

THE JOINT COINAGE OF ECGBERHT AND EADBERHT OF NORTHUMBRIA

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DURING Eadberht's reign as king of Northumbria (737–58), two types of inscribed coins were issued. The more prevalent were issued in Eadberht's name only, the obverse consisting of his name around a central cross and the reverse a quadruped with a variable number of symbols in the fields. A representative example is illustrated in Fig 1. These coins are referred to as 'regal coins'. Although there are three customary renderings of Eadberht's name in the regal coinage, namely EOTBEREhTVΓ•, EAdBERhTVΓ•, and EOTBERHTVS• (and variants), only EOTBEREhTVΓ• and its variants are used in the archiepiscopal coinage.



Fig.1. Regal coin (left); archiepiscopal coin (right) (private collections)

Note: All illustrations in this article are enlarged. The actual size of the coins is usually c. 13–14 mm.

A less common but substantial minority of the coinage of the time is the joint issue of Eadberht and his brother, Archbishop Ecgberht. Ecgberht was elected bishop of York in 732 and raised to archiepiscopal status in 735, serving in this capacity until 766. The obverse of these coins is very similar to that of the regal coins, with Eadberht's name around a central cross. The reverse has a figure of the archbishop on the left of the coin with his name often followed by an abbreviated title. There are variations, but a representative example is illustrated in Fig 1. These coins are referred to as archiepiscopal or Ecgberht coins. They are c. 13–14 mm in diameter and weigh approximately 1 g.¹ They are of relatively fine silver, with silver contents of 46, 62, and 64 per cent as determined from three specimens by Northover and Metcalf, and with perhaps two different standards of fineness, of one-half and two-thirds silver.² The side with Eadberht's name is considered to be the obverse and the side devoted to Ecgberht is considered to be the reverse.

Since Booth's original paper on Northumbrian coinage in 1984,³ which considered this coinage on the basis of only twenty-eight available specimens, many new specimens have come to light, mostly due to the vigorous activities of metal detectorists. With this influx of much

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¹ A tabulation of the weights of a large number (143) of regal and archiepiscopal coins (numbers of each type were not given) gave a mean weight of 0.99 g (Naismith 2012, 305).

² Metcalf and Northover 1994, 611–79.

³ Booth 1984.

new material, it seemed the time was right to reconsider this coinage. This work was inspired by Booth's work, without which this study would have been a far greater challenge.

This study consists of four general parts and a conclusion: the first part will consider some pertinent general aspects of the coinage; the second addresses the classification of the coinage into types, with a proposed scheme for the sequencing of those types; the third consists of some inferences regarding the mint or mints; the fourth consists of other observations on the coinage. At the outset it should be noted that the author has tried to avoid analyses based upon 'style' or inferred characteristics of individual die cutters as much as possible, as such analyses are very subjective, and every attempt was made to base this study upon less subjective features of the coinage.

1. General observations on the archiepiscopal coinage

Estimates of total numbers of obverse and reverse dies produced

Table 1 summarizes the size and characteristics of the study sample.⁴ The method derived by Esty⁵ was used to estimate **e**, the total number of dies for each side, by the formula:

$$e = nd/(n-d)$$

where **n** is the total number of coins and **d** is the total number of different dies. Based upon the sample, this indicates that *c.*151 obverse (Eadberht) dies and *c.*98 reverse (Ecgerht) dies were produced during the entire lifetime of the coinage. The endpoints of the 95 per cent confidence intervals for these estimates were also determined, again according to Esty,⁶ using the formula:

$$e + (2e/n)^2 \pm (2e/n)[(2e)^{0.5}]$$

where **e** is the estimate of dies previously determined and **n** is the total number of coins. The resultant endpoints of the 95 per cent confidence intervals for the obverse dies are 115 to 198 and for the reverse dies 78 to 122.⁷

TABLE 1. Study sample

	<i>Sides with enough detail for die matching</i>	<i>Different dies</i>	<i>Die duplicates</i>
Obverses	127	69 ⁸	58
Reverses	125	55 ⁹	70

From Booth's much smaller sample of coins, Metcalf estimated that for specimens 1–9a, there was an obverse to reverse die ratio of 3:1 and for specimens 10–27, an obverse to reverse die ratio of 6:1.¹⁰ This study's much larger sample of coins allows the ratio to be refined to approximately 1.5:1 (151/98) for the entire series.

Anvil dies received less wear than trussel dies, and thus lasted longer. Fewer anvil dies were therefore required than trussel dies. Consequently the die that was more difficult to produce was generally used as the anvil die. This die was considered more important and often belonged to a king or ruler; in this coinage the anvil die is the Ecgerht die. This at least points to the

⁴ Appendix 1 (pp. 135–6) describes the methods used for image acquisition, die-matching, and die-linking, and gives the sources for the illustrations in the plates.

⁵ Esty 2011.

⁶ Esty 2006.

⁷ The confidence intervals are most appropriately interpreted in this way: with 95 per cent confidence the original number of obverse dies is between 115 and 198, and the original number of reverse dies is between 78 and 122.

⁸ All sixty-nine obverse dies had at least one reverse with enough detail to allow die matching.

⁹ But only 51 of the 55 reverse dies had a corresponding obverse with enough detail to allow die matching. This explains why 55 different reverse dies were used to estimate the total number of reverse dies initially produced, but why only 51 reverse dies corresponded to the 69 different obverse dies. The 69 obverse and 51 reverse dies are illustrated in the plates. The four reverse dies without die-matchable obverses are covered in Appendix 2 (p. 137), so that all known dies at the time of study are recorded for completeness.

¹⁰ Metcalf 1994, 588.

tantalizing possibility that for the archiepiscopal coinage Ecgberht was considered more important, or considered himself to be more important, than Eadberht. This, however, is highly conjectural and cannot be proven. Therefore for this study past convention will be followed and the Eadberht side is considered the obverse and the Ecgberht side the reverse.

The ratios of the total number of known Eadberht (obverse) dies to predicted total dies is $69/151 = 0.46$. The total number of known Ecgberht (reverse) dies to the predicted total dies is $55/98 = 0.56$. Since these numbers are estimates, they are very similar and can be considered to be in agreement. The average of these two numbers is 0.5, which means that only about half of the total number of dies that were produced are known. It should therefore be expected that new varieties will be revealed in the future as new finds surface.

Inferences about the relative sizes of the archiepiscopal and regal coinages

From a larger, ongoing study of the regal coinage by the author calculations by the method of Esty previously cited indicate at the time of writing that there were approximately 517 inscribed obverse dies and 367 'fantastic animal' reverse dies produced for the Eadberht regal coinage. It seems reasonable to conclude that a ratio of the total number of Ecgberht archiepiscopal dies to the total number of Eadberht regal dies is reflected in coinage volumes: $(151 + 98) / (517 + 367) = \sim 0.3$. That Ecgberht's coinage volume equalled approximately 30 per cent that of Eadberht's is not a trifling output for the archiepiscopal coinage.

Terminal or initial full-stop in obverse legend

Most of the obverse legends have a stop, as seen in many figures in this work. Booth¹¹ and others have assumed that this stop is located at the beginning of the legend, i.e., •EOTBEREhTVΓ.¹² For the following reasons, it seems much more likely that the stop is located at the end of the legend, i.e. EOTBEREhTVΓ•. First, Plates 12, 14 and 16 show that the stop is very often closer to the 'Γ' (usually the top half) than it is to the 'E'. In many dies this relationship is quite pronounced, cf. dies oII/23, oIII/4, oIII/5 and oIII/10, which are by way of example but are by no means the only instances of this relationship. Furthermore, in the one case where there is an error and the Γ is not next to an E, die oIV/6 (Pl. 16), the stop maintains its relationship with the Γ instead of the E. Therefore the conclusion seems inescapable that the stop follows the Γ (EOTBEREhTVΓ•) and does not precede the E. For the remainder of this work, the obverse legend will be presented as EOTBEREhTVΓ• when it contains a stop between the Γ and the E.

2. Typology and sequencing of types

Classification of the archiepiscopal coinage

For the Ecgberht side of the coins, Booth suggested that there were two distinct styles, one with the archbishop in simple linear form with straight legs and the other more complex, showing him with flexed knees, with his posture on some of the latter suggesting he is sitting on a chair or throne. During the die matching for this article, where the coin images were observed repeatedly, it seemed that Booth surmised correctly that there are three distinctly different depictions of the archbishop: simple linear, slightly flexed knees (standing), and sitting (Fig. 2).

'Simple linear' refers to the very simple style of this type, where the archbishop has stick legs which are frequently very short, and often a single line, or stick, for his torso. He may not be standing, as the very short legs may mean that he is seated with hips flexed and his legs visible only from the knees down. Therefore, 'simple linear', rather than 'standing' is preferred.

¹¹ Booth 1984.

¹² Note that the Γ is a half-uncial 's' (cf. manuscripts of the period such as the Lindisfarne Gospels and Book of Kells).



Fig. 2. Initial categorization of three reverse types: (a) Simple linear; (b) Standing; (c) Sitting; corresponding obverses included (image b courtesy of CNG; a and c from private collection)

The type illustrated in Fig. 2b is a more accomplished engraving than the simple linear form, and the bent knees or slightly angled legs suggest he is standing. The archbishop as depicted in the right figure of Fig. 2c at first glance may not seem too different from his depiction in the standing type, but several features that will be discussed more fully later, including the angled groundline and the lack of arms or fingers touching the crosses, strongly imply that he is seated. From now on the archbishop will be described as either simple linear, standing, or sitting.

To see if these postures had significance, images of a majority of the reverse dies were subjectively segregated into the three types. The obverses belonging to each reverse type were then examined to see if patterns emerged. The great majority of obverses corresponding to each reverse type separated into different groups as illustrated in Fig. 2 and summarized in Table 2.

TABLE 2. Typical obverse legends and central designs of each reverse type in the initial check

<i>Reverse type</i>	<i>Obverse legend</i>	<i>Central design</i>
Simple linear	EOTBEREHTVT	Central cross, often smaller than in Standing type
Standing	EOTBEREHTVT•	Central cross, often larger than in Simple Linear type
Sitting	EOTBEREHTVT•	Annulet of pellets around obverse central cross, a few with pellets in angles of cross

Since the great majority of the obverse dies segregated into discrete categories for each reverse type, this validated the subjective reverse segregation. Because the obverse segregation was not subjective, as it was based on easily recognized features, the entire study sample was then differentiated into types using the more easily differentiable obverses. Furthermore, since it was the presence of such a small detail as a terminal stop at the end of EOTBEREHTVT that differentiated Type I (EOTBEREHTVT) from Type II (EOTBEREHTVT•) obverses, it seemed that the obverses belonging to the initial Type 3 should be broken down into two further types, a new Type III that lacked pellets in the angles of the cross and a Type IV that had pellets there. Representative examples of each of the final four obverse types follow (Fig. 3). There were a few variations from these representative examples that have significance. These will be discussed later (pp. 126, 127).

All sixty-nine obverse dies were segregated into Types I–IV, and the reverse dies that belonged to each obverse die were grouped. This resulted in the plates, for which the best images of each obverse and reverse die have been used. These dies all bear a designation in the form oI/ ref. no., in which ‘o’ stands for obverse, ‘I’ is the die type (I–IV), and the die number is last. A similar notation is used for the reverse dies. These die designations allow for ease of incorporation of new dies as they are discovered.



Fig. 3. The four varieties of obverse die with associated reverses (Type II and IV images courtesy of CNG; other images from private collection)

A few of the reverse dies span two obverse types through die links, and where this happens, the designation given to that reverse die is the first, or lower number, of the two obverse die types to which it links. For example, a reverse die that links with Types I and II obverse dies, no matter what the archbishop's posture, carries an rI, not an rII, designation. In the few instances where this occurs, the archbishop's posture 'fits' with the first die type. It is these outlier dies, which are mostly from die links of a single reverse with two obverse types, that may potentially confuse the unwary reader: for instance, when one coin has a Type II obverse and an rI reverse. A full explanation, with examples of this potential area of confusion, is given in the section of Appendix 3 (pp. 137–8) regarding Plate 13.

With this final categorization of all of the coins for which the dies had enough detail for die matching on both sides, there are indeed four distinct types that correspond to the four types hypothesized earlier (Fig. 3), with characteristic features summarized in Table 3. Enough data has now been presented to present the full case to show the archbishop is sitting in Type IV dies.

TABLE 3. Summary of distinguishing features of Types I–IV

Type	Obverse legend (with variants)	Type of Archbishop	Additional features
I	EOTBEREhTVΓ	Simple linear	None
II	EOTBEREhTVΓ•	Standing	None
III	EOTBEREhTVΓ•	Sitting	Annulet of pellets around obverse central cross
IV	EOTBEREhTVΓ•	Sitting ¹³	Annulet of pellets around obverse central cross, and pellets in angles of cross

The differing nature and significance of the archbishops's postures and fingers

Representative images of the archbishop as depicted in the typical reverses of the four different obverse types are given in Fig. 4. For all the reverses associated with each obverse type, the reader should consult the plates.

¹³ In all examples of Type IV, the legs extend past the angled line at the bottom; this only occurs in three of twelve Type III reverse dies.



Fig. 4. The four types of reverse dies (images courtesy of EMC (rI/7), Keith Chapman rIII/10), Mike Vosper (rIV/2) and private collector (rII/1))

In all reverse dies belonging to Type I obverses (**Pl. 11**), the legs are straight and stick-like, and terminate in perpendicular fashion with a horizontal straight line representing the 'ground'. These characteristics indicate either that the archbishop is standing and is shown with very short legs, or that he is seated with his legs only visible from the knees down. The majority, thirteen of nineteen, reverse dies associated with Type II obverses (**Pl. 13**) show bent knees with the feet more or less under the body in a posture that suggests weight bearing, with the legs terminating at a horizontal straight line representing the 'ground'. In one die the knees are not definitively identifiable, and of the remaining four reverse dies associated with Type II obverses, all with straight legs, one is considered to be a contemporary copy (rII/17),¹⁴ and is thus unreliable for analysis, two die link with both Type I and Type II obverses, and are thus considered rI reverses, and the last of the four has straight legs and is thus deemed an rI reverse, pending die link evidence as another link between Types I and II. The posture shown in these dies strongly suggests that the archbishop is standing. Of the reverses corresponding to Type III obverses (**Pl. 15**), two characteristics have changed compared to the reverses for Type II obverses. First, the feet no longer reside below the body in a manner which supports weight bearing but are directed away from the archbishop in a way implying that he is seated, as mentioned earlier. This observation is not new. Booth suggested that some reverses seemed to depict the archbishop sitting.¹⁵ Second, the line upon which the feet terminate is no longer perpendicular to the long axis of the archbishop's body, but slopes downward in relation to it in all Type III dies. It hardly seems likely that this is meant to depict the archbishop standing on a slope or walking downhill, and more likely shows the archbishop's feet on the floor or base of a chair, angled to show perspective as if the observer were in front of, and to the left of, the archbishop. It is possible that the perspective is the same as that shown in the following illustration of 'Bede's chair' at Jarrow, Fig. 5.



Fig. 5. 'St Bede's chair', St Paul's Church, Jarrow (left); Type III (centre); Type IV (right) (image of 'St. Bede's chair' courtesy of Wayne Robinson; Type III courtesy of private collector; Type IV courtesy of Mike Vosper)

¹⁴ This coin is considered a contemporary copy because the style is crude compared to the remainder of the study sample and it appears to be low fineness silver, or billon, in hand.

¹⁵ Booth 1984, 76.

The reverse dies corresponding to Type IV obverses are very similar to those corresponding to Type III obverses, except that in all four Type IV reverse dies the legs extend past the sloping baseline, with one remarkable die, rIV/2, going so far as to show feet, clearly not positioned on any ground or floor line (**Pl. 16**).¹⁶ That the legs extend past the sloping baseline in Type IV dies is further evidence that the archbishop is not standing but seated, with the angled baseline in this type representing the edge of his seat over which his legs extend and his knees bend, rather than representing the floor or base of the chair as is suggested in Type III reverse dies. The legs going past the angled line at the bottom of the flan are also a characteristic of Type IV dies, being present in all four of them but in only three of the twelve Type III reverse dies, when there is enough detail to make this determination. To this point the evidence indicates that the archbishop is standing on level ground in Type II reverse dies, and sitting on a chair in Type III and IV reverse dies.

There is further evidence supporting the hypothesis which concerns the archbishop's arms, hands, and fingers. On the reverses associated with Type II obverses (**Pl. 13**) the archbishop appears to be holding the implements next to him, as indicated by arms terminating at the implements or fingers touching them, as has been used to show the holding of an implement on other sceattas as well (**Fig. 6**).



Fig. 6. Sceattas with standing figures holding crosses (all images courtesy of CNG)¹⁷

On the reverses corresponding to Types III and IV obverses (**Pl. 15, 16**) the archbishop seems not to be holding the crosses on either side (the only implements in these types are crosses – there are no croziers), as his arms do not terminate on the staves of the crosses nor do his fingers touch them. His arms only appear to superimpose on the staves of the crosses. Data was sought to confirm these impressions. For the fifteen Type II reverse dies with standing legs for which enough detail was present to make this determination,¹⁸ an implement was shown being held by at least one arm in all fifteen dies (**Pl. 13**). For Type III reverses (**Pl. 15**), however, in all ten dies on which both arms are clearly seen, there is no evidence of arms terminating on a cross or fingers touching a cross, and therefore no indication that the crosses are being held, in any of the twelve dies (see **Fig. 7** for enlarged images of representative examples).¹⁹ Furthermore, in all three Type III reverse dies in which only one arm is seen, there is no evidence that it is holding its adjacent cross. In the four Type IV reverse dies, there is also no evidence that any cross is being held (**Pl. 16**).²⁰

¹⁶ The fifth reverse associated with a Type IV obverse die, die rIII/1, links obverses of Types III and IV and is thus a Type III reverse die.

¹⁷ The sceat on the left (Abramson 63–20; *SCBC* 808) shows arms terminating at the crosses that are being held. The middle coin (*SCBC* 816) shows two crosses being held with fists or fingers. The sceat on the right is of Egberht, showing the right hand terminating on the cross, indicating that it is being held, with the fingers of the left hand also holding the cross.

¹⁸ Given the vagaries of condition and strike, it was necessary in some cases to use multiple examples of a die (up to four) to be completely certain.

¹⁹ In ten dies, both arms are seen well enough to make this determination; in the other two dies only one arm is sufficiently visible, and in both instances the implement is not being held. In some cases, more than one example was needed to make this determination.

²⁰ In one die, rIV/3, the right arm is missing, so the evidence is seven of seven, not eight of eight, arms in four dies which show arms failing to hold a cross.



Fig. 7. The archbishop's hands and fingers on Type III reverses (left and middle) and Type IV (right) (left image courtesy of Keith Chapman; middle image courtesy of Andy Gillis; right image courtesy of Mike Vosper)



Fig. 8. Obverse of William I Canopy type penny, North 843 (image courtesy of CNG)

It may be concluded that there is very good evidence that the crosses are not being held in Type III and Type IV reverse dies.²¹ A parallel may be found in an example of the 'canopy' type penny of William I minted three centuries later (Fig 8). The vertical structures on each side of William's head might represent the staves of a throne, which support the triangular apex above his crown. Similarly, the two crosses in Ecgberht's Type III and IV reverses may represent crosses surmounted on the staves of the chair on which he is sitting, since he is not holding them. However, this is conjectural and perhaps not likely, as there are no examples of crosses surmounted on staves on any archbishop's throne in the early Christian church nor on any of the six extant English episcopal thrones *c.* AD 1100–1300 (none earlier survive).²² Instead, it may be that the crosses are free-standing devices behind the archbishop.

There is further information to support the hypothesis concerning the position of Ecgberht's hands and fingers. In Type III (Pl. 15), all hands are cupped, palms up, with seven of twelve right hands and eight of twelve left hands showing fingers. In Type IV reverses, all hands are cupped, palms up, with two of three right hands and three of four left hands showing fingers (Pl. 16). Hands cupped upwards are arguably not positioned to hold crosses.

If the archbishop is not holding the crosses, as they seem to be surmounted on the staves of his chair or are free-standing devices behind him, and his hands do not look like they are holding the crosses in Types III and IV reverses, the position of his hands may convey another meaning: his hands are in the *orans* position of prayer. This was commonly used in antiquity and is depicted frequently in many media. Two typical examples from antiquity, in different media, one before Ecgberht's time and the other after, are illustrated in Fig. 9, and bear a strong resemblance to Ecgberht's appearance as portrayed in an economy of detail on his coins. That the hands are at shoulder height on the examples in this figure and are slightly lower on the coins may just reflect artistic licence, necessitated by the limited space available

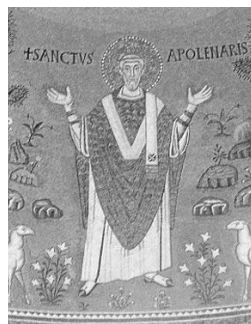


Fig. 9. Images of the *orans* position from antiquity: Constantine X Ducas (1059–67) two-thirds miliaresion (DOC 6c) (left; courtesy of CNG); mosaic showing Saint Apollinare, first bishop of Ravenna, Basilica of Sant'Appollinare in Classe, Ravenna, mid-sixth century AD (right; courtesy of Mary Ann Sullivan, Bluffton University)

²¹ Since it is impossible to know the exact intent of the die cutter, it is at least possible (but not at all likely) that what is being depicted is just a rather simplified way of rendering a figure holding two crosses.

²² Tracy 2015.

on the coins to show the legend and the crosses behind the archbishop as well as the archbishop's hands.²³ Hands in the *orans* position on other types of sceattas have also been described by Gannon.²⁴

In summary, all of the preceding information taken together strongly indicates that the coinage is divided into four basic types.²⁵ Type I shows a simple linear archbishop holding crosses or croziers. Type II shows him standing and usually holding two crosses (infrequently a cross and a crozier instead), and Types III and IV show him sitting on a seat or throne either surmounted with two crosses on staves, or with free-standing cross-bearing devices behind him, with his hands in the *orans* position of prayer.

Sequencing of types

Now that the coinage has been categorized into four general types, sequencing of the types can be considered. It is here that the few outlier reverses that span two obverse types, and which have been mentioned earlier, prove helpful (Figs 10 and 11). These die links, bridging two obverse types, may be closely related chronologically, rather than merely representing mules. If they were mules this would imply a lapse in control, with two or more types issued concurrently and if this were the case, more occurrences would be expected. These first two die links (Fig. 10) imply that obverse Types I and II were closely linked chronologically and the last link (Fig. 11) implies the



Fig. 10. Two links in the Corpus between Type I and II obverse dies, with a straight leg reverse die (four images on left from private collection; image oI/3 and reverse below it courtesy of Baldwin's; two images on right courtesy of James Booth)²⁶

²³ It might be argued that the appearances of the terminal arms of the archbishop in the Type I reverses might also suggest the *orans* position of prayer, but this is very unlikely. No fingers are depicted in this type and the design elements beside the archbishop do not suggest the back staves of a chair, as croziers would not be surmounted on staves, and would be carried instead. Thus, the devices in Type I reverses are meant to represent croziers or crosses that would have been carried. Lastly, to carry implements and have the hands also in the *orans* position of prayer seems contorted and unlikely. The curved nature of the arms crossing the implements in Type I reverses is instead probably due to the very simplistic depiction of the archbishop in this type as compared to the more detailed and slightly more elegant renderings in Types II–IV.

²⁴ Gannon 2003, 83, 87–8; Gannon 2011, 99–103.

²⁵ With the exception of a few die links with a reverse die linking two obverse dies.

²⁶ There is a third reverse die, not shown here, that appears to be a Type I die showing the archbishop with straight legs as in Type II. A die link between Types I and II obverses for this reverse die may have existed as well, but has not yet been discovered.



Fig. 11. Die link between Type III and IV obverse dies (the two images to right courtesy of Portable Antiquities Scheme; other images from private collection)

same for Types III and IV. Additionally, Type III and IV reverses are very similar, both showing the archbishop in what appears to be a sitting posture, rather than the standing posture of Type II, and they are very different from the simple depiction of simple linear in Type I. This may also imply that Types III and IV are closely related in time as well.

There are twenty-four combinations of the four types. However, the chronological linkages of I with II and III with IV reduce the number of possible sequences to just six:

I→II→III→IV
 IV→III→II→I
 IV→III→I→II
 I→II→IV→III
 II→I→III→IV
 II→I→IV→III

It is most unlikely that the engravers would have anticipated that more types were to be issued and that they were to be made successively more simple by removing design elements along the way: first the stops in the angles of the cross, then the annulet of pellets, and finally the terminal stop after the Γ. Hence, it is improbable that the coins were issued in the second sequence, IV→III→II→I, illustrated in Fig. 12, even though it preserves the chronological linkages of Types I and II and Types III and IV.



Fig. 12. Proposed sequence IV→III→II→I (images of Types IV and II in Figs 12–14 courtesy of CNG; other images from private collection)

Similarly, consider the putative sequence II→I→IV→III, shown in Fig. 13. This sequence of issue, although again possible because it preserves the linkages of I and II and III and IV, is still very unlikely. For the engravers to have alternated complicated and simple designs defies logic.



Fig. 13. Proposed sequence II→I→IV→III

Similar reasoning applies to all of the other proposed sequences except the sequence $I \rightarrow II \rightarrow III \rightarrow IV$, illustrated in Fig. 14. The principle of Occam's razor applies and thus this is the most likely sequence of issue.²⁷



Fig. 14. Preferred sequence $I \rightarrow II \rightarrow III \rightarrow IV$

3. Separate mints for the archiepiscopal and regal coinages

There are several possibilities for the place or places of minting of the regal coinage of Eadberht and the archiepiscopal coinage of Ecgbert. First, regal and archiepiscopal coins might have been produced concurrently at the same mint or mints. Second, regal and archiepiscopal coins might have been produced at the same mint or mints, but only one type was produced at a time. Third, there were separate mints for each. Without the discovery of mint records or dies sequestered at an ecclesiastical site, it is unlikely that it will ever be known with certainty which of these is the case; however, information from the coins themselves will be used to build what is believed to be a compelling case for one of the three possibilities. Five separate features will be discussed.

Could archiepiscopal coins have been a distinctly separate phase of the regal coinage?

There are four different types of the archiepiscopal coinage, all of which appear to have been temporally sequenced, from Type I to Type IV as already described. It is unlikely that the production of regal coins was interrupted long enough for all four types of archiepiscopal issues to have been minted, since the archiepiscopal coinage output was approximately 30 per cent that of the entire output of regal coins. The evolution of the archiepiscopal coinage from the simple linear archbishop of Type I to the more elaborate designs of the Type IV issues perhaps implies the passage of a considerable length of time. This does not rule out the possibility that the archiepiscopal coins were produced in four chronologically separated and distinct phases at the regal mint, each time interrupting the production of regal coins, nor do they rule out archiepiscopal coins being produced at the same time as regal coins at the same mint, but information which follows will be used to argue strongly against these latter two possibilities.

Attempted die matching of the obverses of Eadberht regal coins and Ecgbert archiepiscopal coins

With the spelling and overall design elements of the obverse dies for regal coins and archiepiscopal coins being nearly the same, if the dies were used in the same mint and regal and archiepiscopal coins were struck concurrently, it is quite likely they would have been shared, if not by common practice, at least occasionally by accident. At the time of writing, from the

²⁷ This sequence allows for the issues to be distinguished in the most logical fashion. All this sequence requires is for the engravers to have wished to distinguish separate issues one from another in a simple way, each time by the addition of a small incremental step. The stop after the Γ distinguishes Type II from Type I. Retaining the stop and adding an annulet of pellets around the cross distinguishes Type III from Types II and I. Retaining all past features and adding pellets in the angles of the cross distinguishes Type IV from all the others.

previously mentioned ongoing study of the regal coinage of Eadberht, 161 distinctly different obverse dies with the king's name spelled the same way as on the Ecgberht archiepiscopal issues, namely EOTBEREhTVΓ and EOTBEREhTVΓ• (and spelling variants) have been identified. Matches among any of these regal dies and the seventy different obverse dies of the Ecgberht archiepiscopal coinage were sought. None was identified. Because only tiny fractions of the total coin outputs of both the regal and archiepiscopal issues have been recovered, this is not conclusive evidence that obverses were not shared between them. It only indicates that if sharing occurred it was not extensive. However, the results support the significant finding that obverse dies made for Eadberht were only intended and used to strike his regal coins and those for Ecgberht, only archiepiscopal coins.

The Γ in the obverse legend

Booth noted that the downstroke of the Γ was a 'great convenience to the engraver in arranging and orienting his lettering' for the Eadberht regal issues, and surmised that the position of the Γ in relation to the central cross was used to help centre and align the placement of the letters in the obverse legend.²⁸ A representative regal obverse die illustrating this feature is shown in Fig. 15. This use of the position of the Γ relative to the central cross to help with legend alignment for the regal coinage did not carry through to the archiepiscopal coinage, however. As can be seen from a simple inspection of the archiepiscopal obverse dies (**Pl. 10, 12, 14 and 16**) the position of the Γ in relation to the central cross is variable, and could not have been useful for alignment of the obverse lettering. In an attempt to quantify this, a visual inspection of the obverse dies (**Pl. 10, 12, 14 and 16**) showed that in only fifteen of sixty-eight did the bottom stroke of the Γ appear to line up with the top of the central cross in the manner typical of regal dies (Fig. 15).²⁹ This indicates a fundamental difference in the way the legends of the obverse dies were centred for the archiepiscopal coinage as compared to the regal coinage. Since the issuance of all of the types of Eadberht regal coins employed this technique, even those whose obverse legend spellings were not of the EOTBEREhTVΓ and EOTBEREhTVΓ• types, it is difficult to imagine the archiepiscopal coinage failing to employ this approach if it were made at the same mint. It is also unlikely the archiepiscopal coins were a separate phase or phases of a multiphased Eadberht coinage for the same reason.



Fig. 15. Representative obverse die of the regal coinage (private collection)

Anomalous legend spellings and their significance

Table 4 summarizes the many different spellings of Eadberht's and Ecgberht's names. The most common obverse legend spelling by far is EOTBEREhTVΓ, with or without the terminal stop. The most common reverse spelling is ECGBERhT, often with the abbreviated title for 'archbishop', consisting of 'A', 'R', or 'AR'. The 'A' and 'R', when used, are placed almost anywhere on the remaining unused periphery of the die. Spellings other than the most common ones for both obverse and reverse are often represented by only one die.

²⁸ Booth 1984, 76.

²⁹ This analysis was subjective; the contemporary copy was excluded.

TABLE 4. Obverse and reverse legend spellings for Types I–IV³⁰

<i>Obverse dies</i>			<i>Reverse dies</i>		
<i>Type</i>	<i>Legend</i>	<i>No. of dies</i>	<i>Type</i>	<i>Legend</i>	<i>No. of dies</i>
I	EOTBEREhTVΓ	14	I	ECGBERhTAR	14
	EOTBREhTVΓ			ECGBERhAR	1
	(retrograde)	1		ECGBERhA	1
	EOTBREhTVΓ	3		ECGBERhTA	1
II	EOTBEREhTVΓ•	24	II	ECGBERh	1
	EOTREBEhTVΓ•	1		ECGBERhTAR	14
III	EOTBEREhTVΓ•	10		ECGBERhTA	1
	Γ•VThEREBTOE			ECGBERhATR	1
	(retrograde)	1		ECGBERhT	6
	OTBEREVhTEΓ•	1	III	ECGBERhTR	1
	ETBEREhTVΓ•	1		ECGBERhA	1
	OTBEREhTVΓ•	1		ECGBERTA	2
	EOTBEREhTVΓ•	1		ECGBERhTAR	1
	EOTBERETVΓ•	1		ECGBERhT	
	EOTBER•EhTVΓ•	1		(mirror image reverse)	1
	EOTBERET•hV	1	IV	ECGBERT	2
IV	EOTBEREhTVΓ	1		ECGBERhT	1
	EOTBEREhTVΓ•	5		ECGBERTA	1
	OTBEREhTVΓ•	1			
	EOTΓ•BERERVΤ	1			

Note: Excluding the one contemporary copy.

It has been suggested from an earlier, much smaller sample of coins, that the anomalous spellings may indicate experimentation.³¹ Table 4 suggests, at the very least, that this was not always the case. Many of the spellings make no sense and are clearly errors, often omissions, transpositions, or clear misspellings, for example, EOTREBEhTVΓ•, OTBEREVhTEΓ•, EOTBERET•hV, EOTBER•EhTVΓ, ECGBERhAR, ECGBERhA, ECGBERh and ECGBERhATR, and especially the most anomalous of all, EOTΓ•BERERVΤ. This evidence suggests that the engravers were prone to making errors and suggests that they were more skilled artistically than linguistically. However, the less egregious variants, such as EOTBREhTVΓ, OTBEREhTVΓ•, ETBEREhTVΓ•, and similar are so near to the most common form that they could have represented either experimentation as the language evolved or less serious spelling errors. Since it cannot be proven that all variations represented actual errors, the entire group of spelling variants are subsequently referred to as ‘anomalous’.

If the rate of anomalous obverse legends of the regal coinage is significantly different from that for the archiepiscopal coinage,³² this has implications concerning the possibility of a single mint for both. Data from the regal study shows that for dies where the regal legends were spelled the same as they were for Ecgbert, namely EOTBEREhTVΓ, EOTBEREhTVΓ•, and the anomalous variants of these, there were only five dies with an anomalous spelling in a total of 161 obverse dies.³³ These legends were: EOTBERETVΓ•, EOTEREhTVΓ, EOTBCRhTVΓ•, EOTEREhTVΓ• and EOT•BEREhTVΓ; there is only one die of each.³⁴ These numbers give a non-anomalous spelling proportion of $156/161 = 0.969$ for regal dies. Using the information from Table 4 to determine the proportions of non-anomalous spelled obverse legends for the archiepiscopal coinage gives the following data (Table 5).

³⁰ For those few reverse dies that link with two obverse types, the reverse legend is categorized as the first die type (for example, I instead of II for the reverse dies that link obverse types I and II).

³¹ Booth 1984, 76.

³² Both used EOTBEREhTVΓ, EOTBEREhTVΓ•, and slight variants of these legends.

³³ Regal legends and their variants based on the spellings of EOTBERHTVS and EAdBEREhTVΓ•, the other two ways of spelling the regal name, were not included in this analysis since these spellings were not used in the archiepiscopal series.

³⁴ Bude 2014 discusses ‘Retrograde-man’, a little-used, inaccurate engraver of regal dies who could not have engraved archiepiscopal dies because his errors are of a peculiar, recognizable style, not present in the archiepiscopal dies. His dies were not included in this analysis.

TABLE 5. Most frequent obverse legends and number of anomalous dies for each type

Type	Most frequent or intended legend	No. of dies with intended legend / total no. of dies	No. of anomalies
Type 1	EOTBEREhTVΓ	14/18	4
Type 2	EOTBEREhTVΓ•	24/25	1
Type 3	EOTBEREhTVΓ•	10/18	8
Type 4	EOTBEREhTVΓ•	5/7	2
Total		53/68	15

Note: Table 5 excludes one coin considered to be a contemporary counterfeit (dies oII/26 and rII/17, Fig. 17).

These data give a total correct, or non-anomalous, proportion of $53/68 = 0.78$ for the archiepiscopal dies. Using the N-1 Chi-Square test for two proportions,³⁵ the ‘accuracy rates’ of the obverse legends for the archiepiscopal coinage and for the regal coinage are certainly statistically significantly different, with a $p < 0.000004$.³⁶

That the rates of anomalous obverse legends for the regal coinage and the archiepiscopal coinage are so extremely unlikely to be the same indicates that the engraver or engravers who cut the dies for Eadberht did not cut them for Ecgerht. These data indicate that either there were two separate mints, or there were two carefully separated *officinae* in the same building. Since strict segregation of the dies for two different *officinae* located in the same mint seems such a waste of effort given the similarity of the obverse dies of both types, it is much more likely there were separate regal and archiepiscopal minting sites, based on this information alone.

Contribution of find-site distribution patterns to the question of mints

From author’s unpublished data on regal coins, and from data collected for this work, the find sites of archiepiscopal coins (forty-five in total) and all regal coins with EOTBEREhTVΓ and EOTBEREhTVΓ• (and variants) were plotted (100 total). Mean find-sites, or the ‘site of highest coin recovery density’, of each coinage were also calculated and plotted to aid in visual inspection of the data, as it may be difficult to integrate visually the distributions of coin loss of each type from scatterplots of data. The methods are described in Appendix 4 (pp. 138–9). For the regal coins, find-sites for obverses with the spellings of EAdBERhTVΓ• and EOTBERHTVS and their variants, which are the two other main types of regal legends, were not used for two reasons. First, it is most likely that regal and archiepiscopal coins with similar obverse legend spellings bear the closest temporal relationship, and thus result in a more accurate comparison than if the comparison were made with other regal types with substantially different obverse legends which may have been more distanced in time from the archiepiscopal issues with EOTBEREhTVΓ (and variants). Second, it is possible that regal coins with the other spellings of EAdBERhTVΓ• and EOTBERHTVS• (and their variants) might have different mint locations or find-site distributions than the archiepiscopal coins because the different spellings might have indicated regional variations. The mean find-sites for regal and archiepiscopal issues with legends of the EOTBEREhTVΓ type are displayed in Fig 16. The upper map is a scatterplot of the Eadberht regal issues and the middle map is a scatterplot of the Ecgerht archiepiscopal issues.³⁷ The bottom map is a plot of the mean find-sites of regal coins (denoted by a square) and archiepiscopal coins (denoted by a circle).

The mean find-sites for regal and archiepiscopal issues are very close to each other, separated by a straight line distance of only approximately six miles and neither mean findsite is at, or very near, York, with both much closer to Driffield. The Ecgerht mean find-site is only approximately eight miles south-west of Driffield. This could mean that York was not the site

³⁵ In this case the Chi-Square test for proportions is a statistical test to determine how likely it is that these two apparently different proportions could have been obtained by chance alone during sampling of the outputs from these two dies.

³⁶ This means there is only a 1/250,000 chance that the error rates are not truly different and that the apparent difference is due to chance alone. For this study this means the differences in the two proportions are indeed meaningful.

³⁷ Some find-sites have more than one coin but in these cases, the data points do not discriminate between single and multiple finds.

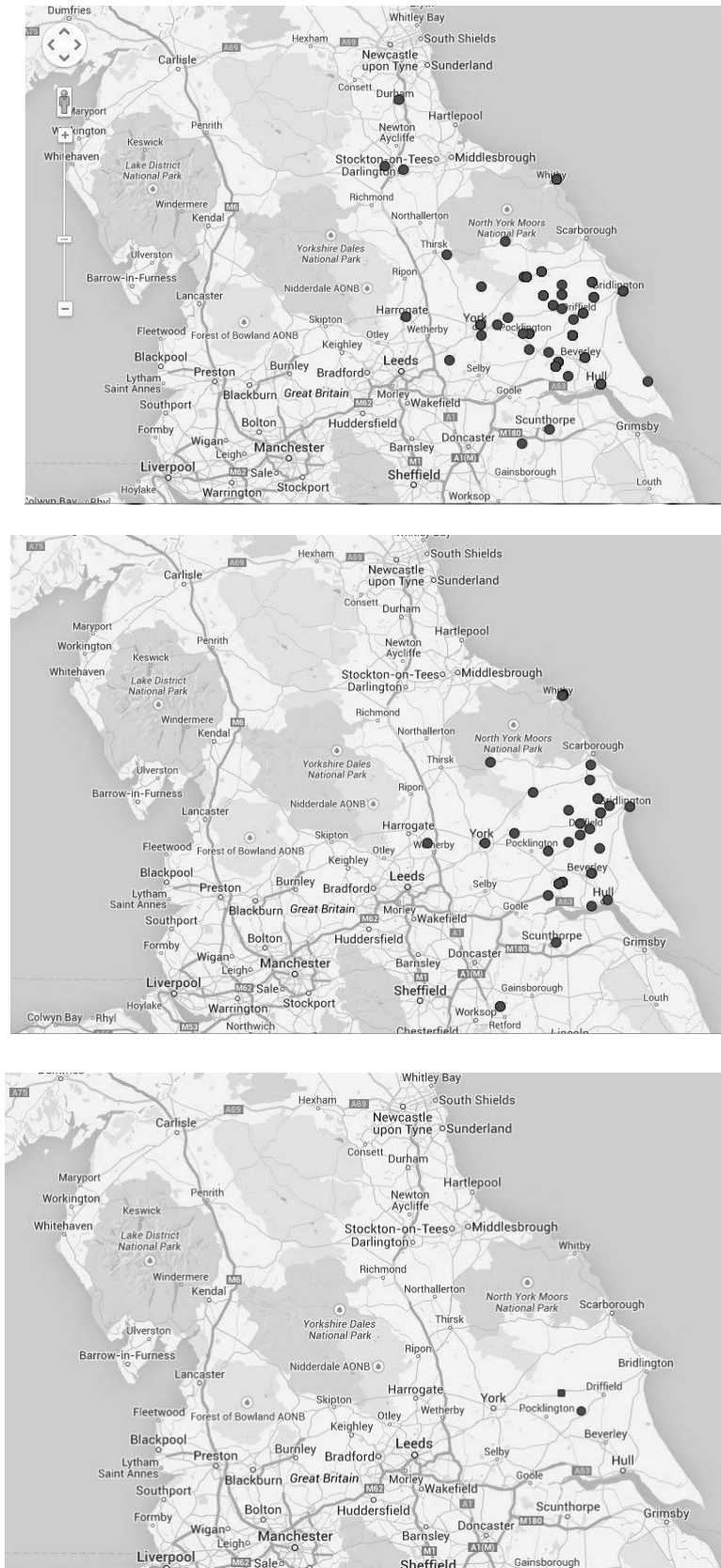


Fig. 16. Find sites of archiepiscopal and regal coins (images produced and reproduced with permission, according to the use policy of <http://www.hamstermap.com>)

of either mint. However, there are difficulties in using findspots to infer mint locations, as there are factors which skew the use of find-site data. York and its immediate surrounding area is densely urban and not easily amenable to coin discovery. Topography also greatly influences coin recovery. In northern England, the Yorkshire Wolds (where the mean find-sites of both regal and archiepiscopal coins are located) are lower and more arable ground, and are thus more easily detectable than other areas.³⁸ Furthermore, Robbins has recently noted that 70 per cent of all Portable Antiquities Scheme finds were on cultivated land.³⁹ Nonetheless, the close proximity of the find-sites strongly suggests that the regal and archiepiscopal coins circulated side by side, and may indicate that the mints for both issues were very close to each other, perhaps even located in the same regal/ecclesiastical centre.

Conclusions on the mint(s)

The archiepiscopal and regal coins were issued at distinctly separate mints. Where these mints were located cannot be determined with certainty; however, they were probably close to each other. Current thinking has York as the most likely site of the mint for the archiepiscopal series, as well as for the regal series,⁴⁰ but this data shows it is at least possible the mints were not in York. If York is the location of the mints, the find-sites suggest that a large portion of the coinage went east to the Driffield area for commerce.

4. Other observations on the Coinage

Interesting errors and oddities

Errors and oddities are illustrated in Fig 17. Die rI/2 is missing the legs, but given the small space allotted for legs, the straight 'ground', and the overall style, it was assigned to the Type I reverse dies. Die oI/5 has a mirror image retrograde legend and also has a spelling anomaly (EOTBREhTVT). It is the obverse of the coin with missing legs, die rI/2. Die rIV/3 is missing a right shoulder and possibly an arm. Die oII/11 appears to have been initially engraved without the third 'E' (between the 'R' and the 'h'), which appears to have been added after the error was noticed, given the small size of the 'E' and its unusual position. Die rII/11 has a third 'leg'. Die oIII/15 has a mirror image retrograde legend. Die rIII/2 is a mirror image die. The coin from dies oII/26 and rII/17 (last two images) has a crude style and appeared to be of low fineness silver, strongly suggesting that it is a contemporary counterfeit.



Fig. 17. Errors and oddities (image of oII/11 courtesy of EMC; oIII/15 courtesy of James Booth; rIII/2 courtesy of Fitwilliam Museum, Cambridge; rIV/3 courtesy of Mike Vosper; other images from private collection)

³⁸ Richards, Naylor Holas-Clark 2009, section 2.4.2.1, 'Northern England'.

³⁹ Robbins 2013, 59.

⁴⁰ Naismith 2012, 306.

Is the pellet sometimes present on the reverse a centration hole?

The location of the archbishop to the left edge of the reverse seems odd. If the pellet is indeed a centration hole for marking the die,⁴¹ the archbishop was perhaps placed on the side so he did not appear to have a navel.⁴² As described in Appendix 5 (p. 139), on a subset of coins available to the author for inspection and measurement, the pellet on the reverse and the centre of the cross on the obverse, which sometimes has a raised pellet, were indeed located in the centre of the beaded borders, and are thus centration holes, used to help locate the placement of the edge beads on both sides of the die.

The Archbishop's implements

Both crosses and croziers can be seen at each side of the archbishop. In rI reverse types (**Pl. 11**) the most common arrangement is for one of each, a cross (on the archbishop's right) and a crozier (on his left) in twelve of eighteen dies. In four of eighteen dies there are two croziers, one on each side, and in two of eighteen dies there are two crosses. There were two different die links tying cross/crozier and crozier/crozier issues for Type I. In Type II reverse types (**Pl. 13**), fourteen of sixteen have crosses on each side (contemporary copy excluded); two of sixteen have a cross on the right side and a crozier on the left. In Type III and IV reverses (**Pl. 15, 16**) there are only crosses on each side, and this makes sense if the crosses are no longer considered to be implements but rather sit upon the staves of a high-backed throne or chair, or are free-standing devices behind the archbishop. This material is summarized in Table 6.

TABLE 6. Summary of the relationships of the crosses and croziers to the archbishop for each reverse type

<i>Reverse type</i>	<i>Cross on right / crozier on left (no. of dies)</i>	<i>Crozier on each side (no. of dies)</i>	<i>Cross on each side (no. of dies)</i>
rI	12/18	4/18	2/18
rII	2/16		14/16
rIII			12/12
rIV			4/4

Lettering styles

The author is not an expert in epigraphy; however, the obverses of Type I often have a 'high, small O' (at least twelve of sixteen dies) and the letters are often smaller and of a simpler style than those present in other types.

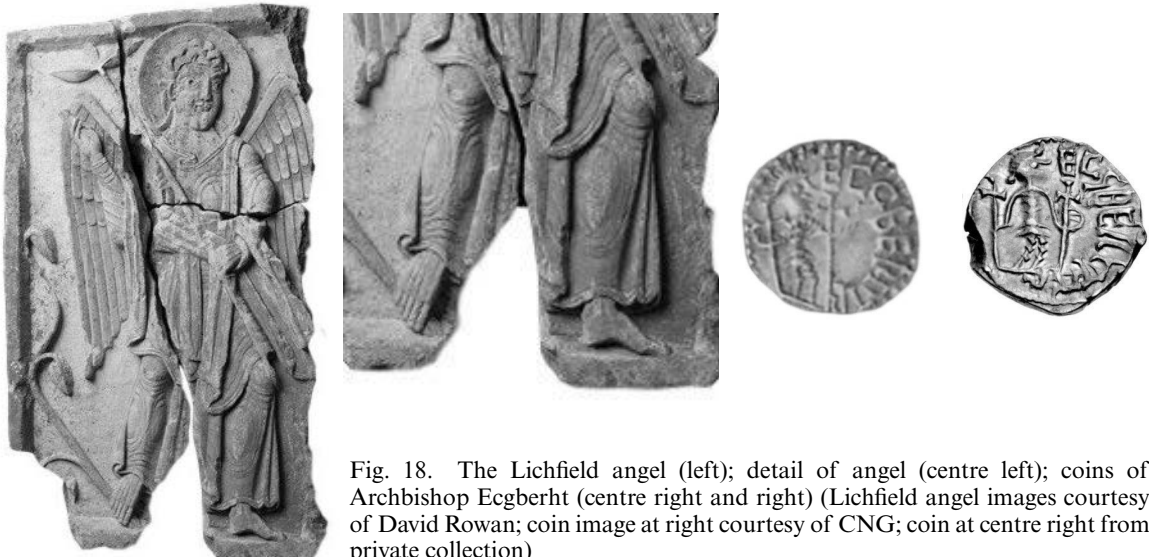


Fig. 18. The Lichfield angel (left); detail of angel (centre left); coins of Archbishop Eggerht (centre right and right) (Lichfield angel images courtesy of David Rowan; coin image at right courtesy of CNG; coin at centre right from private collection)

⁴¹ See **Pl. 11, 13, 15–16**.

⁴² Dr Anna Gannon, *pers. comm.*, 30 Nov. 2013.

The Archbishop's clothing

Not much can be said about the archbishop's clothing as there is so little detail depicting it. The archbishops of Type I obverses are stick-like and very primitive. Some have slight expansions of the lower torso which may suggest clothing, and a very few have minimal markings on the chest that might be attempts at rendering clothing details, but for the most part they are about as crude and simple as they can be. In the reverse types rII–rIV, the archbishop is shown wearing a garment at the waist and hips and less often at the chest, but the detail is so sparse that little can be offered to explain the appearance. There is sometimes a plaited appearance to the legs which



Fig. 19. Possible examples of the *pallium* on coins of Archbishop Ecgberht (images courtesy of Keith Chapman)

is also seen once at the arms, which is reminiscent of the draped clothing of the Lichfield angel, a piece of early medieval sculpture *c.* 800 (Fig. 18). Given the relative difficulty in engraving fine detail in a *c.* 13–14 mm coin compared to depicting fine detail in a 2½ foot limestone sculpture, the similarity in appearance of the angel's legs to the plaited legs and arms in the coinage, two examples of which are illustrated in Fig 18, probably suggests that the coins are meant to indicate similar folds in draped clothing.⁴³

It is documented that Ecgberht received the *pallium* from Rome in 735.⁴⁴ There is a transverse band across the chest in many of the reverse dies, types rII–rIV,

with representative examples shown in Fig 19. It is possible that this is meant to portray the *pallium*, but this is far from certain.

5. Conclusions

Approximately 151 obverse (Eadberht) dies and 98 reverse (Ecgberht) dies were produced,⁴⁵ with about half of them known from coins in the study. The number of dies produced for archiepiscopal coins was approximately 30 per cent of that produced for regal coins; it is therefore likely that the volume of archiepiscopal coinage was approximately 30 per cent of that of the regal coinage.

There are four types of archiepiscopal coins (Fig. 3 on p. 122). It is highly likely they were issued in a sequence of increasing complexity, beginning with the simplest, Type I, and terminating with the most complex, Type 4, as shown in the figure.

The regal and archiepiscopal coins were struck at different mints, albeit close to each other. It is possible that neither regal nor archiepiscopal coins were issued in York. The location of the highest chance of coin recovery (the mean⁴⁶ find-site) for archiepiscopal coins was approximately twenty-one miles east of York and only eight miles southwest of Driffield, indicating the Driffield area was a major area of economic activity in the mid eighth century. How prominent that economic activity was in relation to that of York cannot yet be determined as recovery factors probably cause the under-representation of York finds.

APPENDIX 1

Methods for the acquisition of images, credits for images used in the plates, die-matching, and die-linking

Image acquisition

Images were obtained from many sources: personal visits to the Ashmolean, British, and Fitzwilliam museums; photographs kindly supplied by the curators of the Hull museum, Hull; the Corpus of Early Medieval Coin Finds maintained by the Department of Coins and Medals of the Fitzwilliam Museum, Cambridge; private collections, with photographs generously provided by the owners (thanks to: Keith Chapman, James Booth, Tony Abramson, Mark Fox, and individuals who wish to remain anonymous); photographs personally taken of the coins in auction

⁴³ Dr Anna Gannon, *pers. comm.*, 24 June 2015.

⁴⁴ Hind 1909.

⁴⁵ Ninety-five per cent confidence intervals of 115 to 198 for the obverse dies and 78 to 122 for the reverse dies.

⁴⁶ Some would prefer the use of the word 'average' but mathematically and statistically speaking, 'mean' is most correct.

and dealer catalogues held in the Fitzwilliam Museum catalogue collection with much helpful assistance given by Prof. Ted Buttrey; photographs provided by dealers (thanks to: Andy Gillis (www.gilliscoins.com), Classical Numismatic Group, Inc. (www.cngcoins.com), Simon Shipp (Den of Antiquity at www.vcoins.com), Baldwin's (www.baldwin.co.uk), Italo Vecchi, Mike Vosper (www.vosper4coins.co.uk), Goldberg Coins and Collectibles, Inc. (www.goldbergcoins.com) and Spink and Son Ltd. (www.spink.com), the professional version of Coin Archives (www.coinarchives.com) which contains in a digital format images from the great majority of the important auctions, beginning in 2000 or 2001 and extending to the date of this project; the Portable Antiquities Scheme (<http://finds.org.uk>); UK Detector Finds Database (www.ukdfd.co.uk); ebay, Inc. (www.ebay.com) from late 2010 to the date of this project; and an extensive search of the internet. For the images used in this study, permission has been obtained from the appropriate parties. Variability in the fidelity of the images is caused by the multiplicity of sources. Images of approximately 230 coins were initially obtained. These included examples of multiple images of the same coin, for which there were several causes, such as a coin having been sold more than once and photographed for each sale, or having been photographed for sale and then again as part of the acquirer's collection. At this stage no attempt was made to exclude these multiple images of the same coin. This was done at die matching.

Sources of coins on the plates

Tony Abramson	Pl. 10, 1–2; Pl. 11, 1; Pl. 12, 1; Pl. 12, 4
Baldwin's	Pl. 10, 3; Pl. 12, 2
James Booth	Pl. 11, 9; Pl. 12, 7–8; Pl. 12, 10; Pl. 12, 14; Pl. 12, 24; Pl. 13, 7; Pl. 13, 10; Pl. 13, 18; Pl. 14, 1; Pl. 14, 4; Pl. 14, 15; Pl. 15, 15; Pl. 16, 5; Pl. 16, 7
Keith Chapman	Pl. 10, 8–10; Pl. 11, 3; Pl. 12, 3; Pl. 12, 5; Pl. 12, 23; Pl. 13, 16; Pl. 14, 13–14; Pl. 15, 13; Pl. 16, 1; Pl. 16, 8
Classical Numismatic Group, Inc.	Pl. 10, 11; Pl. 11, 4; Pl. 12, 9; Pl. 13, 9; Pl. 14, 9; Pl. 14, 18; Pl. 15, 1–2; Pl. 15, 11; Pl. 15, 14, Pl. 15, 16; Pl. 16, 2
Corpus of Early Medieval Coin Finds (EMC)	Pl. 10, 6–7; Pl. 10, 16; Pl. 11, 7; Pl. 11, 15; Pl. 12, 11; Pl. 12, 15; Pl. 12, 19; Pl. 13, 15
Den of Antiquity (Simon Shipp)	Pl. 11, 14
Patrick Finn fixed price lists	Pl. 10, 13; Pl. 11, 13; Pl. 12, 13; Pl. 13, 12–13; Pl. 14, 9–10; Pl. 14, 12; Pl. 15, 9; Pl. 16, 7
Fitzwilliam Museum, Cambridge	Pl. 10, 12; Pl. 11, 5; Pl. 14, 2; Pl. 15, 6
Mark Fox	Pl. 14, 6; Pl. 15, 12
Future Museum (http://futuremuseum.co.uk/)	Pl. 14, 16
Andy Gillis	Pl. 10, 15; Pl. 10, 17–18; Pl. 11, 6; Pl. 11, 8; Pl. 11, 17; Pl. 12, 6; Pl. 12, 18; Pl. 13, 4; Pl. 14, 5
I. & L. Goldberg	Pl. 12, 19; Pl. 13, 6
Portable Antiquities Scheme	Pl. 16, 4
UK Detector Finds Database	Pl. 13, 8
Italo Vecchi	Pl. 11, 16
Mike Vosper	Pl. 14, 11; Pl. 15, 10; Pl. 16, 9–10
Private collections	Pl. 10, 4–5; Pl. 10, 14; Pl. 11, 2; Pl. 11, 10–12; Pl. 11, 18; Pl. 12, 12; Pl. 12, 17; Pl. 12, 20–22; Pl. 12, 25–26; Pl. 13, 1–3; Pl. 13, 5; Pl. 13, 11; Pl. 13, 14; Pl. 13, 17; Pl. 13, 19; Pl. 14, 7–8; Pl. 14, 17; Pl. 15, 3–5; Pl. 15, 7; Pl. 16, 6; Pl. 16, 11–12

Die matches of Ecgberht/Eadberht archiepiscopal issues

Obverse images were split from the corresponding reverse images for every coin before die matches were performed so that the matches of each side were done without knowledge of the attributes of the other side.

All images were cropped and enlarged to 300 pixels width and then die-matched in the usual fashion by viewing side by side images on a computer monitor. Images of a small minority of coins subjectively assessed to have poor detail⁴⁷ were initially set aside until the die matches of the better quality images were performed. This was because these images had so little detail that if they failed to die match before all the good images were reviewed, a die match might be missed that could later be accomplished by comparing with the full set of better quality images. In a few cases, probably less than ten, die matches could eventually be obtained of these poor quality images, but these few low quality coins were not included in the die calculations so as not to bias the study sample. They were, however, included in the die links.

⁴⁷ This is due to bad images, very low grade coins, or fragmentary coins.

APPENDIX 2

Four difficult, partial identifications

The first three coins in Fig. 20, a–c, could not be characterized due to the inability to completely determine if a stop were located between the ‘I’ and the ‘E’ on the obverses. The die designations are best estimates, and are given here to assist future research. The fourth coin lacks so much detail that neither side could be characterized, but enough detail was seen in the reverse during die matching to be certain it was a unique die. The die designations for the first three coins are provisional since the obverses cannot be completely characterized, and were made considering the detail on both sides and by comparing their details to coins of known types. Best guesses of legends for the first three coins are: rII/18: ECGBERhT• [sic]; oII/27: EOTBEREhTVT•; rI/19: ECGBERhTAR; oI/19: EOTBEREhTVT; rI/20: ECGBERhTAR; oI/20: EOTBEREhTVT. Die oII/27 has a minute speck where the presumed stop should be, but it was not prominent enough to be convincing and the coin was not available for an in-hand inspection.



Fig 20. (a) rII/18;oII/27; (b) rI/19;oI/19; (c) rI/20;oI/20; (d) ??;?? (images of c and d courtesy of James Booth; other images from private collections)

APPENDIX 3

Explanatory notes for the plates**Pl. 10. Type I obverse dies with die-matchable reverses**

In general, these Type I obverse dies have a simpler style lettering than is present in obverse die types II–IV. The best independent image of each die has been used here and elsewhere in the plates.

Pl. 11. Reverse dies used with Type I obverse dies

In four of eighteen rI dies, there are croziers on each side of the archbishop; in twelve of eighteen rI dies there are crosses on each side. In die rI/2, the engraver forgot to give the archbishop legs, but the overall style of the die is that of the simple linear type and it is thus included with Type I reverses. Also note that in twelve of eighteen dies the ground or surface on which the archbishop stands or sits is perpendicular to his legs and body, and in the remaining dies the ground or surface slopes slightly upwards towards the centre. All of the legs are straight and the figure of the archbishop on every die has the characteristics of Type I as illustrated in Fig. 3 (p. 122).

Pl. 12. Type II obverse dies with die-matchable reverses

The lettering style of this type is generally not as simple as that in Type I. The four dies at the bottom of the plate, set slightly apart, are the four outlier Type II obverse dies that have reverses with an archbishop with straight legs (simple linear type, Type I reverse die). The coin from die oII/26 appears to be low silver or billon and the style is crude. It is therefore considered a contemporary copy.

Pl. 13. Reverse dies used with Type II obverse dies

The first fifteen dies all fit the appearance of the archbishop as illustrated in the Type II coin in Fig. 3 (p. 122). Thus they coincide with the reverses with the archbishop in the standing posture in Type II.⁴⁸ The bottom four dies are

⁴⁸ Note that the area of the legs on die rII/15 is indistinct and it is not completely certain that the legs are bent, as they are in the first fourteen dies. However, since the ‘ground’ upon which the archbishop stands is perpendicular to his body as it is in dies rII/1–14, and since he is holding the crosses as is typical of Type II but is not a feature of Types III and IV, this die is treated as an rII die and is catalogued as rII/15.

all of the simple linear variety, and thus have the same appearance as the archbishops in Type I as illustrated in Fig. 3, yet they belong to obverses of Type II. At first glance this may be confusing. The last two dies in the bottom row, rI/11 and rI/18, die match with both Type I and Type II obverses. Thus by convention, they are given 'rI' die designations, even though in this figure they belong to Type II obverses, because reverses that match with two different types of obverses are assigned to the lower type number of the two obverse die types. The second die on the bottom row, rII/17 (the reverse die to obverse die oII/26), is considered to be a contemporary counterfeit and therefore it is not surprising that it does not follow convention. The first die in the bottom row, rII/16, is an outlier that does not fit the classification. It has stick legs but is used with a Type II obverse die. Except for the legs the archbishop otherwise appears more ornate than other simple linear archbishops, so this could also be a transitional issue or mule. Dies rI/11 and rI/18 show how a die with an rI designation can correspond to an obverse die with an oII designation. Obverses and reverses are described as Type I obverse, or Type II reverse, etc. when they fit the convention of the typical classifications given in Fig. 3 (p. 122). In the few instances where the reverse dies are outliers, such as rII/16, rII/17, rI/11 and rI/18, they are described in ways that differentiate them. These four dies, rII/16, rII/17, rI/11, and rI/18, comprise four of five of the potentially confusing dies. The only other example is reverse die rIII/1, which die links Type III and Type IV obverse dies (Fig 11, p 127).

Pl. 14. Type III obverse dies with characterizable reverses

Die oIII/15 is a mirror image engraver error. The last die set apart from the others, oIII/18, is an outlier, as it has the annulet of pellets but lacks a terminal stop after the Γ . However, it is probably either an engraver error or an example of a die where the terminal stop filled in with use before this coin was struck. This die links through a common reverse with a typical Type III obverse die that contains a stop (though the second obverse die itself contains another error, a misspelled legend: EOTBERET•hV), as shown in **Pl. 15**, upper set of images.

Pl. 15. Die link in Type III and reverse dies used with Type III obverse dies

Upper set of images: This die link shows that obverse die oIII/18 described in the explanatory note for **Pl. 14** (top coin in this figure, right coin in bottom row of **Pl. 14**), that lacks a terminal stop is likely to be a Type III obverse die, as it links with another Type III obverse. Note, however, that the obverse die to which it links (bottom picture) also has an error, with the legend spelled EOTBERET•hV. However, even with the errors, this die is also considered to be a Type III obverse die. Although it lacks a Γ , it has a stop in the legend and also has an annulet of pellets. These two coins together suggest that this particular engraver may have had an especially difficult time getting things right, which might also explain why in only eighteen obverse dies of this type there were a total of eight dies with legend anomalies.

Lower set of images: There are crosses on each side of the archbishop on all dies. The dies have a downward sloping straight line at the archbishop's feet. The archbishop is generally depicted wearing a hat. Die rIII/2 is a mirror image engraver error. It is not the reverse to die oIII/15 (third coin from the left, fourth row, **Pl. 14**), which is also a mirror image engraver error.

Pl. 16. Type IV obverse dies and reverse dies used with Type IV obverse dies

Upper set of images: Die oIV/6 has the most aberrant spelling of any of the dies, with the legend EOTT•BERERTV. Note, however, that the stop or pellet retains a relationship with the Γ , and not the E.

Lower set of images: Note that die rIII/1, the last die in this set, is not listed as a Type IV reverse die, but rather carries an rIII designation. This is because it die links both Type III and Type IV obverses, and is thus classified as a Type III reverse die. This link is illustrated in Fig. 11 (p. 127). The archbishop's legs do not go below the slanted line in this die, as is the case in eight of eleven Type III reverse dies.⁴⁹ All four reverse dies with an rIV designation have legs that go below the slanted line, two crosses, and downward sloping 'ground', and in one, rIV/2, the feet clearly do not rest on the sloped line. The archbishop wears a hat in all four rIV dies.

APPENDIX 4

Analysis of find-sites

Find-sites were obtained from many sources, including the EMC database, Booth's study,⁵⁰ and data reported from individual collectors and auction catalogues. Although the veracity of some of these data is perhaps questionable, and the exact find-sites are rarely known, it is still very likely that inferences can be made from the mean find-sites, also called the 'site of highest coin recovery density' derived from these data. When only an inexact find-site was given such as 'near Driffield', the find-site was plotted as if the coin were actually found in Driffield. Data means can 'smooth out', or reduce, the effects of variabilities or errors in individual datum, especially when the amount of data is large as in this study. Both archiepiscopal and regal coins with spelling variants of EOTBEREhTVΓ• or EOTBEREhTVΓ, such as EOTREBEhTVΓ•, ETBEREhTVΓ•, or even EOTT•BERERTV, were included in the sample. Forty-nine archiepiscopal coin find-sites were known. Four were excluded as they were outliers found far

⁴⁹ There were eleven Type III reverse dies for which enough detail was present to allow this determination to be made.

⁵⁰ Booth 1984.

from the others: Ervik, Norway; near Bolton northwest of Manchester; Attmire Cave, Settle; and Whithorn, Dumfries and Galloway, Scotland. 104 regal coin find-sites were also known. Four were excluded as outliers, one having been found on the coast east of Norfolk, another near London, another near Edinburgh, and the last one near Whithorn. Thus, find-site distribution maps were plotted, as well as the site of highest coin recovery densities determined, using the find-sites of forty-five archiepiscopal coins and 100 regal coins. The latitude and longitude of each findsite were found using online software (<http://www.distancesfrom.com>). The arithmetic means of the latitudes and longitudes of both archiepiscopal and regal coins were calculated. Scatterplot distribution maps of each type of coinage, as well as a map showing both sites of highest coin recovery density, were plotted using online software (<http://www.hamstermap.com>) and are displayed in Fig. 16 (p. 132).

APPENDIX 5

Centration holes

Only coins that could be measured and viewed in-hand were used for this portion of the study, as the vagaries of lighting and photographic technique were considered to introduce too much potential for error into the measurements. For reverses, measurements of the radii were made with digital calipers from the centre of the central pellet to the centre of an edge bead. For obverses, the measurements were made from the centre of the central cross to the centres of edge beads. Two radius measurements per side were made, performed as far apart radially as possible, up to 180 degrees. The goal was for all measurements to be made 180 degrees apart but because the entire beaded border was not always present, as large an angle of separation as possible was used. The range of the radial measurements for both sides was from 90 to 180 degrees. Eight reverses (sixteen radius measurements) and twelve obverses (twenty-four radius measurements) were available for measurement in this way. The mean reverse radius (with standard deviation) was 6.46 +/- 0.28 mm, range = 6.15–7.08 mm, and the mean obverse radius was 6.49 +/- 0.21 mm, range = 5.98–6.88 mm. These very tight standard deviations and the near equality of the mean reverse and obverse radii (6.46 mm and 6.49 mm, respectively) indicates that the central reverse pellet and the centre of the obverse cross were centration holes and that the intended diameters of both sides from the centre of one edge head through the centration hole to the centre of the opposite edge were ~13 mm.

BIBLIOGRAPHY

- Booth, J.F., 1984. 'Sceattas in Northumbria', in D. Hill and D.M. Metcalf (eds), *Sceattas in England and on the Continent. The Seventh Oxford Symposium on Coinage and Monetary History*, BAR British Series, 128 (Oxford, 1984), 71–111.
- Bude, R., 2014. 'The Class E sceattas of Eadberht: the work of "Retrograde Man"', in T. Abramson (ed.), *Studies in Early Medieval Coinage. III. Sifting the Evidence*. (London), 18–28.
- Esty, W., 2006. 'How to estimate the original number of dies and the coverage of a sample', *NC* 166, 359–63.
- Esty, W., 2011. 'The Geometric Model for estimating the number of dies', in F. De Callatay and E. Lo Cascio (eds), *Quantifying Monetary Supplies in Graeco-Roman Times*, *Pragmateiai* 21 (Bari), 1–16.
- Gannon, A., 2003. *The Iconography of Early Anglo-Saxon Coinage* (Oxford).
- Gannon, A., 2011. 'Coins, images and tales from the Holy Land: questions of theology and orthodoxy' in T. Abramson (ed.), *Studies in Early Medieval Coinage. New Perspectives*. (Woodbridge), 88–103.
- Hind, G.E., 1909. 'Egbert', in C.G. Herbermann, E.A. Pace, C.B. Pallen, T.J. Shahan, and J.J. Wynne (eds), *The Catholic Encyclopedia* (New York), vol. 5, 326.
- Metcalf, D.M., and Northover, J.P., 1994. 'What are sceattas made of? Historical implications of their alloys', in D.M. Metcalf (ed.), *Thrymsas and Sceattas in the Ashmolean Museum Oxford. Vol. 3*, RNS Special Publication 27C (London), 611–79.
- Naismith, R., 2012. 'Kings, crisis and coinage reforms in the mid-eighth century', *Early Medieval Europe* 20, 291–332.
- Richards, J.D., Naylor, J., and Holas-Clark, C., 2009. 'Anglo-Saxon landscape and economy: using portable antiquities to study Anglo-Saxon and Viking Age England'. *Internet Archeology* 25 (<http://intarch.ac.uk/>).
- Robbins, K.J., 2013. 'Balancing the scales: exploring the variable effects of collection bias on data collected by the Portable Antiquities Scheme', *Landscapes* 14 (1) (June 2013), 54–72.
- Tracy, C. and Budge, A., 2015. *Britain's Medieval Episcopal Thrones* (Oxford).