no accession number). Donated by S.S. Banks in 1818, from Tealby Hoard (1807). Illustrated by W.C. Wells, *BNJ* 21 (1931-33), Plate VII, 9.

20b. [1.27] Current whereabouts unknown. Ex F. Elmore Jones, Glendining (London) Auction 13 April 1983, lot 1168 (part 2); ex W.C. Wells; ex P.W.P. Carlyon-Britton, Sotheby (London) Auction 20 November 1916, lot 1530 (illustrated on Plate 35). Illustrated by N. Heywood in *BNJ* 1 (1902), plate before p. 97, number 14. Illustrated by W.C. Wells, *BNJ* 21 (1931-33), Plate VII, 10. This coin was described in the FEJ auction catalogue as 'ragged and corroded'.

20c. [1.40] A. Dawson. Found by a metal-detectorist near Darlington, 1995 (broken and repaired).

21a. 1.47 British Museum 1935–6–3–89. Purchased from L.A. Lawrence. Illustrated by Lawrence, *BNJ* 14 (1918), plate facing p. 13, number 21.

21b. 1.39 Lord Stewartby. Ex E.J. Harris collection. Ex F. Elmore Jones, Glendining (London) Auction 10 April 1984, lot 1460; ex W.C. Wells (Ticket written by F. Elmore Jones that accompanies the coin states: 'ex W.C.W coll.')

21c. 1.45 A. Dawson collection. Ex *Spink's Numismatic Circular* 109, number 2 (April 2001), p. 142, number HSO0380 (illustrated).

22a. 1.42 British Museum 1935–6–3–90. Purchased from L.A. Lawrence. Illustrated by N. Heywood in *BNJ* 1 (1902), plate before p.97, number 23. Illustrated by L.A. Lawrence, *BNJ* 14 (1918), plate facing p. 13, number 20 (obverse only). Coin is listed in *BMC* as having Ⱥ in the obverse legend; that it is Ⱥ is confirmed by specimen (22b).

22b. 1.42 Northampton Museum and Art Gallery. Ex F. Elmore Jones, Glendining

(London) Auction 7 October 1986, lot 1731. Ex W.C. Wells collection.

22c. 1.42 Christie's (London) Auction 15 May 1990, lot 152 (part 2). British Museum Security Photographs R 17374.10, row 9, number 4.

22d. [0.54] *ECM* number 1993.0283. Found by a metal-detectorist in Bawsey, Norfolk (map reference TF 6819), October 1993. *BNJ* Coin Register 1993, number 283. Coin was identified in the course of the compilation of this Catalogue.

22e — *ECM* number 2006.0162. Found by a metal-detectorist near Dereham, Norfolk.

23a. 1.32 British Museum, 1927–6–2–112. Leicester hoard (1927), LH-Report 112.

23b. 1.43 British Museum, 1935–6–3–80. Purchased from L.A. Lawrence. Ticket in handwriting of Lawrence indicates that the coin is from the Ampthill hoard (1836). Illustrated by T.C.R. Crafter, *BNJ* 68 (1998), Plate 6, 22.

23c. 1.35 Current whereabouts unknown. Ex F. Elmore Jones, Glendining (London) Auction 10 April 1984, lot 1459 (part 2).

8.6 Data from H. Mossop, *The Lincoln Mint* (Newcastle upon Tyne: 1970).

H. Mossop's study of the Lincoln mint is difficult to use. The summary data concerning coins of Class A presented in Table 3.8 was been extracted from Mossop's study. For the sake of completeness, the detailed data upon which the summary is based is presented here.

CLASS A

Moneyer, plate	*No.*	*Die combination*	*No. of coins*	*Remarks on Obverse dies*	*Singletons*
Andreu					
LXXXVII	28–29	Aa	4	= Lanfram F	
LXXXVII	30–31	Bb	2		
LXXXVIII	1	Cb	1		
LXXXVIII	2	Bc	1		Reverse
Godric					
LXXXVIII	19	Aa	1	= Raulf C	
LXXXVIII	20	Ba	1	= Lanfram C	
LXXXVIII	21	Cb	2	= Lanfram D	
LXXXVIII	22–23	Dc	5		
Lanfram					
LXXXIX	6	Aa	1		Obverse
LXXXIX	7	Ba	2		
LXXXIX	8–9	Cb	7	= Godric B	
LXXXIX	10	Db	1	= Godric C	
LXXXIX	11–13	Ec	3		
LXXXIX	14	Fd	1	= Andreu A	Reverse
Raulf					
LXXXIX	24	Aa	1		Obverse + Reverse
LXXXIX	25	Bb	1		Obverse + Reverse
LXXXIX	26	Cc	1	= Godric A	Reverse
Raven					
XC	11–12	[Xx][5]	2		
XC	13–14	Aa	3		
Svein					
XC	30	Aa	6		
XC	31	Bb	6		
TOTALS		19 obverse dies; 16 reverse dies.	52		3 obverse singletons 5 reverse singletons

Obverse dies data derived from Mossop: $n = 52$; $d = 19$; $d_1 = 3$.

Reverse die data derived from Mossop: $n = 52$; $d = 16$; $d_1 = 5$.

[5] These two die-duplicates published by Mossop were included as moneyer 'Ra…', but not fully identified at the time; the coins were not given a die-combination identity by Mossop. The two coins are now known to be of the moneyer Raven on the basis of a further coin published by T.C.R. Crafter, *BNJ* 68 (1998), Plate 6, no. 1. The full legend of the reverse die is +RAVEN:ON:LINCO: The coins are therefore included in the statistical data and assigned to there proper place here.

CLASS C

Plate, ***moneyer***	*No.*	*Die combination*	*No. of coins*	*Remarks on Obverse dies*	*Singletons*
Andreu					
LXXXVIII	7–8	Gf	3		
LXXXVIII	9	Hg	2	= Raven G	
LXXXVIII	10–11	Ig	2		
LXXXVIII	12–14	Jh	6		
Godric					
LXXXVIII	27–28	Ge	2	= Raulf E and Svein C	
LXXXVIII	29–31	Hf	7		
Lanfram					
LXXXIX	17–18	Hf	2		
LXXXIX	19	Ig	1	= Raven D	Reverse
Raulf					
LXXXIX	28–30	Ee	5	= Godric G and Svein C	
LXXXIX	31	Ff	1		Obverse + Reverse
Raven					
XC	16–17	Cb	5		
XC	18–19	Dc	5	= Lamfram I	
XC	20–21	Ed	2		
XC	22	Fe	1		Obverse + Reverse
XC	23	Gf	1	= Andrev H	
Svein					
XCI	1–2	Cc	3	= Godric G and Raulf E	
XCI	3	Dc	1		Obverse + Reverse
Turstain					
XCI	8–9	Aa	2		
TOTALS		14 obverse dies; 16 reverse dies.	51		3 obverse singletons 4 reverse singletons

Obverse dies data derived from Mossop: $n = 51$; $d = 14$; $d_1 = 3$.

Reverse die data derived from Mossop: $n = 51$; $d = 16$; $d_1 = 4$.

CLASS F

*Plate, **moneyer***	*No.*	*Die combination*	*No. of coins*	*Remarks on Obverse dies*	*Singletons*
Andreu					
LXXXVIII	17	Lj	1		Obverse
LXXXVIII	18	Mj	1		Obverse
Lanfram					
LXXXIX	23	Li	1		Obverse + Reverse
Raulf					
LXXXIX	7–9	Kk	3		
LXXXIX	10	Ll	1		Obverse + Reverse
Raven					
XC	28–29	Ji	2		
Turstain					
XCI	10	Bb	1		Obverse + Reverse
TOTALS		7 obverse dies; 6 reverse dies.	10		5 obverse singletons 3 reverse singletons

Obverse dies data derived from Mossop: $n = 10$; $d = 7$; $d_1 = 5$.

Reverse die data derived from Mossop: $n = 10$; $d = 6$; $d_1 = 3$.

Additional numismatic material from the Gayton hoard increases the number of known dies, but reduces the number of singletons. In the Gayton hoard there are two die duplicates of Mossop, LXXXVIII, 18 (**175** and **176**); two die duplicates of Mossop LXXXVIII, 17 (**177** and **178**); one die duplicate of Mossop, XC, 7-9 (**183**); one penny of the moneyer Turstain from dies not previously recorded (**187**).

With addition of material in the Gayton hoard, obverse die data: $n = 16$; $d = 8$; $d_1 = 3$.

With addition of material in the Gayton hoard, reverse die data: $n = 16$; $d = 7$; $d_1 = 3$.

9. Catalogue: the Gayton hoard (1998–9)

9.1. Introduction

The cataloguing process began in 1998 shortly after the first parcel of the hoard was discovered. The recovery of the second parcel in 1999 slowed progress on the whole hoard as it was necessary to break off from work on the first parcel to assess the second parcel for consideration under the provisions of the Treasure Act (1996). Subsequently, the two parcels have been integrated and the entire hoard is treated as a whole in the following catalogue, finalised in May 2006. The painstaking task of cataloguing has occupied the intervening years.

The format of the Catalogue has been adapted from that which I applied to the coins from the Thorpe Thewles hoard.[1] The format has been developed in order to accommodate the greater volume of material from Gayton adequately. The primary function of the layout is to present full legend readings of individual specimens even when these can be only partial.

9.2. Arrangement and conventions

The catalogue numbers run sequentially throughout in the left-hand column. The coins have been arranged alphabetically by modern place name of mint, with coins of uncertain mint and contemporary imitations following. Each mint commences on a new page. Under each mint the coins have been arranged alphabetically by moneyer's name. The coins of each moneyer are arranged in class order. Coins with an identifiable subclass precede those that do not within each class group, thus A2 precedes A. Arrangement by class takes precedence over moneyer's name in the coins of uncertain mint, in order to facilitate future identification.

A header is given to each page, top right, usually a mint name with the specimen numbers given on that page in square brackets ([…]).

Illustrated coins are marked with bold-type catalogue numbers.

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[1] T. Crafter, 'Twelve pennies of Henry II from the Thorpe Thewles hoard', *BNJ* 75 (2005), 169–72.

Weights are given in grams. Weights in square brackets ([...]) indicate damaged or otherwise underweight coins that have been excluded from the metrological analysis.

Die-axis has been calculated from the king's bust upright, usually with 0° running through the king's neck and central fleur of the crown.

Coins that have been subjected to Electron Probe Mircoanalysis as part of this thesis have 'EMPA conducted 2005' placed at the end of the references and can be found listed in Table 5.2 by catalogue number.

Legend readings

[ ]	Indicates that a letter or letters are off the flan or illegible on the specimen.
( )	Indicates an alternative reading.
?	In a legend donates uncertainty concerning the letter or abbreviation mark immediately preceding it.
[RAVL]	Letters shaded grey indicates a probable legend reading, but that the letters are not established by reference to any known die-duplicate.

9.3. Identification by die

The hoard catalogue is not a die corpus; in this respect the material differs from the rest of the primary numismatic evidence presented in this thesis. The poor production of coinage in late twelfth-century Britain requires multiple die duplicates to establish the legend readings of individual specimens. The identity of a majority of the specimens in the hoard has only been established by identifying other published specimens struck from the same dies. However, the possibility of identifying coins by dies is quite distorted owing to the selective retention of specimens in collections over the past two hundred years.

The importance of the information obtained from the hoard cannot be divorced from the numismatic skills deployed to identify the coins. Most coins cannot be identified from reading the legends, for these are only ever partial. Identification is achieved in this series through a mixture of recognising the likely emendation, a skill honed by experience, and expending much labour in recovering the full legend reading from die duplicates that yield missing parts.

Undoubtedly, the majority of surviving specimens come from hoards – more particularly one huge hoard, that found at Tealby, Lincolnshire in 1807. Of the *c.*6,000 coins in the Tealby

hoard all but around 750 were melted down at the Tower.[2] The retained coins were selected by Taylor-Combe on the basis of legibility of mint signature, which would have favoured the the neater, less ill-struck coins of Class A, producing a sample unrepresentative of the hoard as a whole which was concealed at the end of the coinage *c.*1180.[3]

The under-representation of Class F is problematic and means that a majority of the coins in Gayton are without parallel. Even in private collections, which are less liable to contain the biases of institutional collections, the same problem is encountered. For example, F. Elmore Jones possessed 29 Class F pennies of Canterbury, the Gayton hoard contains 65. Consequently the content of the Gayton hoard is of unprecedented importance for our knowledge of coins of the late phases of the coinage, but identification of such late coins to the extent possible with those of Class A is largely precluded. For many coins I have employed the term 'presumably' before a tentative attribution, as a stronger designation than 'possibly', to indicate that such an attribution is likely to be correct based on our current knowledge of the activities of mints and moneyers. The phrase 'dies not traced' indicates that I have not been able to find die-duplicates of the specimen in question in any published source. There are a few coins in the Gayton hoard that are die-duplicates (for example, **36–7**, **46–7**, **70–71**), but the dies are otherwise unknown.

How the legend readings were established cannot be checked from simply listing one definitive reading for die combinations. Secondly, future advancement of the subject will be achieved by providing precise die-identifications of further specimens, a comparative process that relies on the identification of duplicate specimens with similar areas of legend or design visible. Therefore, precise legend readings are given in full for each specimen in order that the reader can be satisfied of the correct reading as derived from all specimens from that die and to facilitate comparison of further specimens such as may require identification.

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[2] For the probable content and fate of the Tealby hoard see C. Sturman, 'Sir Joseph Banks and the Tealby hoard', *Lincolnshire History and Archaeology* 24 (1989), pp. 51–2.
[3] Crafter, 'Re-examination', p. 58.

In the interests of clarity, references are given in a concise format. The primary sources of reference are *BMC* and *FEJ Photographs*. Other references such as *EMCH* and *SCBI* are employed as necessary. Additionally, citation is made to five mint-specific studies:

Eaglen, *Bury St Edmunds*	R.J. Eaglen, *The Abbey and Mint of Bury St Edmunds* (London: 2006).
Crafter, *Ipswich*	T. Crafter, 'A die study of the Cross-and-Crosslets Type of the Ipswich mint, c.1161/2–1180', *NC* 162 (2002), pp. 237–51.
Crafter, *Northampton*	The two coins of Northampton are included in the catalogue of that mint in this thesis (§7.4) and are cross-referenced accordingly.
Allen, *Durham*	'Durham mint before Boldon Book', *Anglo-Norman Durham*, ed. D. Rollason, M. Harvey, and M. Prestwich (Woodbridge: 1994), pp. 381–98.
Mossop, *Lincoln*	H.R. Mossop, *The Lincoln Mint c.890–1279* (Newcastle-upon-Tyne: 1970).

Particular coins are given expanded treatment in section 4.3.1 and cross-reference is made to that section in the remarks on the particular coins in the Catalogue.

9.4 Catalogue

CONTENTS – CATALOGUE NUMBERS

Identified mints

Bristol	**1–6**
Bury St Edmunds	**7–22**
Canterbury	**23–124**
Carlisle	**125–128**
Colchester	**129–130**
Durham	**131**
Exeter	**132–133**
Hereford	**134–135**
Ipswich	**136–171**
Leicester	**172**
Lincoln	**173–187**
London	**188–215**
Newcastle	**216–220**
Northampton	**221–222**
Norwich	**223–231**
Thetford	**232–246**
Wilton	**247**
Winchester	**248–251**
York	**252–256**

Uncertain and illegible coins

Class A	**257–259**
Class C	**260–270**
Class D	**271–274**
Class E	**275**
Class F	**276–298**
Uncertain class	**299–309**

Contemporary imitations **310–311**

No.	*Class*		*Identification, legend readings, and references*	Wt (g)	Die-Axis
			ELAF		
1	A	Obv.	[+hENRIREXÆN]GL		
		Rev.	+E[ ]TO		
			An upright is visible after the cross. The mint signature could be LÆNTO for Canterbury, but that signature is only known in Class A for the moneyers Alferg, Adam, and Wiulf, none of whose names begin with an upright.	1.26	270°
2	A	Obv.	[ ]RIR[ ]		
		Rev.	[ ]ELÆ[ ]		
			This combination of letters is only found in the name Elaf, an attribution strengthened by the relative position of the letters in relation to the reverse design.	1.40	320°
3	F1	Obv.	[+hENR]IREX:		
		Rev.	+EILÆF:ON[:BRIꟃT]		
			Die duplicate of *BMC* 8 and *FEJ Photographs* 13/7–8. Electron Probe Microanalysis conducted 2005.	1.30	90°
4	F1	Obv.	[+hEN]RI·RE[X:]		
		Rev.	+E[ILÆF:ON:BR]IꟃT		
			Die duplicate of *BMC* 8 and *FEJ Photographs* 13/7–8.	1.20	0°
			ROGIER		
5	F1	Obv.	+hENRIREX		
		Rev.	+ROGI[ER:O]N:BRIST		
			Die duplicate of of next coin, no. 6. Electron Probe Microanalysis conducted 2005. For discussion of coin, see §4.3.1.	1.41	20°
6	F1	Obv.	[+h]ENRIRE[X]		
		Rev.	+ROGI[ER:ON]:B[RIST]		
			Die duplicate of of previous coin, no. 5. For discussion of coin, see §4.3.1.	1.44	20°

No.	*Class*		*Identification, legend readings, and references*	Wt (g)	Die-Axis
			HENRI		
7	B1	Obv.	+hENRIREX[ΛN]		
		Rev.	+hENRI:O[N:ƧED]M:		
			Die duplicate of *BMC* 19–23 and *FEJ Photographs* 13/20. Eaglen die combination 60.	1.40	310°
8	C	Obv.	+[hENRI:R:AG:]		
		Rev.	[+hE]NRI:O[N:]S[:]ED[MV:]		
			Die duplicate of *BMC* 16–18 and *FEJ Photographs* 13/19. Eaglen die combination 57.	1.21	45°
9	D1	Obv.	[+]hENR[ ]EX		
		Rev.	+hEN[RI:ON:S:]EDMV		
			Die duplicate of *FEJ Photographs* 13/24. Eaglen die combination 61. Dies not represented in *BMC*.	1.11	320°
10	E3	Obv.	+hENRI[R]EX		
		Rev.	+[hE]NRI:ON:ƨ:[EDM:]		
			Die duplicate of *BMC* 28–30 and *FEJ Photographs* 13/25. Eaglen die combination 64. This coin identifies the sub-class as E3.	1.40	270°
			RAULF		
11	F1	Obv.	+h[ENRIRE]X:		
		Rev.	+RÆVL:[ON:ƨ:ED]MV:		
			Die duplicate of *BMC* 33*a* and *FEJ Photographs* 13/31. Eaglen die combination 69.	1.33	135°
12	F1	Obv.	+[hENRIR]EXÆ[NG]		
		Rev.	+RÆVL[:ON:ƨ:EDMV]		
			Die duplicate of *BMC* 36*a* = *SCBI* 12: 348. Dies not represented in *FEJ Photographs*. Eaglen die combination 74.	1.34	240°
13	F1	Obv.	+hEN[RIREXÆNG]		
		Rev.	[+RÆVL:]ON:ƨ:E[DMV]		
			Die duplicate of *BMC* 36*a* = *SCBI* 12: 348. Dies not represented in *FEJ Photographs*. Eaglen die combination 74.	1.43	310°
14	F1	Obv.	+[hENRI:REX]		
		Rev.	+R[ÆVL:ON:ƨ:]EDM:		
			Die duplicate of *BMC* 36. Dies not represented in *FEJ Photographs*. Eaglen die combination 71.	1.26	150°
15	F2	Obv.	+hENRI:REX		
		Rev.	+RÆ[VF:]O[N:]S:E[DM·]		
			Die duplicate of *BMC* 32 and *FEJ Photographs* 13/27. Eaglen die combination 67.	1.37	350°
16	F2	Obv.	+[hENRI:R]EX		
		Rev.	+ROVL[F:ON:S:]EDM·		
			Die duplicate of *BMC* 38–9 and *FEJ Photographs* 13/33. Eaglen die combination 76.	1.48	180°

No.	*Class*		*Identification, legend readings, and references*	Wt (g)	Die-Axis
			RAULF (*continued*)		
17	F	Obv.	+hENREXAN		
		Rev.	+RAVL:ON:S:EDM:		
			Die duplicate of *BMC* 31, *FEJ Photographs* 13/26 and next coin, 18. Eaglen die combination 66.	1.35	60°
18	F	Obv.	[+hEN]RE[XAN]		
		Rev.	+RA[V]L:ON[:S:EDM:]		
			Die duplicate of *BMC* 31, *FEJ Photographs* 13/26 and previous coin, 17. Eaglen die combination 66.	1.43	160°
19	F	Obv.	+hENRI:REX		
		Rev.	+ROVLF:ON:S:EDM·		
			Die duplicate of *BMC* 38–9 and *FEJ Photographs* 13/33. Eaglen die combination 76.	1.31	180°
20	F	Obv.	[+]hENRIREX		
		Rev.	+RAVL:ON·S:ED:		
			Die duplicate of *BMC* 40. Dies not represented in *FEJ Photographs*. Eaglen die combination 77.	1.40	290°
21	F	Obv.	+h[ ]X·		
		Rev.	[+R]AVL:ON:~:E[DMV]		
			Dies not represented in *BMC* or *FEJ Photographs*. Eaglen die combination [79]. Die duplicate of of next coin, no. 22. For discussion of coin, see §4.3.1.	1.33	330°
22	F	Obv.	+h[X·]		
		Rev.	[+]RA[V]L:ON[:~:E]DMV		
			Dies not represented in *BMC* or *FEJ Photographs*. Eaglen die combination [79]. Die duplicate of of previous coin, no. 21. For discussion of coin, see §4.3.1.	1.34	340°

No.	*Class*		*Identification, legend readings, and references*	Wt (g)	Die-Axis
			ALFERG		
23	A2	Obv.	[+hE]NRIREX[ΛNG]		
		Rev.	+Λ[LFERG]:ON:LΛ[N]		
			Die duplicate of *BMC* 56–7, *FEJ Photographs* 14/10–11, *English Medieval Coin Hoards* I, Norton Subcourse no. 1.	1.24	140°
			GOLDEEP		
24	C1	Obv.	[+hENR]I:R[ ]		
		Rev.	[+]GOLDE[EP:ON:LA]		
			Die duplicate of *BMC* 75 and *FEJ Photographs* 15/1–2.	1.22	270°
25	C1	Obv.	[+hENRI]		
		Rev.	[+GOL]DEE[P:ON:LA]		
			Die duplicate of *BMC* 75 and *FEJ Photographs* 15/1–2. Broken into two pieces.	1.24	30°
26	F/C3	Obv.	[ ]RE:		
		Rev.	[+]GOL[DEEP:ON:L]		
			Die duplicate of *FEJ Photographs* 15/17–18. Dies not represented in *BMC*.	1.47	180°
			GOLDHAVOC		
27	A1	Obv.	+hEN[RIREXANG]		
		Rev.	+GOL[DhΛVOL:]ON:LΛ		
			Die duplicate of *BMC* 63–4 and *FEJ Photographs* 14/18.	1.31	180°
28	B	Obv.	[+hENRIREX]ΛNG		
		Rev.	+[GO]LDhΛVOL:ON:LΛN		
			Die duplicate of *BMC* 65 and *FEJ Photographs* 14/19.	1.42	210°
			LAMBRIN		
29	F	Obv.	[+hEN]RIREXA		
		Rev.	[ ]L[ ]IN:ON:LAN		
			Dies not represented in *BMC* or *FEJ Photographs*. For discussion of coin, see §4.3.1.	1.17	240°
			RAUL		
30	F	Obv.	+hENRIRE[ ]		
		Rev.	+RAVL:ON:[LA]N		
			Dies not traced.	1.18	310°
31	F	Obv.	[+]hENRI:REX		
		Rev.	+RAVL:[ON:LAN]T		
			Dies not traced.	1.41	200°
32	F	Obv.	[+hEN]RIREXA		
		Rev.	+[RA]VL:O[N:LAN]TO		
			Dies not traced.	1.21	45°
33	F	Obv.	+hENR[ ]		
		Rev.	+RAVL[:ON:LAN]T		
			Dies not traced.	1.43	270°

N°.	*Class*		*Identification, legend readings, and references*	Wt (g)	Die-Axis
			RAUL (*continued*)		
34	F	Obv.	+h[ ]		
		Rev.	[ ]RÆVLF[ ]CÆNT		
			Round C in reverse legend. Hair curls constructed from annulets. Dies not traced. For discussion of coin, see §4.3.1.	1.14	330°
35	F	Obv.	[ ]		
		Rev.	[ ]L:ON:C[ ]		
			Presumably moneyer Raul. Dies not traced.	1.09	160°?
36	F	Obv.	[ ]EX		
		Rev.	+RÆ[ ]N:		
			Presumably moneyer Raul at Canterbury. Die duplicate of next coin, 37. Dies not traced.	1.19	230°
37	F	Obv.	+h[ ]EX		
		Rev.	[ ]:O[ ]		
			Reverse legend largely illegible, but a Die duplicate of previous coin, 36. Dies not traced.	1.40	300°?
38	F	Obv.	+[ ]		
		Rev.	+RÆ[ ]T		
			Presumably moneyer Raul at Canterbury. Dies not traced.	1.39	45°
39	F	Obv.	+hE[ ]		
		Rev.	+RÆ[ ]O		
			Presumably Raul at Canterbury. Dies not traced.	1.10	210°
			RICARD		
40	A2	Obv.	[+hENRIR]EXÆNGL		
		Rev.	+[RIC]ÆRD[:O]N[:CÆ]NT		
			Die duplicate of *FEJ Photographs* 16/2. Dies not represented in *BMC*.	1.35	240°
41	B1	Obv.	[+hENRIREXÆ]NG		
		Rev.	+R[IC]ÆRD:[ON:CÆN]		
			Die duplicate of *FEJ Photographs* 16/10. Obverse die same as *BMC* 149.	1.28	140°
42	B	Obv.	+hENR[IREXÆNGL]		
		Rev.	+RICÆ[RD:]ONC[Æ]NT		
			Die duplicate of *BMC* 98–100, *FEJ Photographs* 16/4, and *SCBI* 16 (Norweb), 328. Electron Probe Microanalysis conducted 2005.	1.38	45°
43	B	Obv.	+hENR[IREX]ÆN[GL]		
		Rev.	[+RI]CÆR[D]ON:C[ÆNT]		
			Die duplicate of *BMC* 98–100, *FEJ Photographs* 16/4, and *SCBI* 16 (Norweb), 328.	1.17	230°
44	B	Obv.	[+hE]NRI[REXÆN]GL		
		Rev.	[+RICÆRD:ON]:CÆ[N]		
			Die duplicate of *BMC* 100*a* = *SCBI* 16 (Norweb) 329 and *FEJ Photographs* 16/6.	1.41	140°

No.	*Class*		*Identification, legend readings, and references*	Wt (g)	Die-Axis
			RICARD (*continued*)		
45	C1	Obv.	[+h]ENR:R:A		
		Rev.	[+]R[I]CARD:O[N:C]A		
			Die duplicate of *BMC* 105 and *FEJ Photographs* 16/12.	1.18	210°
46	C1	Obv.	[+hE]NRI:RE:		
		Rev.	[ ]RIC[ ]N:CA[ ]		
			Die duplicate of of next coin, 47. Dies not traced.	1.45	150°
47	C1	Obv.	[ ]		
		Rev.	[ ]		
			Illegible, but a Die duplicate of of previous coin, 46. Dies not traced.	1.38	310°
48	C2	Obv.	[+hENR]I:R:AG		
		Rev.	+RI[CARD:ON]:CAN		
			Die duplicate of of *FEJ Photographs* 16/16. Obverse die same as *BMC* 180.	1.44	290°
49	C2	Obv.	[+hENR]I:REXA		
		Rev.	[+RICARD:ON]CA[NTO]		
			Die duplicate of *BMC* 113–14 and *FEJ Photographs* 16/21.	1.20	90°
50	C2	Obv.	[ ]RI:RE:		
		Rev.	[ ]ICAR[ ]		
			Presumably Ricard at Canterbury.	1.23	230°
51	D1	Obv.	[+hE]NRIREX		
		Rev.	+[RICARD:ON:CA·]		
			Die duplicate of *BMC* 118 and *FEJ Photographs* 16/28.	1.23	230°
52	D1	Obv.	+hENRIRE:		
		Rev.	+RICARD:[ON:C]AN	1.34	310°
			Die duplicate of *BMC* 127 and *FEJ Photographs* 17/1.		
53	D1	Obv.	+hENRI[:RE]:		
		Rev.	[+RICARD:]ON:CA[N:]		
			Die duplicate of *BMC* 123–5. Dies not represented in *FEJ Photographs*.	1.46	330°
54	D3/C	Obv.	[+hEN]RI:R:		
		Rev.	[+RIC]ARD:ON:C[ ]	1.23	310°
			Obverse die same as *BMC* 120. Reverse uncertain		
55	D	Obv.	[ ]ENRI:REX:		
		Rev.	[ ]ARD:ON:CANT		
			The die-style of this coin is strange and is akin to the so-called irregular Class B dies used at Ilchester mint, *BMC* 298.	1.39	45°
56	E2	Obv.	[+hENRIR]E[X:]		
		Rev.	[+RICA]RD:O[N:CAN:]		
			Die duplicate of *BMC* 129–32 and *FEJ Photographs* 17/2.	1.40	70°

No.	*Class*		*Identification, legend readings, and references*	Wt (g)	Die-Axis
			RICARD (*continued*)		
57	F1	Obv.	[+hENRIR]EX:		
		Rev.	[+RICAR]D:ON[:CAN]		
			Die duplicate of *BMC* 138–9. Reverse die same as *FEJ Photographs* 17/9 (erroneously listed in the Index as a Die duplicate of).	1.16	180°
58	F1	Obv.	[+hENRIRE]XAN		
		Rev.	[+RI]CARD:ON:C[AN]		
			Die duplicate of *BMC* 134–5 and *FEJ Photographs* 17/8. Electron Probe Microanalysis conducted 2005.	1.26	45°
59	F	Obv.	[+h]ENRIREXA:		
		Rev.	+RICA[RD:]O[N:C]AN		
			Die duplicate of *BMC* 136–37 and *FEJ Photographs* 17/7.	1.53	190°
60	F	Obv.	+hENR[IR]EX[ ]		
		Rev.	+R[I]CA[RD:ON:C]AN·		
			Dies not traced.	1.30	40°
61	F	Obv.	[ ]EXA		
		Rev.	[ ]ARD:[ON]:CA[ ]:		
			Dies not traced.	1.38	310°
62	F	Obv.	[ ]NRIR[		
		Rev.	[+]RICARD[:ON]:CA[ ]		
			Dies not traced.	1.35	270°
63	F	Obv.	[ ]X:		
		Rev.	[ ]RD:ON[ ]		
			Presumably Ricard at Canterbury. Dies not traced.	1.45	0°
64	F	Obv.	[ ]RIR[		
		Rev.	+RIC[ ]		
			Presumably Ricard at Canterbury. Dies not traced.	1.49	300°
65	F	Obv.	[ ]RI[ ]		
		Rev.	[ ]AR[ ]N:		
			Presumably Ricard at Canterbury. Dies not traced.	1.17	130°
66	F	Obv.	+hE[ ]		
		Rev.	[ ]ICAR[ ]		
			Presumably Ricard at Canterbury. Dies not traced.	1.40	340°
67	F	Obv.	+h[ ]		
		Rev.	[ ]D:ON:CA[ ]		
			Presumably moneyer Ricard. Dies not traced.	1.24	120°
68	F	Obv.	[+hE]NRIREX:		
		Rev.	[ ]ARD:[ ]		
			Presumably Ricard at Canterbury. Dies not traced.	1.09	290°
69	F	Obv.	[ ]RIREX:		
		Rev.	[ ]RIC[ ]		
			Presumably Ricard at Canterbury. Dies not traced.	1.29	30°

No.	*Class*		*Identification, legend readings, and references*	Wt (g)	Die-Axis
			RICARD (*continued*)		
70	F	Obv.	[ ]hEN[ ]		
		Rev.	[ ]RICA[ ]		
			Presumably Ricard at Canterbury. Dies not traced. A Die duplicate of of next coin, 71.	1.32	290°
71	F	Obv.	+h[ ]		
		Rev.	[ ]		
			Illegible, but a Die duplicate of of previous coin, 70. Presumably Ricard at Canterbury. Dies not traced.	1.50	270°
72	F	Obv.	[ ]RIR[ ]		
		Rev.	+RIC[ ]		
			Presumably Ricard at Canterbury. Dies not traced.	1.31	120°
73	F	Obv.	[ ]EXA		
		Rev.	[ ]RICAR[ ]		
			Presumably Ricard at Canterbury. Dies not traced.	1.19	170°
74	F	Obv.	[ ]		
		Rev.	+RICA[ ]N:		
			Presumably Ricard at Canterbury. Dies not traced.	1.43	110°
75	F	Obv.	+hE[ ]		
		Rev.	[ ]CARD:O[ ]	1.24	0°?
			Presumably Ricard at Canterbury. Dies not traced. Round letter forms on obverse and reverse. For discussion of coin, see §4.3.1.		
			RICARD M		
76	A2	Obv.	[+hEN]RIREXA[NGL]		
		Rev.	+RIC[ARD:M:ON:CA]N		
			Die duplicate of *BMC* 144 and *FEJ Photographs* 17/12.	1.43	270°
77	D1	Obv.	+[hENRI:R]IX		
		Rev.	[+]RIC[ARD:]M:[ON:CA]		
			Die duplicate of *BMC* 155 and *FEJ Photographs* 17/22.	1.46	240°
78	E3	Obv.	[+hE]NRI:REX:		
		Rev.	+RICARD:M:O[N:CA]		
			Die duplicate of *FEJ Photographs* 17/26. Obverse die same as *BMC* 158*a* = *SCBI* 53 (Scottish Museums), 342. Electron Probe Microanalysis conducted 2005.	1.40	200°
			ROGIER		
79	A2†	Obv.	+hENRIREX[A]NGL		
		Rev.	+ROGIER:ON:CAN		
			Die duplicate of *BMC* 161 and *FEJ Photographs* 17/30. Electron Probe Microanalysis conducted 2005.	1.39	120°
80	D1	Obv.	[+hENRI:]REX		
		Rev.	[+R]OGIER[:ON:]CA[N]		
			Die duplicate of *FEJ Photographs* 18/8 and next coin, 81. Dies not represented in *BMC*. This coin identifies the class and subclass.	1.37	180°

No.	*Class*		*Identification, legend readings, and references*	Wt (g)	Die-Axis
			ROGIER (*continued*)		
81	D1	Obv.	[+hENRI:R]EX		
		Rev.	[+ROGI]ER[:ON:]:CA[N]		
			Die duplicate of *FEJ Photographs* 18/8 and previous coin, 80. Dies not represented in *BMC*. This coin identifies the class and subclass.	1.30	220°
82	E(?)	Obv.	+hENRI:RE[ ]		
		Rev.	[ ]R:ON:CAN[ ]		
			Presumably moneyer Rogier. Dies not traced.	1.46	170°
83	F1	Obv.	+hENRIREX:		
		Rev.	+ROG[IER:ON:]CANT:		
			Die duplicate of *BMC* 171 and *FEJ Photographs* 18/16. Electron Probe Microanalysis conducted 2005.	1.39	220°
84	F	Obv.	+[ ]		
		Rev.	[+RO]GIER:ON:CA[ ]		
			Dies not traced.	1.40	300°
85	F	Obv.	+hENRI:[ ]		
		Rev.	[+R]OGIER:ON:CAN:		
			Dies not traced.	1.40	290°
86	F	Obv.	[ ]NRI[ ]		
		Rev.	[+]ROG[IER:O]N:CA[ ]		
			Dies not traced.	1.32	300°
87	F	Obv.	[ ]RE		
		Rev.	[ ]ER:O[		
			Presumably Rogier at Canterbury. Dies not traced.	1.44	150°?
88	F	Obv.	[ ]		
		Rev.	+R[ ]R:O[ ]		
			Presumably Rogier at Canterbury. Dies not traced.	1.29	130°
89	F	Obv.	[+hE]NRI:REX		
		Rev.	+ROGIER:ON[ ]		
			Presumably Rogier at Canterbury. Dies not traced.	1.25	180°
90	F	Obv.	+hENRI[ ]		
		Rev.	[+]ROGIER:ON:[ ]		
			Presumably Rogier at Canterbury. Dies not traced.	1.27	250°
91	F	Obv.	+hE[ ]		
		Rev.	+ROGIER:ON[ ]		
			Presumably Rogier at Canterbury. Dies not traced.	1.44	340°
92	F	Obv.	[ ]		
		Rev.	[ ]R:ON[ ]		
			Presumably Rogier at Canterbury. Dies not traced.	1.40	220°

No.	*Class*		*Identification, legend readings, and references*	Wt (g)	Die-Axis
			SOLOMON		
93	F	Obv.	[ ]R[ ]X		
		Rev.	[ ]OO)ON:O[ ]		
			Moneyer not represented in *BMC* or *FEJ Photographs*, but known from specimen (from different dies) in collection of Mr A. Dawson. For discussion of coin, see §4.3.1.	0.69	?
			WIULF		
94	A	Obv.	+hEN[RIREXⱯN]GL		
		Rev.	+WIVLF:O[N:LⱭNT]O		
			Die duplicate of *BMC* 183–4 and *FEJ Photographs* 18/29.	1.18	45°
95	C2	Obv.	[+]hENRI:R:		
		Rev.	+WIVLF:ON:LⱭN		
			Dies not traced.	1.43	160°
96	C	Obv.	[+hEN]RI:R·		
		Rev.	+WIV[LF:O]N:LⱭN		
			Dies not traced.	1.37	320°
97	E3	Obv.	+hEN[RI:REX]		
		Rev.	[ ]LF:O[ ]		
			Same obverse dies as *BMC* 198 and *FEJ Photographs* 19/11. Reverse die not traced.	1.41	180°
			UNCERTAIN		
98	C	Obv.	[+h]EN[ ]		
		Rev.	+[ ]EL[ ]LⱭN		
			Uncertain moneyer. Dies not traced.	1.40	260°
99	C	Obv.	[ ]ENRI:RE:[ ]		
		Rev.	[ ]ⱭV[ ]:ONL[ ]		
			Presumably moneyer Raul. Dies not traced.	1.35	160°?
100	C	Obv.	[ ]		
		Rev.	[ ]D(or R):O[ ]		
			Moneyer is presumably either Ricard or Rogier at Canterbury.	1.46	230°
101	F1	Obv.	hE[ ]		
		Rev.	+PA[ ]A:O[ ]TO		
			Uncertain moneyer. See discussion in text, §2.3.1. Die duplicate of of next coin, 102.	1.45	130°
102	F1	Obv.	+hEN[ ]		
		Rev.	[ ]Ⱥ[ ]TO		
			Uncertain moneyer. See discussion in text, §2.3.1. Die duplicate of of previous coin, 101.	1.25	250°
103	F	Obv.	[ ]		
		Rev.	+GO[ ]LⱭ		
			Moneyer is either Goldeep or Goldhavoc. Dies not traced.	1.45	0°

No.	*Class*		*Identification, legend readings, and references*	Wt (g)	Die-Axis
			UNCERTAIN (*continued*)		
104	F	Obv.	[ ]ENRI[ ]		
		Rev.	[ ]ON:LANT		
			Dies not traced.	1.50	160°
105	F	Obv.	[ ]RI[ ]X·		
		Rev.	+R[ ]N:LAN		
			Moneyer Raul, Ricard or Rogier. Dies not traced.	1.27	155°
106	F	Obv.	hEN[ ]		
		Rev.	[ ]ON:LAN[ ]		
			Moneyer uncertain. Dies not traced.	1.36	140°?
107	F	Obv.	+hEN[ ]		
		Rev.	[ ]R?[ ]N:LAN:		
			Moneyer either Raul, Ricard, or Rogier. Dies not traced.	1.41	140°
108	FI	Obv.	[ ]EX:		
		Rev.	[ ]N:L[ ]T		
			Moneyer uncertain. Dies not traced.	1.39	270°
109	F	Obv.	[+]hENRI[ ]		
		Rev.	[ ]ON:LAN[ ]		
			Moneyer uncertain. Dies not traced.	1.26	70°
110	F	Obv.	[ ]REX·		
		Rev.	[ ]N:LA[ ]		
			Moneyer uncertain. Dies not traced.	1.43	230°?
111	F	Obv.	[ ]NRIRE[ ]		
		Rev.	+[ ]ANT		
			Moneyer uncertain. Dies not traced.	1.33	320°
112	F	Obv.	[ ]EX		
		Rev.	[ ]LA		
			Moneyer uncertain. Dies not traced.	1.43	320°?
113	F	Obv.	[ ]REX:		
		Rev.	[ ]ON:LA[ ]		
			Moneyer uncertain. Dies not traced.	1.44	20°
114	F	Obv.	[ ]A		
		Rev.	[ ]ON:LAN[ ]		
			Moneyer uncertain. Dies not traced.	1.27	140°
115	F	Obv.	[ ]N[ ]		
		Rev.	+[ ]:ON[ ]NT:		
			Moneyer uncertain. Dies not traced.	1.16	230°
116	F	Obv.	[ ]X:A:		
		Rev.	[ ]N:LAN		
			Moneyer uncertain. Dies not traced.	1.34	240°
117	F	Obv.	[+hEN]RIREX		
		Rev.	[ ]LA[		
			Moneyer uncertain. Dies not traced.	1.43	?

No.	*Class*		*Identification, legend readings, and references*	Wt (g)	Die-Axis
			UNCERTAIN (*continued*)		
118	F	Obv.	[ ]RIR[ ]		
		Rev.	+[ ]ON:[ ]ÆN		
			Moneyer uncertain. Dies not traced.	1.14	180°
119	F	Obv.	[ ]RIREXÆ		
		Rev.	+[ ]ÆN		
			Moneyer uncertain. Dies not traced.	1.31	45°
120	F	Obv.	+h[ ]		
		Rev.	[ ]ON:C[ ]		
			Moneyer uncertain. Dies not traced. Fleur as sceptre head. For discussion of coin, see §4.3.1.	1.37	0°
121	F	Obv.	+hENR[ ]		
		Rev.	[ ]N:CÆ		
			Moneyer uncertain. Dies not traced.	1.29	180°
122	F	Obv.	[ ]NRIR[ ]		
		Rev.	[ ]ON[ ]CANT		
			Moneyer uncertain. Dies not traced.	1.21	?
123	F	Obv.	[ ]REX		
		Rev.	[ON]:CANT		
			Uncertain moneyer. Dies not traced.	1.37	45
124	F?	Obv.	*Brockage*		
		Rev.	[ ]CÆN[ ]		
			Brockage. Moneyer uncertain. Only the bottom parts of the letters of the signature are visible.	1.06	N/A

N°.	*Class*		*Identification, legend readings, and references*	Wt (g)	Die-Axis
			WILLEM		
125	E	Obv.	[+hENRI:]RE		
		Rev.	+W[ILLEL]M:O[N]:CAR		
			Die duplicate of *BMC* 224 and *FEJ Photographs* 20/8.	1.27	110°
126	F2	Obv.	+[hENRI:REI:]		
		Rev.	+WILLELM:[ON:CAR]		
			Die duplicate of *BMC* 226–7 and *FEJ Photographs* 20/12. Electron Probe Microanalysis conducted 2005.	1.42	320°
127	F	Obv.	+[hE]NRIREX:		
		Rev.	[+WILLELM:]ON:CAR		
			Die duplicate of *BMC* 225 and *FEJ Photographs* 20/10. Electron Probe Microanalysis conducted 2005.	1.27	30°
128	F	Obv.	+hENRIR[EX]		
		Rev.	+WILLEL[M:ON:]CA		
			R: 229 is this really *BMC* 230?	1.37	280°

N°.	*Class*		*Identification, legend readings, and references*	Wt (g)	Die-Axis
			WILLEM		
129	A1	Obv.	[+hENRI]REX[Λ]NGL		
		Rev.	+Λ[L]WIN:ON:C[OLE]C:		
			Die duplicate of *BMC* 238. Dies not represented in *FEJ Photographs*.	1.13	240°
			PIERES		
130	E	Obv.	+hENRI[RE:]		
		Rev.	[+P]IE[RES:+ON]:COL		
			Die duplicate of *FEJ Photographs* 20/34. Obverse die same as *BMC* 247.	1.09	90°

No.	*Class*		*Identification, legend readings, and references*	Wt (g)	Die-Axis
131	B		**IOHAN**		
		Obv.	✣hENRIREXΛ[NG]		
		Rev.	✣IOh[ΛN:O]N:[DVNhOL]		
			Die duplicate of *BMC* 251*a* (= *SCBI* 53: 350), 252 and *FEJ Photographs* 21/3. Allen, *Durham*, die-combination 16.	1.46	110°
			Electron Probe Microanalysis conducted 2005.		

N°.	*Class*		*Identification, legend readings, and references*	Wt (g)	**EXETER [132–133]** Die-Axis
			ROGIER		
132	D1	Obv.	+hENRI:[RE]X[:]		
		Rev.	[+R]OG[IE]R:O[N]:E[XSE:]		
			Die duplicate of *BMC* 270–71 and *FEJ Photographs* 21/18. Electron Probe Microanalysis conducted 2005.	1.34	300°
			T[——]		
133	B/C	Obv.	+hENRIREX[ΛN]		
		Rev.	+T[ ]R?[ON:XƧEL]E∾:		
			Die duplicate of *BMC* 272 and *EMCH*, p. 5 no. 13. Moneyer previously given as Ricard or Rainir. For discussion of coin, see §4.3.1.	1.15	320°

N°.	*Class*		*Identification, legend readings, and references*	Wt (g)	Die-Axis
			DRIU		
134	C/A	Obv.	+[hENRI:R:]A:		
		Rev.	[+DRIV]:ON[:hERFORD:]		
			Die duplicate of *BMC* 284–7 and *FEJ Photographs* 21/27-8.	1.45	320°
			[—]WARD		
135	A	Obv.	[ ]ENRIREXANGL		
		Rev.	[ ]WARD[:O]N:hE[RE]		
			Die duplicate of *BMC* 292*a*? (Additions). Anonymous collection, Cf. *BMC Henry II*, p. 169. For discussion of coin, see §4.3.1.	1.44	260°

No.	*Class*		*Identification, legend readings, and references*	Wt (g)	Die-Axis
			NICOLE		
136	B	Obv.	+hENRIREX[ΛNG]		
		Rev.	+NIƆOL:ON:[GIPEV:]		
			Die duplicate of *BMC* 303 and *FEJ Photographs* 22/5–6. Crafter die combination 1. *SCBI* 16, 358 and *SCBI* 26, 1478. Electron Probe Microanalysis conducted 2005.	1.38	320°
137	B	Obv.	[+hENRIR]EXΛNG		
		Rev.	[+N]IƆOL:O[N:GIPEV:]		
			Die duplicate of *BMC* 303 and *FEJ Photographs* 22/5–6. Crafter die combination 1. *SCBI* 16, 358 and *SCBI* 26, 1478. Broken into two pieces, fragment missing.	[1.27]	140°
138	B	Obv.	[+hEN]RIREXΛ[NG]		
		Rev.	+N[IƆOL:ON:GIPE]W		
			Die duplicate of *BMC* 305–6. Dies not represented in *FEJ Photographs*. Crafter die combination 3. *SCBI* 16, 359.	1.26	340°
139	C2	Obv.	+hENR[:RE]		
		Rev.	[+]NIƆOLE[:ONbIPE]		
			Die duplicate of *BMC* 313–14 and *FEJ Photographs* 22/12. Crafter die combination 16. Electron Probe Microanalysis conducted 2005.	1.43	330°
140	C2	Obv.	[+hENRI:]RE		
		Rev.	[+NI]ƆOLE:[ONGIPE:]		
			Die duplicate of *BMC* 315*a* and *FEJ Photographs* 22/15. Crafter die combination 7.	1.16	210°
141	C3	Obv.	+h[ENRI:RI(Λ?)]		
		Rev.	+NIƆ[O]LE:[ON]:YIP		
			Die duplicate of *BMC* 309. Dies not represented in *FEJ Photographs*. Crafter die combination 5.	1.27	60°
142	C	Obv.	+[hENRI:R]		
		Rev.	[+NI]ƆOLE:[O]N:[PIP]		
			Die duplicate of *FEJ Photographs* 22/8. Reverse die same as *BMC* 307–8. Crafter die combination 6.	1.42	290°
143	D/C	Obv.	[+h]EN[RIREX:]		
		Rev.	+N[IƆOLE:O]N:G[IP]ES:		
			Die duplicate of *BMC* 320–21 and *FEJ Photographs* 22/17. Crafter die combination 32.	1.43	180°
144	D1	Obv.	+hENRIREX[:]		
		Rev.	+NIƆO[LE:ON:G]IPE:		
			Die duplicate of *BMC* 316–18, *SCBI* 16 (Norweb), 364 and *SCBI* 21 (Yorkshire), 1266. Dies not represented in *FEJ Photographs*. Crafter die combination 26.	1.40	20°
145	F	Obv.	[+h]ENRIREX[		
		Rev.	+NIƆOL[		
			Dies not represented in *BMC* or *FEJ Photographs*.	1.44	340°

N°.	*Class*		*Identification, legend readings, and references*	Wt (g)	Die-Axis
			NICOLE (*continued*)		
146	F	Obv.	[+hENR]IREX		
		Rev.	+NIꞒOLE:O[N:GIPES]		
			Die duplicate of *BMC* 328 and *FEJ Photographs* 22/25. Crafter die combination 41.	1.43	170°
147	F	Obv.	+[ ]X:		
		Rev.	+NIꞒOL[E:ON:GIPE]S:		
			Dies not traced.	1.41	140°
148	F	Obv.	[+hENR]IRE[X]Ā		
		Rev.	+NIꞒOLE:ON:G[IPES]		
			Die duplicate of *BMC* 327 and *FEJ Photographs* 22/23. Crafter die combination 40. 'Near Brussels' hoard, *BNJ* 57 (1987), p. 116 no. 10.	1.37	0°
149	F	Obv.	[ ]		
		Rev.	[ ]ꞒOLE:ON:G[ ]		
			Dies not traced.	1.49	170°
150	F	Obv.	[+]hENR[EXĀ]		
		Rev.	[+]NIꞒOLE:ON:GIPES:		
			Die duplicate of *BMC* 327 and *FEJ Photographs* 22/23. Crafter die combination 40. 'Near Brussels' hoard, *BNJ* 57 (1987), p. 116 no. 10.	1.47	110°
151	F	Obv.	[ ]RIR[ ]		
		Rev.	[+]NICOL[ ]GIPE[ ]		
			Dies not traced.	1.35	110°
152	F	Obv.	[+h]ENRIREX·		
		Rev.	[ ]ꞒOLE:O[ ]		
			Dies not traced.	1.04	240°
153	F	Obv.	[ ]		
		Rev.	[ ]ꞒOLE:[ ]		
			Dies not traced.	1.42	270°
154	F	Obv.	[ ]EX[ ]		
		Rev.	[ ]ꞒOLE:O[ ]		
			Dies not traced.	1.39	30°
155	F	Obv.	+hE[ ]EX		
		Rev.	+NIꞒOL[ ]		
			Die duplicate of of next coin, 156, dies otherwise not traced.	1.45	300°
156	F	Obv.	[ ]EX:		
		Rev.	[ ]ꞒOLE[ ]		
			Die duplicate of of previous coin, 155, dies otherwise not traced.	1.33	150°
157	F	Obv.	+hENRIREX:		
		Rev.	[+NIꞒOLE:]ON:GIPES:		
			Die duplicate of *FEJ Photographs* 22/30. Dies not represented in *BMC.* Crafter die combination 53.	1.08	320°

N°.	*Class*		*Identification, legend readings, and references*	Wt (g)	Die-Axis
			RODBERT		
158	C2	Obv.	+[hENRI]:R:		
		Rev.	[+ROBERT]:ON:PI[P·]		
			Die duplicate of *BMC* 336 and *FEJ Photographs* 23/1–2. Crafter die combination 14. *SCBI* 16: 362.	1.33	290°
159	C2	Obv.	[+hENRI]:R		
		Rev.	[+R]OBER[T:ON:VI:]		
			Die duplicate of *BMC* 335 and *FEJ Photographs* 22/35. Crafter die combination 11. *SCBI* 16: 360.	1.15	270°
160	C2	Obv.	[+hENR]I:R		
		Rev.	+RO[BERT:O]N:P		
			Die duplicate of *FEJ Photographs* 23/7. Dies not represented in *BMC*. Crafter die combination 18. *SCBI* 16: 363.	1.42	200°
161	C2	Obv.	[+hENRI:]R		
		Rev.	[+ROBERT]:ON[:P]		
			Die duplicate of *FEJ Photographs* 23/7. Dies not represented in *BMC*. Crafter die combination 18. *SCBI* 16: 363.	1.41	0°
162	E3	Obv.	+[hENRI:R]E		
		Rev.	[+ROB]ERT:ON:[GIP:]		
			Die duplicate of *BMC* 338 and *FEJ Photographs* 23/8. Crafter die combination 37. *SCBI* 16: 365 and *SCBI* 26, 1483.	1.40	40°
163	F	Obv.	+hENRIREX		
		Rev.	+ROBERT:ON:GIPE		
			Die duplicate of *BMC* 342. Dies not represented in *FEJ Photographs*. Crafter die combination 62. Double struck.	1.12	?
164	F	Obv.	[+h]ENRI·RE		
		Rev.	+RODBE[RT:ON:GIP]:		
			Die duplicate of *BMC* 343 and *FEJ Photographs* 23/10–11. Crafter die combination 57. Electron Probe Microanalysis conducted 2005.	1.39	270°
165	F	Obv.	[ ]REXĀ		
		Rev.	+RODBER[T:ON:G]IPE:		
			Dies not represented in *BMC* or *FEJ Photographs*.	1.21	250°
166	F	Obv.	+hE[ ]		
		Rev.	+ROD[ ]ON:G		
			Dies not represented in *BMC* or *FEJ Photographs*.	1.55	0°
			TURSTAIN		
167	F	Obv.	+hE[NRIR]		
		Rev.	+[T]VR[ST]Ā[IN:ON:G]		
			Die duplicate of *BMC* 353. Dies not represented in *FEJ Photographs*. Crafter die combination 75.	1.28	0°

No.	*Class*		*Identification, legend readings, and references*	Wt (g)	Die-Axis
			TURSTAIN (*continued*)		
168	F	Obv.	+hEN[RIR]		
		Rev.	+TVRSTÆIN:ON:GI		
			Die duplicate of *BMC* 354 and *FEJ Photographs* 23/26. Crafter die combination 76.	1.29	70°
169	F	Obv.	[+h]ENRI:RE		
		Rev.	[+TV]RSTÆIN:O[ ]		
			Presumably this mint, but may be Thetford. Dies not traced.	1.19	230°
170	F1	Obv.	[ ]X		
		Rev.	+TVR[ ]G		
			Presumably this mint, but may be Thetford. Dies not traced.Dies not traced.	1.42	?
			UNCERTAIN		
171	F	Obv.	[ ]REX		
		Rev.	[ ]ON:GIPE		
			Dies not traced.	1.00	250°

No.	*Class*		*Identification, legend readings, and references*	Wt (g)	Die-Axis
			RICARD		
172	A1	Obv.	[✠hENRI]REX⅄N[GL]		
		Rev.	✠RIC⅄[RD:ON:LE]RE:		
			Die duplicate of *BMC* 367–9 and *FEJ Photographs* 23/32.	1.27	270°

N°	*Class*		*Identification, legend readings, and references*	Wt (g)	Die-Axis
			ANDREV		
173	C2	Obv.	[+hENRI:]REXÆ:		
		Rev.	[+]ÆNDREV[:ONLINCOLN]		
			Die duplicate of *BMC* 381–3 and *FEJ Photographs* 24/13. Mossop LXXXVIII, 12–14. Collar of pellets.	1.15	30°
174	C2	Obv.	[+hENRIREXÆ]		
		Rev.	[+ÆNDREV:O]NLINL[OLN]		
			Obverse die same as *BMC* 402 and *FEJ Photographs* 25/8. Reverse dies same as BMC 381–3 and *FEJ Photographs* 24/13. Die combination not in Mossop. Cf. *BMC Henry II*, p. cxliii.	1.41	40°
175	F1	Obv.	+hE[NR]IREX:		
		Rev.	+[ÆNDR]EV:ON:LIN:		
			Die duplicate of *FEJ Photographs* 24/17. Reverse die same as *BMC* 846. Mossop LXXXVIII, 18. Die duplicate of of next coin, 176. For discussion of coin, see §4.3.1.	1.41	320°
176	F1	Obv.	[+hENRIREX:]		
		Rev.	[+ÆNDREV:ON:]:L[I]N:		
			Die duplicate of *FEJ Photographs* 24/17. Reverse die same as *BMC* 846. Mossop LXXXVIII, 18. Die duplicate of of previous coin, 175. For discussion of coin, see §4.3.1.	1.49	270°
177	F	Obv.	[+]h[EN]RI:[RE]X		
		Rev.	[+]ÆN[DR]E[V:]ON[:LI]N[:]		
			Die duplicate of *BMC* 846. Reverse die same as *FEJ Photographs* 24/17. Mossop LXXXVIII, 17. Die duplicate of of next coin, 178. For discussion of coin, see §4.3.1.	1.42	290°
178	F	Obv.	+[hENRI:REX]		
		Rev.	+Æ[NDREV:ON:L]IN:		
			Die duplicate of *BMC* 846. Reverse die same as *FEJ Photographs* 24/17. Mossop LXXXVIII, 17. Die duplicate of of previous coin, 177. For discussion of coin, see §4.3.1.	1.45	200°
			GODRIC		
179	C	Obv.	+[hENRI:]R:Æ:		
		Rev.	+GODR[IL:ON:LIN]		
			Die duplicate of *BMC* 394 and *FEJ Photographs* 24/21. Mossop LXXXVIII, 29–31. Fragment broken in three.	[0.75]	90°
			LANFRAM		
180	A*	Obv.	[ ]		
		Rev.	[+]LÆNFR[ÆM:ON:LIN]		
			Reverse die same as *FEJ Photographs* 24/27. Mossop LXXXIX, 14. No obverse detail visible.	1.26	?

N°.	*Class*		*Identification, legend readings, and references*	Wt (g)	Die-Axis
			RAULF		
181	B	Obv.	[+]hENRI[RE]X[ANG]		
		Rev.	[+RAVL]F[:O]N:L[IN]CO		
			Die duplicate of *BMC* 407*b* (Additions) and *FEJ Photographs* 24/34-5. Mossop LXXXIX, 27 = *BMC* 407*b* = *SCBI* 16: 373.	1.49	0°
182	E	Obv.	+h[ER XA]		
		Rev.	+RA[VL:ON:LIN]COL		
			Die duplicate of *BMC* 417–18. Dies not represented in *FEJ Photographs*. Mossop XC, 3–4.	1.34	90°
183	F1	Obv.	[+hENRIR]EX·		
		Rev.	[+RAV]LF[:O]N:L[IN]		
			Die duplicate of *BMC*420 and 439, and *FEJ Photographs* 25/4-5. Mossop XC, 7–9.	1.22	90°
			RAVEN		
184	A1	Obv.	[+hENR]RI[REX]ANGL		
		Rev.	+RAVEN:ON:L[INC]OL		
			Die duplicate of *FEJ Photographs* 25/25. Dies not represented in *BMC*. Mossep XC, 11–12. This coin identifies the moneyer. For discussion of coin, see §4.3.1.	1.24	220°
			SWEIN		
185	A	Obv.	+hNR[IREXANGL]		
		Rev.	[+S]WEIN[:ON:LINCOL]		
			Die duplicate of *BMC* 427–8 and *FEJ Photographs* 25/17. Mossop XC, 30. E omitted from king's name.	1.14	30°
			TURSTAIN		
186	C2	Obv.	+[hENRI:R:]		
		Rev.	+[TVRSTA]IN:ON:L·		
			Die duplicate of *BMC* 437 and *FEJ Photographs* 25/22-3. Mossop XCI, 8–9.	1.28	160°
187	F	Obv.	+[ ]		
		Rev.	+TV[ ]:L		
			Dies not represented in *BMC*, *FEJ Photographs* or Mossop. For discussion of coin, see §4.3.1.	1.42	230°

N°.	*Class*		*Identification, legend readings, and references*	Wt (g)	Die-Axis
			AH[——]		
188	F	Obv.	+[h]ENRIR[EX]		
		Rev.	+ÆAh[ ]N:LVN:		
			These dies have not been traced. The moneyer's name is possibly an unrecorded spelling of Acard. For discussion of coin, see §4.3.1.	1.04	60°
			ALWIN		
189	A*	Obv.	+[h]ENRIREXÆN[GL]		
		Rev.	+ÆLWIN:ON:LVND		
			Die duplicate of *BMC* 444 and *FEJ Photographs* 25/31.	1.23	45°
190	C1	Obv.	[+hEN]R:R:A[G]		
		Rev.	+Æ[LWIN:ON:L]VN		
			Die duplicate of *BMC* 451. Dies not represented in *FEJ Photographs*. This coin confirms the identify of the moneyer. Chipped. Electron Probe Microanalysis conducted 2005.	[1.42]	170°
191	E	Obv.	[+hE]N[RIRE]Xs		
		Rev.	[+]ÆL[FVINE:ON]:L[V:]		
			Die duplicate of *BMC* 509 and *FEJ Photographs* 26/4. s at end of obverse legend facilitated identification.	1.11	330°
192	E or F	Obv.	[ ]		
		Rev.	+ÆLFWINE[:ON:]LV		
			Dies not represented in *BMC* or *FEJ Photographs*. For discussion of coin, see §4.3.1.	1.25	?
			GEFFREI		
193	A1	Obv.	[+hENRI]REXÆNGL		
		Rev.	[+]GEF[FREI:O]N:L[V]N[D]		
			Die duplicate of *FEJ Photographs* 26/21. Reverse die same as *BMC* 467.	1.31	0°
194	C3	Obv.	+[hENRI:R:AG:]		
		Rev.	[+G]EFF[REI:ON:LVND?]		
			Die duplicate of *BMC* 471-2. Dies not represented in *FEJ Photographs*.	1.18	45°
			GODEFREI		
195	C2	Obv.	[ ]Æ:		
		Rev.	[+G]O[DEF]REI:ON[:LVNDE]		
			Die duplicate of *BMC* 483 and *FEJ Photographs* 26/31.	1.39	240°
196	D1	Obv.	+[hENRIREX·]		
		Rev.	+GODEFREI[:ON:L]V		
			Die duplicate of *BMC* 485 and *FEJ Photographs* 26/34.	1.44	10°
197	F1	Obv.	[+h]ENRIREX:		
		Rev.	+GO[DEF]REI:O[N:LVN]		
			Die duplicate of *BMC* 491. Dies not represented in *FEJ Photographs*. This coin identifies the subclass as F1. Electron Probe Microanalysis conducted 2005. For discussion of coin, see §4.3.1.	1.31	320°

N°.	*Class*		*Identification, legend readings, and references*	Wt (g)	Die-Axis
			HUNFREI		
198	A	Obv.	+hENRI[REXΛN]GL		
		Rev.	+hVNFREI:O[N:L]V[N:]		
			Die duplicate of *BMC* 492. Dies not represented in *FEJ Photographs*.	1.42	320°
199	A1	Obv.	[+]hEN[ ]GL		
		Rev.	+hV[NFREI:ON:L]VN:		
			Reverse die same as *BMC* 492; obverse possibly same as 493(?). Dies not represented in *FEJ Photographs*.	1.43	260°
			LEFWINE		
200	C	Obv.	[+]hENR[I:RE]		
		Rev.	[+L]EFVINE[:ON:LVN]		
			Die duplicate of *FEJ Photographs* 27/21. Obverse die same as *BMC* 508*b*.	1.27	270°
201	F	Obv.	[ ]		
		Rev.	[WI]NE:ON[ ]		
			Presumably Lefwine at London. Dies not traced; a Die duplicate of of next coin, 202. For discussion of coin, see §4.3.1.	1.21	?
202	F	Obv.	[ ]		
		Rev.	[ ]W[INE:ON]		
			Presumably Lefwine at London. Dies not traced, but a Die duplicate of of previous coin, 201. For discussion of coin, see §4.3.1.	1.07	?
			MARTIN		
203	A1	Obv.	[+hE]NRIREXΛ[NG]L		
		Rev.	+MĀ[RTIN:ON:LV]N:		
			Die duplicate of *FEJ Photographs* 27/31. Obverse die same as *BMC* 517.	1.46	270°
204	A/C	Obv.	[+hE]NRIREXΛ[NGL]		
		Rev.	[+MĀR]TIN:ON:L[VN]		
			Die duplicate of *FEJ Photographs* 28/3. Obverse die same as *BMC* 521; reverse die same as *BMC* 523.	1.44	20°
			PIERES MER		
205	A	Obv.	+hENRIREXΛNGL		
		Rev.	+PIR[ES]:M:ON:LVND		
			Die duplicate of *BMC* 540*x* and *FEJ Photographs* 28/25.	1.29	270°
			PIERES SAL		
206	C	Obv.	[ ]		
		Rev.	[+PIERE]S:S:ON[:LVN]		
			Reverse die same as *FEJ Photographs* 28/34. Obverse uncertain and illegible.	1.50	340°

N°.	*Class*		*Identification, legend readings, and references*	Wt (g)	Die-Axis
			RICARD		
207	A2	Obv.	[+hE]NRIREX[ÆNGL]		
		Rev.	+RIL̄ÆR[D:ON:LVN]D		
			Die duplicate of *FEJ Photographs* 29/6. Obverse die same as *BMC* 546, 559*a*, and 571.	1.17	330°
208	A*	Obv.	[+hENRIREX]ÆNG		
		Rev.	+RIL̄ÆR[D:ONLV]N		
			Die duplicate of *BMC* 554*x* and *FEJ Photographs* 29/9-10.	1.45	210°
209	D1	Obv.	[+hENRIRE]X		
		Rev.	[+RIL̄ÆR]D:ON:[LVN]		
			Die duplicate of *BMC* 556 and *FEJ Photographs* 29/11.	1.32	40°
210	D1	Obv.	[+hENRIR]EX		
		Rev.	[+RIL̄]ÆRD:ON[:LVN]		
			Die duplicate of *BMC* 556 and *FEJ Photographs* 29/11.	1.42	90°
			RODBERT		
211	A2	Obv.	[+h]ENRIREXÆNGL		
		Rev.	+RODBERT:ON:LVN:		
			Die duplicate of *BMC* 559*a* and *FEJ Photographs* 29/12.	1.38	10°
212	A1	Obv.	+hENRIREXÆNGL		
		Rev.	+RODBERT[:ON:LV]N		
			Die duplicate of *BMC* 559 and *FEJ Photographs* 29/13. Electron Probe Microanalysis conducted 2005.	1.44	270°
			SWETMAN		
213	A	Obv.	+[hE]NRIREX[ ]N[ ]		
		Rev.	[+]SWETMÆN:ON:LV		
			Reverse die same as *BMC* 563. Obverse die not traced.	1.28	220°
214	C	Obv.	[ ]		
		Rev.	[+SWED]ÐÆN:ON:L[V]		
			Reverse die same as *BMC* 567*a* (= *SCBI* 12: 333) and *FEJ Photographs* 29/23-4. No obverse die impression visible.	1.13	?
			WID		
215	A*	Obv.	+hENRIRE[X]ÆNG		
		Rev.	[+WID:O]N:LVNDEN		
			Die duplicate of *BMC* 572 and *FEJ Photographs* 29/31.	1.39	220°

N°.	*Class*		*Identification, legend readings, and references*	**NEWCASTLE [216–220]** Wt (g)	Die-Axis
			WILLEM		
216	C2	Obv.	[+hENRI]:RE		
		Rev.	+[WILAM]:ON:NEV:		
			Die duplicate of *BMC* 592*b* and *FEJ Photographs* 30/10. Annulets in crown band. Electron Probe Microanalysis conducted 2005.	1.44	320°
217	D1	Obv.	[+hE]NRI:RE[X]		
		Rev.	[+]W[ILLAME:]ON:NIV		
			Die duplicate of *BMC* 598 and *FEJ Photographs* 30/14.	1.23	60°
218	D3/C	Obv.	[+hENRI]REXA		
		Rev.	+P[ILLAM:]ON:NE		
			Die duplicate of *BMC* 595 and *FEJ Photographs* 30/12.	1.43	340°
219	F1	Obv.	[+h]ENR[ ]		
		Rev.	[+WILLE]LM:ON:NIV:		
			Die duplicate of *BMC* 608*a* and *FEJ Photographs* 30/22. Electron Probe Microanalysis conducted 2005.	1.17	200°
220	F	Obv.	[ ]		
		Rev.	+[WILLELM]:ON:NIVE		
			Presumably *BMC* 608, but unverified.	1.22	270°

N°.	*Class*		*Identification, legend readings, and references*	Wt (g)	Die-Axis
			NORTHAMPTON [221–222]		
			ENGELRAM		
221	C2	Obv.	+hEN[RIR]		
		Rev.	[+]INGELRA0):[ON:N]		
			Die duplicate of *BMC* 618–19 and *FEJ Photographs* 30/32–3. Crafter, *Northampton*, 17d.	1.44	210°
			PIERES		
222	A1	Obv.	+h[ENR]IR[EXANG]L		
		Rev.	+PIERES[:ON:NORh]A:		
			Die duplicate of *BMC* 620 and *FEJ Photographs* 31/1–2. Crafter, *Northampton*, 4e. No pellets on king's upper arm. Electron Probe Microanalysis conducted 2005.	1.38	150°

N°.	*Class*		*Identification, legend readings, and references*	Wt (g)	Die-Axis
			GILEBERT		
223	A1	Obv.	+hENRIREXA[NGL]		
		Rev.	+[GIL]LEBERT[:ON:]NEPI		
			Die duplicate of *BMC* 581–2 and *FEJ Photographs* 31/18–19. Dies erroneously identified as Newark mint in *BMC*.	1.25	0°
224	B	Obv.	[ ]		
		Rev.	+G[ILEB]ERT[:ON:N]ORW		
			Reverse die same as *BMC* 641. Obverse of this specimen is illegible and uncertain.	1.42	270°
225	C3/B	Obv.	+hENRI:R:A		
		Rev.	+G[ILEB]ERT[:O]N:[NOR]W		
			Obverse die same as *BMC* 649–50 and *FEJ Photographs* 31/24–5. Reverse die same as *BMC* 641.	1.26	90°
226	F	Obv.	[+hEN]RIREXA:		
		Rev.	[+G]ILEBER[T:ON:NORD]		
			Die duplicate of *FEJ Photographs* 31/17. Obverse die same as *BMC* 855*a* = *SCBI* 16, 403 (Hugo of Norwich). For discussion of coin, see §4.3.1.	1.31	270°
			HERBERT		
227	A	Obv.	[ ]XA[ ]		
		Rev.	+hERBERT:ON:NORPI		
			Reverse die same as *FEJ Photographs* 31/22. Obverse uncertain owing to severe double striking.	1.46	160°
			HUE		
228	C	Obv.	[+hENRI:]R:		
		Rev.	[+hV]E:ON:NORWIC·		
			Die duplicate of *BMC* 660–61 and *FEJ Photographs* 31/33.	1.22	330°
			NICOL		
229	C3/B	Obv.	[+hENRI:]R:A		
		Rev.	[+NICOL:]ON[:NORW]		
			Die duplicate of *BMC* 668 and *FEJ Photographs* 32/3. Annulets in crown band.	1.20	340°
			PICOT		
230	B2	Obv.	[+hE]NRIREX[ANG]		
		Rev.	[+PICOT:O]N:N[O]RW[I]		
			Die duplicate of *BMC* 674–5 and *FEJ Photographs* 32/8.	1.40	120°
			REINER		
231	A	Obv.	[+h]ENRIREXA[ ]		
		Rev.	[+REINER:]ON:NOR[EP]		
			Reverse die same as *BMC* 678–80 and *FEJ Photographs* 32/12–14. Obverse uncertain.	1.40	160°

N°.	*Class*		*Identification, legend readings, and references*	Wt (g)	Die-Axis
			SIWATE		
232	A*	Obv.	[+hENRIREXΛNGL]		
		Rev.	[+SIW]Λ[TE:ON:]TEFFO		
			Die duplicate of *FEJ Photographs* 33/1. Reverse die same as *BMC* 710-11.	1.39	260°
233	A*	Obv.	[+hENRIRE]XΛ[NGL]		
		Rev.	[+SIWΛTE:ON:]TEF[FO]		
			Die duplicate of *FEJ Photographs* 33/1. Reverse die same as *BMC* 710-11.	1.30	90°
234	A	Obv.	[+hENRI]REXΛNGL		
		Rev.	+SIWΛT[E:ON:]TEFFO		
			Die duplicate of *BMC* 712 and *FEJ Photographs* 33/2.	1.40	270°
235	C	Obv.	[+hENRI:R:ΛN]		
		Rev.	+SIPΛ[TE:ON:TED]		
			Die duplicate of *BMC* 713–15, *FEJ Photographs* 33/3, and *SCBI* 16: 407.	1.43	230°?
			WILLEM		
236	A*	Obv.	[+hENRIREX]ΛNG		
		Rev.	[+PILLEM:O]N:TE[T]		
			Die duplicate of *BMC* 728–30 and *FEJ Photographs* 33/20-21.	1.41	0°
237	A*	Obv.	[+hENRIREX]Λ[NG]		
		Rev.	[+PILLEM]:ON:TET		
			Die duplicate of *BMC* 728–30 and *FEJ Photographs* 33/20-21.	1.40	10°
238	C	Obv.	+hEN[ ]:Λ		
		Rev.	+W[ ]N:TEF		
			Dies not traced.	1.42	180°
239	D1	Obv.	+[hENRI:RE]X		
		Rev.	[+]W[ILLEM:]ON:T[E:]		
			Die duplicate of *BMC* 739 and *FEJ Photographs* 33/27.	1.36	45°
240	D1	Obv.	[+hENRIR]EX		
		Rev.	+W[ILLEM:ON]:TE:		
			Die duplicate of *BMC* 739 and *FEJ Photographs* 33/27.	1.18	280°
			WILLEM MA		
241	A*	Obv.	+hENRIREXΛNGL		
		Rev.	[+WI]LLEM:MΛ:ON:TEF		
			Die duplicate of *BMC* 745 and *FEJ Photographs* 33/18-19.	1.38	0°
242	A*	Obv.	+hENRIREX[ΛNGL]		
		Rev.	[+WIL]LEM[:MΛ:O]N:T[EF]		
			Die duplicate of *BMC* 745 and *FEJ Photographs* 33/18-19.	1.32	45°

N°.	*Class*		*Identification, legend readings, and references*	Wt (g)	Die-Axis
			MONEYER UNCERTAIN		
243	F	Obv.	[ ]		
		Rev.	[ ]ON:TEF[ ]		
			Dies not traced. For discussion of coin, see §4.3.1.	1.09	30°
244	F	Obv.	[ ]RIREX		
		Rev.	+T?[ ]ON:T		
			The very large space that the moneyer's name occupies indicates Turstain. Dies not traced. For discussion of coin, see §4.3.1.	0.99	70°
245	F	Obv.	+hENRIREX[ ]		
		Rev.	[ ]ON:TE[ ]		
			Dies not traced. For discussion of coin, see §4.3.1.	1.43	20°
246	F	Obv.	[ ]NRI:R[ ]		
		Rev.	+[ ]ON:T		
			Fleur-de-lis sceptre-head. The very large space that the moneyer's name occupies indicates Turstain. Dies not traced. For discussion of coin, see §4.3.1.	1.23	180°

N°.	*Class*		*Identification, legend readings, and references*	Wt (g)	Die-Axis
			ASCHETIL		
247	A2	Obv.	+hEN[RIREXÆNG]L		
		Rev.	[+Æ]SCH[ETIL:ON:]WILT		
			Die duplicate of *BMC* 751 and *FEJ Photographs* 33/31.	1.23	140°

N°.	*Class*		*Identification, legend readings, and references*	WINCHESTER [248–251] Wt (g)	Die-Axis
			HERBERT		
248	A2	Obv.	[✣hE]NRIRE[XA]NGL		
		Rev.	✣[hER]BERT[:ON:PI]NES		
			Die duplicate of *BMC* 760 and *FEJ Photographs* 34/2.	1.34	270°
249	C1	Obv.	[✣hENRI:R:A]		
		Rev.	✣hER[EBE]RT[:ON:PIN]		
			Die duplicate of *BMC* 764–5 and *FEJ Photographs* 34/12.	1.43	320°
			The edge of the king's mantle is beaded.		
250	C1	Obv.	✣hENRI:R[ ]		
		Rev.	✣hE[RBERD:ON]WI		
			Die duplicate of *BMC* 766–7 and *FEJ Photographs* 34/13.	1.42	230°
251	A2	Obv.	✣[hENRI]REXA[NGL]		
		Rev.	[✣]WILLEM:ON:WIN[ES]		
			Die duplicate of *BMC* 777 and *FEJ Photographs* 34/21.	1.33	270°
			See discussion of these dies above.		

N°.	*Class*		*Identification, legend readings, and references*	Wt (g)	Die-Axis
			GRIFFIN		
252	A1	Obv.	+h[ENRIREX/\]NGL		
		Rev.	+GR[IFFIN:ON:EVEPI]C:		
			Die duplicate of *BMC* 789–90 and *FEJ Photographs* 34/32.	1.40	100°
			Electron Probe Microanalysis conducted 2005.		
			HERBERT		
253	D1	Obv.	+[hE]NRI:REX		
		Rev.	[+hERBERD]:ON:EVE		
			Die duplicate of *BMC* 796–7 and *FEJ Photographs* 35/4.	1.38	45°
			Electron Probe Microanalysis conducted 2005.		
			HERVI		
254	A1	Obv.	[+hEN]R[IREX]/\[NGL]		
		Rev.	+hER[VI:ON:EVIR]WI		
			Die duplicate of *BMC* 799*a* (= *SCBI* 53: 378) and 800, and *FEJ Photographs* 35/7.	1.42	100°
			IORDAN		
255	A	Obv.	[+hENRI]RE[X/\NGL]		
		Rev.	+IO[RDAN:ON:EVERWI]		
			Die duplicate of *BMC* 803–5. Dies not represented in *FEJ Photographs*. Fragment.	[0.58]	0°
			WILLEM		
256	A1	Obv.	[+hENRIRE]X/\N[GL]		
		Rev.	+WILLE[M:ON:EVER]		
			Die duplicate of *BMC* 806*a*–808 and *FEJ Photographs* 35/12.	1.28	290°

N°.	*Class*		*Identification, legend readings, and references*	Wt (g)	Die-Axis
			UNCERTAIN		
257	A	Obv.	[ ]RE[ ]NGL		
		Rev.	+[ ]ÆLT[ ]		
			The moneyer's name is presumably Waltier, but the coin is not a Die duplicate of of any of the known dies for moneyers of this name.	1.33	300°
258	A	Obv.	[ ]RIREXΛN[ ]		
		Rev.	[ ]IC:[ ]		
			It is assumed that letters visible on the reverse are the end of the Moneyer's name (the letters could be IL: as in Daniel) but it could be the end of the mint signature, as in WINC for Winchester, EVERWIC for York, etc.	1.18	270°
259	A	Obv.	[ ]ENRIREX[ ]		
		Rev.	[ ]Λ[ ]ON:E?[ ]		
			It is possible that first letter of the mint signature is B. If the letter is E, the mint is either Exeter or York (EVERWIC). If the letter is B the mint is Bristol.	1.11	270?
260	C2	Obv.	+[ ]		
		Rev.	+WIL[ ]E?:		
			Reverse legend largely illegible.	1.44	?
261	C2	Obv.	+[ ]		
		Rev.	[ ]D:ON:C or L[ ]		
			Presumably Canterbury, moneyer Ricard or London, moneyer Edmund or Ricard.	1.12	?
262	C2	Obv.	[ ]		
		Rev.	[ ]		
			Legends completely smoothed and illegible.	1.13	?
263	C2	Obv.	+hEN[ ]		
		Rev.	[ ]		
			Reverse legend illegible.	1.30	90°
264	C	Obv.	[ ]R:Æ:		
		Rev.	+[ ]		
			Reverse illegible.	1.19	210°
265	C	Obv.	+hE[ ]		
		Rev.	+PIERES:[ ]		
			Moneyers named Pieres are known at Colchester and London and both struck in Class C. For discussion of coin, see §4.3.1.	1.03	?
266	C	Obv.	[ ]:RE		
		Rev.	[ ]E[ ]O[ ]		
			Reverse legend largely smoothed and illegible.	1.41	?

No.	*Class*		*Identification, legend readings, and references*	Wt (g)	Die-Axis
			UNCERTAIN		
267	C	Obv.	[ ]XAN		
		Rev.	[ ]NICO[ ]		
			Presumably Nicole at Ipswich or Norwich, but not from any known dies. The combination of letters at the end of the reverse legend is unusual and the curl of hair is oddly elongated. It is possible that is coin is a contemporary forgery.	1.45	180°
268	C	Obv.	+hEN[ ]		
		Rev.	+[ ]N		
			Presumably Canterbury or London mint.	1.34	60°
269	C	Obv.	[ ]		
		Rev.	+RAVLF:[ ]		
			Presumably Canterbury mint.	1.29	?
270	C	Obv.	+hEN[ ]		
		Rev.	[ ]ON[ ]		
			Reverse legend largely illegible.	1.35	?
271	D1	Obv.	[ ]RIRE:		
		Rev.	+[ ]ON[ ]		
			Reverse legend largely illegible.	1.34	?
272	D	Obv.	[ ]		
		Rev.	[ ]		
			Legends illegible.	1.20	170°
273	D	Obv.	[ ]		
		Rev.	[ ]V[ ]		
			The style of the reverse indicates Class D. Fragment.	[0.53]	?
274	D	Obv.	[ ]R[ ]		
		Rev.	[ ]		
			Illegible. Dies not traced.	1.36	?
275	E		[ ]		
			[ ]		
			Legends illegible. Dies not traced. Broken, two fragments.	[1.03]	?
276	F	Obv.	[ ]		
		Rev.	[ ]AVL:O[ ]		
			Presumably Raul at Bury St. Edmunds or Canterbury. Dies not traced.	1.24	45°
277	F	Obv.	[ ]		
		Rev.	+[ ]ET:ON:[ ]		
			No moneyer's name is recorded ending ET. Perhaps the letters represent an unusual spelling of Rodbert, if so, the mint may be Ipswich.	1.17	?
278	F	Obv.	[ ]		
		Rev.	[ ]RO[ ]		
			Dies not traced. Possibly moneyer Rodbert or Rogier.	1.25	?

N°.	*Class*		*Identification, legend readings, and references*	Wt (g)	Die-Axis
			UNCERTAIN		
279	F	Obv.	[ ]RIR[		
		Rev.	[ ]V[	1.33	?
			Reverse legend illegible. Dies not traced.		
280	F	Obv.	+h[ ]		
		Rev.	[+]ÆDÆM:O[ ]		
			These are unrecorded dies. For discussion of coin, see §4.3.1.	1.19	160°
281	F	Obv.	[ ]ENRIR[ ]		
		Rev.	[ ]		
			Reverse legend illegible. Dies not traced.	1.30	?
282	F	Obv.	[ ]RI:REX[		
		Rev.	[ ]:ON:O? (or S?)[ ]		
			These are unrecorded dies. Possibly Bury St Edmunds mint (?). Fragment.	[1.01]	?
283	F	Obv.	[+hE]NRIREX		
		Rev.	+GO[ ]		
			Goldhavoc at Canterbury or Godefrei at London? For discussion of coin, see §4.3.1.	1.48	0°
284	F	Obv.	[ ]EXÆ:		
		Rev.	+RÆVLF:ON[ ]		
			The moneyer Raulf is only attested at Bury St. Edmunds and Canterbury mints. Dies not traced.	1.34	160
285	F	Obv.	+hENR[ ]		
		Rev.	+R[ ]		
			Dies not traced.	1.38	340°
286	F	Obv.	[ ]		
		Rev.	[ ]		
			Illegible. Dies not traced. Fragment.	[0.62]	?
287	F	Obv.	[ ]		
		Rev.	[ ]		
			Illegible. Dies not traced.	1.26	?
288	F	Obv.	[ ]EX		
		Rev.	[ ]		
			Dies not traced.	1.11	?
289	F	Obv.	[ ]EX		
		Rev.	[ ]:ON[ ]		
			Reverse legend illegible. Dies not traced.	1.04	?
290	F	Obv.	[ ]		
		Rev.	[ ]		
			Illegible. Dies not traced. Broken, a large fragment.	[1.12]	?

N°.	*Class*		*Identification, legend readings, and references*	Wt (g)	Die-Axis
			UNCERTAIN		
291	F	Obv.	hENR[ ]		
		Rev.	[ ]ÆN:O[ ]		
			No initial cross at start of the obverse legend. The moneyer is presumably Turstan.	1.38	?
292	F	Obv.	+hENR[ ]		
		Rev.	+[ ]		
			Reverse legend illegible. Dies not traced.	1.43	220°
293	F	Obv.	+hE[ ]		
		Rev.	[ ]:ON:[ ]		
			Reverse legend illegible. Dies not traced.	1.28	?
294	F	Obv.	[ ]EX[ ]		
		Rev.	[ ]		
			Reverse legend illegible. Dies not traced. Fragment.	[0.93]	?
295	F	Obv.	[ ]		
		Rev.	[ ]		
			Illegible. Dies not traced.	1.29	?
296	F	Obv.	[ ]NRIREX[ ]		
		Rev.	[ ]		
			Illegible. Dies not traced.	1.03	?
297	F	Obv.	[ ]		
		Rev.	[ ]:O[ ]		
			Reverse legend illegible. Dies not traced. Fragment.	[0.82]	?
298	F	Obv.	[ ]hENR[ ]		
		Rev.	[ ]ON:[ ]		
			Reverse legend illegible. Dies not traced.	1.45	?
299	F?	Obv.	[ ]hENR[		
		Rev.	[ ]	1.40	?
			Reverse legend illegible. Dies not traced.		
300	F?	Obv.	[ ]ENRIR[ ]		
		Rev.	+[ ]		
			Reverse legend illegible. Dies not traced.	1.38	170°
301	F?	Obv.	[ ]		
		Rev.	+R[ ]N		
			Reverse legend illegible. Dies not traced. Fragment.	[0.98]	180°
302	F?	Obv.	h[ ]		
		Rev.	[ ]		
			No initial cross at start of obverse legend. Fragment broken in two.	[0.82]	?
303	?	Obv.	[ ]		
		Rev.	[ ]		
			Legends illegible. Dies not traced. Fragment	[0.39]	?

No.	*Class*		*Identification, legend readings, and references*	Wt (g)	Die-Axis
			UNCERTAIN		
304	?	Obv.	[ ]		
		Rev.	[ ]		
			Illegible. Dies not traced. Fragment.	[0.25]	?
305	?	Obv.	[ ]		
		Rev.	[ ]		
			Illegible. Dies not traced. Fragment.	[0.26]	?
306	?	Obv.	[ ]X[ ]		
		Rev.	[ ]		
			Illegible. Dies not traced. Fragment broken in two.	[0.33]	?
307	?	Obv.	[ ]		
		Rev.	[ ]		
			Illegible. Dies not traced. Fragment.	[0.23]	?
308	?	Obv.	[ ]		
		Rev.	[ ]		
			Illegible. Dies not traced. Fragment.	[0.23]	?
309	?	Obv.	[ ]		
		Rev.	[ ]		
			Illegible. Dies not traced. Fragment.	[0.14]	?

N°.	*Class*		*Identification, legend readings, and references*	Wt (g)	Die-Axis
310	—	Obv.	+LDRRIhEΛ		
		Rev.	[ ]ΛPhDEVR[ ]		
			Obverse die of this imitation known from a specimen in collection of Mr A. Dawson. For discussion of coin, see §4.3.1.	[0.98]	N/A
311	—	Obv.	[ ]IRIREXĀ:		
		Rev.	[ ]RCM[ ]		
			Very large crosslets on the reverse and style of lettering unofficial. For discussion of coin, see §4.3.1.	[1.37]	N/A

10. Catalogue: the Crescents Coinage of Scotland

10.1. Introduction

In recent years there has been a tendency towards the integration of catalogues of series with die-studies, but at the expense of clear description of individual specimens. For example, two recent mint studies have achieved their methodological purpose, but do not provide a suitable platform for further identification of new specimens or demonstrate working.[1] The format of this Catalogue has no antecedent and was adopted to present and combine an integrated catalogue and die-study with accurate individual description.

It is preferable to deal with each coinage on its own terms; there is no necessity to standardise methodology. Coinages that were poorly produced, such as the coinages of late twelfth-century Britain, present special problems, of which two may be stated in support of conjoining clear descriptive cataloguing and a die-study as attempted here. Firstly, multiple die-duplicates are required to establish the legend readings. How the legend readings were established cannot be checked from simply listing one definitive reading for die combinations. Secondly, future advancement of the subject will be achieved by providing precise die-identifications of further specimens, a comparative process that relies on the identification of duplicate specimens with similar areas of legend or design visible. Therefore, precise legend readings are given in full for each specimen in order that the reader can be satisfied of the correct reading as derived from all specimens from that die and to facilitate comparison of further specimens such as may require identification.

10.2. Referencing system

The corpus presented here lists all of the known die combinations for the Crescents type. Each die combination is given a running number in bold type in the top left of each block of die duplicates. Individual specimens are listed sequentially of each die combination, and citation

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[1] T. Crafter, 'A die-study of the Cross-and-Crosslets type of the Ipswich mint, *c.*1161/2-1180', *NC* 162 (2002), pp. 237–51; R. J. Eaglen, 'The mint of Huntingdon', *BNJ* 69 (1999), pp. 47–145.

of individual specimens in the thesis is given as 'die combination number'–'specimen number' in bold type, thus **1a**, **22c**, etc.

A header is given to each page, top right, usually a mint name with the die-combination given on that page in square brackets ([...]).

Each obverse and reverse has been assigned a reference number.

Obverse dies are non-specific to mints and the obverse die references run sequentially throughout with a superscript suffix indicating the class of the coin, thus 2^{A}, 9^{B}, 18^{C}, etc. The superscript suffix is not part of the numeration sequence, but is present to indicate the class of the die. Obverse dies of Perth are numbered sequentially as a separate group and with a superscript P after the die number, thus 3^{P}.

References to reverse dies require more explanation: the first prefix letter refers to the mint (if named); the following letter refers to the moneyer and the numbers run sequentially for each moneyer. Thus, BW1= Berwick, moneyer Willem die number 1; RR23 = Roxburgh, moneyer Raul die number 23; RD2 = moneyer Raul Derlig die number 2. As to what the reference means in any particular instance, this may be deduced from reading across to the reverse legend given in each entry in the Die Corpus, or by glancing at the heading that is given on the top right-hand corner of each page. Again a superscript suffix has been appended to indicate the class.

Illustrated coins are marked with an asterisk.

Weights are given in grams. Weights in square brackets ([...]) indicate damaged or otherwise underweight coins that have been excluded from the metrological analysis.

Die-axis has been calculated from the king's head upright, usually with 0° running through the king's neck and central fleur of the crown.

Specimens are presented in alphabetical order of institution or location. Coins of which the current whereabouts are unknown are always given last.

10.3. Conventions adopted in Catalogue

Legend readings

[ ]	Indicates that a letter or letters are off the flan or illegible on the specimen.
( )	Indicates an alternative reading.
?	In a legend donates uncertainty concerning the letter or abbreviation mark immediately preceding it.
[RAVL]	Letters shaded grey indicates a probable legend reading, but that the letters are not established by any specimens in the corpus.
[//////]	Is used for double struck specimens to indicate an uncertain gap between visible parts of legend, which is often repeated.

Provenance and pedigree

Details of provenance and pedigree for each specimen have been placed beneath each block of die duplicates. The first reference is to the current location of the specimen. In the case of museums, an accession/item number is given in all cases expect for the Ashmolean Museum, which (as yet) does not have such a system. After the current location appear

1) the details of the pedigree in reverse date order;
2) the provenance of the coin (if known) including other information relevant to the coins location;
3) if a coin has been previously published or illustrated, details follow the pedigree.

In the interests of clarity, references are given in a concise format. All auctions were held in London unless otherwise indicated. The precise format of references to earlier works has been preserved (e.g. fig. 32A, plate XV, etc.). Coins that have been subjected to Electron Probe Mircoanalysis as part of this thesis have 'EMPA conducted 2005' placed at the end of the note. Single finds are given expanded treatment in the analytical chapter (§5.8) and cross-reference is made to the reference numbers given there (e.g. S1, S7).

10.4. Chart indices of dies

The die-links have been represented in the following 'chart indices of dies' (Fig. 10.1–10.7),[2] which allow the structure of the coinage to be seen at a glance. A chart index of dies has been

[2] I am grateful to Lord Stewartby for originally suggesting to me this format, which I subsequently developed into the cross-referenced tables presented here.

produced for each named mint and class without mint name. Obverse die number-boxes shaded grey indicate that the obverse die number is used at another mint and will be found in another chart index.

The structure of the coinage has been developed from a task of refinement. By moving the columns and rows up and down, the line of die combination numbers has been arranged into a rough line, running diagonally top-left to bottom-right.

Some general rules may be stated. The general rule for mules, as stated by Brooke, is that they occur at a change of type and the obverse is usually the earlier die.[3] Modified, this rule applies to a coinage of immobilised type: that mules occur at a change of class.

It is self-evident that, as the product of two separate dies, one coin proves that those dies were present together at one point in time. It follows, therefore, that dies of one kind that are die-linked are likely to be associated closely together. Numbers found within the heavy-lined boxes are die-combinations of a true class; numbers that occur outside the boxes are mules.

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[3] G. C. Brooke, *A Catalogue of English Coins in the British Museum: The Norman Kings* (London: 1916), vol. 1, p. xxxviii.

Dies	1^{A}	2^{A}	4^{B}	5^{B}
$F1^{A}$			**5**	
$F2^{A}$			**6**	
$F3^{A}$				**7**
$RD1^{A}$	**8**			
$W1^{A}$		**9**		

Figure 10.1: Without mint name Class A die combinations (for Ailbode see Fig. 10.6).

Dies	2^{A}	11^{C}	12^{C}	13^{C}
$BA1^{C}$		**10**		
$BW1^{C}$	**13**			
$BW2^{C}$			**15**	**17**
$BW3^{C}$			**16**	
$BW4^{C}$				**18**
$BW5^{C}$				**19**
$BW6^{C}$				**20**
$BW7^{C}$				**21**
$BW8^{E}$	**14**			

Figure 10.2: Berwick die combinations (for Raul Derlig at Berwick see Fig. 10.5).

Dies	10^{B}
$D1^{B}$	**22**

Figure 10.3: Dunfermline die combination.

Dies	10^{B}	14^{C}	15^{C}	19^{C}	20^{C}	24^{C}	30^{D}
$EA1^{C}$	**23**				**28**		
$EA2^{C}$		**25**					
$EA3^{C}$		**26**					**30**
$EA4^{C}$			**27**				
$EH1^{C}$							**33**
$EA5^{D}$							**29**
$EA6^{D}$	**24**			**32**		**31**	

Figure 10.4: Edinburgh die combinations.

Dies	11^{C}	25^{C}	26^{C}	27^{C}	28^{C}	29^{C}
$BRD1^{C}$		**12**	**11**			
$RRD1^{C}$	**127**					
$RRD2^{C}$			**128**			
$RD2^{C}$	**129**					
$RD3^{C}$	**130**					
$RD4^{C}$	**131**					
$RD5^{C}$	**132**	**133**				
$RD6^{C}$			**134**			
$RD7^{C}$			**135**			
$RD8^{C}$			**136**			
$RD9^{C}$			**137**			
$RD10^{C}$				**138**		
$RD11^{C}$					**139**	
$WB1^{C}$						**140**
$WB2^{C}$						**141**

Figure 10.5: Raul Derlig at Berwick, Roxburgh and without mint name Class C die combinations.

Dies	2^P	3^P	1^P	4^P	5^P	6^P	7^P	8^P	9^P	10^P
$A1^P$			**1**							
$A2^P$	**2**									
$A3^P$	**3**									
$A4^P$		**4**								
$PF1^P$			**34**							
$PF2^P$			**35**	**38**						
$PF3^P$			**36**		**41**					
$PF4^P$			**37**		**42**					
$PF5^P$				**39**		**45**				
$PF6^P$				**40**						
$PF7^P$					**43**					
$PF8^P$					**44**		**47**			
$PF9^P$						**46**				
$PF10^P$							**48**			
$PF11^P$								**49**		
$PF12^P$									**50**	
$PF13^P$										**51**

Figure 10.6: Perth die combinations (including Ailbode).
Note: Obverse 1^P is placed out of sequence (for explanation, see §5.4.3).

Dies	1[A]	2[A]	3[A]	6[B]	7[B]	8[B]	9[B]	10[B]	16[C]	17[C]	18[C]	19[C]	20[C]	21[C]	22[C]	23[C]	24[C]	29[D]	31[D]	32[D]
RR1[B]	**52**																			
RR2[B]		**53**																		
RR3[B]		**54**																		
RR4[B]			**55**																	
RR5[B]			**56**																	
RR6[B]				**57**																
RR7[B]				**58**																
RR8[B]					**59**															
RR9[B]						**60**	**61**													
RR10[C]								**62**												
RR11[C]								**63**												
RR12[C]								**64**	**69**											
RR13[C]										**73**										
RR14[C]								**65**		**74**								**90**		
RR15[C]								**66**	**70**	**75**	**77**						**88**			
RR16[C]									**71**	**76**	**78**							**91**		
RR17[C]								**67**	**72**			**81**								
RR18[C]											**79**									
RR19[C]											**80**									
RR20[C]								**68**					**82**							
RR21[C]													**83**							
RR22[C]														**84**						
RR23[C]															**85**					
RR24[C]															**86**					
RR25[C]																**87**				
RR26[C]																		**92**		
RR27[C]																		**93**		
RR28[C]																				**99**
RR29[C]																	**88***	**94**		
RR30[D]																	**89**	**95**		
RR31[D]																		**96**		
RR32[D]																		**97**		
RR33[D]																			**98**	
RR34[D]																				**100**
RR35[D]																				**101**

Figure 10.7: Roxburgh die combinations, Classes A–D (for Raul Derlig at Roxburgh see Figure 10.5).

10.5 Catalogue

CONTENTS – DIE COMBINATIONS

WITHOUT MINT NAME CLASS A

Ailbode	**1–4**
Folpolt	**5–7**
Raul Der	**8**
Willame	**9**

BERWICK

Adam	**10**
Raul Der	**11–12**
Willam	**13–21**

DUNFERMLINE

Raul	**22**

EDINBURGH

Adam	**23–32**
Hue.	**33**

PERTH

Folpolt	**34–51**

ROXBURGH

Raul	**52–126**
Raul Derlig	**127–8**

WITHOUT MINT NAME CLASS C

Raul Derlig	**129–39**
Walter Bueter	**140–41**

WITHOUT MINT NAME CLASS E

Radulfus	**142–7**
Raul Derlig	**148–52**
UNCERTAIN COINS	**153–5**

1	Obverse 1[P]	Reverse A1[P]	Wt (g)	Die-Axis
a.*	+W[ILLA]ME.:REX	+:A:I[:L:B]:O:D:[E:]	1.40	140°
b.	+[WILLA]ME:REX	[+]:A:I:L:[B:O:D:E:]	1.52	0°
c.*	[+]W[IL]LAME:REX	+:A[:]I:L:B:[O:D]:E:	1.43	240°
d.	+WILL[A]M[E:REX]	[+:A:I:L:]B:O:D[:E:]	1.62	110°

a. British Museum, CM 1987–9–18–1. Bought Spink. Ex J.K.R. Murray; ex R.W. Cochran-Patrick, Sotheby 30 March 1936, lot 113 (part); ex J. Wingate, Sotheby 29 November 1875, lot 9. Engraved illustration of this coin given by J. Wingate, *Illustrations of the Coinage of Scotland* (Glasgow: 1868), Pl. 2 no. 9. Engraved illustration of this coin given by J. Lindsey, *A View of the Coinage of Scotland* (Cork: 1845), Pl. 2 no. 32.

b. Fitzwilliam Museum, Cambridge, CM.176–1957. Ex R.C. Lockett, Glendining 18 June 1957, lot 20 (illustrated); ex Sotheby 31 July 1914, lot 116. *Lockett Photographs* (Scottish coins) 1/66.

c. National Museums of Scotland, Edinburgh, H.C681. Richardson, *Catalogue*, p. 5 no. 3.

d. Lord Stewartby. Bought 1965. Ex H.J. Marr.

2	Obverse 2[P]	Reverse A2[P]	Wt (g)	Die-Axis
a.*	[+L]EREIWILAM[:]	+:A:I[:L:B:]O:D:E:	1.36	170°
b.*	+LERE[I]WILAM:	+:A:I:L:B:O[:D:]E:	1.54	320°
c.	+LER[EIWILAM:]	[+:A:I:]L:B:O:D:[E:]	1.50	140°
d.	+LERE[IW]ILA[M:]	[+:]A:I:[L:]B:O:D:E[:]	1.36	40°

a. National Museums of Scotland, Edinburgh, H.C16467. T. Coats collection. Burns, *Coinage*, vol. 1, p. 58, no. 1 and vol. 3, Pl. IV, fig. 29.

b. National Museums of Scotland, Edinburgh, H.C16468. T. Coats collection. This specimen cited by Burns, *Coinage*, vol. 1, p. 58 as supplementing the inscription of no. 1.

c. Lord Stewartby. Bought Baldwin, 1975.

d. Current whereabouts unknown. Ex J. Davidson, Dix Noonan Webb 9 December 2003, lot 310; ex R.W. Cochran-Patrick, Sotheby 30 March 1936, lot 113 (part).

3	Obverse 2[P]	Reverse A3[P]	Wt (g)	Die-Axis
a.*	+LER[EIWILAM:]	[+:A:I]:L:B:O:[D:E:]	1.21	180°

a. National Museums of Scotland, Edinburgh, H.C680. Ex R.C. Lockett, Glendining 26 October 1960, lot 687 (illustrated); ex R.W. Cochran-Patrick, Sotheby 30 March 1936, lot 114(a). *Lockett Photographs* (Scottish coins) 1/67.

4	Obverse 3^{P}	Reverse $A4^{P}$	Wt (g)	Die-Axis
a.*	+ꟻR:ЄIWI[LL]ĀM: ›	[+:]A:I:L:B:O:D:Є:	1.45	135°

a. Lord Stewartby. Bought 8 April 1961. Ex R. Carlyon-Britton.

Moneyer: Folpolt

5	Obverse 4^{B}	Reverse $F1^{A}$	Wt (g)	Die-Axis
a.*	+REI:WILL[ĀM]Є	[+:F]:O:L:P:O:[L:T:]	1.46	150°
b.*	+REI:WI[LL]ĀMЄ	+[:F:]O:L:P:O[:L]:[T:]	1.49	100°

a. National Museums of Scotland, Edinburgh, H.C682. Ex R.C. Lockett, Glendining 26 October 1960, lot 691 (part); ex R.W. Cochran-Patrick, Sotheby 30-31 March 1936, lot 114(b). Burns recorded this specimen when it was in the possession of R.W. Cochran-Patrick; Burns, *Coinage*, vol. 1, p. 58 and vol. 3, Pl. IV, fig. 29B. *Lockett Photographs* (Scottish coins) 1/79.

b. Lord Stewartby. Ex H.J. Dakers and C.H. Dakers joint collection, Glendining 8-9 October 1946, lot 284 (part).

6	Obverse 4^{B}	Reverse $F2^{A}$	Wt (g)	Die-Axis
a.*	+[REI:WILL]ĀMЄ	[+:F:O:L:P:]O:L:T:	1.49	110°
b.	[+RЄ]I:WI[LLĀM]Є	+[:F]:[O:L]:P:O:[L]:[T:]	1.41	10°
c.*	+REI:WIL[LĀM]Є	[+:]F:O:L:P:O:L:[T:]	1.43	130°
d.	[+]REI:WILLĀMЄ]	[+:F:O]:L:P:[O]:[L:T:]	[0.61] *cut halfpenny*	135°

a. Ashmolean Museum, Oxford. H. Hird donation, 1953. *SCBI* 35 (Oxford/Glasgow), no. 15. D.M. Metcalf conducted metallurgical analysis by XRF on this coin, 'The quality of Scottish sterling silver 1136-1280', *CIMS*, p. 82 no. 24. EPMA conducted 2005.

b. Fitzwilliam Museum, Cambridge, CM.1.2623–1990. C.E. Blunt.

c. Lord Stewartby. Ex 'Canadian' collection.

d. Current whereabouts unknown. Found at Holywood, Dumfriesshire in 1989 by a metal-detectorist. Single find S6.

7	Obverse 5^{B}	Reverse $F3^{A}$	Wt (g)	Die-Axis
a.	[+RЄ]IWILLA[ ]	[+:F:O:L:P:]O:[L:]T:	1.74	240°
b.*	+REI[WILLA]	[+:F:O:]L:P:O[:L:T:]	1.44	140°

a. University Museum of Cultural Heritage, Oslo. Daeli Hoard, 1840. H. Holst, 'Mynter og myntilignende metallpreg fra de Britiske Oyer i norske funn, nedlagt etter ar 1100', *Nordisk Numismatisk Årsskrift* (1939), pp. 103-24, at p. 110, no. 18. I. (not illustrated).

b. Lord Stewartby. Ex J.K.R. Murray, Spink 29 April 1987, lot 42; bought Spink, 1976.

Moneyer: Raul Der

8	Obverse 1[A]	Reverse RD1[A]	Wt (g)	Die-Axis
a.	[+]W[:I:]L:A:M:E[:RX:·]	+:R:A[:V]:L[:D:]E:R:	1.48	150°
b.*	+W:I:[L:A:M:]E:RX[:·]	+:R:A:V:L[:]D:E:R:	1.47	40°
c.*	[+]W:I:L:A:M:E:RX[:·]	+[:R:]A:V:L:D:E:R:	1.40	310°
d.	[+W:I:]L:A:M:E:R[X:·]	+:[R:A:V:]L:D:E:R:	1.46	310°

a. Ashmolean Museum, Oxford. Purchased from I. Stewart, 1982. Ex H.J. Dakers and C. H. Dakers joint collection, Glendining 8-9 October 1946, lot 283 (part)? *SCBI* 35 (Oxford/Glasgow), no. 21. EPMA conducted 2005.

b. British Museum, CM 1906–11–3–4484. Parkes Weber donation.

c. National Museums of Scotland, Edinburgh, H.C719. Ex R.C. Lockett, Glendining 18 June 1957, lot 26 (part). *Lockett Photographs* (Scottish coins) 1/87.

d. Lord Stewartby. Ex G.C. Drabble, Glendining 13 December 1943, lot 1163 (part); ex T. Bearman; ex R.M. Foster, Sotheby 5 November 1905, lot 265 (part).

Moneyer: Willame

9	Obverse 2[A]	Reverse W1[A]	Wt (g)	Die-Axis
a.*	[+:]W:I:L:L:A:M[:E:R¨X]	+:W:I:L:L:A:M:E[:]	1.46	50°
b.	[+:]W:I:L:L:A:M[:E:R¨X]	+:W:[I:L:L:]A:M:E:	1.29	270°
c.	[+:]W:I:L:L:[A:M:E:R¨X]	[+:]W:I:L:L[:A:M:E:]	[0.65] *cut halfpenny*	180°

a. National Museums of Scotland, Edinburgh, H.C683. Burns recorded this specimen as in the collection of the Society of Antiquaries of Scotland; Burns, *Coinage*, vol. 1, p. 58 and vol. 3, Pl. IV, fig. 29A. Richardson, *Catalogue*, p. 5 no. 2.

b. Lord Stewartby. Ex J.E.L. Murray.

c. Lord Stewartby. Ex H.J. Dakers and C. H. Dakers joint collection, Glendining 8-9 October 1946, lot 284 (part).

10	Obverse 11[C]	Reverse BA1[C]	Wt (g)	Die-Axis
a.	[+L]Є[RЄIWILAO:]	+A[DAO·BЄRЄ]WIC	[1.15]	300°
b.*	+LЄR[ЄIWIL]AO:	+ADAO[·BЄR]ЄWIC	1.27	40°
c.*	[+]LЄRЄIWILAO[:]	+A[DA]O·BЄRЄWIC	1.51	300°
d.	+LЄRЄ[IWIL]LAO:	+ADA[O·BЄR]ЄWIC	1.37	40°

a. McManus Galleries, Dundee, 1966–108.
b. National Museums of Scotland, Edinburgh, H.C16477. T. Coats collection. Burns, *Coinage*, vol. 1, p. 60, no. 10 and vol. 3, Pl. IV, fig 36.
c. National Museums of Scotland, Edinburgh, H.C703. Richardson, *Catalogue*, p. 7 no. 15.
d. Lord Stewartby. Ex H.J. Dakers and C.H. Dakers joint collection, Glendining 8-9 October 1946, lot 282 (part); ex Society of Antiquaries, Dowell (Edinburgh) 5 June 1874, lot 112?

Moneyer: Raul Derlig

11	Obverse 26[C]	Reverse BR1[C]	Wt (g)	Die-Axis
a.*	[+RЄIW]IL[AM·]	+RAVLDЄRLIGBЄR	1.37	50°
b.	[+]R[ЄI]WILAM·	+RA[VL]DЄR[L]IGB[ЄR]	1.29	20°
c.*	[+]R[ЄI]WILAM·	+RAVL[DЄR]LIGBЄ[R]	1.31	50°
d.	[+R]ЄIWIL[AM·]	[+RAVLD]ЄRLIGBЄ[R]	1.31	270°
e.	[+RЄIWILA]M·	[+RAVLDЄ]RL[IGBЄR]	[0.27] *cut farthing*	140°
f.	+RЄIWI[LA]M[·]	+R[AV]LD[ЄR]LIGBЄR	1.26	270°

a. Ashmolean Museum, Oxford. From I. Stewart by exchange, 22 August 1963. Ex H.A. Parsons, Glendining 11 May 1954, lot 700 (ilustrated). *SCBI* 35 (Oxford/Glasgow), no. 23. EPMA conducted 2005.
b. Fitzwilliam Museum, Cambridge, CM.1.2624–1990. C.E. Blunt. Ex J. Davidson.
c. National Museums of Scotland, Edinburgh, H.C725. Ex R.C. Lockett, Glendining 18 June 1957, lot 21 (part); ex T. MacKenzie. *Lockett Photographs* (Scottish coins) 1/70.
d. National Museums of Scotland, Edinburgh, H.C726. Ex R.C. Lockett, Glendining 26 October 1960, lot 690 (part). *Lockett Photographs* (Scottish coins) 1/69.
e. University Museum of Cultural Heritage, Oslo. Daeli hoard, 1840.
f. Lord Stewartby. Bought 30 October 1959. Ex H.J. Dakers and C. H. Dakers joint collection, Glendining 8 October 1946, lot 283 (part); ex G.C. Drabble, Glendining 4 July 1939, lot 762; ex R.W. Cochran-Patrick, Sotheby 30 March 1936, lot 115. This specimen cited by Burns, *Coinage*, vol. 1, p. 61 when it was in the collection of R.W. Cochran-Patrick.

12	Obverse 25^{C}	Reverse $BR1^{C}$	Wt (g)	Die-Axis
a.*	+[L]ЄRЄIW[IL]ĀO	+RĀ[VL]DЄ[R]L[IGB]ЄR	1.34	280°

a. Royal Mint Museum, Llantrisant. W.J. Hocking, *Catalogue of Coins, Tokens, Medals, Dies, and Seals in the Museum of the Royal Mint*, vol. 1: Coins and Tokens (London: 1906), no. 2702.

Moneyer: Willam

13	Obverse 2^{A}	Reverse $BW1^{C}$	Wt (g)	Die-Axis
a.*	+:W:I:L:L:Ā[:M:Є:R¨X]	+WILLĀ[O)BЄR]ЄWIC	1.45	240°
b.*	[+:]W:I:L[:L:]Ā:M:Є:R[¨X]	+WILLĀO)B[Є]RЄWIC	1.43	20°
c.	+:W:I[:L:L:]Ā:M:Є[:R¨X]	+WILLĀO)[BЄR]ЄWIC	1.48	220°
d.*	[+:]W[:I:L:L:]Ā:M:Є[:R¨]X	+WILLĀO)BЄRЄW[IC]	1.41	290°
e.	+:W[:I:L:L:Ā:M:Є:R¨]X	+WILLĀO)[B]ЄRЄWIC	1.50	0°
f.	+:W:I:L:[L:]Ā:M:Є:R[¨X]	+WILLĀO)BЄRЄW[IC]	1.49	140°

a. British Museum, CM 1841–10–28–6. Purchased from H.O. Cureton.
b. National Museums of Scotland, Edinburgh, H.C694. Burns recorded this specimen as in the collection of the Society of Antiquaries of Scotland; Burns, *Coinage*, vol. 1, p. 59 and vol. 3, Pl. IV, fig. 32A. Richardson, *Catalogue*, p. 6 no. 9.
c. National Museums of Scotland, Edinburgh, H.C695.
d. National Museums of Scotland, Edinburgh, H.C697. Ex R.C. Lockett, Glendining 18 June 1957, lot 21 (part); ex B. Roth, Sotheby 14 October 1917, lot 330 (illustrated). *Lockett Photographs* (Scottish coins) 1/72.
e. National Museums of Scotland, Edinburgh, H.C16473. T. Coats collection. Burns, *Coinage*, vol. 1, p. 59, no. 6 and vol. 3, Pl. IV, fig 32.
f. Lord Stewartby. Ex P. Thorburn (December 1953). Ex R.W. Cochran-Patrick, Sotheby 30 March 1936, lot 116(a); ex Society of Antiquaries, Dowell (Edinburgh) 5 June 1874, lot 111. Illustrated by I. Stewart in *Mints, Dies and Currency* (London: 1971), Pl. XV no. 2a.

14	Obverse 2^{A}	Reverse $BW8^{E}$	Wt (g)	Die-Axis
a.*	[+]:W[:I:L:L:Ā:M:Є:R¨X]	+WIL:L[ĀMO]NB·(or D·)	1.41	180°
b.*	[+]:W[:I:L:L:]Ā:M[:Є:]R¨X	[+WIL:]LĀMON[B·(or D·)]	1.53	300° *check this*

a. National Museums of Scotland, Edinburgh, H.C696. Richardson, *Catalogue*, p. 7 no. 10.
b. Lord Stewartby. Bought from A.H.F. Baldwin private collection, 1975.

15	Obverse 12^{C}	Reverse BW2^{C}	Wt (g)	Die-Axis
a.*	[+L]ЄRЄIWIL[ĀOЄ:]	[+]WILĀOBЄRЄ[WIC]:	1.47	90°
b.	[+]LЄRЄI[WILĀOЄ:]	[+WIL]ĀOBЄR[ЄWIC:]	1.40	
c.*	+[LЄRЄI]WILĀOЄ:	+[W]IL[Ā]OBЄRЄW[IC:]	1.53	310°
d.	+LЄ[R]ЄI[WIL]Ā[OЄ]:	+WILĀ[O]B[RЄ]WIC:	1.55	

a. Ashmolean Museum, Oxford. H. Hird donation, 1953. *SCBI* 35 (Oxford/Glasgow), no. 24; the details of the pedigree are incorrect. EPMA conducted 2005.
b. National Museum of Denmark, Copenhagen. C.J. Thomsen. K. Erslev, *Catalogue de la de Monnaies de feu Christian Jürgensen Thomsen. Seconde partie, Les Monnaies du moyen-age.* Tome III, contenant les monnaies de l'Europe septentrionale et plusieurs appendices (Copenhagen: 1876), no. 9777.
c. National Museums of Scotland, Edinburgh, H.C16474. T. Coats collection. Burns, *Coinage*, vol. 1, p. 59, no. 7 (not illustrated).
d. Paisley Museum and Art Galleries, 1192/1957. Bought Baldwin, 1957.

16	Obverse 12^{C}	Reverse BW3^{C}	Wt (g)	Die-Axis
a.*	[+L]ЄRЄIWILĀ[OЄ:]	+WILĀ[OD]WI:	1.46	60°
b.*	[+]LЄRЄIWIL[ĀOЄ:]	[+W]ILĀOD[WI:]	1.42	180°

a. National Museums of Scotland, Edinburgh, H.C699. Richardson, *Catalogue*, p. 7 no. 12.
b. Lord Stewartby. Bought 24 July 1987. Ex J. Davidson.

17	Obverse 13^{C}	Reverse BW2^{C}	Wt (g)	Die-Axis
a.*	+[LЄR]ЄI[W]ILLĀOЄ	+[WIL]ĀOBЄRЄW[IC:]	1.42	260°
b.*	+LЄ[R]ЄIW[IL]LĀOЄ	+W[ILĀOB]ЄRЄWIC[:]	1.49	290°

a. National Museums of Scotland, Edinburgh, H.C700. Richardson, *Catalogue*, p. 7 no. 13.
b. Lord Stewartby. Ex W.S. Marshall, Glendining 29 April 1946, lot 161 (part).

18	Obverse 13^{C}	Reverse BW4^{C}	Wt (g)	Die-Axis
a.*	+LЄRЄI[WILLĀO]Є	+WIL[ĀODЄB]ЄRЄW	1.44	320°
b.*	+[L]ЄRЄ[IWILL]ĀOЄ	[+WI]LĀ[O]DЄBЄRЄW	1.46	190°
c.	+L[ЄRЄ]IWILL[Ā]OЄ	[+W]ILĀODЄ[BЄRЄW]	1.51	60°

a. National Museums of Scotland, Edinburgh, H.C702. Ex R.C. Lockett, Glendining 26 October 1960, lot 690 (part); ex J.H. Pollexfen, Sotheby 26 June 1900, lot 151 (part). *Lockett Photographs* (Scottish coins) 1/71.
b. National Museums of Scotland, Edinburgh, H.C16475. T. Coats collection. Burns, *Coinage*, vol. 1, p. 59, no. 8 and vol. 3, Pl. IV, fig 35.
c. Lord Stewartby.

19	Obverse 13^{C}	Reverse BW5^{C}	Wt (g)	Die-Axis
a.*	+L[Є]RЄI[WILLAƆЄ]	[+WILLAƆD]ЄBЄ[R]ЄW	1.45	20°
b.*	+[LЄRЄIWILLA]ƆЄ	[+WI]LLAƆ[DЄBЄRЄW]	1.40	250°
c.*	+LЄRЄI[WILLAƆЄ]	[+WILLAƆD]ЄBЄRЄW	1.55	40°?

a. Ashmolean Museum, Oxford. Bought April 1987. Ex J.K.R. Murray (not in auction). EPMA conducted 2005.
b. Lord Stewartby. Bought 1961. Ex P. Thorburn.
c. Lord Stewartby. Bought 31 August 1962. Ex H.J. Dakers and C.H. Dakers joint collection, Glendining 8 October 1946, lot 283 (part).

20	Obverse 13^{C}	Reverse BW6^{C}	Wt (g)	Die-Axis
a.*	+LЄRЄ[IWILLA]ƆЄ	[+]WILLAƆDЄ[BЄRЄW]	1.42	240°
b.*	+LЄRЄI[WILL]AƆЄ	[+WIL]LAƆDЄBЄRЄW	[1.08]	140°

a. National Museums of Scotland, Edinburgh, H.C701. Richardson, *Catalogue*, p. 7 no. 14.
b. National Museums of Scotland, Edinburgh, H.C16476. T. Coats collection. Burns, *Coinage*, vol. 1, p. 59, no. 9 (not illustrated).

21	Obverse 13^{C}	Reverse BW7^{C}	Wt (g)	Die-Axis
a.*	[+LЄ]RЄIW[ILL]AƆЄ	+W[LLLA]MOBЄR[V]	1.45	30°
b.*	+[L]ЄRЄIW[IL]LAƆЄ	+WLLLAM[OBЄR]V	1.31	170°

a. National Museums of Scotland, Edinburgh, H.C698. Richardson, *Catalogue*, p. 7 no. 11.
b. Lord Stewartby. Ex W.S. Marshall, Glendining 29 April 1946, lot 161 (part); ex A.N. Brushfield, Glendining 28 March 1940, lot 25(b).

22	Obverse 10^{B}	Reverse $DR1^{B}$	Wt (g)	Die-Axis
a.*	✚"RЄIW[ILL]ÆM	✚R·[Æ·VL]:ON·DVN	1.46	0°
b.*	[✚·]·RЄIW[ILLÆM]	[✚R·Æ·]VL:ON·[DVN]	[0.80] *cut halfpenny*	0°
c.	✚"R[ЄIWIL]LÆM	[✚R·Æ·V]L:ON·DV[N]	[0.74] *cut halfpenny*	160°?
d.	[✚"RЄIWILL]ÆM	[✚R·]Æ·VL:[ON·DVN]	[0.66] *cut halfpenny*	290°?

a. British Museum, CM 1912–7–7–1. Bought from R.D. Shapcott. Illustrated by I. Stewart in *NC* 1955, Pl. III no. 2 and in *Mints, Dies and Currency* (London: 1971), Pl. XV no. 3a.

b. T. Crafter. Bought International Numismatics Ltd, Melbourne, Australia, 5 November 2003. EPMA conducted 2005.

c. Lord Stewartby. Ex D.S. Napier, Glendining 30 May 1956, lot 205 (part).

d. Lord Stewartby. Bought from A.H.F. Baldwin private collection, 1975. Illustrated by Lord Stewartby in *Moneta Mediævalis* (Warsaw: 2002), Pl. 16 no. 1.

23	Obverse 10[B]	Reverse EA1[C]	Wt (g)	Die-Axis
a.*	+[¨]RЄIW[ILL]Ā[M]	[+]ĀDĀO:ONЄDЄN[BV]	1.42	20°

a. Lord Stewartby. Ex H.J. Dakers and C.H. Dakers joint collection, Glendining 8 October 1946, lot 283 (part). Illustrated by I. Stewart in *Mints, Dies and Currency* (London, 1971), Pl. XV no. 3b and by Lord Stewartby in *Moneta Mediævalis* (Warsaw: 2002), Pl. 16 no. 4.

24	Obverse 10[B]	Reverse EA6[C]	Wt (g)	Die-Axis
a.	+[¨]RЄIW[ILL]Ā[M]	+ĀDĀMONЄDĀN	1.45	?

a. Current whereabouts unknown. Sold by York Coins, Inc., March 2005. Information and images kindly provided by Mr Anthony Wilson of York Coins, Inc.

25	Obverse 14[C]	Reverse EA2[C]	Wt (g)	Die-Axis
a.	[+L]ЄRЄIWI[LĀO:]	+ĀD[ĀMONЄDЄN]ЄBV:	[0.74] *cut halfpenny*	270°
b.	+LЄRЄIWILĀO:	+ĀDĀMONЄDЄNЄBV:	1.46	190°
c.*	+LЄRЄIWILĀO[:]	+ĀDĀMONЄDЄNЄBV:	1.51	270°
d.	[+]LЄRЄIWILĀ[O:]	+ĀDĀMONЄDЄNЄBV:	1.35	200°
e.*	+LЄRЄIWILĀO:	+ĀDĀMONЄDЄNЄBV:	1.48	0°
f.	[+L]ЄRЄIWILĀ[O:]	[+ĀDĀM]ONЄDЄNЄBV:	1.30	10°
g.	+LЄRЄIWILĀO:	+ĀDĀMONЄDЄNЄBV:	1.44	110°

a. Ashmolean Museum, Oxford. Bought Seaby, September 1980. *SCBI* 35 (Oxford/Glasgow), no. 25. EPMA conducted 2005.
b. Fitzwilliam Museum, Cambridge, CM.1.2625–1990. C.E. Blunt.
c. National Museums of Scotland, Edinburgh, H.C730. Richardson, *Catalogue*, 'Addenda', p. 334 no. 13. Annotation in NMS of Richardson reads: 'Ex Pollexfen'.
d. National Museums of Scotland, Edinburgh, H.C731. Ex R.W. Cochran-Patrick 117 (part)?; ex R.C. Lockett, Glendining 26 October 1960, lot 690 (part). *Lockett Photographs* (Scottish coins) 1/74.
e. Society of Antiquaries of Newcastle upon Tyne, SC/2.
f. Strathclyde University (Collins Gallery, Glasgow), SC/5.
g. Lord Stewartby. Bought Spink, 1961.

26	Obverse 14[C]	Reverse EA3[C]	Wt (g)	Die-Axis
a.	+LЄRЄIWILAO:	+[/////////]NЄDЄNЄBV	1.45	165°
b.*	+LЄRЄIWILAO[:]	+ADAMONЄDЄNЄBV	1.48	320°
c.	+LЄRЄIWI[LAO:]	+ADAMONЄDЄNЄBV	1.41	50°
d.*	+LЄRЄIWILAO:	+ADAMONЄDЄNЄBV	1.48	120°
e.	+LЄRЄI[WILA]O:	[+ADAMO]NЄDЄNЄBV	1.50	120°

a. British Museum, CM GHBS 6. Illustrated by R.W. Cochran-Patrick in *Records of the Coinage of Scotland* (Edinburgh: 1876) vol. 2, Pl. I, no. 2. Illustrated by H.A. Grueber in *Handbook of The Coins of Great Britain and Ireland in The British Museum* (London: 1899), Pl. XLI, 6.

b. British Museum, CM E4959. Illustrated by I.H. Stewart in *The Scottish Coinage* (London: 1967) Pl. II, 18.

c. National Museums of Scotland, Edinburgh, H.C734. Ex R.C. Lockett, Glendining 18 June 1957, lot 22 (part); ex R.W. Cochran-Patrick 117 (part)?. *Lockett Photographs* (Scottish coins) 1/73.

d. National Museums of Scotland, Edinburgh, H.C16487. T. Coats collection. Burns, *Coinage*, vol. 1, p. 61, no. 20 and vol. 3, Pl. IV, fig 39.

e. Lord Stewartby. Bought Seaby, 1961.

27	Obverse 15[C]	Reverse EA4[C]	Wt (g)	Die-Axis
a.*	+LЄRЄIWILAOЄ	[+]ADAOONЄDЄNBVR	1.47	45°

a. Lord Stewartby.

28	Obverse 16[C]	Reverse EA1[C]	Wt (g)	Die-Axis
a.*	+[L¨]ЄRЄIWI[LA]O[:]	[+AD]AO)ONЄDЄNЄBV	1.45	
b.*	+[L¨]ЄRЄIWILAO:	[+A]DAO:ONЄDЄNЄ[BV]	1.47	0°
c.	[+L¨]ЄRЄI[WILA]O[:]	+AD[AO:ONЄDЄ]NЄBV	1.43	220°
d.	+L¨Є[////]ILAO:[////]O:	+[////]ЄDЄNЄBV[//]ЄNЄBV	1.46	—
e.	[+L¨]ЄRЄIW[I]LA[O:]	+[ADAO:ONЄ]DЄNЄBV	1.41	250°

a. Aberdeen Museum and Art Gallery, ABDMS11886. Anonymous bequest, 1947.

b. National Museums of Scotland, Edinburgh, H.C735. Ex R.C. Lockett, Glendining 18 June 1957, lot 22 (part); ex R.W. Cochran-Patrick, lot 117 (part)? *Lockett Photographs* (Scottish coins) 1/75.

c. National Museums of Scotland, Edinburgh, H.C736. Ex R.C. Lockett, Glendining 18 June 1957, lot 22 (part); ex H.A. Parsons. *Lockett Photographs* (Scottish coins) 1/77.

d. National Museums of Scotland, Edinburgh, H.C16490. T. Coats collection. Burns, *Coinage*, vol. 1, p. 61, no. 23 (not illustrated). Erroneously listed by Burns as of the moneyer Hue of Edinburgh.

e. Lord Stewartby. Ex P. Thorburn; ex W.S. Marshall, Glendining 29 April 1946, lot 161 (part); ex A.N. Brushfield, Glendining 28 March 1940, lot 25(a).

29	Obverse 30^{D}	Reverse EA5^{D}	Wt (g)	Die-Axis
a.	+L:ЄRЄI[WI]LLAO)	+ADAMON:ЄD:	1.49	330°
b.	[+L:]ЄRЄIWILLAO)	+ADAMON[:Є]D:	1.34	90°
c.*	+L:ЄRЄIWILLAO)	+ADAMON:ЄD:	1.40	270°
d.	+L:ЄRЄIWILLAO)	+[AD]AMON:ЄD:	1.38	125°

a. Ashmolean Museum, Oxford. Purchased from I. Stewart, 1982. Ex G.C. Drabble, Glendining 13 December 1943, lot 1162 (part). *SCBI* 35 (Oxford/Glasgow), no. 27. EPMA conducted 2005.

b. National Museums of Scotland, Edinburgh, H.C732. Richardson, *Catalogue*, p. 9 no. 28.

c. National Museums of Scotland, Edinburgh, H.C733. Ex Christmas, Ex Petrie, Ex Lockett. *Lockett Photographs* (Scottish coins) 1/76.

d. Lord Stewartby. Ex H.J. Dakers and C.H. Dakers joint collection, Glendining 8 October 1946, lot 284 (part). Illustrated by I. Stewart in *Mints, Dies and Currency* (London, 1971), Pl. XV no. 5ai.

30	Obverse 30^{D}	Reverse EA3^{C}	Wt (g)	Die-Axis
a.*	[+L:]ЄRЄIWILL[AO)]	+A[DA]O)ONЄDЄNЄBV	1.44	330°
b.*	+[L:]ЄRЄIW[I]LŁAO)	+ADAO)ONЄDЄNЄBV	1.41	10°
c.	[+L:]ЄRЄIW[ILLAO)]	+A[DAO)ONЄDЄN]ЄBV	[0.61] *cut halfpenny*	270°

a. Hunterian Museum, Glasgow. Purchased from R. MacPherson, 1981. *SCBI* 35 (Oxford/Glasgow), no. 26. Illustrated by J.D. Bateson in *Coinage in Scotland* (London: 1997), p. 41.

b. National Museums of Scotland, Edinburgh, H.C729. Richardson, *Catalogue*, 'Addenda', p. 334 no. 12.

c. Lord Stewartby. Bought from A.H.F. Baldwin private collection, 1975.

31	Obverse 24^{C}	Reverse EA6^{D}	Wt (g)	Die-Axis
a.*	[ ]L[ ]AO)Є[ ]	+ADA[MONЄDA]N	1.46	180°

a. British Museum, CM SSBp001–1. Acquired from S.S. Banks.

32	Obverse 19^{C}	Reverse EA6^{D}	Wt (g)	Die-Axis
a.*	+LЄRЄIWILAO)Є	[+AD]AMONЄD[AN]	[1.05]	230°

a. National Museums of Scotland, Edinburgh, H.C16488. T. Coats collection. Burns, *Coinage*, vol. 1, p. 61, no. 21 (not illustrated).

33	Obverse 30[D]	Reverse EH1[C]	Wt (g)	Die-Axis
a.*	+[L:]ЄRЄIWILLAO)	+hVЄOFЄDЄNЄBV	1.39	90°
b.	+L:ЄRЄIWI[LLAO)]	+hVЄOFЄDЄNЄBV	—	—
c.*	+L:ЄRЄI[WILLA]O)	+hVЄO[FЄDЄNЄ]BV	1.49	300°
d.	+L:ЄRЄIWILLAO)	+h[VЄ]OFЄDЄNЄBV	1.52	40°
e.	+L:ЄRЄIWILLAO)	+hVЄOFЄDЄNЄBV	1.30	
f.	+L:ЄRЄIWILLAO)	+hVЄOFЄDЄNЄBV	1.62	180°
g.	+L:ЄRЄIWILLAO)	+hVЄO[FЄD]ЄNЄBV	1.50	30°
h.	+L:ЄRЄI[WI]LLAO)	+hVЄOF[ЄDЄN]ЄBV	1.43	0°
i.	+[L:]ЄRЄIWILLAO)	+hVЄOFЄDЄN[ЄBV]	1.37	40°
j.	[+]L:ЄRЄIWILLAO)	+hVЄOFЄDЄNЄBV	1.39	
k.	+L:ЄRЄIWILLAO)	+hVЄOFЄDЄNЄBV	1.27	0°

a. Ashmolean Museum, Oxford. H. Hird donation, 1953. *SCBI* 35 (Oxford/Glasgow), no. 28. EPMA conducted 2005.

b. Bank of Scotland, MACC 04/09/424.

c. British Museum, CM 1848–2–12–331. Acquired from Lord Enniskillen.

d. Fitzwilliam Museum, Cambridge, CM.158–1957. Presented by the executors of R.C. Lockett in his memory. Ex R.C. Lockett, Glendining 18 June 1957, lot 23 (illustrated). *Lockett Photographs* (Scottish) 1/78.

e. Montrose Museum and Art Gallery, M1980.946.

f. National Museums of Scotland, Edinburgh H.C737. Ex Pollexfen. Richardson, *Catalogue*, 'Addenda', p. 335 no. 14.

g. National Museums of Scotland, Edinburgh H.C738. Richardson, *Catalogue*, p. 10 no. 29 and Pl. I, fig. 7. Illustrated by N.McQ. Holmes in *The Edinburgh Mint and its Coinage* (Edinburgh: 1982), p. 6.

h. National Museums of Scotland, Edinburgh H.C739.

i. National Museums of Scotland, Edinburgh H.C16489. T. Coats collection. Burns, *Coinage*, vol. 1, p. 61, no. 22 and vol. 3, Pl. IV, fig 40.

j. Paisley Museum and Art Galleries, 1193/1957. Bought Baldwin, 1957.

k. Lord Stewartby. Ex H.J. Dakers and C.H. Dakers joint collection, Glendining 8-9 October 1946, lot 283 (part). Illustrated by I. Stewart in *Mints, Dies and Currency* (London: 1971), Pl. XV no. 5aii.

34	Obverse 1^P	Reverse $PF1^P$	Wt (g)	Die-Axis
a.*	+WI[L]LÆME:REX	+FOLPOLTDEPERT:	1.47	330°

a. National Museums of Scotland, Edinburgh, H.C693. Ex R.C. Lockett, Glendining 18 June 1957, lot 24 (illustrated). *Lockett Photographs* (Scottish) 1/81.

35	Obverse 1^P	Reverse $PF2^P$	Wt (g)	Die-Axis
a.*	[+]WILLÆM[E:REX]	[+FOLPOL]TDEPERT:⁘	1.40	330°
b.	[+]WIL[LÆME:REX]	[+FOLPOL]TDEPERT[:⁘]	1.37	130°

a. National Museums of Scotland, Edinburgh, H.C692. Richardson, *Catalogue*, p. 6 no. 8.
b. Lord Stewartby. Ex H.J. Dakers and C. H. Dakers joint collection, Glendining 8 October 1946, lot 283 (part)?

36	Obverse 1^P	Reverse $PF3^P$	Wt (g)	Die-Axis
a.*	+WILLÆME[:REX]	+FOLPO[LTDE]PERT:	1.51	270°
b.	+WI[LL]ÆME:R[EX]	+F[O]LPO[LT]DEPER[T]:	1.22	310°
c.	+WIL[LÆ]ME:RE[X]	[+FO]LPOLTDEPERT[:]	1.48	190°

a. Ashmolean Museum, Oxford. Christ Church College. From the Dyke hoard, 1780. C.W.C. Oman, 'Catalogue of English, Scotch, Irish and Colonial coins and tokens in the Barton collection', (Manuscript catalogue of 1890), vol. 2 no. 666. *SCBI* 35 (Oxford/Glasgow), no. 29. D.M. Metcalf conducted metallurgical analysis by XRF on this coin, 'The quality of Scottish sterling silver 1136-1280', *CIMS*, p. 82 no. 25. EPMA conducted 2005.
b. Ashmolean Museum, Oxford. Purchased from I. Stewart, 1982. Ex R. Carlyon-Britton. *SCBI* 35 (Oxford/Glasgow), no. 30. EPMA conducted 2005.
c. Lord Stewartby. Bought 31 October 1959. Ex D. McFarlan.

37	Obverse 1^P	Reverse $PF4^P$	Wt (g)	Die-Axis
a.*	+[WILLÆME:]REX	+FO[LP]OLTDE[P]ERT:	1.57	260°

a. Lord Stewartby. Bought 24 April 1968, Basel.

38	Obverse 4^P	Reverse $PF2^P$	Wt (g)	Die-Axis
a.*	+LERE IWI[LLA]O⁘	+FOLPOLTDEPE[R]T:⁘	1.60	200°
b.	+LE[RE]IW[ILLAO⁘]·	[+FOLP]OLTD[EPERT]:⁘	1.53	220°

a. National Museums of Scotland, Edinburgh, H.C.16472. T. Coats collection. Burns, *Coinage*, vol. 1, p. 59, no. 5 and vol. 3, Pl. IV, fig 31.
b. Lord Stewartby. Ex H.A. Parsons (701).

39	Obverse 4^P	Reverse $PF5^P$	Wt (g)	Die-Axis
a.*	+LEREIWI[LL]AO··	+FOLPOLTDEP[E]RT[:]	1.44	190°
b.*	+LEREIW[ILLAO··]	+FOLPOL[TDEPERT]:	1.45	270°
c.	[+L]EREIW[ILLAO··]	[+F]OLPO[LTDEPERT:]	1.38	
d.	[+LEREIWILLAO··]	[+FOLP]OLTDEPERT[:]	1.42	50°
e.	[+LER]EIW[ILLA]O··	[+FOLPO]LTD[EPE]RT:	1.32	50°

a. National Museums of Scotland, Edinburgh, H.C690. Richardson, *Catalogue*, 'Addenda', p. 334 no. 11.
b. National Museums of Scotland, Edinburgh, H.C691. Ex R.C. Lockett, Glendining 26 October 1960, lot 688. *Lockett Photographs* (Scottish coins) 1/80.
c. Perth Museum and Art Gallery, SMC 1.
d. Lord Stewartby. Bought 24 July 1987. Ex J.. Obverse is double struck.
e. Lord Stewartby. Bought Seaby, 11 January 1963.

40	Obverse 4^P	Reverse $PF6^P$	Wt (g)	Die-Axis
a.*	[+LE]REI[ ]O··	[ ]LPO[ ]	1.45	150°

a. Lord Stewartby. Bought Baldwin, 1975.

41	Obverse 5^P	Reverse $PF3^P$	Wt (g)	Die-Axis
a.*	[+LERE IW]IL[L]AO[:·]	[+F]OLPOLTD[EPERT:]	1.48	0°

a. Lord Stewartby. Bought Spink, 30 October 1959.

42	Obverse 5^P	Reverse $PF4^P$	Wt (g)	Die-Axis
a.*	[+]LER[EIWILL]AO:·	+F[OL]POLTD[E]PERT:	1.28	160°

a. Lord Stewartby. Bought Baldwin, 7 April 1992.

43	Obverse 5^P	Reverse $PF7^P$	Wt (g)	Die-Axis
a.*	+LЄRЄ[IWIL]LĀO:·:	+FOLPO[LT]DЄPЄRT:	1.49	50°
b.*	+L[ЄRЄIWI]L[L]ĀO:·:	[+FO]LP[OLTD]ЄPЄRT:	1.29	110°
c.	+LЄ[RЄIWI]LLĀO:·:	+FOL[POLT]DЄPЄRT:	1.46	110°
d.*	[+]L[Є]RЄIWILLĀO[:·]	+FOLPOLTDЄPЄRT:	1.21	180°
e.	[+LЄR]ЄIWILLĀ[O]:·:	+FOLP[OLTDЄP]ЄRT:	1.41	220°
f.*	+LЄRЄ[IW]ILLĀO[:·]	[+F]OLPOLTDЄPЄRT:	1.39	270°
g.	+LЄR[ЄIW]IL[L]ĀO[:·]	+FO[LPOLT]DЄPЄRT:	1.33	90°
h.	+LЄ[RЄIWIL]LĀO:·:	[+F]OLP[OL]TDЄPЄ[RT:]	—	30°

a. British Museum, CM 1939–8–3–4.
b. National Museums of Scotland, Edinburgh, H.C16471. T. Coats collection. Burns, *Coinage*, vol. 1, p. 59, no. 4 (not illustrated).
c. National Museums of Scotland, Edinburgh, H.C689. Ex R.C. Lockett, Glendining 26 October 1960, lot 688 (part); ex G.C. Drabble, Glendining 4 July 1939, lot 764 (part)? *Lockett Photographs* (Scottish coins) 1/82.
d. National Museums of Scotland, Edinburgh, H.C688. Richardson, *Catalogue*, p. 6 no. 7.
e. Fitzwilliam Museum, Cambridge, CM.1.2626–1990. C.E. Blunt.
f. Lord Stewartby. Bought 31 August 1962. Ex H.J. Dakers and C. H. Dakers joint collection, Glendining 8 October 1946, lot 282 (part).
g. Current whereabouts unknown. Ex J. Davidson, Dix Noonan Webb 9 December 2003, lot 311. Bought Baldwin, 1967.
h. Current whereabouts unknown. Ex R.C. Lockett, Glendining 26 October 1960, lot 689 (part). *Lockett Photographs* (Scottish coins) 1/85.

44	Obverse 5^P	Reverse $PF8^P$	Wt (g)	Die-Axis
a.*	+L[ЄRЄIW]IL[L]ĀO:·:	[+F]OLPOLTDЄPЄ[R]	1.45	280°
b.*	[+]LЄRЄIWIL[L]ĀO:·:	+FOLPOLTDЄPЄR	1.53	210°

a. National Museums of Scotland, Edinburgh, H.C686. Richardson, *Catalogue*, p. 6 no. 5.
b. National Museums of Scotland, Edinburgh, H.C16469. T. Coats collection. Burns, *Coinage*, vol. 1, p. 58, no. 2 (not illustrated).

45	Obverse 6^P	Reverse $PF5^P$	Wt (g)	Die-Axis
a.*	[+IЄRЄIW]ILLĀO[:]	[+FO]LPOLTD[ЄPЄRT:]	1.39	0°

a. Lord Stewartby. Bought A.H.F. Baldwin private collection, 1975.

46	Obverse 6^P	Reverse $PF9^P$	Wt (g)	Die-Axis
a.*	[+I]ЄRЄIWILLA[O:]	[+FO]LPOLTDЄPЄ[RT:]	1.46	45°
b.	[+]IЄRЄIW[ILLAO:]	+FOLPOL[TDЄPЄRT:]	1.44	
c.	+IЄRЄIWILL[A]O:	[+FOL]POLTDЄPЄRT:	1.44	60°

a. Ashmolean Museum, Oxford. H. Hird donation, 1953. *SCBI* 35 (Oxford/Glasgow), no. 33. D.M. Metcalf conducted metallurgical analysis by XRF on this coin, 'The quality of Scottish sterling silver 1136-1280', *CIMS*, p. 82 no. 23.

b. Perth Museum and Art Gallery, SMC 2 (PLAS no. 562).

c. Lord Stewartby. Bought 1975. Ex R.C. Lockett, Glendining 18 June 1957, lot 25 (illustrated); ex T. Bearman; ex J.G. Murdoch, Sotheby 11-13 May 1903, lot 7. *Lockett Photographs* (Scottish coins) 1/83.

47	Obverse 7^P	Reverse $PF8^P$	Wt (g)	Die-Axis
a.*	+LЄ[RЄIWILLAO:·:]	+FOLPO[LTDЄP]ЄR	1.44	20°

a. National Museums of Scotland, Edinburgh, H.C685. Richardson, *Catalogue*, 'Addenda', p. 334 no. 10. Annotation in NMS copy of Richardson reads: 'Ex Pollexfen'.

48	Obverse 7^P	Reverse $PF10^P$	Wt (g)	Die-Axis
a.	[+LЄR]ЄIWIL[LAO:·:]	[+F]OLPOLT[DЄP]ЄR[T]	1.43	70°
b.*	[+LЄR]ЄI[WIL]LAO:·:	+FOLPOL[T]DЄPЄR[T]	1.37	
c.*	+LЄRЄIWIL[L]AO[:·:]	+FOLPOLTDЄPЄRT	1.35	20°

a. Ashmolean Museum, Oxford. Purchased from I. Stewart, 1982. Ex W.S. Marshall, Glendining 29 April 1946, lot 161 (part); ex A.N. Brushfield, Glendining 28 March 1940, lot 25(c). *SCBI* 35 (Oxford/Glasgow), no. 32.

b. National Museum of Denmark, Copenhagen. C.J. Thomsen. K. Erslev, *Catalogue de la de Monnaies de feu Christian Jürgensen Thomsen. Seconde partie, Les Monnaies du moyen-age.* Tome III, contenant les monnaies de l'Europe septentrionale et plusieurs appendices (Copenhagen, 1876), no. 9779.

c. Lord Stewartby. Bought London 1961.

49	Obverse 8^P	Reverse PF11^P	Wt (g)	Die-Axis
a.	[+LEREIW]ILLA◎[:]	+FOLPOL[TPERT:]	1.35	90°
b.*	[+]LE[REIWI]LLA◎:	+FOLPOLT[P]ER[T]:	1.47	320°
c.*	[+L]EREIWILL[A◎:]	+FOLP[OL]TPER[T]:	1.27	300°
d.*	+LERE[IWI]LLA◎:	+FO[LP]OLTPERT[:]	1.48	320°
e.*	+LERE[IWI]LLA◎:	+[F]OLPOLT[P]ERT:	1.49	
f.	[+]LE[REI]WILLA[◎:]	+FOLPOLT[PERT]:	1.38	150°
g.	[+LEREIWIL]LA◎:	+FOLPOL[TTTERT:]	0.76 *cut halfpenny*	320°
h.	[+]LEREIWILLA[◎:]	[+FO]LPOLTPERT:	—	180°

a. Ashmolean Museum, Oxford. Purchased from I. Stewart, 22 August 1963. *SCBI* 35 (Oxford/Glasgow), no. 31. EPMA conducted 2005.
b. National Museums of Scotland, H.C16470. T. Coats collection. Burns, *Coinage*, vol. 1, p. 58, no. 3 and vol. 3, Pl. IV, fig 30.
c. National Museums of Scotland, H.C684. Richardson, *Catalogue*, p. 6 no. 4.
d. Hunterian Museum, Glasgow, GLAHM 14567. W.J. Cuthbert bequest.
e. T. Crafter. Bought Baldwin, 26 July 2000. Ex R. MacPherson, 1982.
f. Lord Stewartby. Bought London 1961. Ex Grantley, 1677.
g. Lord Stewartby. Bought A.H.F. Baldwin private collection, 1975.
h. Current whereabouts unknown. Ex R.C. Lockett, Glendining 26 October 1960, lot 689 (part). *Lockett Photographs* (Scottish coins) 1/84.

50	Obverse 9^P	Reverse PF12^P	Wt (g)	Die-Axis
a.*	[ ]LEREI[W]IL[ ]	+FOLPO[LT]DEPERT	1.42	320°
b.	[ ]LER[EI]WILA[ ]	[+FOL]POLTDE[P]ERT	1.35	
c.*	[///]LEREIW[//////////]	[+]FOLPOLTDEPERT	1.40	110°

a. Ashmolean Museum, Oxford. Purchased from I. Stewart, 1982. R. Carlyon-Britton. *SCBI* 35 (Oxford/Glasgow), no. 34.
b. Paisley Museum and Art Galleries, 1191/1957. Bought Baldwin, 1957.
c. Lord Stewartby. Bought Baldwin, 31 August 1962. Ex H.J. Dakers and C. H. Dakers joint collection, Glendining 8 October 1946, lot 283 (part)? Obverse double struck.

51	Obverse 10^P	Reverse PF13^P	Wt (g)	Die-Axis
a.*	+LEREIWILLA◎··	+FOLPOLTDEPERT	1.35	210°
b.	[+L]E[REIWILLA◎··]	[+FOLPOLTDEPE]R[T]	*Broken and chipped*	

a. National Museums of Scotland, H.C687. Richardson, *Catalogue*, p. 6 no. 6.
b. Marischal Museum, University of Aberdeen, 40515.

52	Obverse 1[A]	Reverse RR1[B]	Wt (g)	Die-Axis
a.*	[+W:I:L:A:M]:E:[RX:·:]	+[R]AV[·LONR·O]C·	[0.84] *cut halfpenny*	0°
b.*	[+W:I:L:]A:M:E:RX[:·:]	+RAV·LON[R·OC·]	1.32	260°
c.	[+W:I:L:A:M:]E:RX:·:	[+RAV·LON]R·OC·	[0.77] *cut halfpenny*	90°

a. Ashmolean Museum, Oxford. Donated by I. Stewart, 1982. *SCBI* 35 (Oxford/Glasgow), no. 36.
b. Lord Stewartby. 1975; ex Drabble 1163.
c. Lord Stewartby. Bought A.H.F. Baldwin private collection, 1975.

53	Obverse 2[A]	Reverse RR2[B]	Wt (g)	Die-Axis
a.*	[+:W:I:L:L:]A:M:E[:R¨X]	[Λ:V]L:ON[ ]	1.47	310°
b.	+:W:I:L:[L:A:M:E:R·]·X	[ ]Λ:VL:ON[ ]	1.30	140°
c.*	[+]:W:I:L:[L:A:M:E:]R¨X	[ ]Λ:VL:ON[ ]	1.48	110°

a. British Museum, CM 1841–10–28–7. Purchased from H. O. Cureton.
b. Lord Stewartby. Ex H.J. Dakers and C. H. Dakers joint collection, Glendining 8 October 1946, lot 284 (part). Illustrated by I. Stewart in *Mints, Dies and Currency* (London, 1971), Pl. XV no. 2b.
c. Current whereabouts unknown. Ex J. Davidson, Dix Noonan Webb 9 December 2003, lot 312; ex R.W. Cochran-Patrick, Sotheby, 30-31 March 1936, lot 124 (part).

54	Obverse 2[A]	Reverse RR3[B]	Wt (g)	Die-Axis
a.*	[+]:W:I:L:L:A:M:E[:R¨X]	+RΛVL:ON:ROC	1.45	280°

a. Lord Stewartby. Bought 24 July 1987. Ex J. Davidson.

55	Obverse 3[A]	Reverse RR4[B]	Wt (g)	Die-Axis
a.*	+W[ ]L:L·AM:RX	+·R[ ]:V[L:O]N:R·C	1.38	100°
b.	+W[ ]L:L·AM:RX	+·R[:V]L:ON:R·C	1.45	220°

a. Ashmolean Museum, Oxford. Purchased from I. Stewart, 1982. Ex G.C. Drabble, Glendining 13 December 1943, lot 1163 (part). *SCBI* 35 (Oxford/Glasgow), no. 37. EPMA conducted 2005.
b. Lord Stewartby. Bought Baldwin, 10 July 1958.

56	Obverse 3[A]	Reverse RR5[B]	Wt (g)	Die-Axis
a.*	+W[ ]L:L·Ā M:RX	[ ]A:V:[ ]ON·ROC	1.32	120°

a. Lord Stewartby. Bought Seaby, December 1972.

57	Obverse 6[B]	Reverse RR6[B]	Wt (g)	Die-Axis
a.	[+RЄI]WILLĀ[MЄ]	[+RĀ:]VL:ON:R[OC]	[0.63] *cut halfpenny*	40°
b.*	+RЄIWILLĀMЄ	+RĀ:VL:ON:ROC	1.32	80°
c.	+[RЄIW]ILLĀMЄ	[+R]Ā[:VL]:ON:ROC	1.48	220°

a. Ashmolean Museum, Oxford. Donated by I. Stewart, 1982. *SCBI* 35 (Oxford/Glasgow), no. 39.
b. National Museums of Scotland, Edinburgh, H.C706. Ex R.C. Lockett, Glendining 18 June 1957, lot 26 (part). *Lockett Photographs* (Scottish coins) 1/88.
c. Lord Stewartby. Bought London, 1961.

58	Obverse 6[B]	Reverse RR7[B]	Wt (g)	Die-Axis
a.*	+RЄIWIL[LĀM]Є	+:R[Ā·VL:]ONR·OC	1.48	0°
b.	[+RЄIW]I[L]LĀMЄ	[+:R]Ā·VL:ON[R·OC]	[0.63] *cut halfpenny*	310°

a. Lord Stewartby. Bought Seaby, 8 April 1961. Ex C.A.Whithorn.
b. Lord Stewartby. Bought 15 December 1954. Ex P. Thorburn.

59	Obverse 7[B]	Reverse RR8[B]	Wt (g)	Die-Axis
a.*	+RЄIW[ILL]ĀM	+·RĀ:VL:ON:R[O]C:	1.47	220°
b.	+RЄIWILLĀM	+·RĀ:VL:ON:ROC:	1.39	220°

a. National Museums of Scotland, Edinburgh, H.C705. Richardson, *Catalogue*, p. 7 no. 16 and Pl. I, fig. 6.
b. Lord Stewartby. Ex J.K.R. Murray, Spink no. 57, 29 April 1987, lot 44; bought from Spink, 1966.

60	Obverse 8^{B}	Reverse $RR9^{B}$	Wt (g)	Die-Axis
a.*	+RЄI[WILLÆM: ·]	[+R]Æ:V·L:[ON·RO]	1.38	
b.	+RЄI[WIL]L[Æ]M[: ·]	[+R]Æ:V·L:[O]N·RO	1.49	310°
c.*	+RЄIW[ILL]ÆM: ·	+RÆ[:V·L:ON·]RO	1.39	320°
d.	[+RЄ]IWILLÆM:[·]	[+RÆ:V·L:]ON·RO	1.43	90°

a. Aberdeen Art Gallery and Museum, ABDMS 11888.

b. Ashmolean Museum, Oxford. Purchased from I. Stewart, 1982. *SCBI* 35 (Oxford/Glasgow), no. 38. EPMA conducted 2005.

c. National Museums of Scotland, Edinburgh, H.C16478. T. Coats collection. Burns, *Coinage*, vol. 1, p. 60, no. 11 and vol. 3, Pl. IV, fig 33.

d. Lord Stewartby. Bought 31 August 1962. Ex H.J. Dakers and C. H. Dakers joint collection, Glendining 8 October 1946, lot 282 (part).

61	Obverse 9^{B}	Reverse $RR9^{B}$	Wt (g)	Die-Axis
a.*	[ ]RЄIWILL[ ]	+R:Æ:V[·L:ON·R]O	1.48	90°

a. National Museums of Scotland, Edinburgh, H.C704. Ex R.C. Lockett, Glendining 26 October 1960, lot 692 (part); ex J. Witte, Sotheby 13 April 1908, lot 331 (part). *Lockett Photographs* (Scottish coins) 2/1.

62	Obverse 10^{B}	Reverse $RR10^{C}$	Wt (g)	Die-Axis
a.*	+¨RЄIW[ILL]ÆM	[+]RÆVLDEROCЄ[BVRЄ]	1.48	180°
b.*	+¨RЄ[I]WILLÆM	+RÆ[VL]DEROCЄBVRЄ	1.37	120°
c.*	+¨RЄIWIL[LÆ]M	+[RÆV]L[DER]OCЄBVRЄ	1.41	250°
d.	+[¨R]ЄIW[ILLÆ]M	+RÆVLDЄ[ROCЄBV]RЄ	1.54	270°

a. Ashmolean Museum, Oxford. Purchased from I. Stewart, 1982. Ex R.W. Cochran-Patrick, Glendining 30 March 1936, lot 123(a). *SCBI* 35 (Oxford/Glasgow), no. 40. EPMA conducted 2005.

b. British Museum, CM E4960.

c. British Museum, CM 1848–2–16–135. Acquired from Lord Enniskillen.

d. Lord Stewartby. Bought Spink, 1961.

63	Obverse 10^{B}	Reverse $RR11^{C}$	Wt (g)	Die-Axis
a.*	+¨RЄI[WIL]LÆM	[ ]ЄROCЄBVR:	1.51	130°

a. Lord Stewartby. Ex J.K.R. Murray, Spink no. 57, 29 April 1987, lot 45; bought Spink, July 1979. Illustrated by Lord Stewartby in *Moneta Mediævalis* (Warsaw: 2002), Pl. 16 no. 2.

64	Obverse 10[B]	Reverse RR12[C]	Wt (g)	Die-Axis
a.*	[+"REIWIL]LAM	+RAV[LDEROCEBVR:]	1.44	70°

a. Lord Stewartby. Bought Seaby, 8 April 1961.

65	Obverse 10[B]	Reverse RR14[C]	Wt (g)	Die-Axis
a.*	+"REIWIL[L]AM	+RAVLDEROCEBVR	1.57	0°

a. Lord Stewartby. Bought Spink, 1961. Ex H.A. Parsons 1933.

66	Obverse 10[B]	Reverse RR15[C]	Wt (g)	Die-Axis
a.*	+"REIWILLAM	+RAVLDEROCEBVR:	1.34	180°
b.	+["]REIW[ILLA]M	+RAVLDER[OCE]BVR:	1.42	270°

a. National Museums of Scotland, Edinburgh, H.C707. Richardson, *Catalogue*, p. 8 no. 17.
b. Lord Stewartby. Bought Seaby, 8 April 1961.

67	Obverse 10[B]	Reverse RR17[C]	Wt (g)	Die-Axis
a.*	[+"R]EIWILLA[M]	+RAVLDE[ROCEBV]R·	1.66	

a. Aberdeen Art Gallery and Museum, ABDMS 11889.

68	Obverse 10[B]	Reverse RR20[C]	Wt (g)	Die-Axis
a.*	+"REIW[ILLA]M	+RAVL:[ON]:ROC	1.29	270°
b.*	[+"RE]IWI[LLAM]	[+]RA[VL:O]N:RO[C]	1.55	310°
c.	+["RE]IW[ILLAM]	+RAVL:O[N]:ROC	1.49	180°

a. Ashmolean Museum, Oxford. Purchased from I. Stewart, 22 August 1963. *SCBI* 35 (Oxford/Glasgow), no. 35. D.M. Metcalf conducted metallurgical analysis by XRF on this coin, 'The quality of Scottish sterling silver 1136-1280', *CIMS*, p. 82 no. 26.
b. National Museums of Scotland, Edinburgh, A.1946.136. Donated by Dr A.J. Young.
c. Lord Stewartby. Bought Spink, 1961. Illustrated by Lord Stewartby in *Moneta Mediævalis* (Warsaw: 2002), Pl. 16 no. 3.

69	Obverse 16^{C}	Reverse RR12^{C}	Wt (g)	Die-Axis
a.*	[+L]ЄRЄIWILLAO)Є	+RAVLDЄROCЄBVR:	1.44	240°

a. Lord Stewartby. Bought 10 December 1964. Ex L.A. Lawrence (1312).

70	Obverse 16^{C}	Reverse RR15^{C}	Wt (g)	Die-Axis
a.*	+LЄR[ЄIWILL]AO)Є	+RAVLDЄRO[ ]	1.40	290°

a. Lord Stewartby. Bought 24 July 1987. Ex J. Davidson; bought Baldwin.

71	Obverse 16^{C}	Reverse RR16^{C}	Wt (g)	Die-Axis
a.*	+[LЄRЄI]WILLAO)Є	[ ]VLDЄROЄCBV[ ]	1.45	310°
b.*	[+LЄ]RЄIWILLAO)Є	[ ]LDЄROЄC[ ]	1.38	20°

a. Lord Stewartby. Bought from A.H.F. Baldwin private collection, 1976.
b. Lord Stewartby. Bought 24 July 1987. Ex J. Davidson. Overstruck on German *pfennig*.

72	Obverse 16^{C}	Reverse RR17^{C}	Wt (g)	Die-Axis
a.*	[+LЄ]RЄI[WILL]AO)[Є]	+RAVLDЄRO[CЄBVR·]	1.34	70°
b.*	[+]LЄRЄI[WILLA]O)Є	[+]RAVLDЄROCЄBVR·	1.38	20°

a. Ashmolean Museum, Oxford. Purchased from I. Stewart, 22 August 1963. *SCBI* 35 (Oxford/Glasgow), no. 44; die-axis here corrected.
b. Lord Stewartby. Bought Spink, 1961.

73	Obverse 17^{C}	Reverse RR13^{C}	Wt (g)	Die-Axis
a.*	[+L]ЄRЄIWILLAO)Є	+RAVLDЄROCЄBVR[:]	1.44	300°
b.	[+LЄRЄIWILLAO)Є]	[+RAVL]DЄROCЄ[BVR:]	1.31	
c.*	[+]LЄRЄI[WILLAO)Є]	+RA[VLDЄROCЄ]BVR:	1.44	340°
d.*	+[L]ЄRЄIW[ILL]AO)Є	+RAVLDЄRO[CЄ]BVR:	1.44	300°

a. British Museum, CM 1841–10–28–4. Purchased from H.O. Cureton.
b. National Museum of Denmark, Copenhagen. C.J. Thomsen. K. Erslev, *Catalogue de la de Monnaies de feu Christian Jürgensen Thomsen. Seconde partie, Les Monnaies du moyen-age.* Tome III, contenant les monnaies de l'Europe septentrionale et plusieurs appendices (Copenhagen, 1876), no. 9781. Probably this obverse die.
c. National Museums of Scotland, Edinburgh, H.C16482. T. Coats collection. Burns, *Coinage*, vol. 1, p. 60, no. 15 (not illustrated).
d. Lord Stewartby. Bought Seaby, 8 April 1961. Ex R. Carlyon-Britton (6015).

74	Obverse 17^{C}	Reverse RR14^{C}	Wt (g)	Die-Axis
a.	+LЄR[Є I]W[ILL]ĂO[Є]	+RĂVLDЄ[ROC]ЄBVR	1.51	230°
b.*	[+]LЄRЄI[WILLĂO]Є	[+RĂVLDЄ]ROCЄBVR	1.39	30°

a. Strathclyde University (Collins Gallery, Glasgow), SC/4.
b. Lord Stewartby. Bought Baldwin, 10 December 1964. Ex W. De Vore; Ex Rushton.

75	Obverse 17^{C}	Reverse RR15^{C}	Wt (g)	Die-Axis
a.	[+]LЄRЄIWILLĂOЄ	+RĂVLDЄRO[CЄ]BVR	1.26	140°

a. Lord Stewartby. Bought Baldwin, 1976. Ex G.C. Drabble, Glendining 13 December 1943, lot 1162 (part).

76	Obverse 17^{C}	Reverse RR16^{C}	Wt (g)	Die-Axis
a.*	[+L]ЄRЄIWILLĂ[OЄ]	+RĂVLD[Є·R]OЄCBVR⁘	1.40	220°
b.*	[+]LЄRЄIW[ILLĂOЄ]	+RĂVL[DЄ·ROЄCB]VR[⁘]	[1.16]	230°

a. British Museum, CM 1906–11–3–4485. Parkes Weber donation. Another ticket states bought from Spink in 1898. Ticket states: 'overstruck on a German coin cf. Lockett continental lot 692'.
b. Stranraer Museum, WIWMS Whit 91/13418. Found in excavations at Whithorn Priory, 1986 × 1991. P. Hill, *Whithorn and St Ninian*, p. 347 no. 2 (not illustrated). Single-find S17.

77	Obverse 18^{C}	Reverse RR15^{C}	Wt (g)	Die-Axis
a.*	[////////////////]ĂOЄ[///]	+[RĂVLON]ROCĂS	1.47	130°

a. Lord Stewartby. Bought Baldwin, 1976. Ex Bascom states ticket. Obverse double-struck.

78	Obverse 18^{C}	Reverse RR16^{C}	Wt (g)	Die-Axis
a.*	[ ]LЄRЄI[ ]ĂOЄ	+RĂVLDЄ·ROЄCBV[ ]	1.41	50°

a. Lord Stewartby. Bought 24 July 1987. Ex J. Davidson.

79	Obverse 18^{C}	Reverse RR18^{C}	Wt (g)	Die-Axis
a.*	✣[ ]LÆƠЄ	[R]ÆVL[ ]ROCЄBV[ ]	1.33	270°
b.	[✣ L]ÆƠЄ	[ ]RÆVL[ROCЄBV]	1.43	30°

a. Lord Stewartby. Bought Baldwin, 1959.
b. Lord Stewartby. Bought 8 April 1961.

80	Obverse 18^{C}	Reverse RR19^{C}	Wt (g)	Die-Axis
a.*	[ ]ЄRЄI[ ]LÆƠЄ	[ ]LDЄRO[ ]BVR:	1.56	300°

a. Lord Stewartby. Bought from A.H.F. Baldwin private collection.

81	Obverse 19^{C}	Reverse RR17^{C}	Wt (g)	Die-Axis
a.*	[ ]ILÆƠЄ[ ]	✣RÆVLDЄ[ROC]ЄBVR·	1.36	50°

a. Lord Stewartby. Bought Spink, 1961.

82	Obverse 20^{C}	Reverse RR20^{C}	Wt (g)	Die-Axis
a.*	[✣L"]ЄRЄI[WILÆ]Ơ[:]	[✣]RÆV[L:ON:ROC]	1.34	150°

a. Lord Stewartby. Bought from A.H.F. Baldwin private collection.

83	Obverse 20^{C}	Reverse RR21^{C}	Wt (g)	Die-Axis
a.*	✣[L"]ЄRЄIWILÆƠ:	✣RÆVLD[ЄROCЄB]V:	1.54	310°
b.*	✣[L"]Є[R]ЄIW[ILÆ]Ơ:	✣RÆV[LD]ЄROCЄB[V:]	1.46	140°
c.*	✣[L"]ЄR[ЄIWILÆ]Ơ[:]	[✣RÆVLDЄROC]ЄBV[:]	1.24	140°

a. Ashmolean Museum, Oxford. Purchased from I. Stewart, 22 August 1963. Ex 'Canadian'. *SCBI* 35 (Oxford/Glasgow), no. 43.
b. Lord Stewartby. Bought Seaby, 8 April 1961. Ex Parsons.
c. Lord Stewartby. Bought Baldwin, 8 April 1963.

84	Obverse 21^{C}	Reverse RR22^{C}	Wt (g)	Die-Axis
a.*	[+LЄ LAO:]	[+R]AVLDЄRO[CЄ]BV[R]	1.16	
b.	[+LЄ LAO:]	[+RAVL]DЄROCЄBV[R]	1.48	
c.*	[+LЄ]LAO:	+RAVL[DЄROCЄ]BVR	1.52	90°
d.*	[+]LЄ[LAO:]	[+RAVL]DЄROCЄBV[R]	1.25	60°

a. Aberdeen Art Gallery and Museum, ABDMS 11890.
b. Perth Museum and Art Gallery, SMC 4 (PLAS no. 564).
c. Lord Stewartby. Bought Spink, 1961.
d. Lord Stewartby.

85	Obverse 22^{C}	Reverse RR23^{C}	Wt (g)	Die-Axis
a.*	+LЄR[Є]W[IL]AO[:]	+RA:VL:ON:ROC	1.35	270°
b.	+LЄR[ЄIWIL]AO:	+[RA]:VL:ON:ROC	[1.02]	190°

a. British Museum, CM 1841–10–28–5. Purchased from H.O. Cureton.
b. National Museums of Scotland, Edinburgh, H.C715. Richardson, *Catalogue*, p. 9 no. 23.

86	Obverse 22^{C}	Reverse RR24^{C}	Wt (g)	Die-Axis
a.	+[L]ЄRЄIWILLAO[:]	+RAVL[DЄR]OCЄBV	1.49	140°
b.*	+LЄR[Є]WILLAO[:]	+RAVL[DЄR]OCЄBV	1.45	45°
c.*	[+L]ЄRЄIWILLA[O:]	+R[AVLDЄ]ROCЄBV	1.55	260°
d.	+LЄ[RЄ]IW[IL]LAO:	+RAVL[DЄ]ROCЄBV	1.35	110°
e.*	+LЄRЄIWILLAO:	+RAVLDЄROCЄBV	1.40	330°
f.	[+LЄ]RЄIWILL[AO:]	[+R]AVLDЄROCЄ[BV]	1.60	
g.	+LЄR[ЄIWIL]LAO:	[+RAVLDЄ]ROCЄBV	1.48	
h.	+[L]ЄR[Є]IWILLAO:	[+]RAVLDЄROC[Є]BV	1.42	340°

a. Ashmolean Museum, Oxford. H. Hird donation, 1953. Ex R.W. Cochran-Patrick, Glendining 30 March 1936, lot 121 (part); bought Spink, *Numismatic Circular*, vol. 44, parts 8 and 9 (August-September 1936), p. 298, no. 54456. *SCBI* 35 (Oxford/Glasgow), no. 42. EPMA conducted 2005.
b. British Museum, CM E4962.
c. National Museums of Scotland, Edinburgh, H.C16483. T. Coats collection. Burns, *Coinage*, vol. 1, p. 60, no. 16 (not illustrated).
d. National Museums of Scotland, Edinburgh, H.C710. Richardson, *Catalogue*, p. 8 no. 20.
e. National Museums of Scotland, Edinburgh, H.C711. Ex R.C. Lockett, Glendining 18 June 1957, lot 26 (part). *Lockett Photographs* (Scottish coins) 2/2.
f. Paisley Museum and Art Galleries, 1190/1957. Bought Baldwin, 1957.
g. Yorkshire Museum, York. *SCBI* 21 (Yorkshire), 1512.
h. Lord Stewartby. Bought Baldwin, 31 August 1962.

87	Obverse 23^{C}	Reverse RR25^{C}	Wt (g)	Die-Axis
a.*	[+LEREI]WILLA[O.]	[+RAVL]DE[RO]CEBVR[E]	1.46	230°
b.	+LER[EIW]IL[LA]O.	+RA[V]L[DERO]CEBVRE]	1.35	40°
c.*	+LEREI[WILL]AO[.]	+RAVLDEROCEB[V]RE	1.44	30°

a. Ashmolean Museum, Oxford. Purchased from I. Stewart, 1982. *SCBI* 35 (Oxford/Glasgow), no. 47.
b. Lord Stewartby. Bought Seaby, 8 April 1961. Ex R. Carlyon-Britton (601b).
c. Lord Stewartby. Bought Baldwin, 31 August 1962. Ex H.J. Dakers and C. H. Dakers joint collection, Glendining 8 October 1946, lot 283 (part).

88	Obverse 24^{C}	Reverse RR15^{C}	Wt (g)	Die-Axis
a.*	[ ]LEREI[L]LAOE	+RAVLDEROCE[ ]	1.45	50°

a. Lord Stewartby. Bought Baldwin, 31 August 1961. Ex H.J. Dakers and C.H. Dakers joint collection, Glendining lot 283 (part). Daniels 1926.

88*	Obverse 24^{C}	Reverse RR29^{C}	Wt (g)	Die-Axis
a.*	[ ]LEREI[ ]LLAO[E]	+RAVL[////]+RAVL[////]	1.56	?

a. Lord Stewartby. Bought Baldwin, 1976. Ex G.C. Drabble, Glendining 13 December 1943, lot 1163 (part). Double-struck.

89	Obverse 24^{C}	Reverse RR30^{D}	Wt (g)	Die-Axis
a.*	[ ]EREIWILL[ ]	+RA[VLONROC]AS	1.43	210°
b.	[ ]LEREIWI[LLAO]E:]	[+RAVL]ONROCA[S]	1.36	270°
c.*	[ ]EREIWILLAOE:	[+RAVLO]NROCA[S]	1.40	290°
d.	+[ ]EREIWILLA[O]E:	+[////]AVLON[////]CAS	1.33	220°

a. British Museum, CM 1915–4–4–3. Transfer from the British Medieval Department.
b. Clongowes College, Naas, Republic of Ireland.
c. Lord Stewartby. Bought 8 April 1961.
d. Lord Stewartby. Bought Baldwin, 1973. Reverse double-struck.

90	Obverse 30^{D}	Reverse RR14^{C}	Wt (g)	Die-Axis
a.	+LE[REIWI]LLAO[: :]	+RAVLDERROCE[BV]R	1.50	120°
b.*	+LERE[IWILLA]O: :	+RAVL[DER]OCEBVR	1.48	0°

a. Fitzwilliam Museum, Cambridge, CM.1.2627–1990. C.E. Blunt.
b. Lord Stewartby. Bought Seaby, 8 April 1961.

91	Obverse 30[D]	Reverse RR16[C]	Wt (g)	Die-Axis
a.*	[ ]WIL[ ]	[ ]ROЄCB[ ]	[1.18]	220°

a. Lord Stewartby. Bought Baldwin, March 1973.

92	Obverse 30[D]	Reverse RR26[C]	Wt (g)	Die-Axis
a.*	+LЄ[RЄIWI]LLAO): :	+ARAVL:ONRO	1.41	70°
b.	+LЄRЄIWILLAO): :	+ARAVL:ONRO	—	330°

a. National Museums of Scotland, Edinburgh, H.C16481. T. Coats collection. Burns, *Coinage*, vol. 1, p. 60, no. 14 (not illustrated).
b. Current whereabouts unknown. Ex R.C. Lockett, Glendining 18 June 1957, lot 27 (part). *Lockett Photographs* (Scottish coins) 2/9.

93	Obverse 30[D]	Reverse RR27[C]	Wt (g)	Die-Axis
a.*	[+L]ЄRЄIWILLAO)[: :]	+RAVLDЄROCЄBVR	1.47	
b.*	+[LЄRЄIW]ILLAO): :	+RAVLDЄRO[CЄ]BVR	1.48	0°
c.	+LЄRЄIWILLAO): :	+R[AVL]DЄROCЄBVR	—	230°

a. National Museums of Scotland, Edinburgh, H.C716. Richardson, *Catalogue*, p. 9 no. 24.
b. Lord Stewartby. Bought 24 July 1987. Ex J. Davidson.
c. Current whereabouts unknown. Ex Clontesbrook Trust, Glendining 7 June 1974, lot 303 (illustrated); ex R.C. Lockett, Glendining 26 October 1960, lot 692 (part). *Lockett Photographs* (Scottish coins) 2/7.

94	Obverse 30[D]	Reverse RR29[C]	Wt (g)	Die-Axis
a.*	+[LЄ]RЄIWIL[LAO): :]	+RAVL[DЄR]OCЄBVR·	1.40	125°
b.*	[+]LЄRЄIWILLAO): :	+RAVLDЄROCЄBVR·	1.44	
c.	+LЄRЄIWILLAO): :	+[R]AVLDЄROCЄ[BVR·]	1.32	140°

a. British Museum, CM 1841–10–28–3. Purchased from H.O. Cureton.
b. National Museums of Scotland, Edinburgh, H,C709. Richardson, *Catalogue*, p. 8 no. 19.
c. Lord Stewartby. Bought Seaby, 8 April 1961.

95	Obverse 30^{D}	Reverse $RR30^{D}$	Wt (g)	Die-Axis
a.*	+L[ЄRЄIWI]LLAO): :	+RA[ ]ONR[ ]	1.41	110°
b.	?	[ ]ONROCA[ ]	1.50	
c.*	+LЄRЄIW[I]LLAO)[: :]	+RAVLONROCAS	1.48	0°

a. Ashmolean Museum, Oxford. H. Hird donation, 1953. *SCBI* 35 (Oxford/Glasgow), no. 46.
b. Yorkshire Museum, York. *SCBI* 21 (Yorkshire), no. 1511.
c. Lord Stewartby. Bought Spink, 1961.

96	Obverse 30^{D}	Reverse $RR31^{D}$	Wt (g)	Die-Axis
a.	+LЄRЄIWILLAO): :	+RAVLONROC·	1.42	200°
b.	+LЄRЄIWILLAO): :	+RAVLONROC·	1.44	330°
c.*	+LЄRЄIW[ILLAO): :]	+R[A]VLONROC[·]	1.31	40°
d.	[+]LЄRЄIWILLAO)[:] :	+[R]AVLONROC[·]	1.65	
e.	+LЄRЄIWILLAO): :	+RAVLONROC·	1.32	160°

a. Ashmolean Museum, Oxford. Purchased from I. Stewart, 22 August 1963. Ex McFarlan; Ex Napier. *SCBI* 35 (Oxford/Glasgow), no. 41; Roman M erroneously given in Sylloge; die-axis corrected from Sylloge.
b. Birmingham City Museum and Art Galleries, 1993 C 576. I.D. Finney, no. 402. Published in *Spink's Numismatic Circular*, vol. 103/2 (March 1995), p. 49, no. 1. Ex J.K.R. Murray, Spink Coin Auctions no. 57, 29 April 1987, lot 48; ex H. J. Marr; ex Lord Grantley, Glendining 18 May 1944, lot 1675 (illustrated); ex Ex J. G. Murdoch, Sotheby 11-13 May 1903, lot 10 (illustrated).
c. National Museums of Scotland, Edinburgh, H.C712. Richardson, *Catalogue*, p. 8 no. 21.
d. Inverness Museum and Gallery, IVNMG 1982.190.
e. Lord Stewartby. Bought Spink, 1961. Ex Lord Grantley.

97	Obverse 30^{D}	Reverse $RR32^{D}$	Wt (g)	Die-Axis
a.*	+LЄRЄIWILLAO): :	+RAVL·ONROCBV:	1.41	160°

a. Lord Stewartby. Bought Spink, 1961. Ex Parsons 701.

98	Obverse 31^{D}	Reverse RR33^{D}	Wt (g)	Die-Axis
a.	+L[:]ЄRЄIWI[LL]ĂO)	+[R]ĂVLONROCĂS	1.47	110°
b.	+L:ЄRЄIWI[LLĂO)]	[+R]ĂVLONRO[CĂS]	1.42	90°
c.*	+[L:]ЄRЄIWI[L]LĂO)	+RĂVLONROCĂS	1.48	240°
d.*	+[L]:ЄRЄI[WI]LLĂO)	+[RĂ]VLON[R]OCĂS	1.48	310°

a. National Museums of Scotland, Edinburgh, H.C708. Richardson, *Catalogue*, p. 8 no. 18.
b. Fitzwilliam Museum, Cambridge, CM.1.2628–1990. C.E. Blunt, bought Spink, 1988.
c. Lord Stewartby. Bought Spink, 1961. Illustrated by I. Stewart in *Mints, Dies and Currency* (London, 1971), Pl. XV no. 5b.
d. Current whereabouts unknown. Ex J. Davidson, Dix Noonan Webb 9 December 2003, lot 313; bought Spink & Son Ltd, 1967; ex R.C. Lockett, Glendining 18 June 1957, lot 27 (part). *Lockett Photographs* (Scottish coins) 2/8.

99	Obverse 32^{D}	Reverse RR28^{C}	Wt (g)	Die-Axis
a.*	[ ]LЄRЄIWILLĂO)Є	+RĂVLDЄROCBV:	1.48	160°

a. Lord Stewartby. Bought Spink, 1961.

100	Obverse 32^{D}	Reverse RR34^{D}	Wt (g)	Die-Axis
a.*	+LЄRЄIWILLĂO)Є	+[R]ĂVLONROCĂS:	1.49	
b.*	+LЄRЄIWILLĂO)Є	+RĂV[LONR]OCĂS:	1.44	140°
c.	+LЄRЄIW[IL]LĂO)Є	+RĂ[VL]ONROCĂS:	1.42	70°

a. National Museums and Galleries of Wales, Cardiff, 81.115H. Bought Spink, December 1981 (*Spink's Numismatic Circular*, no. 8411).
b. National Museums of Scotland, Edinburgh, H.C16480. T. Coats collection. Burns, *Coinage*, vol. 1, p. 60, no. 13 and vol. 3, Pl. IV, fig 37.
c. Lord Stewartby. Ex Walters 611.

101	Obverse 32^{D}	Reverse RR35^{D}	Wt (g)	Die-Axis
a.	[+LЄ]RЄIW[ILLĂO)Є]	[+]R[ĂV]ONRO[C]	—	—
b.*	[+LЄR]ЄIWIL[LĂ]O)Є	[+R]ĂV[ ]NROC[ ]	1.47	310°
c.*	[+L]ЄRЄI[WILLĂ]O)[Є]	+RĂ[ ]O[ ]	1.45	200°

a. Bank of Scotland, Edinburgh, MACC 04/09/428.
b. Lord Stewartby. Bought Seaby, December 1972.
c. Lord Stewartby. Bought Baldwin, March 1987.

102	Obverse 24[C]	Reverse RR36[E]	Wt (g)	Die-Axis
a.*	[ ]ЄRЄIW[ ]	[ ]RÆ:VL[ ]	1.31	160°

a. Lord Stewartby. Bought Baldwin, 31 August 1962. Ex H.J. Dakers and C. H. Dakers joint collection, Glendining 8 October 1946, lot 282 (part).

103	Obverse 33[E]	Reverse RR37[E]	Wt (g)	Die-Axis
a.*	[ ]LЄRЄI[ ]	+R[ ]LD[ ]BVR[ ]	1.34	230°

a. Lord Stewartby. Bought Seaby, 8 April 1961.

104	Obverse 34[E]	Reverse RR38[E]	Wt (g)	Die-Axis
a.*	+LЄRЄI[ ]·	[ ]Æ:VL:ON:[ ]	1.45	150°

a. Lord Stewartby. Bought Baldwin, 10 July 1958.

105	Obverse 35[E]	Reverse RR36[E]	Wt (g)	Die-Axis
a.*	+[L]ЄIWILÆ[·:·]	+[ ]V[ ]NROC:	1.44	220°

a. Lord Stewartby. Bought 24 July 1987. Ex J. Davidson.

106	Obverse 35[E]	Reverse RR39[E]	Wt (g)	Die-Axis
a.*	+LЄRЄIWILÆ·:·	+RÆ:VL:ON:ROC·	1.46	

a. Lord Stewartby. Bought 24 July 1987. Ex J. Davidson.

107	Obverse 35[E]	Reverse RR40[E]	Wt (g)	Die-Axis
a.*	[+LЄR]ЄIWILÆ·[:·]	+Æ[R]Æ:V:L:O[N:ROC]	1.29	210°

a. Lord Stewartby. Bought Seaby, 8 April 1961. Ex R. Carlyon-Britton; ex Argyll.

108	Obverse 36[E]	Reverse RR41[E]	Wt (g)	Die-Axis
a.*	+LЄ[ ]ÆO:	+ÆRÆ:VL:ON:[ ]	1.45	290°

a. Lord Stewartby. Bought from A.H.F. Baldwin private collection, 1975.

109	Obverse 37[E]	Reverse RR42[E]	Wt (g)	Die-Axis
a.*	[ ]LЄR[ ]WIL[ ]	+RΛVLDЄROC[ ]V:	1.37	160°

a. National Museums of Scotland, Edinburgh, H.C16479. T. Coats collection. Burns, *Coinage*, vol. 1, p. 60, no. 12 (not illustrated).

110	Obverse 38[E]	Reverse RR43[E]	Wt (g)	Die-Axis
a.*	[ ]RЄI:WIL[ ]	+RÆVLON[ ]OC	1.18	200°

a. National Museums of Scotland, Edinburgh, H.C713.

111	Obverse 39[E]	Reverse RR44[E]	Wt (g)	Die-Axis
a.	[ ]RЄIWIL[ ]	+[RÆ:VL:]ON:ROC	1.17	270°
b.	[RЄIWIL]	[+R]Æ:VL:O[N:ROC]	1.29	
c.*	[ ]RЄIWIL[ ]	[+R]Æ:VL:ON:R[OC]	1.15	0°

a. Hawick Museum, HAKMG: 06.0074. Found by a metal-detectorist at Raeshaw Plantation, Roxburghshire, 2002. Single find S15.
b. Perth Museum and Art Gallery, SMC 3 (PLAS no. 563; number written in ink on the obverse of the coin.)
c. Lord Stewartby. Bought Baldwin, late 1960s. Ex Baddinsgill hoard, 1832. Published by Lord Stewartby in *NC* 2005, p. 225 no. 3 and illustrated Pl. 27.

112	Obverse 40[E]	Reverse RR45[E]	Wt (g)	Die-Axis
a.*	[ ].RЄIWIL[ ]	+RÆ[ ]VL:[ ]OC:	1.41	210°
b.*	[ ]ЄIW[ ]	[+RÆ].V[L]ON[OC:]	1.11	

a. Lord Stewartby. Ex W.S. Marshall, Glendining 29 April 1946, lot 161 (part); ex A.N. Brushfield, Glendining 28 March 1940, lot 25(e).
b. Found by a metal-detectorist at Fortrose, Ross & Cromarty in 2004. Single find S5.

113	Obverse 41[E]	Reverse RR29[C]	Wt (g)	Die-Axis
a.*	+RЄ[ ]WILLÆM·D··:	+RÆ[VL·O]NROCBV:	1.59	0°

a. National Museums of Scotland, Edinburgh, H.C717. Richardson, *Catalogue*, p. 9 no. 25.

114	Obverse 41[E]	Reverse RR46[E]	Wt (g)	Die-Axis
a.*	+RЄ[WIL]LÆM·D··:	+RÆVL[ ]ROCBV	1.39	90°

a. Lord Stewartby. Bought Baldwin, 1979.

115	Obverse 42[E]	Reverse RR47[E]	Wt (g)	Die-Axis
a.*	+RЄI:W[//////////]	+RÆV[L:ON OC]	1.28	?

a. Lord Stewartby. Bought Seaby, 8 April 1961. Ex R. Carlyon-Britton. Obverse double-struck.

116	Obverse 43[E]	Reverse RR47[E]	Wt (g)	Die-Axis
a.*	+[ ]:R[ ]·:·O	[+R]ÆVL:ON[ ]OC	[1.08] *chipped*	160°

a. National Museums of Scotland, Edinburgh, H.C714. Richardson, *Catalogue*, p. 8 no. 22.

117	Obverse 44[E]	Reverse RR40[E]	Wt (g)	Die-Axis
a.	[ ]WIL[ ]	+[ÆR]Æ:V:L:[ON:]ROC	1.41	
b.*	+WILЄL:[ ]	[+]ÆRÆ:V:L:ON:ROC	1.24	50°
c.*	[ ]MV··	+ÆRÆ[:V:L:ON:]ROC	1.51	90°

a. Yorkshire Museum, York. *SCBI* 21 (Yorkshire), 1509.
b. Lord Stewartby. Ex J. Davidson.
c. Lord Stewartby. Bought from A.H.F. Baldwin private collection, 1975. Ex Duke of Argyll and R. Carlyon-Britton.

118	Obverse 45[E]	Reverse RR48[E]	Wt (g)	Die-Axis
a.*	[ ]WIL[ ]	+RÆVLOИ[ ]C··	1.24	210°

a. Lord Stewartby. Bought Baldwin, late 1960s. Ex Baddinsgill hoard, 1832. Published by Lord Stewartby in *NC* 2005, p. 225 no. 2 and illustrated Pl. 27.

119	Obverse 46^{E}	Reverse RR49^{E}	Wt (g)	Die-Axis
a.*	+·L[ ]LЄLV··	+RÆ·VL.ON·ROЄ	1.34	170°

a. Lord Stewartby. Bought Baldwin, late 1960s. Ex Baddinsgill hoard, 1832. Published by Lord Stewartby in *NC* 2005, p. 225 no. 4 and illustrated Pl. 27.

120	Obverse 47^{E}	Reverse RR50^{E}	Wt (g)	Die-Axis
a.*	[ ].WIL[ ]	+RÆ:VL:ON[ ]C:	1.28	190°

a. Lord Stewartby. Bought Seaby, 1978.

121	Obverse 48^{E}	Reverse RR51^{E}	Wt (g)	Die-Axis
a.*	[ ]WILЄLV[ ]	[ ]Æ·VL·O[ ]	1.32	50°?

a. Lord Stewartby. Bought Spink, 1999.

122	Obverse 49^{E}	Reverse RR52^{E}	Wt (g)	Die-Axis
a.*	[ ]	[ ]RÆWL:DЄ[ ]	1.22	100°

a. Lord Stewartby. Bought Spink, 1999.

123	Obverse 50^{E}	Reverse RR53^{E}	Wt (g)	Die-Axis
a.*	[ ]:[ ]	[ ]OИROCЄ:	[0.67] *cut halfpenny*	180°?

a. Lord Stewartby. Bought M. Senior, 28 July 1999.

124	Obverse 51^{E}	Reverse RR54^{E}	Wt (g)	Die-Axis
a.*	[ ]:[ ]W[ ]Є[ ]	+RAVL·ON:ROC	1.41	310°

a. National Museums of Scotland, Edinburgh, K.2002.228. Found by a metal-detectorist at Soutra, Midlothian, in 2000. Single find S16.

125	Obverse 52^{E}	Reverse RR55^{E}	Wt (g)	Die-Axis
a.*	[ ]	[ ]L:O[ ]	1.15	?

a. Found by a metal-detectorist at Fala, Midlothian, 1993. Single find S3.

126	Obverse 53^{E}	Reverse RR56^{E}	Wt (g)	Die-Axis
a.*	[ ]	[ ]VL:ON[ ]	[0.42] *fragment*	?

a. Found by a metal-detectorist at Dornoch, Sutherland, May 2004. Single find S2.

Moneyer: Raul Derlig

127	Obverse 11^{C}	Reverse RRD1^{C}	Wt (g)	Die-Axis
a.	[+LЄRЄIWIL]ĀO:	[+RĀ]VLDЄR[LIGRO:]	[0.82] *cut halfpenny*	300°
b.*	+LЄ[RЄIWIL]ĀO:	+R[ĀVLDЄRLIG]RO:	1.44	120°
c.*	+L[ЄRЄIWILĀO:]	[+RĀVLDЄ]RLIG[RO:]	1.41	40°?

a. University Museum of Cultural Heritage, Oslo. Daeli hoard, 1840. Overstruck on a *pfennig* of Frederick Barbarossa of Duisberg mint.

b. Lord Stewartby. Ex Clontesbrook Trust, Glendining 7 June 1974, lot 304 (part); ex R.C. Lockett, Glendining 26 October 1960, lot 692 (part). *Lockett Photographs* (Scottish coins) 2/11. Illusrated by I. Stewart in *Lagom* (Münster: 1981) p. 206, nos. 2a and 2b. Overstruck on a *pfennig* of Frederick Barbarossa of Duisberg mint.

c. Lord Stewartby. Ex W.S. Marshall, Glendining 29 April 1946, lot 161 (part); ex A.N. Brushfield, Glendining 28 March 1940, lot 25(f).

128	Obverse 26[C]	Reverse RDR2[C]	Wt (g)	Die-Axis
a.	+L[ЄR]ЄIWILAO:	+R[A]VL[DЄR]LIGRO	1.46	220°
b.*	[+L]ЄRЄIWILAO[:]	+RAVLDЄRLIGRO	1.44	300°
c.*	+LЄ[RЄIWIL]AO:	+RAVLDЄRLIGRO	1.45	150°
d.	+LЄ[RЄIWILA]O:	+[RAVLDЄRLI]GRO	1.40	50°
e.	+LЄRЄIWI[L]AO:	+[R]AVLDЄRLIGRO	1.48	160°
f.	+LЄRЄIW[ILA]O:	[+]RAVLDЄ[R]LI[G]RO	—	310°

a. Ashmolean Museum, Oxford. From I. Stewart by exchange, 17 August 1966. Ex R.W. Cochran-Patrick, Sotheby 30 March 1936, lot 127 (part); ex Society of Antiquaries. *SCBI* 35 (Oxford/Glasgow), no. 45. EPMA conducted 2005.

b. British Museum, CM SSBp001–17. Acquired from S.S. Banks.

c. National Museums of Scotland, Edinburgh, H.C727. Ex J.G. Murdoch, Sotheby 11-13 May 1903, lot 12; ex Kermack Ford; ex A.B. Richardson. Burns recorded this specimen when it was in the possession of A.B. Richardson; Burns, *Coinage*, vol. 1, p. 61 and vol. 3, Pl. IV, fig. 38A.

d. Lord Stewartby. Ex H.A. Parsons, Glendining 11 May 1954, lot 701 (part).

e. Lord Stewartby. Ex Clontesbrook Trust, Glendining 7 June 1974, lot 304 (part); ex R.C. Lockett, Glendining 26 October 1960, lot 692 (part). *Lockett Photographs* (Scottish coins) 2/6. Illustrated by I. Stewart in *Lagom* (Münster: 1981) p. 206, no. 3.

f. Current whereabouts unknown. Ex J.K.R. Murray, Spink 29 April 1987, lot 52; ex R.C. Lockett, Glendining 18 June 1957, lot 27 (part). *Lockett Photographs* (Scottish coins) 2/10.

129	Obverse 11[C]	Reverse RD2[C]	Wt (g)	Die-Axis
a.*	+LEREIW[IL]ÆO:	+RÆVLD[ERLIG]:·:	1.39	340°
b.*	[+L]ERE[I]WI[LÆO:]	[+RÆVLDE]RLIG[:·:]	[0.69] *fragment*	90°
c.*	[+L]EREIWILÆO[:]	+RÆVLDE[RLIG:·:]	1.27	290°
d.	+LER[EIWILÆO]:	+RÆ[VLDERL]IG:·:	—	45°

a. National Museums of Scotland, Edinburgh H.C723. Ex R.C. Lockett, Glendining 18 June 1957, lot 26 (part). *Lockett Photographs* (Scottish coins) 2/3.

b. Perth Museum and Art Gallery, SMC 639. Found in excavations in High Street, Perth, in 1975-7. Single find S14.

c. Lord Stewartby. Bought 31 August 1962. Ex H.J. Dakers and C. H. Dakers joint collection, Glendining 8 October 1946, lot 282 (part).

d. Current whereabouts unknown. Ex R.C. Lockett, Glendining 26 October 1960, lot 692 (part). *Lockett Photographs* (Scottish coins) 2/4.

130	Obverse 11[C]	Reverse RD3[C]	Wt (g)	Die-Axis
a.*	[+LE]REI[WIL]ÆO[:]	[ ]LDE[ ]	1.39	140°
b.*	[+LEREIW]ILÆO:	[ ]ÆVL[ ]	1.35	180°
c.	[+LE]REI[WI]LÆO:	[ ]ÆVL[D]E[ ]	1.46	210°

a. Ashmolean Museum, Oxford. Purchased from I. Stewart, 1982. *SCBI* 35 (Oxford/Glasgow), no. 18.

b. Royal Mint Museum, Llantrisant. W.J. Hocking, *Catalogue of Coins, Tokens, Medals, Dies, and Seals in the Museum of the Royal Mint*, vol. 1: Coins and Tokens (London: 1906), no. 2701. Overstruck, but undertype uncertain.

c. Lord Stewartby. Bought 10 December 1964. Ex W. De Vore.

131	Obverse 11[C]	Reverse RD4[C]	Wt (g)	Die-Axis
a.*	[+LE]REIW[ILÆO:]	[+RÆVLDE]RLIG[:]	1.43	320°
b.*	[+L]ERE[I[WI]LÆ[O]:	+R[ÆV]LDERLIG:	1.40	270°

a. Ashmolean Museum, Oxford. Purchased from I. Stewart, 1982. *SCBI* 35 (Oxford/Glasgow), no. 17.

b. Lord Stewartby. Bought 1961. Ex H.A. Parsons, Glendining 11 May 1954, lot 701 (part).

132	Obverse 11^{C}	Reverse RD5^{C}	Wt (g)	Die-Axis
a.*	[+]LEREIWILAO:	+R[AV]LDERLIG:	1.46	80°
b.	[+]LEREI[WILAO:]	+R[AVLDER]LIG:	1.42	
c.	[+]LER[EIW]ILAO:	+R[AV]LDE[RL]IG:	1.42	140°

a. Ashmolean Museum, Oxford. H. Hird donation, 1953. Ex R.W. Cochran-Patrick, Sotheby 30 March 1936, lot 128. *SCBI* 35 (Oxford/Glasgow), no. 16. EPMA conducted 2005.

b. National Museum of Denmark, Copenhagen. C.J. Thomsen. K. Erslev, *Catalogue de la de Monnaies de feu Christian Jürgensen Thomsen. Seconde partie, Les Monnaies du moyen-age. Tome III, contenant les monnaies de l'Europe septentrionale et plusieurs appendices* (Copenhagen, 1876), no. 9782.

c. Lord Stewartby. Bought 24 July 1987. Ex J. Davidson.

133	Obverse 25^{C}	Reverse RD5^{C}	Wt (g)	Die-Axis
a.*	+LEREI[W]ILAO	+RAVLDE[RL]IG:	1.27	320°
b.	[+L]ERELWILAO	+R[AVL]DERLIG:	1.36	320°

a. National Museums of Scotland, Edinburgh, H.C724. Ex R.C. Lockett, Glendining 26 October 1960, lot 692(?); ex J.G. Murdoch, Sotheby 11-13 May 1903, lot 11 (illustrated); *Lockett Photographs* (Scottish coins) 2/5.

b. Lord Stewartby. Bought 24 July 1987. Ex J. Davidson.

134	Obverse 26^{C}	Reverse RD6^{C}	Wt (g)	Die-Axis
a.*	[+]LERELW[ILAO:]	[L]DERLIG[:]?	1.36	135°
b.	+LE[RELWI]LAO:	[ ]LDERLIG[:]?	1.29	180°

a. Birmingham City Museum and Art Galleries, 1993 C 571. I.D. Finney, bought Seaby Ltd, 1947.

b. Lord Stewartby. Bought 10 August 1958.

135	Obverse 26^{C}	Reverse RD7^{C}	Wt (g)	Die-Axis
a.*	+LERE[IWILAO:]	[+RAV]LDERL[IG:·:]	1.48	110°
b.	+[////]RELWIL[////]AO:	+RAV[L]DERLIG:·:	1.39	?

a. Ashmolean Museum, Oxford. *SCBI* 35 (Oxford/Glasgow), no. 19. Purchased from I. Stewart, 1982. Die-axis here corrected from sylloge. EPMA conducted 2005.

b. Lord Stewartby. Bought Spink, 1961. Obverse double-struck.

136	Obverse 26^{C}	Reverse RD8^{C}	Wt (g)	Die-Axis
a.*	[+LEREG]IWILAO):	+RAV[L]DE[R]LIG:·	1.31	150°

a. National Museums of Scotland, Edinburgh, H.C720. Richardson, *Catalogue*, p. 9 no. 26.

137	Obverse 26^{C}	Reverse RD9^{C}	Wt (g)	Die-Axis
a.*	[+]L[E]REIWILAO)[:]	+RAVL[DE]RLIGFL	1.42	200°
b.	[+]LERE IWI[LAO):]	+[RAVL]DERLIGFL	1.46	0°
c.*	+LER[E]IWILAO):	+[RA]VLDERLIGFL	1.47	70°

a. National Museums of Scotland, Edinburgh, H.C16485. T. Coats collection. Burns, *Coinage*, vol. 1, p. 61, no. 18 and vol. 3, Pl. IV, fig 38.
b. National Museums of Scotland, Edinburgh, H.C728. Ex R.C. Lockett, Glendining 18 June 1957, lot 21 (part); ex Petrie, ex Christmas. *Lockett Photographs* (Scottish coins) 1/68.
c. Lord Stewartby. Bought Dix Noonan Webb 8 October 2002, lot 604. Pedigree erroneously given as 'Ex Lockett' in auction catalogue.

138	Obverse 27^{C}	Reverse RD10^{C}	Wt (g)	Die-Axis
a.*	[+REIWI]LAM[·]	+RA[V]LD[E]RLIG:·	1.44	30°

a. National Museums of Scotland, Edinburgh, H.C722. Richardson, *Catalogue*, p. 9 no. 27.

139	Obverse 28^{C}	Reverse RD11^{C}	Wt (g)	Die-Axis
a.	[+L]E[REIWILAO]	+RAVLDERLIG:·	1.45	200°
b.*	[+]LE[REIWI]LAO)[ ]	+RAV[LDE]RLIG:·	1.33	240°
c.	[+]LERE IWIL[AO]	+RAV[LDER]LIG:·	1.48	180°
d.	[+L]ERE IW[ILAO]	+[RAVL]DERLIG:·	1.42	
e.*	+LERE[IWI]LAO)[ ]	+[R]AVL[DER]LIG:·	1.41	350°

a. Ashmolean Museum, Oxford. Purchased from I. Stewart, 1982. *SCBI* 35 (Oxford/Glasgow), no. 20.
b. British Museum, CM SSBp001–15. Acquired from S.S. Banks.
c. National Museums of Scotland, Edinburgh, H.C16486. T. Coats collection. Burns, *Coinage*, vol. 1, p. 61, no. 19 (not illustrated).
d. Paisley Museum and Art Galleries, 1194/1957. Bought Baldwin, 1957.
e. Lord Stewartby. Ex H.J. Dakers and C.H. Dakers joint collection, Glendining 8 October 1946, lot 284 (part).

140	Obverse 29^{C}	Reverse WB1^{C}	Wt (g)	Die-Axis
a.*	+LEREI[ ]AO[ ]	+WALTERBVC[ ]	1.37	220°

a. Society of Antiquaries of Newcastle upon Tyne, SC/1.

141	Obverse 29^{C}	Reverse WB2^{C}	Wt (g)	Die-Axis
a.*	+LERE IWIL[ ]	+WA[ ]ETER	1.41	1.41°

a. Lord Stewartby. Ex 'New Jersey', Stacks (New York) 1 May 1987, lot 1849; ex Marquis of Bute, Sotheby 11 June 1951, lot 212 (part); ex J.G. Lornie. Burns, *Coinage*, vol. 1, p. 58, no. 23*a* and vol. 3, Pl. IV, fig 40A.

142	Obverse 54^{E}	Reverse RA1^{E}	Wt (g)	Die-Axis
a.*	+WLЄLMV[ᔕR]"	[+R]ADVL:FVSO[N]	1.39	160°
b.	+WLЄLMVᔕRЄ"	[+RAD]VL:FVSON	1.22	160°

a. Lord Stewartby. Bought Baldwin, late 1960s. Ex Baddinsgill hoard, 1832. Published by Lord Stewartby in *NC* 2005, p. 225 no. 6 and illustrated Pl. 27.

b. Lord Stewartby. Bought Baldwin, late 1960s. Ex Baddinsgill hoard, 1832. Published by Lord Stewartby in *NC* 2005, p. 225 no. 7 and illustrated Pl. 27.

143	Obverse 55^{E}	Reverse RA2^{E}	Wt (g)	Die-Axis
a.*	+VILLÆM·:RЄID[E]	[+]RÆ:DVL:FVS:ON	1.37	270°
b.*	+[VILL]ÆM·:RЄIDE	+RÆ:[D]VL:[FVS:ON]	1.44	0°
c.	+[VILLÆM]·:RЄIDE	+[RÆ:DVL:FV]S:ON	1.19	0°

a. Ashmolean Museum, Oxford. Purchased from I. Stewart, 1982. *SCBI* 35 (Oxford/Glasgow), no. 22. EPMA conducted 2005.

b. Lord Stewartby. Bought Baldwin, late 1960s. Ex Baddinsgill hoard, 1832. Published by Lord Stewartby in *NC* 2005, p. 225 no. 8 and illustrated Pl. 27.

c. Lord Stewartby. Ex J.E.L. Murray; Spink (London) Auctions no. 69, April 1989, lot 232.

144	Obverse 56^{E}	Reverse RA3^{E}	Wt (g)	Die-Axis
a.*	[ ]L:·:ЄL[ ]	[ ]L:VLFVS: [ ]	1.32	340°

a. Hunterian Museum, Glasgow, GLAHM 14501. W.J. Cuthbert bequest.

145	Obverse 56^{E}	Reverse RA4^{E}	Wt (g)	Die-Axis
a.*	[ ]L:·:ЄL[ ]	[+]RA[D]VL:[FVSON]	1.25	0°

a. Lord Stewartby. Bought Baldwin.

146	Obverse 57^{E}	Reverse RA5^{E}	Wt (g)	Die-Axis
a.*	+W[ ]LM[ ]Ɛ"I·	[ ]S:ON	1.21	90°

a. Lord Stewartby. Bought Classical Numismatic Group Auction no. 20, 25 March 1992, lot 1394.

147	Obverse 58^{E}	Reverse RA6^{E}	Wt (g)	Die-Axis
a.*	+VIL[ ]ÆM[ ]D	+RÆ[ ]:O[ ]⁘	1.36	0°

a. Lord Stewartby. Bought Baldwin, late 1960s. Ex Baddinsgill hoard, 1832. Published by Lord Stewartby in *NC* 2005, p. 225 no. 5 and illustrated Pl. 27.

Moneyer: Raul Derlig

148	Obverse 59^{E}	Reverse RD12^{E}	Wt (g)	Die-Axis
a.*	[ ]RЄIWIL:LA[ ]	+R·ÆVL[D]R·[ ]CN	1.35	310°
b.*	[ ]RЄIWIL:LA[ ]	+R·ÆVLD[R· CN]	1.47	330°

a. National Museums of Scotland, Edinburgh, H.C16484. T. Coats collection. Burns, *Coinage*, vol. 1, p. 60, no. 17 and vol. 3, Pl. IV, fig 34.
b. Yorkshire Museum, York. *SCBI* 21 (Yorkshire), no. 1510. Purchased in York, 1877.

149	Obverse 60^{E}	Reverse RD13^{E}	Wt (g)	Die-Axis
a.*	[ ]LÆO):	[ ]LDЄRL[ ]	1.31	250°

a. National Museums of Scotland, Edinburgh, H.C721.

150	Obverse 61^{E}	Reverse RD14^{E}	Wt (g)	Die-Axis
a.*	[ ]Є1·W[ ]	[ ]Æ[ ]DЄRL[ ]G	1.16	270°

a. Lord Stewartby. Bought 24 July 1987. Ex J. Davidson.

151	Obverse 62^{E}	Reverse RD15^{E}	Wt (g)	Die-Axis
a.*	+[ ]LÆO)⁘	+RÆ.VL.DЄR·LIN	1.37	40°

a. Lord Stewartby. Bought 8 April 1961. Ex R. Carlyon-Britton (6014).

152	Obverse 63^{E}	Reverse RD16^{E}	Wt (g)	Die-Axis
a.*	+LЄRЄIWIL[ ]:	+R[ ]IGON	1.46	40°

a. Lord Stewartby. Bought December 1972.

153	Obverse (?)	Reverse (?)	Wt (g)	Die-Axis
a.	[ ]	[ ]	[?] *chipped cut farthing*	?

a. Scottish Borders Council Museum Service, Kelso Store, KEL KM: D001. Found in excavations undertaken by the Border Burghs Archaeology Project at Springwood Park, Kelso, in 1986. Single find S8.

154	Obverse (?)	Reverse (?)	Wt (g)	Die-Axis
a.	[ ]	[ ]	[0.39] *fragment*	?

a. Found by a metal-detectorist at Llanfaes, Anglesey, 1994. Recorded by E. Besly, 'Short Cross and other medieval coins from Llanfaes, Anglesey', *BNJ* 65 (1995), pp. 46-82, at p. 75 no. 554. Single find S9.

155	Obverse (?)	Reverse (?)	Wt (g)	Die-Axis
a.*	[ ]	[ ]DERO	1.17	80°

a. National Museums of Scotland, Edinburgh, H.C718. Ex R.C. Lockett, Glendining 26 October 1960, lot 691 (part). *Lockett Photographs* (Scottish coins) 1/86. Contemporary forgery?

10.6 CONCORDANCES WITH CATALOGUE

10.6.1. E. Burns, *The Coinage of Scotland* (Edinburgh: 1887).

At its time of publication *The Scottish Coinage* was the most advanced treatment of the medieval coinage of any European nation. The scope and methodologies employed remain impressive today, yet in places the arrangement of the material emerges as somewhat abstruse when the work is employed in modern numismatic research. Burns grouped coins under headings with a reference to an illustration on a Plate, but to determine which individual coin was reproduced the Plate must be checked against the coins in the National Museums of Scotland.

As can be seen from the concordance, the numeration of the coins in text does not parallel that of the illustrations. Burns treated the coinage by mint in the text, but arranged the coins on Plate IV by variety of sceptre-head. Of the twenty-four coins in the collection of Thomas Coats, twenty-three are numerate-catalogued in the text; one is only mentioned as a die duplicate of no. 1, p. 58 (**2b**). Additionally, Burns incorporated and illustrated important specimens from other collections that were not represented in that of Coats. These are mentioned in the text and the figure numbers printed in the margin at the relevant paragraph; in important cases a specimen was numerate-catalogued in the text and given an italicised suffix letter.

Vol. 1	Vol. 3 Plate IV	Catalogue	Vol. 1	Vol. 3 Plate IV	Catalogue
p. 58 no. 1	fig. 29	**2a**	p. 60 no. 12	——	**109a**
——	fig. 29A	**9a**	p. 60 no. 13	fig. 37	**100b**
——	fig. 29B	**6a**	p. 60 no. 14	——	**92a**
p. 58 no. 2	——	**44b**	p. 60 no. 15	——	**73c**
p. 58 no. 3	fig. 30	**49b**	p. 60 no. 16	——	**86c**
p. 59 no. 4	——	**43b**	p. 60 no. 17	fig. 34	**148a**
p. 59 no. 5	fig. 31	**38a**	p. 61 no. 18	fig. 38	**137a**
p. 59 no. 6	fig. 32	**13e**	——	fig. 38A	**128c**
——	fig. 32A	**13b**	p. 61 no. 19	——	**139c**
p. 59 no. 7	——	**15c**	p. 61 no. 20	fig. 39	**26d**
p. 59 no. 8	fig. 35	**18b**	p. 61 no. 21	——	**32a**
p. 59 no. 9	——	**20b**	p. 61 no. 22	fig. 40	**33i**
p. 60 no. 10	fig. 36	**10b**	p. 61 no. 23	——	**28d**
p. 60 no. 11	fig. 33	**60b**	p. 62 no. 23*a*	fig. 40A	**141a**

10.6.2. A. B. Richardson, *Catalogue of the Scottish Coins in the National Museum of Antiquities Edinburgh* (Edinburgh: 1901)

Richardson catalogued twenty-eight coins in the main section and a further five in the Addenda. Richardson begins his numeration afresh for each reign.

Richardson	Catalogue	Richardson	Catalogue	Richardson	Catalogue
p. 5 no. 2	**9a**	p. 7 no. 13	**17a**	p. 9 no. 24	**93a**
p. 5 no. 3	**1c**	p. 7 no. 14	**20a**	p. 9 no. 25	**113a**
p. 6 no. 4	**49a**	p. 7 no. 15	**10c**	p. 9 no. 26	**135a**
p. 6 no. 5	**44a**	p. 7 no. 16	**59a**	p. 9 no. 27	**138a**
p. 6 no. 6	**51a**	p. 8 no. 17	**66a**	p. 9 no. 28	**29b**
p. 6 no. 7	**43d**	p. 8 no. 18	**98a**	p. 10 no. 29	**33g**
p. 6 no. 8	**35a**	p. 8 no. 19	**94b**	p. 334 no. 10	**47a**
p. 6 no. 9	**13b**	p. 8 no. 20	**86d**	p. 334 no. 11	**39a**
p. 7 no. 10	**14a**	p. 8 no. 21	**96c**	p. 334 no. 12	**30b**
p. 7 no. 11	**21a**	p. 8 no. 22	**116a**	p. 334 no. 13	**25c**
p. 7 no. 12	**16a**	p. 9 no. 23	**85b**	p. 335 no. 14	**33f**

10.6.3. J. D. Bateson and N.J. Mayhew, *Sylloge of Coins of the British Isles* 35, Scottish Coins in the Ashmolean Museum, Oxford and the Hunterian Museum, Glasgow (Oxford: 1987)

The Scottish coins in the Ashmolean Museum, Oxford and the Hunterian Museum, Glasgow were syllogized in 1987. In this volume the two collections were integrated with a prefix (A or H) indicating their institutional ownership, retained here in the concordance, appearing after the running number. Post-sylloge, two coins have been acquired by the Hunterian Museum as part of Dr W.J. Cuthbert bequest (**49d, 144a**) and one coin has been acquired by the Ashmolean Museum (**19a**).

SCBI 35	Catalogue	*SCBI* 35	Catalogue	*SCBI* 35	Catalogue
15/A	**5a**	26/H	**30a**	37/A	**55a**
16/A	**132a**	27/A	**29a**	38/A	**60a**
17/A	**131a**	28/A	**33a**	39/A	**57a**
18/A	**130a**	29/A	**36a**	40/A	**62a**
19/A	**135a**	30/A	**36b**	41/A	**96a**
20/A	**139a**	31/A	**49a**	42/A	**86a**
21/A	**8a**	32/A	**48a**	43/A	**83a**
22/A	**143a**	33/A	**46a**	44/A	**72a**
23/A	**11a**	34/A	**50a**	45/A	**128a**
24/A	**15a**	35/A	**68a**	46/A	**95a**
25/A	**25a**	36/A	**52a**	47/A	**87a**

10.6.4. *Lockett Photographs* (Scottish coins)

Unpublished photographs. The coins in the collection of R.C. Lockett were photographed as a prelude to their publication as a volume of a projected *Sylloge Nummorum Brittanicorum*. The Lockett family's insistence on the expeditious sale of the collection contributed to the abandonment of the project, but the concept was recast as the *Sylloge of the Coins of the British Isles*. The high quality of the photographs and the scope of the collection make these an ideal reference work.

Photograph	Catalogue	Photograph	Catalogue	Photograph	Catalogue
1/66	**1b**	1/78	**33d**	2/1	**61a**
1/67	**3a**	1/79	**6a**	2/2	**86e**
1/68	**137a**	1/80	**39b**	2/3	**129a**
1/69	**11d**	1/81	**34a**	2/4	**129d**
1/70	**11c**	1/82	**43c**	2/5	**133a**
1/71	**18a**	1/83	**46c**	2/6	**128e**
1/72	**13d**	1/84	**49h**	2/7	**93c**
1/73	**26c**	1/85	**43h**	2/8	**98d**
1/74	**25d**	1/86	**155a**	2/9	**92b**
1/75	**28b**	1/87	**8c**	2/10	**128f**
1/76	**29c**	1/88	**57c**	2/11	**127b**
1/77	**28c**				

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12. Glossary

Alloy, the act of, or the mixture created by, combining a 'noble' metal (gold and/or silver) with a 'base' one, usually copper.

Atomic Absorption Spectrometry (AAS), a method of chemical analysis involving excitation of characteristic elemental frequencies and their subsequent self-absorption.

Bezant, the name given in the medieval west to the standard gold coin of the Byzantine monetary system, which in the twelfth century was the hyperpyron established by Alexius I in 1092.

Brockage, a coin on which the same design is found in relief on one face and incuse on the other, resulting from the coin having been accidentally struck on top of a preceding coin, which had adhered to one of the dies.

Clipping, the illegal diminution of the flan (q.v.) of a coin by shearing-off excess metal from the edge.

Class, the numismatic term for the division of a coinage issue (q.v.), for a group of coins having the same basic affinities. A class is usually chronological significant.

Die (latin *cuneus*), the single stamp used to produce coins.

Die-axis, the relative position of the reverse die to the obverse die when a coin was struck, as demonstrated by a surviving coin. The die-axis is expressed by following the degrees of a circle to the nearest 10°, calculated as the position of the initial cross (q.v.) on the reverse relative to the obverse with the king's head upright. Most medieval coins have an irregular die-axis, but noting die-axis (along with weight) is useful for identifying individual specimens.

Dirham, the standard silver denomination of the Islamic coinage system from the eighth to the eleventh centuries, derived from the Sasanian drachm.

Electron Probe Microanalysis (EPMA), an (almost) non-destructive near-surface method of compositional analysis on metallographically polished areas on a coin.

Field, the central blank space of a coin without elements of the main design.

Flan, the disk of metal which constitutes the coin.

Grain, the seed of some cereal crop, the average weight of which is the notional basis of a weight system. In Britain the grain was either that of the barley corn (approximately 0.065g) or the lighter wheat grain (approximately 0.05g).

Hoard, a group of coins intentionally concealed together as a group (as opposed to an accidental accumulation of coins, such as votive offerings cast into a spring).

Immobilisation (as in 'Immobilised type'), a coin type (q.v.) that persisted in use over a substantial period of time, during which elements of the design became fossilised or canonical, but ceased to be appropriate (e.g. the bust and name 'Henry' remained unchanged on the Short Cross coinage, 1180–1247).

Initial mark, the symbol (usually a cross) which precedes and denotes the beginning of the legend on a coin (q.v.)

Issue, a single coinage known or presumed to have been produced according to an official directive to a standard weight and alloy.

Legend, the words or letters on a coin, consisting of the ruler's name on the obverse (q.v.) and the name of the mint (q.v.) and moneyer (q.v.) on the reverse (q.v.).

Mint, a place where money is produced, but usually associated with the town in which numerous moneyers were at work separately. Thus, 'Northampton mint' properly denotes the moneyers at work in that borough rather than a single physical building.

Moneyer, the individual responsible for the production of the coins and named on them, not necessary the individual who actually produced the coins.

Obverse, the side of the coin with the name, titles and image of the king. The obverse die carried a more complex design than the reverse (q.v.) and was therefore usually the lower die, which lasted longer.

Mule, a coin produced from dies which were not intended to be used together; such dies are said to have been 'muled' together.

Reverse, the side of the coin naming the mint and the moneyer. The reverse die carried a less complex design than the obverse (q.v.) and was therefore usually the upper die, because this wore out faster.

Standard Deviation, the mathematically defined 'figure of merit' which describes the spread or dispersion of measurements.

Sterling, the term traditionally applied to the Scottish denomination equivalent to the English penny.

Type, the name applied to a coinage issue (q.v.) derived from the main elements of the design as exhibited on each face of a coin. A type is usually subdivided by class (q.v.).

X-ray Fluorescence (XRF), a method of chemical analysis involving bombardment of a sample with polychromatic X-rays. The constituent wavelengths of the resultant fluorescent (or secondary) X-rays, which are characteristic of the original elements in the sample, are analysed by a spectrometer.