A Study of the Distribution, Form and Context of Anglo-Saxon Vessel Glass in seventh to eleventh century England

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Submitted for the degree of PhD
I, Rosalind Broadley, confirm that the work presented in this thesis is my own. Where information has been derived from other sources, I confirm that this has been indicated in the thesis.
Abstract

This thesis is a study of all known Anglo-Saxon vessel glass (2847 sherds) found at twenty-three settlement sites in England dating to between the seventh and eleventh centuries. This material reveals new understandings regarding economic and social structures, and identities in Anglo-Saxon England.

Data collected from recording glass first-hand was combined with information gathered from publications, archives and personal communication with excavators and specialists to form the first national dataset. Quantification of individual vessel forms, colours and decoration, and mapping the distribution of all vessel characteristics has led to the creation of a new typological and geographical framework for understanding these objects.

Glass vessels were used on three principal site types: emporia, monasteries and middle-ranking rural estate centres. Site assemblages of glass vessel fragments can now be characterized and compared to the national corpus to aid interpretation of the nature of the source settlement – and vice versa - because of the discovery that palm-funnel series vessels are much more prevalent at emporia and globular beakers at ecclesiastical sites, showing that glass was being supplied and used in different ways.

Seven case studies of intra-site glass distribution revealed that the anticipated pattern of peripheral disposal alongside dining waste is widespread, but exceptions exist at the monastic sites at Lyminge, Kent, and Jarrow, Tyne and Wear.

Preliminary study of similar material from the rest of the North Sea zone indicates largely parallel patterns of trade and consumption of glass vessels by the same three site types, with great potential for future work and comparison with English data sets.
**Acknowledgements**

Many others have assisted me throughout the long life of this project, and deserve my heartfelt thanks. In particular, Dr Catherine Hills and Dr Helen Geake for getting me off to a good start in Cambridge, and Prof. Andrew Reynolds for accepting me later at UCL and supporting me through resuming, having a maternity break, resuming again, and finally completing. At UCL I have also benefited greatly from the knowledge and patience of Dr. Stuart Brookes and Prof. Ian Freestone.

Information and access was provided by the staff of museums, archaeological units and all the Historic Environment Records up and down the land, and their help is much appreciated. Particular thanks go to Prof. Jenny Price and Prof. Dominic Powlesland for inviting me into their homes during a foray into Yorkshire, and to Andrew Tester of Suffolk County Council for suffering my presence on two separate occasions.

Finally, this project would never have reached completion without the practical and moral support of my husband, James Broadley, and the amazing childcare skills of his mother, Gill – I have been planning all along to write your names in the front, and now here they are!
# Table of Contents

Abstract .................................................................................................................................................. 3
Acknowledgements ................................................................................................................................. 4
List of Figures ........................................................................................................................................ 8
  Chapter 2 ........................................................................................................................................... 8
  Chapter 4 ........................................................................................................................................... 8
  Chapter 5 ........................................................................................................................................... 10
  Chapter 6 ......................................................................................................................................... 17
  Chapter 7 ......................................................................................................................................... 18
Chapter 1: Introduction .......................................................................................................................... 19
  Scope ............................................................................................................................................... 20
  Objectives ....................................................................................................................................... 23
  Contextualizing glass vessels as a container type ........................................................................... 26
Chapter 2: A history of research on mid to late Anglo-Saxon glass vessels ............................................. 31
  Vessel types and chronology ........................................................................................................... 31
  Glass from the emporia and settlements in western Britain ......................................................... 42
  Characterization of site assemblages and the national corpus .................................................... 49
  Site types and intra-site distribution ............................................................................................ 54
  Discussion ......................................................................................................................................... 61
Chapter 3: Research themes, questions and methodologies ................................................................. 66
  Research themes and questions ....................................................................................................... 66
  The dataset ....................................................................................................................................... 70
  Typological approaches to the study of Anglo-Saxon glass from settlement contexts ................. 75
  Contextual approaches to the study of Anglo-Saxon glass from settlement contexts .................. 77
  Compositional Analysis ................................................................................................................... 79
Chapter 4: The corpus overall: form, colour and decoration .................................................................... 83
  Correspondence analysis ................................................................................................................ 102
  Geographical distribution .............................................................................................................. 121
  Conclusion ...................................................................................................................................... 131
Chapter 5: Assemblage analysis ........................................................................................................... 141
  Assemblages from emporia .......................................................................................................... 141
    Hamwic (Southampton) ............................................................................................................... 141
    Ipswich ....................................................................................................................................... 146
    London ....................................................................................................................................... 151
The vessel glass in context (vessel glass meets settlement studies).....321

‘Wics’ or emporia.............................................................................................................321

Monastic sites.....................................................................................................................342

Royal settlements .............................................................................................................348

Beyond estate centres – the middle-ranking foci .......................................................350

Social identities ..................................................................................................................357

Vessel glass as a status marker .......................................................................................359

Defining monastic and secular identities..........................................................................362

Networks of exchange ......................................................................................................363

Regional networks ..........................................................................................................363

Water-borne trade ............................................................................................................366

International comparisons ............................................................................................371

Site types and glass in society .......................................................................................371

Conclusion .........................................................................................................................396

Bibliography .....................................................................................................................401
List of Figures

Chapter 2

Fig. 2.1. Evison’s typology for AD 700-900 (Period III) and AD 900-1100 (Period IV). (Evison 2000, Fig. 4, © The Trustees of the British Museum. Shared under a Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International (CC BY-NC-SA 4.0) licence)

Fig. 2.2. The chronology of key vessel forms from the fifth to eleventh centuries

Chapter 3

Fig. 3.1a. Typology of fragments: colour and decoration

Fig. 3.1b. Typology of fragments: rim and base types

Chapter 4

Table 4.1. Breakdown of corpus by site assemblages

Fig 4.1. Site assemblages as percentages of the corpus

Fig. 4.2. No. of sherds of each sherd length

Fig. 4.3. Blue-green spectrum vs. other colours within corpus

Fig. 4.4. Non-blue-green spectrum colours as a percentage of the corpus

Fig. 4.5. Vessel forms as a % of the corpus

Fig. 4.6. Sherd types as a % of the corpus

Fig. 4.7. Rim types as a % of total rim sherds

Fig. 4.8. Base types, as a % of total base sherds

Fig. 4.9. Decorated and undecorated sherds of all types, as a % of corpus

Fig. 4.10. Decorated sherd types, as a % of total decorated sherds

Fig. 4.11. Colour combinations, as % of applied trailed sherd group

Fig. 4.12. Trail orientations, as % of applied trailed group sherds for which this could be determined

Fig. 4.13. Colour combinations, as % of reticella trailed sherd group

Fig. 4.14. Colour groups, as % of sherds with streaking in metal

Fig. 4.15. Types of moulded decoration, as % of moulded sherds
Fig. 4.16. Colour combinations, as % of bichrome untwisted trailed sherd group

Fig. 4.17. Symmetric plot of form v. colour

Fig. 4.18. Form v. colour 2

Fig. 4.19. Form v. colour 3

Fig. 4.20. Form v. colour 4

Fig. 4.21. Form v. decoration

Fig. 4.22. Form v. decoration 2

Fig. 4.23. Form v. decoration 3

Fig. 4.24. Form v. rim type

Fig. 4.25. Form v. rim diameter

Fig. 4.26. Form v. rim diameter 2

Fig. 4.27. Form v. rim diameter 3

Fig. 4.28. Form v. sherd thickness

Fig. 4.29. Form v. sherd thickness 2

Fig. 4.30. Form v. sherd thickness 3

Fig. 4.31. Vessel colour v. decoration colour

Fig. 4.32. Vessel colour v. decoration colour 2

Fig. 4.33. Vessel colour v. decoration colour 3

Fig. 4.34. Vessel colour v. decoration colour 4

Fig. 4.35. Vessel colour v. decoration colour 5

Fig. 4.36. Vessel colour v. decoration type

Fig. 4.37. Vessel colour v. decoration type 2

Fig. 4.38. Vessel colour v. decoration type 3

Table 4.2. Relationship between the percentage of applied trailed sherds and the percentage of the corpus at each site

Fig. 4.39. Distribution of amber sherds

Fig. 4.40. Distribution of brown sherds

Fig. 4.41. Distribution of black sherds

Fig. 4.42. Distribution of deep blue-green sherds

Fig. 4.43. Distribution of deep green sherds

Fig. 4.44. Distribution of deep red sherds
Fig. 4.45. Distribution of colourless sherds
Fig. 4.46. Distribution of deep blue sherds
Fig. 4.47. Distribution of opaque white sherds
Fig. 4.48. Distribution of purple sherds
Fig. 4.49. Distribution of yellow sherds
Fig. 4.50. Distribution of bowl sherds
Fig. 4.51. Distribution of claw sherds
Fig. 4.52. Distribution of cone sherds
Fig. 4.53. Distribution of globular beaker sherds
Fig. 4.54. Distribution of palm cup sherds
Fig. 4.55. Distribution of palm-funnel sherds
Fig. 4.56. Distribution of funnel sherds
Fig. 4.57. Distribution of grape sherds
Fig. 4.58. Distribution of bottle sherds
Fig. 4.59. Distribution of sherds with applied trailed decoration
Fig. 4.60. Distribution of sherds with reticella trailed decoration
Fig. 4.61. Distribution of sherds with bichrome trailed decoration
Fig. 4.62. Distribution of sherds with mould-blown decoration
Fig. 4.63. Distribution of sherds with swirled decoration

Chapter 5

Fig. 5.1. Hamwic form profile
Fig. 5.2. Hamwic comparison of blue-green and coloured sherds
Fig. 5.3. Hamwic coloured-sherds profile
Fig. 5.4. Hamwic comparison of decorated and undecorated sherds
Fig. 5.5. Hamwic decoration-type profile
Fig. 5.6. Ipswich form profile
Fig. 5.7. Ipswich comparison of blue-green and coloured sherds
Fig. 5.8. Ipswich coloured-sherds profile
Fig. 5.9. Ipswich comparison of decorated and undecorated sherds
Fig. 5.10. Ipswich decoration-type profile
Fig. 5.11. London form profile
Fig. 5.12. London comparison of blue-green and coloured sherds
Fig. 5.13. London coloured-sherds profile
Fig. 5.14. London comparison of decorated and undecorated sherds
Fig. 5.15. London decoration-type profile
Fig. 5.16. York form profile
Fig. 5.17. York comparison of blue-green and coloured sherds
Fig. 5.18. York coloured-sherds profile
Fig. 5.19. York comparison of decorated and undecorated sherds
Fig. 5.20. York decoration-type profile
Fig. 5.21. Comparison of blue-green and coloured sherds at emporia
Fig. 5.22. Comparison of decorated and undecorated sherds at emporia
Fig. 5.23. Form profiles of emporia
Fig. 5.24. Colour profiles of emporia
Fig. 5.25. Decoration profiles of emporia
Fig. 5.26. Lyminge form profile
Fig. 5.27. Lyminge form profile without cones
Fig. 5.28. Lyminge comparison of blue-green and coloured sherds
Fig. 5.29. Lyminge coloured-sherds profile
Fig. 5.30. Lyminge comparison of decorated and undecorated sherds
Fig. 5.31. Lyminge decoration-type profile
Fig. 5.32. Jarrow form profile
Fig. 5.33. Jarrow comparison of blue-green and coloured sherds
Fig. 5.34. Jarrow coloured-sherd profile
Fig. 5.35. Jarrow comparison of decorated and undecorated sherds
Fig. 5.36. Jarrow decoration-type profile
Fig. 5.37. Monkwearmouth form profile
Fig. 5.38. Monkwearmouth comparison of blue-green and coloured sherds
Fig. 5.39. Monkwearmouth coloured-sherd profile
Fig. 5.40. Monkwearmouth comparison of decorated and undecorated sherds

Fig. 5.41. Monkwearmouth decoration-type profile

Fig. 5.42. Barking form profile

Fig. 5.43. Barking comparison of blue-green and coloured sherds

Fig. 5.44. Barking coloured-sherd profile

Fig. 5.45. Barking comparison of decorated and undecorated sherds

Fig. 5.46. Barking decoration-type profile

Fig. 5.47. Whitby form profile

Fig. 5.48. Whitby comparison of blue-green and coloured sherds

Fig. 5.49. Whitby coloured-sherd profile

Fig. 5.50. Whitby comparison of decorated and undecorated sherds

Fig. 5.51. Whitby decoration-type profile

Fig. 5.52. Comparison of blue-green and coloured sherds across ecclesiastical sites

Fig. 5.53. Comparison of form profiles on ecclesiastical sites

Fig. 5.54. Comparison of colour profiles on ecclesiastical sites

Fig. 5.55. Comparison of decoration type profiles on ecclesiastical sites

Fig. 5.56. Brandon form profile compared to ecclesiastical, emporia and national averages

Fig. 5.57. Brandon colour profile compared to ecclesiastical, emporia and national averages

Fig. 5.58. Brandon decoration type profile compared to ecclesiastical, emporia and national averages

Fig. 5.59. Flixborough form profile compared to ecclesiastical, emporia and national averages

Fig. 5.60. Flixborough colour profile compared to ecclesiastical, emporia and national averages

Fig. 5.61. Flixborough decoration type profile compared to ecclesiastical, emporia and national averages

Fig. 5.62. West Heslerton form profile compared to ecclesiastical, emporia and national averages

Fig. 5.63. West Heslerton colour profile compared to ecclesiastical, emporia and national averages

Fig. 5.64. West Heslerton decoration type profile compared to ecclesiastical, emporia and national averages
Fig. 5.65. Butley form profile compared to ecclesiastical, emporia and national averages

Fig. 5.66. Butley colour profile compared to ecclesiastical, emporia and national averages

Fig. 5.67. Butley decoration type profile compared to ecclesiastical, emporia and national averages

Fig. 5.68. Sedgeford form profile compared to ecclesiastical, emporia and national averages

Fig. 5.69. Sedgeford colour profile compared to ecclesiastical, emporia and national averages

Fig. 5.70. Sedgeford decoration type profile compared to ecclesiastical, emporia and national averages

Fig. 5.71. Canterbury form profile compared to ecclesiastical, emporia and national averages

Fig. 5.72. Canterbury colour profile compared to ecclesiastical, emporia and national averages

Fig. 5.73. Canterbury decoration type profile compared to ecclesiastical, emporia and national averages

Fig. 5.74. Northampton form profile compared to ecclesiastical, emporia and national averages

Fig. 5.75. Northampton colour profile compared to ecclesiastical, emporia and national averages

Fig. 5.76. Northampton decoration type profile compared to ecclesiastical, emporia and national averages

Fig. 5.77. Portchester form profile compared to ecclesiastical, emporia and national averages

Fig. 5.78. Portchester colour profile compared to ecclesiastical, emporia and national averages

Fig. 5.79. Portchester decoration type profile compared to ecclesiastical, emporia and national averages

Fig. 5.80. Beverley colour profile compared to ecclesiastical, emporia and national averages

Fig. 5.81. Beverley decoration type profile compared to ecclesiastical, emporia and national averages

Fig. 5.82. Graphical comparison between a typical ecclesiastical assemblage dominated by globular beakers (left) and a typical emporium assemblage dominated by funnel beakers and palm cups (right)
Fig. 5.83. Y1769, conical base from a blue-green funnel beaker, Southampton City College (SOU1484)

Fig. 5.84. Y117, a flat claw containing a dark brown-black streak, from a pale blue claw beaker, Southampton City College (SOU1484)

Fig. 5.85. W196, sherd with very rare opaque white colour and applied gold foil decoration, Buttermarket, Ipswich

Fig. 5.86. W191, pale blue-green funnel beaker sherd with applied gold foil decoration, Buttermarket, Ipswich

Fig. 5.87. W191, pale blue-green funnel beaker sherd with applied gold foil decoration, Buttermarket, Ipswich

Fig. 5.88. W273, pale blue-green body sherd with applied gold foil decoration, Foundation St/Wingfield St, Ipswich

Fig. 5.89. X101, two joining rim sherds from a black globular beaker decorated with horizontal opaque yellow trails, Southampton Street (SOT89), London (Clark 2005, Fig. 6)

Fig. 5.90. X128-X130, pale blue-green vessel fragments, all decorated with horizontal opaque yellow trails, Bruce House (BRU92), London (Clark 2005, fig. 7)

Fig. 5.91. On the left, X154, a blue-green heat-softened rim from a funnel beaker; on the right, X153, a blue-green cavity rim from a palm-funnel series vessel; both from Maiden Lane (MAI86), London

Fig. 5.92. Clockwise from top left: an olive-green body sherd with a red swirl in the metal and opaque white applied trails (A176); an amber body sherd featuring a moulded ridge across the middle (A158); a pale blue-green cavity rim sherd decorated with horizontal opaque yellow applied trails (A163); and a deep blue-green convex base from a globular beaker, featuring red swirls in the metal (A160). Lyminge. (Photograph courtesy of John Piddock)

Fig. 5.93. A110. Colourless cone beaker fragment with self-coloured horizontal applied trails, Lyminge

Fig. 5.94. A109. Pale green body sherd, Lyminge

Fig. 5.95. A107. Colourless body sherd, Lyminge

Fig. 5.96. A168. Blue-green body sherd from a palm cup, Lyminge

Fig. 5.97. A170. Blue-green body sherd from a palm cup, Lyminge

Fig. 5.98. A167. Pale blue body sherd from a palm cup featuring vertical mould-blown ribbing, Lyminge

Fig. 5.99. A165. Deep blue-green body sherd, Lyminge

Fig. 5.100. D129. Pale green body sherd decorated with opaque white applied trails in an unusual ‘combed and looped’ pattern, Jarrow (Cramp 2005, Fig. 32.2.4; reproduced by permission of Historic England)
Fig. 5.101. E179. Base of a deep red globular beaker with reticella decoration, Brandon

Fig. 5.102. E139, rim of a black globular beaker with opaque yellow trails, Brandon

Fig. 5.103. E174, brown globular beaker body sherd with opaque yellow reticella trails, Brandon

Fig. 5.104. E167, blue-green globular beaker base with opaque yellow reticella trails, Brandon

Fig. 5.105. E206, bottle fragment with opaque yellow trail, Brandon

Fig. 5.106. E204, bottle fragment, Brandon

Fig. 5.107. E160, deep blue grape beaker body fragment, Brandon

Fig. 5.108. E181 and E182, body fragments with opaque red swirls in the metal and an opaque yellow trail, Brandon

Fig. 5.109. E190, deep blue hollow claw fragment, Brandon

Fig. 5.110. E193, black and solid claw fragment, Brandon

Fig. 5.111. B122, from the base of a blue-green globular beaker featuring a marvered opaque white reticella trail, Flixborough

Fig. 5.112. B109, a rolled-in rim from a deep blue globular beaker decorated with horizontal opaque yellow trails. Flixborough

Fig. 5.113. B121, from the concave base of a blue-green globular beaker, decorated with red swirls in the metal and an opaque yellow on black reticella trail, Flixborough

Fig. 5.114. B119, body sherd from a pale blue-green bowl decorated with opaque yellow trails and half-marvered opaque-yellow reticella trails, Flixborough

Fig. 5.115. B125, fragment from a rare blown applied foot in deep blue-green, decorated with an opaque white trail with a slight red streak, and a fine red streak or marvered trail on the opposite side, Flixborough

Fig. 5.116. G118. Deep purple solid claw, West Heslerton, in reflected light

Fig. 5.117. G118. Deep purple solid claw, West Heslerton, in transmitted light

Fig. 5.118. G109. Fragment from a hollow blue claw, which is heavily laminated, West Heslerton

Fig. 5.119. G104. Cavity rim fragment from an amber globular beaker, West Heslerton

Fig. 5.120. G108. Amber body fragment from a globular beaker decorated with an opaque yellow reticella trail marvered into the body, West Heslerton

Fig. 5.121. G105. Body sherd from an amber vessel with vertical ribbing, West Heslerton

Fig. 5.122. G114. Deep blue-green body sherd with vertical ribbing, West Heslerton
Fig. 5.123. G115. Pale blue-green body sherd from a palm cup with vertical ribbing, West Heslerton

Fig. 5.124. G107. Cavity rim from a blue-green bowl decorated with horizontal opaque yellow trails, West Heslerton

Fig. 5.125. G102. Body sherd from a blue-green bowl decorated with opaque yellow and self-coloured horizontal reticella trails and an opaque yellow trail, West Heslerton

Fig. 5.126. G101. Rim sherd from a thick olive green cone or bag beaker decorated with horizontal self-coloured trails, West Heslerton

Fig. 5.127. G120. Pale green heat-softened rim sherd from a vessel with horizontal self-coloured trails below the rim, West Heslerton

Fig. 5.128. G117. Pale green heat-softened rim sherd, West Heslerton

Fig. 5.129. G106. Cavity rim from a black vessel featuring horizontal opaque yellow trails, West Heslerton

Fig. 5.130. G113. Body sherd from a turquoise globular beaker with an applied self-coloured trail and a red streak in the metal, West Heslerton

Fig. 5.131. J116, blue-green funnel beaker sherd, Butley

Fig. 5.132. J118, blue-green funnel beaker sherd with self-coloured applied trail, Butley

Fig. 5.133. J124, deep red vessel sherd, Butley, in reflected light

Fig. 5.134. J124, deep red vessel sherd, Butley, transmitted light

Fig. 5.135. J112, deep blue-green vessel sherd with moulded trefoil decoration, Butley

Fig. 5.136. J105, blue-green with mould-blown decoration in a diamond pattern, Butley

Fig. 5.137. J126, olive green vessel sherd with dark green swirls in the metal, Butley

Fig. 5.138. U105. Body sherd from a deep blue globular beaker decorated with opaque yellow trails, Sedgeford

Fig. 5.139. Top row, left to right: U113, a blue-green cavity rim from a palm-funnel series vessel; U105; U111, the base of a pale green funnel beaker; U116, a deep blue-green body sherd. Bottom row, left to right: U112, body sherd from a pale green globular beaker with red trails; U102, a body sherd decorated with an opaque white reticella trail; an opaque red rim sherd not included in the corpus (SH05 BYD OT SF1439); U103, a deep blue-green flat claw form. All from Sedgeford

Fig. 5.140. U103, a deep blue-green flat claw form, in transmitted light, Sedgeford

Fig. 5.141. U101, a body sherd from an olive green globular beaker decorated with a black on self-coloured reticella trail, Sedgeford
Chapter 6

Fig. 6.1. Sites with Anglo-Saxon vessel glass

Fig. 6.2. Map of waterways with evidence of inland navigation, with light blue lines signifying indirect/speculative evidence (©E. Oksanen, ‘Inland Navigation in England and Wales before 1348: GIS Database’)

Fig. 6.3. Percentage of vessel glass sites associated with key features in the landscape

Fig. 6.4. Percentage of sites and glass vessel sherds associated with imported pottery and other material culture categories

Fig. 6.5. Edited map of distribution of vessel glass and glass inkwell fragments at Brandon (after Tester et al. 2014, Fig. 4.72)

Fig. 6.6. Edited phase maps illustrating the principle features of each phase of the Anglo-Saxon settlement (after Tester et al. 2014, Fig. 2.2)

Fig. 6.7. Map showing the spatial relationships of the test pits and trenches excavated in 2007-2009 (by permission of Gabor Thomas, University of Reading)

Fig. 6.8. Plan of 2009 trench at Lyminge (by permission of Gabor Thomas, University of Reading)

Fig. 6.9. Plan of 2008 trench one at Lyminge (by permission of Gabor Thomas, University of Reading)

Fig. 6.10. Plan of 2008 trench two at Lyminge (by permission of Gabor Thomas, University of Reading)

Fig. 6.11. Plan of buildings laid over trench locations at Jarrow (Cramp 2005, Fig. 13.3; reproduced by permission of Historic England)

Fig. 6.12. Plan of Anglo-Saxon features at Jarrow, southern half including Building D (Cramp 2005, Fig. 16.5; reproduced by permission of Historic England; reproduced by permission of Historic England)

Fig. 6.13. Distribution of Anglo-Saxon window glass in Building D, Jarrow (Cramp 2005, Fig. 16.60; reproduced by permission of Historic England)

Fig. 6.14. Distribution of Anglo-Saxon window glass in Building A, Jarrow (Cramp 2005, Fig. 16.35; reproduced by permission of Historic England)

Fig. 6.15. Period 4, phase 4ii, mid ninth century (Loveluck and Atkinson 2007, Fig. 5.7), showing context 3758 in the centre, and also Building 3, with its central hearth

Fig. 6.16. Plan of building 3, with hearth context 466 in the centre, Period 4, Phase 4i, early to mid-ninth century (Loveluck and Atkinson 2007, Fig. 5.2)

Fig. 6.17. Plan of Building 26, with hearth base context 1671 in the centre, Period 5, phase 5a, mid to late ninth century (from Loveluck and Atkinson 2007, Fig. 6.2)

Fig. 6.18. Plan of the West Heslerton settlement and associated cemetery (Haughton and Powlesland 1999, Fig. 4)
Fig. 6.19. Plan of the West Heslerton settlement, showing vessel glass distribution across occupation area (blue), craft/industrial area (green), and ‘multi-functional area’ (purple) (after Haughton and Powlesland 1999, Fig. 4)

Fig. 6.20. Plan of trench locations at Sedgeford (©SHARP)

Fig. 6.21. Anglo-Saxon features within Chalkpit Field and Boneyard at Sedgeford, Norfolk (© Jon Cousins at SHARP)

Fig. 6.22. Map to show the location and extent of Lundenwic (©MOLA [Museum of London Archaeology]). The Royal Opera House site is the large site in the centre, just below site H (Floral St). Sites in pink were excavated by MOLA between 1987 and 2000. C = Maiden Lane; M = Peabody; P = Bruce House; The National Gallery is located just above site A (Trafalgar Square); R = Southampton Street.

Fig. 6.23. Plan of early Period 5 features at the Royal Opera House site, with Building 24 and Open Area 14 highlighted (after Fig. 50, Malcolm et. al. 2003, ©MOLA [Museum of London Archaeology])

Fig. 6.24. Plan of Period 5 Phase 3 features at the Royal Opera House site, with Building 23, Building 24 and Open Area 16 highlighted (after Fig. 51, Malcolm et. al. 2003, ©MOLA [Museum of London Archaeology])

Fig. 6.25. Plan of late Period 5 features at the Royal Opera House site, with Building 50 and Open Areas 16 and 19 highlighted (after Fig. 92, Malcolm et. al. 2003, ©MOLA [Museum of London Archaeology])

Chapter 7

Fig. 7.1. Map of Kentish emporia, with solid symbol sites continuing into the late Anglo-Saxon and Medieval periods and open symbols not (Brookes and Harrington 2010, Fig. 24)
Chapter 1: Introduction

This thesis explores the consumption of glass vessels in Anglo-Saxon England in the seventh to eleventh centuries. The fragments are from monasteries, emporia and rural estate centres located mainly along the coast from Northumbria to Kent and along the south coast to Southampton. These vessel fragments are important for the study of Anglo-Saxon England in the early medieval period both as indicators of international and regional trade and as markers of social activity, display and identity.

The overall aim is to conduct the first comprehensive analysis of vessel glass from Anglo-Saxon settlement sites, and place the results in their wider social context. Chapter 3 details the research agenda and methodology, including a description of the resulting dataset. The database retains the vessel form typologies for middle (seventh to ninth centuries AD) and late Anglo-Saxon (tenth and eleventh century AD) glass established by Harden and Evison (Chapter 2). Chapter 4 collates new information regarding the fragments within the national assemblage to facilitate this and future studies. Chapter 5 examines selected assemblages, characterizing each and comparing them to each other and to the national corpus, to illuminate both the usage of glass vessels in Anglo-Saxon society and their value as an indicator of networks of trade and exchange. In the case of Lyminge, Kent, it was possible to analyse the chemical compositions of a sample of the vessel glass found, and the results featured here. Chapter 6 features intra-site distributional and contextual studies for case study sites, analyzing the use and deposition of glass vessels on a site-by-site basis and discussing the site types that have produced vessel glass and their characteristics. Finally, Chapter 7 offers a discussion of the broad social and economic context for glass vessels, firstly in Anglo-Saxon England and then across north-western Europe.
Scope

This work is concerned with fragments from glass vessels, which are defined as containers made from glass that were excavated from occupation contexts of mid to late Anglo-Saxon date (c. AD 700-1100) in England. Glass is manufactured using three ingredients: soda, silica and a calcium-rich material (e.g. Henderson 2000, 143-144). Middle Saxon glass (and all glass in early medieval northwestern Europe) was made from glass originally produced using natron from Egypt as the soda, resulting in a chemically stable material. Even the raw form was a sought-after commodity and traded over long distances. Materials and glass workers could have been imported on occasion, for example when large-scale glazing programmes were in hand – this was documented by Bede at Monkwearmouth (Cramp 2006, 79), and may well be what happened in Glastonbury in the seventh century (Willmott and Welham 2013 and 2015) and perhaps even in Lyminge, Kent, in the sixth century (Broadley, forthcoming). All required a skilled glassblower to manufacture them - Gudenrath published an excellent pictorial guide to the stages involved (1991, 213-241). Some vessel manufacturing certainly took place in England at Glastonbury Abbey in the late seventh century (Wilmott and Welham 2013 and 2015), and evidence of glass working in the ninth century has been found at Barking Abbey (MacGowan 1996), although the latter seems to indicate production of beads of inlays rather than vessels. In addition, some possible vitreous deposits on crucibles were found at Hamwic (Hunter and Heyworth 1998, 61), although as other industrial process can also produce similar deposits, these are not certainly evidence of glass working, and even if they were, bead manufacture would be the most likely scenario.

It is likely that a significant proportion of eighth and ninth century glass vessels were imported either as traded goods or personal possessions and some would have been regarded luxury items. There are a number of key factors strongly suggesting a reliance on international imports for glass vessels in the middle Anglo-Saxon period, of which the foremost is the strong correlation between
vessel glass distribution and coasts or navigable waterways (Figs. 6.1 and 6.2). There are also widespread but usually unsupported claims that much of the glass in Anglo-Saxon England typologically matches Frankish glass that was traded across the North Sea zone (e.g. Loveluck 2014, 148). There are certainly some rare types for which a strong case can be made: gold foil decorated glass is the best example (Broadley 2016), with grape beakers being another (Tester et al. 2014, 377). However, others have suggested that particular types were made in England, also based on typology and concentrations in distribution patterns. Stiff suggests that bowls and reticella vessels were made in eastern England (2003, 246). However, he follows this with the theory that all of the vessel glass in Lundenwic was probably brought in, presumably either from regional or international sources (ibid., 247). Ultimately, typologies and distributions are circumstantial evidence for the sources of vessel glass groups, and it is not possible to prove a case on these grounds, so we do not know how much of the vessel glass in Anglo-Saxon England was imported or how much was made in England. The only perceivable routes to definitive answers are via future discoveries of production sites (particularly in the Rhineland or in England), or via an international programme of compositional analysis, harnessing current fast-moving scientific developments.

Vessel glass was a desirable commodity in Anglo-Saxon England due to the appealing visual characteristics, the high level of workmanship required, the fragility of glass, and the function of the vessels relating to drinking, feasting and celebration. Part of the value of collecting and studying fragments of Anglo-Saxon vessel glass lies in their ability to indicate particular types of activity (feasting, trade) and access to glass vessels via direct or indirect networks. The interplay between different site types in Anglo-Saxon England is an important area of research, connected to the continual conundrum of whether archaeology can differentiate between sub-groups of elite and middle-ranking sites, particularly secular and ecclesiastical, and whether it matters or not. This study will investigate the contribution of vessel glass to the study of inland trade networks ‘beyond the emporia’. Vessel glass fragments have great
potential to offer a window onto settlement and society at a fascinating time in our past.

The geographical and temporal limitations imposed reflect the nature of the material in question and relate to previous scholarship in the field of Anglo-Saxon glass studies (both discussed in more detail below). The geographical coverage of this work is dictated by the fact that the vessel glass of the British Isles in the early medieval period belonged to two distinct traditions, eastern and western, each with separate sources, separate consumers and differing technological and artistic traditions (for an excellent overview of the western, or ‘Atlantic’ glass, see Campbell 2007). Here the focus is on the eastern glass, found in the regions roughly corresponding to the Anglo-Saxon kingdoms of Kent, Sussex, Essex, East and Middle Anglia, Lindsey and Northumbria, and concentrated in particular in Southampton, the City of London and the modern counties of Kent, Essex, Suffolk, Norfolk, Lincolnshire, North and East Yorkshire, Durham and Northumberland (for a map of the site locations, see Fig. 6.1). This study covers the glass from all the sites in these regions on which vessel glass has been found. More than half of the national corpus by sherd count comes from Southampton (Hamwic) with much of the remainder coming from coastal or riverine sites along the eastern fringe. The Hamwic glass was the subject of a monograph by Hunter and Heyworth published in 1998. Vessel glass from the other three emporia at London (Lundenwic), Ipswich (Gipeswic) and York (Jorvik), has been comparatively well studied but less comprehensively published. The assemblages are essential to any study due to their dominance of the national corpus in terms of sherd count and their importance as a subgroup for comparative purposes.

Early Anglo-Saxon vessel glass from England has been studied extensively; particularly the complete glass vessels buried as grave goods prior to the adoption of Christian burial practices during the seventh century, which form the majority of known material dated to between c. 400 and 650/700 AD. The chronological focus of previous scholarship on earlier material (e.g. Evison
1982) is the primary reason for excluding fifth- and sixth-century glass and instead examining material from the late seventh to eleventh century contexts. The end date was also chosen primarily to reflect the nature of early medieval glass in the archaeological record. Vessel glass of the tenth and eleventh centuries is very rare and usually fragile, which may be one reason why so little has been recovered to date. The late Anglo-Saxon period also appears to constitute a break in the record of glass vessels in England. By the twelfth to thirteenth centuries, the earliest glass of the ‘later’ medieval tradition appears in the archaeological record (Tyson 2000), and evidence for a direct link with the corpus of Anglo-Saxon vessel glass is very limited. The historical range of this thesis (c. AD 700-1100) is also significant in settlement studies: it was during these four centuries that the settlement pattern in England evolved from isolated rural farmsteads to a network of towns and villages, manors, burhs, monasteries and parishes (e.g. Reynolds 1999; Hooke 1998). A pattern of countryside land-use and division was established, which in many areas survived throughout the later medieval period and into the present.

This study is not concerned with glass from burial contexts, or glass without provenance. Window glass and other glass objects such as inkwells, linen smoothers and beads also lie beyond its limits.

**Objectives**

The first aim of this thesis is to move away from previous work on the funerary archaeology of the early Anglo-Saxon period and concentrate instead on glass from settlement contexts of the seventh to eleventh centuries, where there are gaps in current knowledge and potential to learn about glass vessels and settlements in England at that time. This thesis will assess whether there is any significance in the characteristics of recovered glass. Generally only small pieces of vessel glass from this period survive, which are likely to be the sherds missed during the collection and recycling of waste glass. This work will provide a clear and comprehensive analysis of middle and late Anglo-Saxon vessel glass.
and will establish a new framework for the study of such material. Due to the fragmentary nature of the material, a discussion of vessel forms represented is a challenging task, attempted below alongside discussions of the attributes that even the smallest sherd can reveal: colour and decoration (Chapter 4, and p. 30-41 for a history thereof). Another challenging aspect of comparing and contrasting vessel glass assemblages is retaining an awareness of variations in chronology between sites and site assemblages, with the aim of assessing, as Gaut described, ‘which of the observable fluctuations between the sites may reflect chronology and which real differences in consumption’ (2011, 251). Fortunately, the majority of site assemblages within the corpus are centred on the eighth century explosion in consumption of glass vessels and are broadly contemporary with each other. The exceptions with earlier glass are: Canterbury (seventh century), West Heslerton (mostly seventh century, but continues into the eighth), Portchester (seventh to mid-eighth century), and Lyminge (seventh to ninth century glass, but with a larger than usual group of seventh century cone beakers). The exceptions with later glass are Beverley (the first half of the ninth century) and Northampton (c. AD 850-1050), although seventh century glass has also been found in Northampton, but interestingly nothing so far from the core period on the vast majority of sites: AD 700-850. Of these, only the Lyminge and West Hesterton assemblages contain more than 15 sherds (79 and 30 respectively).

One objective is to use as much of the available information as possible: expanding the meaning and relevance of characteristics possessed by the smallest sherds – size, colour, visible decoration, curvature and context. Following the assessment of the glass on a national scale, the next objective is to characterize key assemblages and compare them with each other and the national corpus. The principal methodology for studying the glass assemblages is comparing the specific character of individual assemblages with others (e.g. ratio of forms, variety of colour and decoration, presence of imports), while noting variations in chronology in some cases (e.g. West Heslerton, Yorkshire, and Beverley). The third objective is a detailed study of the archaeological
contexts in which glass of this period is found, both in terms of the types of deposits within sites that produce glass and the taphonomic processes that are involved in their formation, and in terms of the category or character of the sites at which glass is recovered. The contextual element of the study necessarily focuses on material excavated recently under modern conditions. Overall, the research themes addressed by this project are the glass corpus and its typology; glass vessels in Anglo-Saxon society; and glass vessels as an economic indicator of trade and exchange. Chapter 3 includes a comprehensive description of methods employed (p. 68-78).

All of the glass discussed above is the soda-based glass prevalent in middle Saxon England up to around the mid ninth century. At this time, the supply of soda glass seems to have faltered, perhaps as part of general disruption of trade routes in northwestern Europe, perhaps partly in response to reduced demand. During the course of the ninth century, glass producers turned increasingly to locally available potash glass, which used plant-ash for both the soda and calcium required for production in place of either Egyptian natron or recyclable material originally made with natron. By the tenth and eleventh centuries this was all there was, although the chemical structure produced was significantly inferior. Recent research on window glass in Europe (France, Belgium and Germany) has produced a range of very interesting evidence for the beginning of this transition process in the late eighth century (Van Wersch et al., 2015). The first known traces of potash glass appear in window glass from the palace-monastery at Paderborn (Germany), and monasteries at Baume-les-Messieurs (France), Stavelot (Belgium) and Lorsch, Corvey, Brunshausen and Fulda (all in Germany). Van Wersch et al. suggest that ‘the increasing demand for glass in monumental architecture may have contributed to a new type of material’ (ibid.), seemingly focused very strongly on monastic construction. One can surmise that vessel glass production followed the trend set by window glass production. However, comparable evidence for the transition to potash vessel glass has not yet been found, and pan-European research in a similar vein would be a fascinating area for future exploration.
Contextualizing glass vessels as a container type

It is important to be aware at the outset that glass vessels formed only one category of containers used in the Anglo-Saxon period in England – and further afield. Vessels were made from other materials: pottery, wood, horn, leather and metal. Ipswich ware pottery, a middle Anglo-Saxon type dating from c. 720-850 AD (Blinkhorn 1999, 8-9), is a significant body of material for contextualizing glass vessels that coincided chronologically with the flourishing of middle Anglo-Saxon vessel glass. Ipswich ware differs from the vessel glass in that we know its source and that it was manufactured only in Ipswich, but is similar in that it was traded all across eastern England, particularly in areas with coastal or riverine access, and is similarly a useful indicator of internal trade networks. Outside its production zone, Ipswich-ware had a value as the only native wheel-thrown and kiln-fired pottery, and also as a source of a wider range of forms, including the only English-made pitchers. However, other forms included cooking pots, storage jars and bowls – very different from glass, where almost all forms were smaller and probably used for drinking. It is possible that glass bowls were used for serving food instead of drink, but certainly the glass was almost all dining ware and not suitable for storage or food preparation. The only exception is bottles, which are extremely rare at this time, in contrast to the Roman and post-medieval periods. Imported pottery appears not to have reached the hinterlands in significant quantities, and the vessels that did may also have been closely associated with the wine trade (ibid. 11), a theory that can be applied to glass vessels as well. Banham writes that viticulture became possible in England during the ninth century due to an improving climate, but wine ‘must have been imported for the mass before that’ and ‘also became increasingly popular for secular use with Anglo-Saxons who could afford it’ (Banham 2013, 196).

Rare evidence of a wide variety of vessels of wood, horn and metal comes from the seventh-century royal burials at Sutton Hoo and Prittlewell. In the case of the wood and horn drinking vessels, the forms have largely been reconstructed
from the silver fittings that survive. The Prittlewell burial contained the remains of five wooden cups with gilded copper alloy or silver rim mounts, and two drinking horns (Hirst 2004, 34-5). Sutton Hoo mound 1 contained six Maplewood ‘bottles’, seven burr-wood cups and two aurochs’ horns, all with silver-gilt mounts (Carver 2005, Table 21) and all of which appear to have parallels in mound 2. The shapes of the wooden vessels are clearly comparable to palm cups and globular beakers. The term ‘bottle’ is misleading – presumably applied due to the globular bodies and vertical rims present, despite the similarity to glass globular beakers and the likelihood that all were used as cups for drinking. The shape of the burr-wood cups is even more similar to the globular beaker form, as illustrated by East (1983, Fig. 283). Drinking horns are extremely rare high-status finds, paralleled by equally rare glass drinking horns of the sixth and seventh centuries (ibid.). East provides a comprehensive review of the evidence for drinking horns and wooden cups from Anglo-Saxon sites (1983, 385-395), although most are from sixth- and seventh-century grave contexts. Meanwhile, the metal vessels at both sites range from large ferrous cauldrons to engraved hanging bowls, including a set of ten silver bowls and a Byzantine silver dish from Sutton Hoo mound 1, and the ‘Coptic’ copper alloy bowl from Prittlewell. All of the above are large pots or bowls, mainly for cooking or serving foods and not for drinking as with small glass bowls. The only exception to this is the Byzantine flagon from Prittlewell, which appears to have been used for serving liquids (Hirst 2004, 31-3), perhaps in conjunction with the wooden cups, glass vessels, and horns.

Wooden vessels were almost certainly at least as important as pottery right through the Medieval period (McCarthy and Brooks 1998, 98): relative importance of materials is difficult to assess from the archaeological record as organic materials also including horn, leather and basketry rarely survive. The principal evidence for wooden vessels in pre-Conquest England comes from the waterlogged layers of Anglo-Scandinavian York (c. AD 850-1066). Lathe-turned vessels from Coppergate and Bedern in York included 94 bowls, 25 cups and 5 lids, indicating the range and proportions of the forms found (Morris 2000,
The bowls range from relatively flat, almost plate-shaped profiles to deep ones, with the latter in particular being very different to the forms found in glass. Including ‘rounded’, there are five bowl profiles (ibid. Fig. 1017.1,2,3,7 and 8), while for glass bowls we have only a few complete vessels on which to base our knowledge of the profile range, but it is certainly much narrower with only one main shape (a rounded base and vertical or near-vertical rim). Many wooden bowls also have rounded bases, but significant numbers have flat or lathe-turned bases (ibid. 2175), so as with pottery the variety is greater in wood than glass, perhaps reflecting the flexibility of wood-working and the fact that it was much more widespread and accessible. The wooden cups have three main profiles – vertical, in turned and globular (ibid. Fig. 1017.4, 5, and 6), with the globular form being very similar to that of globular beakers. The cups often had decorative metal mounts as seen on seventh-century examples discussed above, and as before, the craftsman’s skill, the precious metals and sometimes the unusual wood species (e.g. the cups of walnut burr-wood from Sutton Hoo, which East suggests was imported, East 1983, 395) indicate that some were items of status.

Very few moulded leather vessels are known from Anglo-Saxon England, with a rare example being the remains of a cup with silver fittings found in a barrow near Buxton in 1848 (Baker 1921, 19). However, leather is under-represented in the archaeological record, and bottles and flasks in particular may have been more common than they appear, as suggested by a late Saxon documentary source mentioning the manufacture of both (McCarthy and Brooks 1998, 100). The later history of leather bottle and flask manufacture also supports this, as both were in widespread use until the fifteenth century at the earliest (Baker 1921, 23).

Provenanced metal vessels from the eighth century onwards are also extremely rare – a silver chalice was found in 1774 in the Trewhiddle Hoard in Cornwall (Dodwell 1982, 61), the burial of which has been dated to c. AD 875. More recently, an engraved cup also thought to have had an ecclesiastical function,
perhaps as a pyx or ciborium used to contain the host during church services, was found in 2007 in the Vale of York Hoard. It was silver-gilt, decorated with vines, leaves, engraved deer and lions and inlaid black niello, and was probably made in ninth-century France or Germany. The form and engraving are very similar to that found on the silver-gilt cup from the Halton Moor Hoard, also found in Yorkshire, in 1815. The decoration features four large animals interspersed with sprays of foliage, all in the Carolingian style, showing that the cup was made in the late eighth or ninth century in northwestern Europe and was imported to England. The Vale of York cup was buried c. AD 927-8, and the Halton Moor cup around a century later (Ager, Cooper and Williams 2007). The fact that all three were found in hoard contexts and that the latter two formed the container for the hoard, illustrates the accidents of preservation that allowed these expensive and easily recyclable vessels to survive. The probability that all three had an original function as liturgical vessels may be significant when considering the function of similarly shaped vessels, especially as it turns out that globular shapes are more common on ecclesiastical sites, although it is also possible that ecclesiastical vessels were more likely to be buried in hoards and survive. Regarding form, the Vale of York and Halton Moor cups are both similar in shape to glass globular beakers and some of the horn and wooden cups mentioned above, featuring globular bodies, and vertical or everted rims. However, the goblet-shaped chalice from the Trewhiddle Hoard is unparalleled in the archaeological record of this period from England. In glass, the closest find so far is the deep blue-green fragment from the foot of a ‘stemmed beaker’ from Flixborough (B125; Fig. 5.115).

In the late Saxon period (the tenth and eleventh centuries), many of the same trends continue. Wooden, leather and horn vessels were again more common than their representation in the archaeological record would suggest, while finds of metal vessels are almost non-existent, probably due to their original worth and to their value for recycling. Small bowls (or large cups) were the most common drinking vessel throughout this period and much of the high Middle Ages, and most were made of wood (McCarthy and Brooks 1998, 113). Pottery
drinking vessels were not common until the fourteenth or fifteenth centuries, and indeed only three main ceramic forms were widespread prior to that – the cooking pot; the bowl, pan or dish; and the jug or pitcher (ibid, 98, 102). The late Saxon cooking pot was very similar to previous versions - small and jar-shaped - and McCarthy and Brooks suggest that some of the smaller ones may have been used as an equivalent of the modern jam-jar (ibid. 106). Vessel glass appears to have been unusual at this time, and is certainly very rare in comparison to middle Saxon glass, although this may be due in small part to the reduced stability of the potash fabric in the soil. Less is known of the vessel forms because the group of known fragments is so small. McCarthy and Brooks state that vessel glass was ‘little more than a crude sideline of the Weald glass industry’ before the sixteenth century (ibid. 101). This statement may be a little harsh, but gives a clear view of the comparative importance of the middle Saxon glass-making imports and perhaps industry, and of how long it took for English glass making to recover equivalent quality and volume.

It is a simple matter to detect skeuomorphs for globular, palm cup and bowl glass forms in particular, notably amongst high-status wooden vessels and the rare metal survivals. Some precious metal vessels found in Scandinavia and on the continent, also exhibit globular and palm cup shaped forms. Pottery vessels and their functionality, however, are markedly distinct from glass vessels throughout the period, as are the more utilitarian groups of wooden and metal vessels. Globular and palm-shaped cup forms seem to have been high-status in glass, metal and wood for many centuries, probably associated with the consumption of alcoholic drinks in communal setting (first perhaps bjorr, a Scandinavian liqueur, then later probably wine). However, other drinking glass forms, including the claw beaker, cone beaker, and funnel beaker (Fig. 2.1), are unparalleled in non-glass materials.
Chapter 2: A history of research on mid to late Anglo-Saxon glass vessels

The aim of this chapter is to review important works in the field of Anglo-Saxon glass studies and to critically appraise the current state of knowledge, with a focus on settlement sites of the mid and late Anglo-Saxon periods (AD 700-1100). Early Anglo-Saxon glass vessels from pre-Christian furnished inhumation cemeteries have been comprehensively studied already and are thus only covered briefly here. Study of early medieval glass has been largely restricted to a handful of authors, including Donald Harden, Vera Evison, Mike Heyworth and John Hunter, Ewan Campbell and Matthew Stiff. The nature and extent of their various contributions is discussed below under thematic headings corresponding to later chapters in this volume.

Vessel types and chronology

No study of past scholarship on mid to late Anglo-Saxon glass vessels would be complete without discussing the work of Donald Harden. During the period following the Second World War, Harden developed the first typology of glass vessels in Britain and Ireland, c. AD 400 to 1000, published in 1950 (Harden, July 1950) and then refined in 1956 (Harden, 1956). Harden followed similar work on continental material by Fremersdorf in Germany (Fremersdorf 1933-4) and Rademacher in France (Rademacher 1942), and based his initial typology on the (then) better-known glass from north-western Europe. Harden was the first in the UK to regard vessel glass from the Dark Ages as an important subject for study, noting a vital link between the Roman and medieval glass industries (Harden 1956, 132).

At first glance, some of Harden’s approaches and interpretations seem antiquated now, with references to ‘the Dark Ages’ and ‘shedding light on that darkness’. What is really striking, however, is that after all this time most of Harden’s work is still relevant. He prefaced his typology with a sensible caution: that division of the material into groups must remain somewhat fluid, and that
such a construction is inevitably a partially subjective exercise. He emphasized the importance of decoration as well as form, particularly in the case of squat jars (now more accurately known as ‘globular beakers’), which is echoed by contemporary practice. In general, he used effective techniques familiar from work that is more recent and many of his syntheses have only been superseded by more recent discoveries. Indeed, Harden did such an exemplary job from the 1950s onwards that there was little need for further development or room for other figures in the field until after he retired in 1970.

Harden clearly distinguishes himself from the antiquaries of the previous century by including comprehensive discussions of glass from settlement sites of the fifth to seventh and eighth to eleventh centuries, including all occurrences known at the time. He was the first to refer to the significant corpus of fragmentary glass from Hamwic (Southampton), where excavations had been underway since 1946 and had already unearthed a ‘most interesting’ assemblage (ibid. 153). The synthesis of seventh- to eleventh-century glass from settlement contexts created as part of this project builds on studies of the material that began with Harden. He concludes his 1956 article with a description of Anglo-Saxon glass containers as ‘household vessels of the rich’ (ibid. 157), most of which were clearly drinking vessels. The ‘household’ and ‘drinking vessel’ parts of this observation still hold, and the view of glass vessels as exclusive to the ‘rich’ has only been shifting to encompass broader access over the past thirty years or so.

Following, and eventually surpassing Harden, Vera Evison is foremost among contributors to Anglo-Saxon glass research, particularly regarding vessels from funerary contexts. Evison’s impressive output of publications on the subject of early medieval vessel glass includes four key articles on specific vessel types: ‘Kempston’ cone beakers (Evison 1972), glass drinking horns (Evison 1975),
Fig. 2.1. Evison’s typology for AD 700-900 (Period III) and AD 900-1100 (Period IV). (Evison 2000, Fig. 4, © The Trustees of the British Museum. Shared under a Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International (CC BY-NC-SA 4.0) licence)
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*Fig. 2.2. The chronology of key vessel forms from the fifth to eleventh centuries*
claw beakers (Evison 1982), and bichrome glass vessels of the seventh and eighth centuries (Evison 1983); and a book chapter entitled ‘Glass vessels in England AD 400-1100’, which constitutes the only published overview of the subject since Harden (Evison 2000). Evison refined Harden’s initial typology to reflect more recently discovered material and created one still in use today (Fig. 2.1). Her typology for AD 700-900 and AD 900-1100 shows most obviously the variety of forms in use in AD 700-900 compared to only globular beakers in AD 900-1100. The figure illustrates the most common forms in use in AD 700-900: the form series leading from palm cups to funnel beakers, globular beakers and bowls. However, it does not illustrate effectively the scale of the presence of these forms compared with the very unusual forms in the lower half of the image (claw beakers, cylindrical beakers, bottles, horns and stemmed beakers). Meanwhile, the illustration of forms for AD 900-1100 fails to illustrate the full range of late Saxon vessel forms mentioned in Evison’s accompanying paper, namely a late claw and a late bottle. It also only places forms as existing within a two-hundred year period and does not depict the waxing and waning and overlapping of forms over time well (see Fig. 2.2). Finally, Evison’s typology illustrates only complete vessels: the typology of fragments presented here (Figs. 3.1a and b) provides a different and much needed viewpoint. Her monograph cataloguing the mainly sixth- and seventh-century Anglo-Saxon glass in the British Museum was released in 2008, and she has also published a large number of specialist reports within site and other publications (with recent relevant examples including Flixborough, Lincolnshire, Evison 2009, and Brandon, Suffolk, Evison 2014).

Claw beakers formed the subject of the third of her four main typologically focused articles (Evison 1982). This piece is the most significant of her output in terms of its impact on the field of early medieval glass studies, being the first attempt to study and catalogue English claw beakers as an insular group, and makes an excellent representative for this category of her work. The relevance of the article to this research project lies largely in its description, catalogue
and discussion of seventh-century and later sub-groups of claw beaker. Evison makes useful statements about colour (seventh-century fragments are usually olive-green or the ‘bright new colours’ of deep blue and green). Furthermore, she notes that the occurrence of claw beakers in settlement contexts at West Stow and Mucking (and now at Lyminge) indicated items in daily use and not as objects solely intended for burial.

There were very few examples of claw fragments from settlement contexts known to Evison at the time that her article was written, no doubt partly due to excavation and retrieval methods and partly to a previous bias towards cemetery excavation. However, it is also a function of the difficulties of positively identifying this form when dealing with fragmentary material, and also the apparent phasing out of the form during the course of the seventh to eighth centuries. As usual, Evison is nothing if not thorough, and she traced and discussed the few sherds known at the time of writing. One in particular, an unstratified sherd from Loveden in Lincolnshire, is highlighted for its unique ‘emerald green’ colour and consequent late seventh-century date (Evison 1982, 51-2, 70, Plate 4b). One assumes that the original identification of these deep colours as a phenomenon of the late seventh century onwards was based on other well-stratified sherds or other associated finds, although this is not stated explicitly. Meanwhile, the Loveden sherd is probably not the latest example discovered by Evison. Despite her contention that (at the time of writing) no site with glass of the period AD 700-1100 had produced any claw beaker fragments, she points out that a potash glass claw from Falcon Street, Ipswich is ‘witness to later developments of indeterminate date’ (ibid, 52, 71). A final contender for the title of latest extant claw fragment, which may be the only one of the three mentioned to be securely stratified, is the sherd listed in the addenda of the article – a flat green-blue claw containing a dark streak, from the Middle Anglo-Saxon ‘monastic’ settlement at Brandon, Suffolk. This sherd has added importance as the first parallel to late claw beakers found in Sweden, and is the first find to support Evison’s suggestion that the Swedish claw beakers were exported from England (which was presumably based on
distribution as it stood of known finds, and perhaps her theory that this production and export route existed for claw beakers in earlier centuries) (ibid, 60). Evison’s article presents a case based on distribution that the tall, conical claw beakers of the mid seventh century were produced in Kent and exported to Buckinghamshire (Taplow) and possibly Germany. She also suggests that the late-seventh-century examples from Suffolk and Sweden must be linked to Kent despite a lack of any finds in Kent so far, as their forms are developed from the earlier Kentish types (1982, 54, 57). She concludes that the earlier type 3c claw beakers were produced in England in the first half of the sixth century and some were exported, and overall that ‘the role played by [early] Anglo-Saxon England in glass production has been underestimated’ (ibid, 58).

Evison introduces her chapter on ‘Glass vessels in England AD 400-1100’ (Evison 2000) by writing that vessels found since Harden created his classification in 1956 have largely conformed to his typological sequence, although some can now be placed in an improved international and chronological context (Evison 2000, 47). Evison retains Harden’s type names as far as possible, which is a sensible strategy for avoiding confusion, and adopts the same approach of illustrating the typological framework using specific referenced examples. It is interesting to note that in Evison’s periods I and II (AD 400-550 and AD 550-700) all the examples given are from England, while in periods III and IV (AD 700-900 and AD 900-1100, Fig. 2.1) only four out of seventeen are English due to the near total lack of complete vessels from England. One key divergence from Harden is the rejection of the term ‘squat jar’ in favour of ‘globular beaker’, apparently because the type covers a wide range of forms, some of which are quite tall, and because the terms ‘jar’ and ‘beaker’ infer different methods of using the vessels (the former suggesting storage and the latter drinking). Evison’s typological adjustment makes sense, and the term ‘globular beaker’ is finally becoming established. Some earlier forms (sixth to seventh century) have sharper shoulder profiles and narrower rim diameters and may have been used as storage jars, but the later forms are much more likely to have been drinking vessels. Regardless of the contents, they constitute a large
group of stable vessels that could have been set down on a table while in use, and are clearly separate from the palm cup/funnel beaker series and other unstable forms. One can imagine cone beakers, palm cups and funnel beakers held in the hand and used continuously by individuals, and then placed on their rims once emptied as suggested by wear marks (Gaut 2011, 255; Stiff 1996, 104). Meanwhile, more stable vessel forms seem to have been associated with collective drinking rituals and with the consumption or ale or mead rather than wine (Gaut 2011, 252, 255).

Evison includes a summary of European and Scandinavian sites important to the study of vessel glass in her review chapter (Evison 2000). It is very useful to mention complete vessel examples from countries where the practice of furnished burial continued for centuries longer than in Britain, as they are an important guide to forms in particular. The clawed globular beaker from a ninth to tenth century pit at St Denis in France (Evison 2000, 83) is a good example of how continental parallels can broaden our vision when studying form. Evison notes that clawed vessels can only be identified by the claws themselves if the glass is fragmentary, meaning that we do not know much about the overall forms of the vessels they were applied to in mid and late Anglo-Saxon England. We might not have expected them to be found on a globular beaker as at St Denis, because all clawed beakers known from England are sub-conical in shape and have applied base rings. However, information gleaned from overseas examples needs to be clearly marked as such when discussing fragmentary glass from England.

Evison’s description of the types found between AD 550 and AD 700 shows that most types in use in the fifth and sixth centuries (cone beakers, bell beakers, claw beakers, palm cups) developed into a late form in use in the early seventh century, but were gone by the eighth. This combined with her subsequent discussion of innovations of colour and technique at the end of the Early period – the re-introduction of bright colours (deep blue, emerald green), the emerging tendency to employ a second colour in decoration, and the
occasional appearance of a horizontal band of latticed trails – illustrates very effectively the nature of the revolution in north-western European glass-making with which we begin here. Evison offers hope for future study of fragments in her introduction to the period AD700-1100, where she states that the original appearance of fragmentary vessels can sometimes be deduced, ‘for known forms are few and the colours and methods of decoration employed are often distinctive and recognizable’ (Evison 2000, 78). Examples given that support this optimistic stance include ‘Valsgärde’ type bowls (ibid, Fig. 4.1, plate 5a) and ribbed palm cups (ibid, Fig. 15a), and importantly a useful illustration of fragments (ibid, Fig. 14) is provided showing fragments from five different vessel types. Caveats are also issued: Evison states that it is not possible to differentiate between palm cups and tall palm cups by rim shape only, and it is certainly true that the current theory about a general progression from hollow-folded rims to simple fold to thickened must remain flexible, as two of the three types appear to have existed concurrently in some places.

As well as the more common forms of the eighth and ninth centuries (tall palm cups, funnel beakers, globular beakers and bowls), Evison lists all the very rare types too (cylindrical jars, horns, bottles, inkwells, late claw beakers and stemmed beakers). In some of these cases only continental examples are known (cylindrical jars, horns), but of course if these finds exist as rare examples in Europe it is possible that some will be found in England eventually, and their inclusion is helpful as future sherds may never be identified if future archaeologists do not know what to look for. The inkwell fragment from Lurk Lane, Beverley (ibid, 82) is an example of a rare sherd that was initially misidentified.

Of the rare forms, inkwells are very interesting due to their contribution to the debate about glass vessels and ecclesiastical production and use, and to what extent excavation of vessel glass today is an indicator of monastic sites. Evison notes that the form is likely to have been resurrected in England at the time of the flourishing of minsters in the eighth century to aid the production of
Christian manuscripts (ibid, 82). Evison also suggests the possibility that the few stemmed beakers found so far may have been used as chalices, a fascinating idea that would be ripe for development if future finds are made available.

Part of the value of Evison’s 2000 article is that it includes a number of tantalizing references to vessels from sites that are currently otherwise unpublished. Until recently, perhaps the most frustrating example, however, was the reference Evison makes to the technique of decorating glass vessels with applied gold foil. Until the publication of her book chapter no finds of this type were known from England, although some European examples had been published (Lundström, 1971). In her chapter, Evison describes a single sherd found at Ipswich as “3104:196/unpublished” (ibid, 85). Unfortunately, this sherd was not illustrated, and despite its importance, it remained unpublished anywhere else. Matthew Stiff subsequently listed three gold foil decorated sherds in his unpublished thesis, all from Ipswich, but only one is illustrated and is mislabeled in the caption (Stiff 1996, vol. 1, 215; vol. 2, 22, 23 and 28, Fig. 12 G). In 2013 a fourth sherd was discovered during the excavations at Lyminge, Kent, and in a fitting conclusion, all four have been published with illustrations in the recent festschrift for Vera Evison (Broadley 2016). If it were not for its inclusion in Evison’s highly comprehensive chapter the original sherd would not have been known in the public domain at all, and it remains exasperating that key sites such as Ipswich are not properly published, and that the glass itself is also frequently inaccessible to researchers.

In ending her chronological progression through the glass of Anglo-Saxon England with a discussion of material of the tenth and eleventh centuries, Evison provides a unique overview of the glass of this time in England. For most of the first millennium AD the glass of north-western Europe was almost exclusively of soda-lime-silica composition, with silica (sand) being the main ingredient, lime often included as an impurity in the sand, and soda acting as the flux. By the end of the ninth century, a technological change had taken place in glass production, and soda-based products had been replaced by much
less durable potash glass (i.e. plant ash, known as ‘potash’ had replaced soda as the type of flux used). Evison makes the interesting point that the amount of vessel glass in use in England seems to have diminished markedly at this time, in contrast to the situation in France where volumes remained high (Evison 2000, 91). This helps to counteract the argument that glass vessel fragments found in England decline partly due to the reduced stability of potash glass in the soil, although that is still a potential factor in the dearth of finds, as is the fact that late Anglo-Saxon potash glass is more difficult to identify than earlier soda glass, especially when residual. However, a familiar problem arises again: most of the glass listed by Evison in this section is either from unpublished sites in London or Ipswich, or it has been lost as in the case of two sherds from Thetford.

If the glass of the eighth and ninth century has only recently received some of the attention it deserves, the very rare glass of the late Saxon period has received almost none at all. Sherds of known form listed by Evison comprise one bottle fragment, one claw fragment and three ‘wide-moutheed’ globular beaker fragments from Ipswich; one globular beaker fragment from Northampton with applied trailed decoration (Evison 2000, 88-90) and one similarly-decorated globular beaker fragment from Waltham Abbey, Essex, making a total of seven. Sherds of unknown form include an unknown number from London, and two from Thetford (seen by Harden but since lost, one of which was not potash but ‘deep blue with streaky lines’, ibid.). The right side of Fig. 2.1 illustrates the narrow range of forms from this period discovered so far, although Period IV numbers 1 and 2 are both from Birka in Sweden. Number 3 is from Waltham Abbey, Essex, which is drawn in the figure but not mentioned in Evison’s text; raising a question mark over whether Evison covered all the material she had knowledge of at the time. Meanwhile, the reverse is true for the bottle and claw fragments from Ipswich, which appear in the text but not in the illustration. A single sherd found at Bishopstone, East Sussex, is one example of a sherd discovered since Evison’s summary, and there are bound to be a few more lurking in archives and backlogs, although probably not many.
The majority of sherds mentioned by Evison are otherwise unpublished, and the assemblages from Ipswich and London in particular are long overdue some attention, considering their importance both for glass studies and the understanding of Late Anglo-Saxon England. Late Anglo-Saxon glass constitutes a major research concern now and for the future, particularly as more sherds emerge. A comparison with French material may help with the identification of more sherds here, and address the question of why survival is so much greater there.

Above all, the significance of Evison’s chapter is that it is the only published overview of Anglo-Saxon vessel glass recent enough to still be relatively up-to-date, and that it is a clear and comprehensive synthesis of vessel glass covering the entire Anglo-Saxon period. Her descriptions of types, techniques and temporal progression provide the best introduction to Anglo-Saxon glass vessels currently available, and her typological figures are still useful. However, no mention is made of contextual setting – even the sites of origin are mentioned in passing. There is little reference to regional variations or to internal exchange networks and no mention at all of the lack of Atlantic glass (a noticeably different range of glass found in the Atlantic seaboard zone, from Cornwall to western Scotland; Campbell 2007, Fig. 45) in Anglo-Saxon England. Overall, Evison’s chapter is descriptive and omits any discussion of what it all means for our knowledge of Anglo-Saxon society and economy – an important absence that this study addresses.

Glass from the emporia and settlements in western Britain

Hunter and Heyworth’s volume on the huge assemblage of fragmentary Middle Saxon vessel glass from Southampton (Hamwic) is of great importance to this field of study for a number of reasons, including but not limited to the size and source of the assemblage itself and the proportion of the Middle Saxon corpus of vessel glass from settlement context that the Hamwic assemblage represents (59%). In terms of sites on which Anglo-Saxon vessel glass has been
found, Hamwic is the most important. Following Evison, Hunter and Heyworth
provided a page of generalized representations of the vessel forms under
discussion in order to provide a frame of reference, followed by numerous
illustrations of various rim and base types from within the assemblage – the
closest we have so far to a typology of fragments. They subdivided the ‘palm
cup/funnel beaker vessel series’ into three rim types (tubular with cavity,
tubular without cavity, rounded) and bases. ‘Other vessel types’ comprises
cone beakers, claw beakers, globular beakers, and bowls. Cone beakers are
confusingly described as being ‘tall beakers’– had it not been for the illustration
in their figure 3 it would have been unclear what exactly was meant by the
term. This illustrates the importance of trying to keep terminology consistent
with previous work within the field of study unless there is an important reason
to change it. All of these divisions and subdivisions are otherwise sensible,
although still potentially problematic at the point of application: for example,
it has been previously noted that the rims of cone beakers and later claw beaker
styles are very similar (rounded with applied trails that are usually body-
coloured), so unless one actually finds a claw fragment it is difficult to prove
the presence of the latter. It is equally difficult to be sure that ‘tall beaker
fragments were not in fact from claw beakers, especially as many were deeply
coloured (ibid., 57) – a characteristic typical of late claw beakers but not of cone
beakers. There is also some overlap with the ‘rounded rim’ category of funnel
beakers as these have a similar profile and occasionally feature horizontal trails.
Equally, the line between the ‘tubular with cavity’ category of palm cups and
bowls is blurred. There are additional factors and trends that may assist a
researcher in categorizing borderline sherds, but these are a matter of opinion
and are disputed – an example being Hunter and Heyworth’s statement that
rolled rims of the palm cup/funnel beaker series are always rolled inwards and
that therefore a rim rolled outwards is a characteristic of bowls (Hunter and
Heyworth 1998, 19), while Stiff states that early palm cup rims are rolled
outwards and that later versions are rolled inwards (Stiff 1996, 52).
The bulk of Hunter and Heyworth’s conclusions relate to the palm-funnel series – 90% of the assemblage they were working with by weight and count (1998, 56). Notable interpretations include the pronounced inward-turned rim as a late funnel beaker feature, and the contraction of the series chronology to between the early eighth and early ninth centuries based on Hamwic’s closely dated stratigraphy (ibid., 56-57). They also gave some consideration to why the glass was there, suggesting that the sherds represent ‘complete vessels within the town’ (ibid., 61) and that the majority were domestic items rather than stock for trade. They seem unsure of the implications of this, writing that the glass ‘might be seen, perhaps inaccurately, as testimony of wealth in a merchant context’ (ibid.). They consider some scanty evidence for glass working (essentially a few droplets), which could not (and still cannot) be proved or disproved. Local manufacturing would explain the apparent deselection of the surviving sherds from a recycling operation, but where was the market? They remark on the lack of evidence for export destinations, with no comparable glass known even from Winchester. The volume concludes with a number of memorable phrases, describing the Hamwic assemblage as ‘a high point in post-Roman glass’ and ‘the last flowering of durable glass in the first millennium’ (1998, 61). Hunter and Heyworth underline its importance on a European level for understanding Hamwic itself, the direction and nature of its trade, and ‘other contemporary towns and the trading networks on which they depended’ (ibid.).

Matthew Stiff submitted his doctoral thesis on vessel glass from emporia in north-western Europe to the University of Oxford in 1996, although it unfortunately remains unpublished. For his study, Stiff selected nine sites as case studies, four of which are in England: York, Ipswich, London and Hamwic (Southampton), thus placing the English emporia in their northern European context. In his typological chapter, Stiff produced very useful summaries of the key features of each vessel type to assist with the identification of these forms when studying fragmentary material (Stiff 1996, 46), although he too uses complete examples from museums as his starting point and in his illustrations.
Stiff’s discussion of the development from tall palm cup to funnel beaker is particularly useful (Stiff 1996, 60-62). Also valuable is the progression shown in the decoration of globular beakers (ibid, 77), which should prove useful for dating future material. However, the distinction between globular beakers, pouch bottles and bag beakers is still not well defined and needs clarification, particularly where fragmentary material is concerned.

In general, Stiff’s references to complete or nearly complete continental and Scandinavian examples of types are very comprehensive. Stiff develops many useful categories and sub-categories and has sound opinions regarding maximizing the potential of fragments while also being aware of their limitations. Many of the same categories and terminology are used in this study, although the approach is reversed to start from the fragment. It is a shame that this useful typology of early medieval vessel glass is unpublished and therefore largely unknown.

Most recently, Ewan Campbell’s many years of work on early medieval glass from Atlantic Britain have culminated in his book ‘Continental and Mediterranean Imports to Atlantic Britain and Ireland, AD 400-800’ (2007), which is very important as the first to collate and interpret imported pottery and glass from Atlantic Britain. The glass in particular had been neglected prior to Campbell’s early interest, and a clear discussion of this group of glass vessels was long overdue. The combination of research on imported pottery and glass within the same research project is an excellent approach. Unfortunately, it was beyond the scope of this project to do the same for Anglo-Saxon England, although I have included references to Ipswich ware and imported pottery on case study sites in Chapter 6. However, the aim is that this work will complement the glass element of Campbell’s research, using similar methodologies and covering the other half of the coastline of Britain, from Hamwic (Southampton) to Northumbria.
Campbell divides the glass found on Atlantic sites into five groups and makes the interesting decision to have three separate groups for vessels in the ‘Atlantic tradition’. The Atlantic groups are those which can be firmly attributed due to the existence of characteristic opaque white trailed decoration; those which are of the right colour, form and provenance but cannot be so confidently identified due to their lack of decoration; and distinctive group found at Whithorn only (2007, 54). The remaining two groups are ‘vessels in the Late Roman tradition’, and ‘vessels in the Anglo-Saxon or Germanic tradition’. Splitting the Atlantic material is a sensible approach that makes the most of the information available regarding decoration and identification without claiming a confidence that often does not exist with fragmentary material. A similar spirit is applied here to different material: Anglo-Saxon glass assemblages feature more vessel forms, colours and types of decoration but the problem of firmly identifying forms is held in common.

In his discussion of the ‘Group B’ vessel types and the sites on which each type has been found in Atlantic Britain, Campbell provides a clear overview of Anglo-Saxon glass forms and characteristics (2007, 60-64). He indicates broad temporal parameters following Evison for using colour, form and decoration to help date fragments of Anglo-Saxon glass – for example, deep red streaks and deep blue appearing from the late sixth century and deep greens, blue-greens, red and black from the early eighth century onwards. Campbell asserts that glass with dark red streaks appears in the late sixth century based on dendrochronological evidence from Buiston crannog (Campbell 2007, 63), which fits well with the earliest finds of this characteristic in south-eastern England. For example, a type 3c claw beaker with red streaks in the metal was found in a burial in the Anglo-Saxon cemetery at Flixton in Suffolk, which has been dated to the mid sixth century based on the combination of the form and decoration (Broadley 2012). Given that a significant amount of Anglo-Saxon glass appears on sites in Atlantic Britain, perhaps having travelled along riverine trade routes from the east coast of England (Campbell 2007, 73, Fig. 48), it has
been very interesting to note that very little, if any, Atlantic glass travelled in the other direction (Chapter 5).

Anglo-Saxon vessel glass, or glass of the ‘Germanic tradition’, reached many Atlantic sites, albeit in lesser quantities than the Atlantic glass itself, and forms Campbell’s ‘Group B’. Campbell’s tables comparing distribution of colours and of types of decoration across his five glass groups are fascinating (ibid., 55-6, tables 4 and 5), and immediately illustrate the importance of these characteristics in studying small sherds, despite problems such as the subjectivity of colour identification. Clear trends and marked differences between the Anglo-Saxon and Atlantic groups emerge. Firstly, the colours ‘light blue’, ‘deep blue’, ‘deep green’ and ‘brown/black’ are typical of the Anglo-Saxon material found in Atlantic Britain, while ‘light yellow’ and to a lesser extent ‘light green’ dominate Atlantic glass, comprising 53% and 25% of Atlantic vessels respectively. The distinctive light yellow colour and the ‘amber/pink dichroic’ glass from Whithorn (33% of the Whithorn vessels) appear to be completely absent from Anglo-Saxon vessel glass assemblages. Equally, self-coloured trails, bichrome decoration and moulded decoration are common attributes for the Anglo-Saxon glass found in Atlantic Britain, while opaque white trails are the only type of decoration found on Atlantic glass, arranged in horizontal, chevron and festoon patterns. There is virtually no overlap of colour or decoration between the Anglo-Saxon glass found in Atlantic Britain and the Atlantic glass groups, which is perhaps one part of the appeal of Anglo-Saxon glass in the Atlantic zone.

Campbell also provides another fascinating table comparing the vessel forms present within each of his five separate groups of glass (Campbell 2007, 72, Table 6), which clearly demonstrates the differences between the groups. Bowls, flagons and goblets dominate the ‘late Roman/Mediterranean’ tradition, while the Anglo-Saxon glass consists mainly of cone beakers and other types of drinking vessel, including palm cups and claw beakers. The decorated vessels of the Atlantic tradition have an even more restricted range,
being 90% cone beakers. In other words, the Roman glass was designed for use and display as tableware in a way that we would understand today, whereas the Anglo-Saxon glass is mainly from drinking vessels, with almost half from unstable forms that could not have been stood on a table in the same way. The Atlantic glass focuses even more on drinking vessels for holding in the hand or passing around. However, it is interesting that the Anglo-Saxon material comprises a much wider variety of forms than the Atlantic tradition. Perhaps this is another aspect of the appeal of Anglo-Saxon vessels in Atlantic Britain. However, one must also allow for chronological factors when making interpretations regarding the differences between Anglo-Saxon and Atlantic glass, which are summarised neatly by Campbell’s figure showing suggested date ranges of imports in the Atlantic region (ibid., Fig. 85). The Atlantic groups (excluding the Whitorn type, which may have been made there), were imports of the sixth and seventh centuries from western France, a period when cone beakers were also prevalent in Anglo-Saxon England. Meanwhile, imports from Anglo-Saxon England to the Atlantic region span a longer period, beginning in the second half of the fifth century and continuing to the end of the eighth century. A good question to ask next regarding glass vessels in Atlantic Britain would be, do glass vessels completely disappear from the region at the end of the eighth century? Followed by, if yes, why and for how long, and if no, what are they replaced by?

In summary, previous scholarship on the form, colour and decoration of Anglo-Saxon glass has been thorough, and Evison’s typology of complete forms still serves its purpose very well. However, there remain key areas with scope for further work, particularly developing the role of colour and decoration in the study of sherds, and creating a typology specifically for fragmentary material.
Characterization of site assemblages and the national corpus

Evison’s 2000 article features limited characterization of a few key assemblages – Barking, for example, described as containing ‘very dark colours, some vivid colours and the more common series of light blues and greens’ (ibid., 86), and Brandon as featuring claw beakers, globular beakers, palm cups and funnel beakers - but quantification and comparison are completely absent from these assessments. Meanwhile, Evison’s most recent publication (Evison 2009), a typically comprehensive specialist report on the important assemblage of glass from Flixborough, Lincolnshire, includes only a brief comparison of the assemblage to others from the north-east, describing ‘a certain amount of similarity... in form, decoration and particularly in colours’ (ibid., 109). Overall, characterization and comparison of assemblages are not a prominent feature of Evison’s work, which has been focused on typological study of the glass itself, and its forms rather than context.

The same is also true of most specialist reports of recent decades, many of which were written by Evison, and most of the rest by researchers whose names will now be familiar (e.g. Donald Harden (Harden 1976), Matthew Stiff (Stiff 2003), etc.). This is a major reason why there is still so much potential for comparative study of key assemblages within this volume. Some of the reports are seriously deficient in useful information, and some are highly comprehensive. An example of the former scenario is the publication of the two sherds of glass from the palace site at Yeavering in Northumbria: only two sherds were found at one of the most significant habitation sites of Anglo-Saxon England and although line drawings are included, no mention is made in the text of the sherds themselves or their context (Hope-Taylor 1977, Fig. 86b). However, Matthew Stiff’s report on the glass finds from the Royal Opera House excavations in London is a much more positive example of a highly informative report (Stiff 2003), in which the assemblage is characterised in both quantitative and qualitative ways. In particular, it includes a remarkable section analyzing the probable rate of recovery of glass from the site, and a useful
discussion of the taphonomic processes involved. The sherds that can be identified are well paralleled and most of the contexts are described and discussed.

The assemblage of middle Anglo-Saxon glass from Hamwic is the first and only individual assemblage from England to be the subject of a complete volume and to be comprehensively characterised in print. This likely to be due to its status as by far the largest in Europe, consisting of over 1700 fragments of eighth- and ninth-century glass, and also very important due to unusually secure stratigraphy, especially in comparison to many Scandinavian sites. John Hunter and Mike Heyworth began a research project on the assemblage in 1983 and produced a final report in 1995, although it did not reach publication until 1998 (Hunter and Heyworth 1998). Part of this book’s importance is that it is a collation of glass from no fewer than 32 sites excavated in Southampton since 1946 that enables cohesive study and understanding of the assemblage as a whole – the lack of such an overview for other sites now buried under modern cities and thus subject to ad hoc ‘keyhole’ archaeology is highly problematic. Ipswich in particular is a good example of a site that is very difficult to integrate into wider research agenda for that reason, and it would be of great benefit to subject the Ipswich assemblage to similar scrutiny.

The Hamwic project illustrates effectively the scale of the challenge represented by characterizing fragmentary assemblages of early medieval glass. In particular, it can be difficult to assign even rim sherds to a particular vessel type because of the usually small size of the fragments, yet this must be balanced against the pressure to pinpoint the identification of as many artefacts as possible within established typologies. The situation presents a methodological conundrum – at one end of the spectrum, one might persevere with trying to fit fragmentary material into typological systems developed for complete vessels, while at the other one might create a new typology of fragment types and relegate the question of the form of the complete vessel to last place. In this case, Hunter and Heyworth have still taken vessel type as the
primary classification factor despite the difficulties, but have then created subsequent categories that reflect the fragmentary nature of the material, in particular distinguishing between decorated and non-decorated non-diagnostic sherds. This type of compromise maybe the most satisfactory way to simultaneously reflect the character of the material and enable it to be discussed ‘within the context of other contemporary vessels and assemblages’ (Hunter and Heyworth 1998, 4).

The Hamwic project was the first to use techniques of vessel quantification, common to ceramic studies, on an assemblage of glass, and the first to outline the potential pitfalls. Hunter and Heyworth made a laudable attempt to test various methods of quantification (sherd count, sherd weight, ‘adjusted weight’, surface area and minimum number of vessels) and compare the results of each for bias. ‘Adjusted weight’ involves using an equation in an attempt to reduce the bias towards fragment or vessel types with thicker walls (ibid, 31). While this was certainly a useful exercise, the results show that although each method produces a bias in one direction or another the margin between them is insignificant. Given that no obviously superior approach has emerged, it falls to each researcher to assess the best methodology for their material and research questions, and then to promote awareness of any bias or potential pitfalls. In an apt example, Hunter and Heyworth conclude that the palm cup and funnel beaker series accounts for approximately 90% of the vessel glass from Hamwic by both weight and count. This is a very high percentage for one (albeit major) type series and begs questions that will be addressed in this thesis. How does this percentage compare to other eighth- and ninth-century assemblages from other regions and other site types? Was this a symptom of the procurement process in Southampton, or does it reflect use contexts and the nature of demand? Although Hunter and Heyworth’s Hamwic volume provided high-profile coverage of a single settlement assemblage, until now there has been no national corpus to measure against, very little comparative work on or quantifiable results regarding regional variation and internal exchange networks.
The Hamwic project was also one of the first studies to fully embrace compositional analysis of early medieval glass alongside typological study, with the aim of increasing the information yielded from fragmentary assemblages. The analysis was done as part of a wider project investigating the composition of glass of the first millennium AD. More recent research all points to widespread and repeated recycling as the common practice across northwestern Europe (e.g. Freestone 2015; Schibille and Freestone 2013; Freestone, Hughes and Stapleton 2008). The study of recycling itself will pose and answer new questions, and batch analysis (identifying vessels made from one batch of glass or a single kiln firing) has great potential. A study was also made of how colour may have been manipulated by early medieval glass-workers using a combination of adding metallic elements to the base glass and adjusting the furnace conditions, which forms a useful summary of the subject. However, unfortunately there was a failure in the Hamwic study to recognize ‘an overlap of the measurement peaks of copper and phosphorus’, meaning that ‘the Hunter and Heyworth data are not fully reliable’ (Ian Freestone, pers. comm.). It can be difficult to obtain permission and funding for the destructive sampling required for this type of analysis, so I am fortunate to be able to include results from a study on glass from Lyminge in this project (Chapters 3, 5 and 6).

Finally, Hamwic features again in Stiff’s 1996 thesis, in which he characterizes the assemblages from all four known emporia of Middle Saxon England: Southampton (Hamwic), London (Lundenwic), Ipswich, and York. His methodology is extremely thorough, with sections on each site describing the condition of the sherds, fragment size, colour, the diagnostic sherds (rims and bases), manufacturing marks, decoration, and the range of identifiable vessel types present. The results for each site are communicated through cumulative frequency diagrams for fragment length and bar charts for colour, rim types, base types and vessel types present. Examples of significant comparative conclusions include the following observations: that Ipswich shows a much
higher percentage of cavity rims, probably meaning that glass appeared earlier there (Stiff 1996, 212, diagram 7); that Ipswich also features the most late potash glass (ibid., 211); that Hamwic is the only site in the sample featuring numerous sherds with trails on the rim (ibid., 237-8); that red and opaque red glass shows a bias towards English sites (ibid., 304); and that the bias of reticella sherds and the bowl form towards the east of England (Ipswich and York) may indicate a production centre for both (ibid., 307, 315). Furthermore, unusual sherds and decorative features are highlighted: e.g. the pink and purple sherds from Hamwic (ibid., 235) or the white sherd with applied gold foil from Ipswich (W196, Fig. 5.85; ibid., 215, Broadley 2016), which will undoubtedly enhance the analysis of future discoveries of these rare types. Stiff’s thesis is the only previous example of such thorough characterization of multiple assemblages of Anglo-Saxon vessel glass, making good use of qualitative methods of analysis and communication of results and helping to refine site chronologies and production and trade activities. He is also the only person to have accessed and researched the Ipswich vessel glass, although his work was completed twenty years ago and was never published. However, Stiff’s work only covered the four high-profile emporia, and he himself stated in his conclusions that ‘the role of glass vessels in the Church is worth considering’ (1996, 322), and that ‘the future agenda of glass studies’ lay with the ‘complex interaction between various different settlement types, each with its own place on the developing network of international trade’ (ibid., 323). This represents an approach to fragmentary glass assemblages that will become an essential part of future practice, and will help to communicate the significance of glass studies to the wider archaeological community and to the public.

Stiff also included Quentovic (France), Dorestad (the Netherlands), Hedeby (formerly in Denmark, now in Germany), Ribe (Denmark) and Kaupang (Norway). However, this work is unpublished and difficult to access. Examples of researchers working and publishing on glass vessels include Ulf Näsman, who has published some excellent work on Scandinavian material especially over many years (e.g. Näsman 2000), and Line van Wersch, who began more
recently and has been using compositional analytical techniques in Belgium and northern France (e.g. van Wersch 2011 and 2008). Both are discussed further under the heading ‘International comparisons’ on Chapter 7.

**Site types and intra-site distribution**

In 1978, Harden published updates on discoveries and developments from the intervening twenty years, with references to sites such as Portchester Castle (Hampshire) and West Stow (Suffolk) under the sub-heading of ‘Early settlement sites’ and York and Waltham Abbey under ‘Late settlement sites’. The focus on settlement sites as opposed to cemeteries illustrated partly the shifting focus of excavators but also the direction in which Harden’s own interest had moved - perhaps he felt then as many do now, that the funerary glass had been studied ad infinitum and that glass from settlement sites had greater potential if only the difficulties of fragmentary artefacts and complex stratigraphy could be overcome.

The settlement archaeology of Middle Saxon England has been dominated in recent decades by three major sites types: monasteries, trading places (wics or emporia) and rural estate centres, with the excavation and eventual publication of key sites such as Flixborough (e.g. Loveluck 2007; Loveluck and Atkinson 2007), Brandon (Tester et al., 2014) and Monkwearmouth-Jarrow (Cramp 2005), and by consideration of ‘productive sites’ (e.g. Pestell 2011 and Ulmschneider and Pestell 2003). In Anglo-Saxon England minsters (in Old English Mynster, itself from the Latin Monasterium) varied widely. There was no standardized model in this period as there was later, and this together with the links at all levels between elite ecclesiastical and secular society makes the early church controversial and relatively elusive in the archaeological record. The archaeology of elite sites in the middle Saxon period is particularly complex and interesting as a result, and the question of whether it is possible to distinguish between minsters and elite secular settlements is the subject of ongoing controversy.
Monastic culture flourished in the eighth century, which is unsurprising because the minster as a unit of religious organization and settlement fitted much more easily into the existing aristocratic culture than the Roman model of bishops and dioceses – ‘an abbot was the father of his family like any Germanic lord’ (Blair, 2000, 25). Many of the leading lights of the early church were noblemen in origin and character, including Benedict Biscop, the founder of Monkwearmouth and Jarrow, and Wilfrid, Bishop of York, who founded a network of minsters extending throughout several kingdoms. We also know that in the case of Monkwearmouth and Jarrow and probably of other foundations as well, that such close ties with royalty and the nobility brought great wealth and supported some very large communities. In AD 716 Ceolfrith, Abbot of the twin monasteries, went on a pilgrimage to Rome with one of three bibles he had commissioned, intending it to be a gift for the pope. It has been estimated that the vellum alone for three bibles would have required the slaughter of 1550 calves, with additional investment of inks, fittings, time and labour in the scriptorium. Furthermore, we know from the Life of Ceolfrith that he left 600 brethren behind and took a contingent of almost 80 with him – a number much larger than any later monastic community in England (Campbell 1982, 74-5).

Of the seven sites used as case studies in Chapter 6, three are documented monastic sites: Monkwearmouth-Jarrow, Lyminge and Barking (the others being London – an emporium, Brandon and Flixborough – elite rural centres with probable monastic phases, and West Heslerton and Sedgeford – probable middle-ranking estate centres). Of these, the only one fully published so far is Monkwearmouth-Jarrow. Rosemary Cramp’s volumes on the twin sites include a report by Vera Evison on the vessel glass from both (Evison 2006), a striking feature of which is the number of sherd links that Evison has identified at Jarrow, making it a useful taphonomic case study (see Chapter 6). The Lyminge project is currently making an essential contribution to our knowledge of Middle and Late Saxon monastic sites, and analysis of the vessel glass and its
significance here and elsewhere will be a key part of that. To date, in addition to a number of interim reports available online (e.g. Broadley 2011), Gabor Thomas has published an overview of the monastic archaeology excavated between 2007 and 2009 in *The Antiquaries Journal* (Thomas, 2013). An entire volume of *Anglo-Saxon Studies in Archaeology and History* on Lyminge will be forthcoming shortly, including a paper on the glass (Broadley, forthcoming). Of the other three case study sites, there has been much speculation over the nature of Flixborough and Brandon too, thus reigniting the aforementioned debate over whether it is possible to distinguish ecclesiastical from elite secular sites based on archaeology alone, which has been led by John Blair, (Blair 1996, 2005). Fortunately, Brandon was finally published in 2014 – the stand out feature of the publication from a vessel glass point of view is that a plot of all the vessel glass and a discussion of the spatial distribution by Andrew Tester was included alongside the traditional typological report supplied by Vera Evison (Tester et al., 2014, Fig. 4.72, 170-177). Both offered some interesting interpretations: Evison noting the quantities of globular beakers and inkwells at Brandon, compared to large quantities of palm and funnel beakers and bowls at Ipswich (ibid., 176-177), and Tester the concentrations at the waterfront and near the halls (ibid., 177). Meanwhile, the only social or economic commentary supplied on the glass from Flixborough comes in an introductory paragraph for the chapter including the glass report, referring to the glass and copper alloy vessels as representing ‘conspicuous consumption’ (Evison 2009, 103). This seems entirely insufficient for such an important assemblage of glass and for such a high profile and long-awaited publication, but does show the need for this type of analysis to be conducted independently here.

This was the age of the emporia. Similar settlements existed all around the coastlines of north-western Europe in the eighth and ninth centuries, and in England each kingdom seems to have had one: York for Northumbria, Ipswich for East Anglia, London (Lundenwic) for Mercia, Hamwic (Southampton) for Wessex, although the situation in Kent seems to have been more dispersed, with Fordwich, Sarre and Sandwich all involved. This study avoids concentrating
extensively on the emporia simply due to the work already produced on glass from these sites by Matthew Stiff (Stiff, 1996), but they are of course an essential element of any study of glass in this period. All emporium assemblages are key for comparative purposes due to sheer volume (Hamwic in particular has produced a vast assemblage relative to other sites) and because some of these sites at least probably had a role in the distribution of glass vessels along with other luxury goods. A key research topic addressed by this volume is the nature of the relationship between the elite rural sites and the emporia. This is a priority research area within early medieval settlement archaeology (see the recent works of Hodges 2012, Wickham 2005, Palmer 2003, Naylor 2004b, Moreland 2000a and 2000b and many others) that has not been approached via the medium of vessel glass until now. The emporia are also of central significance to any study of early medieval settlement simply based on scale: they were ‘extraordinarily large by the standards of their time’ (Hodges 2012, 93). Excavation has determined that Hamwic extended for nearly 50 hectares (ibid.) in the eighth and early ninth centuries, and as such may even have been the most populous settlement in England at the time.

Until very recently there has been little intra-site contextual analysis of vessel glass from Anglo-Saxon settlements. The principal example prior to this project was Hunter and Heyworth’s discussion of the contextual significance of the Hamwic assemblage: although the size of the assemblage alone would make it important on a European scale, the fact that the glass comes from a secure stratigraphic sequence that also featured large numbers of closely dateable artefacts (particularly coins) raises its profile even further, making it the single most important assemblage of glass in Europe from the seventh to ninth centuries. The contextual integrity of the material is of critical importance to early glass studies, especially when one considers the difficulties of dating contexts elsewhere (Hunter and Heyworth 1998, 56-7; Jones 2015, e.g. 31). As well as using the excellent contextual background to suggest a narrower chronology for the palm cup/funnel beaker vessel series, the authors conclude that the other forms represented fall earlier rather than later within the
Hamwic sequence (early eighth to mid ninth centuries), and that this probably
does represent a large reduction in the number of forms in circulation by the
early ninth century. The only form other than the palm cup/funnel beaker
vessel series that appears to continue into the ninth century in Hamwic is
bowls, and Hunter and Heyworth indicate that the sherds are not yet numerous
enough to draw meaningful conclusions about dating or distribution. One
hopes that the picture will change gradually starting with the analysis here of
existing material from other sites and continuing with future discoveries. This
project will add additional intra-site contextual studies to the record, and from
a range of sites to place some new information in a clear gap.

Campbell states correctly in the summary of his work that imported pottery
and glass is of ‘fundamental importance in assessing the chronology and
function’ (2007, xiv) of early medieval settlement sites in Atlantic Britain, and
precisely the same is true of vessel glass in Anglo-Saxon England: it is hoped to
complete similar work on glass from the Anglo-Saxon tradition to enable useful
conclusions to be made about sites where it has been or will be found.
Campbell develops an effective typology for the import sites themselves, which
enables him to describe their common characteristics clearly – it is only
unfortunate that space did not allow the specifics of the typology to be included
in the published volume. Clear patterns emerge – for example that
ecclesiastical sites appear to have been secondary recipients rather than the
primary import customers (ibid, 124). In Chapter 6 of this volume, I have
developed the first typology of this kind for Anglo-Saxon sites that produced
vessel glass.

However, above all, Campbell is a key proponent of taphonomic studies
concerning glass, and successfully discredits the once-prevalent theory that the
glass sherds on Atlantic sites are merely cullet rather than vessels by finding
dispersed sherd links (sherd that join and therefore must be from the same
vessel). These strongly suggest vessels being used and broken on the sites in
question. In addition to sherd-link studies his work involves vessel-to-sherd
ratios and ‘minimum number of vessels’ or MNV – all techniques from pottery studies which are much harder to apply successfully when studying glass assemblages. Colour was a major factor in reaching the estimates were reached (Campbell 2007, 93). Great care needs to be taken when applying vessel-to-sherd ratios to glass or when estimating the minimum number of vessels that an assemblage represents due to the significantly lower quantities and the lack of ‘fabric’ types in comparison with pottery, but the rewards can be worthwhile. The minimum number of vessels may be more useful than straightforward sherd counts, provided one can show how the estimates were reached, because with a sherd count one can be describing the degree of fragmentation of the assemblage rather than the original scale of glass-use on the site. Measuring the level of degradation is also significant for site and assemblage interpretation, and in contrast to Matthew Stiff, Campbell uses sherd weight rather than maximum sherd size as an indicator of how degraded an assemblage of glass is. It remains to be seen which method is the most effective.

It is undoubtedly easier to study taphonomic processes when one is either concentrating on pottery or combining pottery and glass as Campbell has done, but his study of the glass at Dinas Powys shows the possibilities. His primary case study is a very useful example of the method and the graphical displays of horizontal distribution in particular are valuable: the standard is set to which the case studies of Anglo-Saxon sites in Chapter 6 aspired, as far as is possible with the information available in each case. Campbell shows that by plotting the size and horizontal distribution of the sherds across the site features one can reveal primary and secondary deposition and draw interesting conclusions about activity on the site, which may prove equally useful in future analyses on other sites. In this case, it is clear that the majority of the glass was deposited close to building 2 in a midden area representing secondary disposal, probably of organic flooring and bedding material containing fragments of other waste. Longbury Bank (near Tenby in Dyfed) is an example given by Campbell of the potential that his work at Dinas Powys has to illuminate the meaning of
distribution patterns at other sites: the finds of glass from the central areas of both sites are of similar density, with tiny sherds representing micro-refuse missed during cleaning processes (Campbell 2007, 104). This allowed Campbell to suggest the potential locations of buildings at Longbury Bank that have left no other trace, which would not have been possible without the Dinas Powys comparison. Another approach ripe for wider application is quantification of sherd types into rim, body and base categories, to test whether initial indications at Dinas Powys and Hamwic that bases are under-represented and may have been deliberately removed from the assemblages holds true elsewhere.

Campbell has also found success at Dinas Powys in the identification and plotting of the sherd links related to three separate vessels. He concluded that vessels were broken in the southeastern corner of the site (ibid, 94, Fig. 64), although it seems likely that very few sites have equal potential for similarly detailed results. Another fascinating aspect of the study that may be unique to Dinas Powys is work done on the area of glass-working (probably bead-making): Campbell was able to draw conclusions regarding the selection of deeply-coloured glass for re-use and the apparent discard of colourless or nearly colourless sherds. Although other sites may lack the specific evidence for similar glass working, it is possible that these observations will have implications for the interpretation of other assemblages.

Finally, although his work and findings are discussed in more detail in Chapter 7, it is important to be aware of Bjarne Gaut’s work on the vessel glass from the emporium at Kaupang, Norway (Gaut 2007 and 2011). His thorough 2011 paper studies the typological patterns within the assemblage, and analyses both the intra-site spatial distribution and the chemical composition of the glass. This methodological trifecta has rarely been seen before, at least in print, but surely represents the way of the future. His detailed comparison with other glass assemblages from emporia around the North Sea zone has also been very
useful for this project and will no doubt be a key reference piece when further pan-regional research is conducted in the future.

Discussion

In the volume ‘The making of England: Anglo-Saxon art and culture AD 600-900’ (Webster and Backhouse 1991) Evison describes eight sherds from Barking, Essex, and four from Whitby, North Yorkshire that are not published in detail elsewhere. The most significant aspect of this is that vessel glass sherds were included alongside ornate silver pins and gold incised plaques, monumental stone sculpture, carved wooden writing tablets and illuminated manuscripts, in this volume about the cultural achievements of Middle Saxon England and the development of the English nation. This in itself is an eloquent expression of the importance and potential of Anglo-Saxon vessel glass to the study of Anglo-Saxon art and society.

Evison’s work is largely confined to typological definition and sequencing, although a few exceptions appear in the summary of her 2000 article (Evison 2000, 90-92). These are general observations regarding the national corpus and its social distribution – that ‘there is a certain amount of homogeneity... in the forms, colour and techniques...although there are local differences’, and that in the Middle Saxon period glass vessels in brilliant colours ‘were available to ecclesiastical and upper class customers’ (ibid., 91). These statements were not supported by any evidence and are essentially addenda to the main typological thrust of the chapter. They do, however, raise numerous questions regarding the nature, extent and significance of the regional variations and the consumers of glass vessels that will be addressed by this thesis, and highlight the future work required in the field of early medieval glass studies.

Campbell concludes that more attention has to be paid in future to taphonomic processes when interpreting the stratigraphy and patterns of consumption on elite early medieval sites. Furthermore, he summarizes evidence for the
movement of goods through the ‘Atlantic Curtain’, showing that Anglo-Saxon glass moved east to west along similar routes to Anglo-Saxon metalwork, and commenting that some metalwork did travel in the other direction (Campbell 2007, 140): this raises the question of whether any glass of the Atlantic tradition did as well, although so far there is no evidence yet that it did, which is interesting in itself. Atlantic material in the east will be something to watch out for as future discoveries are made. Most importantly of all, Campbell underlines the fact that a large part of the importance of work on luxury goods of this period like glass vessels lies in their ability to shed light on the processes of early medieval state-formation (ibid., 140-1). In the case of Anglo-Saxon England, we can use glass vessels to look at the developing social and economic fabric of the region.

In his concluding chapter entitled ‘Glass in Society’ (unfortunately unpublished), Stiff addresses the social and historical context of Middle Saxon glass in the most thorough treatment yet of this kind. In an excellent discussion of the role of the Church in the production, trade and consumption of glass vessels in this period, he mentions the colossal organizational and fiscal resources of the early church and suggests the possibility that minster communities may have been the main producers as well as the main consumers of glass vessels (Stiff 1996, 323). To support this, he draws on glass working evidence (particularly San Vincenzo, Italy), documentary sources, and vessel glass itself from European monastic communities. In the case of the latter, some complete vessels survive due to greater continuity from the Roman world, which provide a useful context for sites of an ecclesiastical nature in Anglo-Saxon England. Stiff’s discussion addresses evidence both for glass chalices and liturgical use, and use in community gatherings and entertainments. Ultimately, despite his own focus on trading settlements, Stiff emphasizes the importance of understanding the interaction between the Church and glass vessels for developing our knowledge of the place of glass vessels in Anglo-Saxon society, and as noted above, in his closing phrases he describes the future agenda of glass studies as lying within ‘the complex
interaction between the various different settlement types’ (ibid., 323), in which ‘monastic’ sites, trading settlements, and all sites in between will have an important role to play. As they would have been a significant locus of demand (John Moreland, pers. comm.), a principal aim of this project is to explore precisely that.

Stiff contributes to the debate over function of vessel glass in emporium contexts by stating that all of his case study sites demonstrate that glass was in use as well as being present as a commodity for trade, as shown by the significant quantities found in domestic refuse contexts. He questions what this means for the status of glass and of the glassworkers and traders in society, commenting that the luxury nature of glass may have been overemphasized (ibid., 319). It is possible that this was particularly true in the emporia, as inhabitants had increased access to and familiarity with glass vessels, and to a lesser degree in the other settlements examined here, where vessels are more likely to have been specifically desired and deliberately imported. This shows the importance of studying the context types that produce vessel glass of this period, and also creates vital questions: what was the relationship between the emporia and their surrounding regions, and what does this reveal about the connections between the occupants of the emporia and the elite? Stiff states that future work ‘must also consider the status of these other settlements as well as the range of other finds recovered in order to build up a picture of the relative value of glass in early medieval society’ (ibid.). This work will address these and other problems, questions and future tasks, which are presented in detail in Chapter 3. This thesis represents the next stage of development in the field, building in particular on Matthew Stiff’s important contribution to early medieval vessel glass studies.

Fifth to seventh century glass from burial contexts has been extensively researched and summarized, but no thorough review of Middle and Late Anglo-Saxon glass from the full range of settlement contexts exists. Harden and Evison both contributed excellent overviews of the material of the whole Anglo-Saxon
period and produced accompanying typologies that are still useful today, but until recently there has not been enough glass from Middle and Late Anglo-Saxon settlement contexts or information about those contexts to make a significant study of the later glass. Availability of information on excavated sites is still frustratingly patchy, often due to the difficulties of bringing complex sites to publication, but a synthesis of what we do know is long overdue. The vital work done by Hunter and Heyworth on the Hamwic assemblage will benefit from comparison to as many other sites and site types as possible. There is also obvious potential for a study similar to Ewan Campbell’s work on imported glass in Atlantic Britain to be made regarding Anglo-Saxon vessel glass, particularly regarding his emphasis on intra-site taphonomic study, and for comparisons to be made with Atlantic Britain. Above all, scope exists for building on Matthew Stiff’s analysis of the vessel glass from emporia with work on elite rural sites and the internal network of production and trade. Consideration of the existing research on mid to late Anglo-Saxon glass vessels has inspired both key areas of investigation studied here and suggested methodologies with which to tackle them, and both will be discussed in more detail in Chapter 3.

Principal achievements of Anglo-Saxon vessel glass research to date:

- Extensive typological and chronological development for Middle Saxon glass by Evison in particular
- Thorough treatment of specific assemblages, especially those from the emporia (Hunter and Heyworth, and Stiff)
- Campbell’s synthesis of glass from the Atlantic tradition and discussion of glass from the Anglo-Saxon tradition that reached sites in Atlantic Britain
Gaps in knowledge/research opportunities:

- Synthesis of glass of the Anglo-Saxon tradition from settlement contexts (excluding emporia)
- Intra-site contextual studies of the glass from the same sites
- The nature, extent and significance of regional variation between assemblages
- Understanding of glass vessel production sites
- The internal exchange network for vessel glass, and especially the relationship between the emporium assemblages and the rest
- Whether any glass from the Atlantic tradition travelled back to Anglo-Saxon sites
- Characterization of site types where late glass is found

Gaps in method/methodological opportunities:

- No comprehensive typology of fragments
- Little characterization and comparison of assemblages, especially using qualitative methods, and especially for sites beyond the emporia
- More compositional analysis of Middle and Late Anglo-Saxon vessel glass needed
Chapter 3: Research themes, questions and methodologies

Research themes and questions

The research questions for this project can be grouped according to three principal themes:

1) the corpus and its typology;
2) the role of glass in Anglo-Saxon society;
3) glass vessels and trade.

The first theme springs from the fact that previously no one has gathered a comprehensive body of information on fragmentary vessel glass from settlement contexts, so the precise nature of the glass vessels in use in Anglo-Saxon England was not known in a thorough and quantifiable manner. A new dataset encompassing all the sites in middle Anglo-Saxon England on which vessel glass has been found enables reassessment of exiting typologies and chronologies for Anglo-Saxon glass, and provides a foundation for the comparison, interpretation and addition of current and future site and regional assemblages. There will be an opportunity to consider anew the dramatic differences between the scale of glass consumption in the Middle Saxon period with an almost total lack of evidence for glass vessels in the Late Saxon period.

The key questions within this first strand are:

- To what extent do existing typologies need enhancing, particularly with reference to highly fragmentary material?
- What can syntheses of the comparatively abundant Middle Saxon glass and the extremely rare Late Saxon glass reveal about the vessel forms and characteristics in use in those periods?
- Can significant variations in the appearance of different colours and types of decoration be identified in the corpus?
- Can stratigraphic distribution on key sites add information about the chronology of glass use?
• How do the late Saxon glass sherds from individual sites compare to each other in terms of form, sherd size, and level of preservation and how can this inform future excavation and analysis?

Additionally, it is impossible to avoid questions and speculation regarding production, although there is very little hard evidence to be had at present. Compositional analysis of the Lyminge assemblage has been incorporated into the project in pursuit of new information about how the glass (from there at least) was made, and where either the vessels themselves or the raw materials came from. Comparison of the results to analyses of similar assemblages (e.g. Hamwic, Whithorn) is an integral part of the process of interpretation.

The second theme involves exploring and interpreting the social contexts of glass vessels in Anglo-Saxon England. Little concerted focus has been placed in this area, especially in print. The principal exception is the unpublished doctoral thesis by Matthew Stiff (1996), which concentrated only on glass from emporia, and had a broad geographical scope covering major sites on all sides of the North Sea. The vessel glass assemblages have great potential to inform us about glass use and middle and late Anglo-Saxon society, when studied individually, comparatively, and all together. Questions about how and where glass vessels were used in Anglo-Saxon society fall into three categories, relating to the nature of the sites on which vessel glass has been found, the character of the assemblages on those sites, and the contextual distribution of vessel glass within sites.

What can the sites on which vessel glass is found tell us about glass use and middle and late Anglo-Saxon society?

• Does developing a ‘site typology’ of characteristics (e.g. size, structures, layout, setting) for the sites that have produced vessel glass produce any worthwhile conclusions regarding the consumption of glass vessels in Anglo-Saxon England?
• Is there a correlation between middle Saxon glass assemblages and the presence of other key artefact groups on the case-study sites (e.g. styli representing the largely ecclesiastical activity of writing)?

• Where are the ‘negative’ sites – sites which one might have expected to produce glass but did not, and can any meaning be attached to them?

What can the vessel glass site assemblages and their characteristics tell us about glass use and activity on the sites on which they are found?

• What are the similarities and differences between all the site assemblages – are there any positive or negative patterns, or any key common denominators or exceptions? How can these be interpreted, and what do they reveal about the role of glass vessels in Anglo-Saxon society?

• Do glass vessel forms replicate other materials or vice versa, and what social explanations might lie behind such situations?

• Did settlements of different character consume different types of glass vessels? If so why might this be?

• How do ratios of vessel forms (where identifiable) vary regionally in eastern England, and how does this compare to ratios in Atlantic Britain? What does this reveal about glass use and/or aesthetic fashion?

• Can differences in glass use be identified between sites and regions and if so, what does this mean for interpretation of glass use and glass trade?

What can the intra-site distribution patterns of vessel glass tell us about glass use and middle and late Anglo-Saxon society?

• Can the methodology of studying intra-site distribution of vessel glass tell us anything about how the glass was being used and deposited on different sites and in different regions?

• Does comparison of distribution studies reveal any significant patterns or exceptions in how vessel glass was used and deposited?

• How does the synthesis of distribution studies on Anglo-Saxon sites compare with Ewan Campbell’s results from studying distribution of vessel glass from Atlantic Britain?
• What value do sherd link studies amongst the key assemblages have in indicating patterns of glass use and disposal, and how does this compare with Campbell’s findings regarding vessel glass from Atlantic Britain?

Finally, there are many questions relating to glass vessels in Late Anglo-Saxon England, although, as highlighted again by this project, so little evidence that there are very few answers. Despite the very small numbers of sherds and sites involved, it is worth asking about the types of site where glass was being used in this period and where it was not, the types of intra-site contexts where sherds are being found and thus about deposition patterns in this period. It is worth asking, and outlining the tiny nuggets of information that do exist, because the very rarity of this glass makes the information that does exist more important, and means that it is more useful to collate it so that any future finds can build on what little we have. The big question relating to Late Anglo-Saxon glass is how and why the scale and of vessel glass manufacture, consumption and use changed from the middle to the late Saxon periods changed so dramatically, and likely theories will be considered despite the lack of definitive answers.

The third principal research theme relates to glass vessels as indicators of trade and as means of studying economic structure in Anglo-Saxon England. Scholars have been turning increasingly to analyse the role of rural estate centres and seasonal markets, and how these sites were connected with well-known monasteries and emporia, but as yet little use has been made of vessel glass in this context.

**What can vessel glass tell us about internal (regional) and external (international) trade networks, especially the relationships between elite rural sites and coastal trading settlements?**

• How do assemblages from rural site types compare to those from the four emporia, both individually and together? Are there discernible differences, and if so, what do they signify?
• What can vessel glass show us about the relationship between the emporia and their surrounding regions, and what does this reveal about the connections between the occupants of the emporia and the elite?

• How do any regional patterns in the character of glass assemblages compare with those observed by Stiff amongst the emporium assemblages?

• Is it possible to identify any imported glass with confidence?

• Is there any evidence for glass of the Atlantic tradition (see Campbell 2007) on these Anglo-Saxon sites? Either way, what are the implications in terms of trade and exchange patterns at the time?

The dataset

The data for this project was gathered from three principal sources:

1) published reports, books and articles;
2) grey literature - site documents and unpublished reports, and
3) physical assemblages of glass artefacts themselves in museums and other archaeological archives.

I completed most of this programme of work in 2005, when I visited archives from York to Southampton over a period of six months, including Hull to see the Flixborough glass, Fort Cumberland to see the Portchester archive, Barking to see the Barking archive, and the home of Valerie Fenwick in Suffolk to see glass and records from Butley. Visits to the Lyminge excavation have been an annual event from 2008 onwards, and I visited the home of Dominic Powlesland in the Vale of Pickering, Yorkshire, and Suffolk County Council in 2011 to finish work on the case study sites of West Heslerton and Brandon respectively. In total, I visited and viewed the glass from Hamwic, Brandon, London, York, Lyminge, Flixboroush, West Heslerton, Butley and Barking, which together constitute more than 80% of the national corpus. I was not able to see the remaining assemblages, and relied on published and unpublished reports to add them to the dataset. By far the largest of these was the glass from Ipswich (11.7%), fortunately recorded by Matthew Stiff in the 1990s for his PhD thesis (Stiff 1996), followed by the glass from Jarrow (2.8%) and Monkwearmouth
(0.6%), which was published by Vera Evison (Evison 2006). The other assemblages not physically seen were all very small assemblages: Canterbury (0.5%), Northampton (0.4%), Portchester (0.4%), Beverley (0.2%), Whitby (0.1%), Cheddar (0.1%), Eynsham (0.1%) and Pevensey (0.1%).

On each archive visit I photographed every sherd of glass and recorded the following details using the units of measurement listed:

<table>
<thead>
<tr>
<th>Vessel form</th>
<th>From a defined list (e.g. globular beaker)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum length, width and thickness</td>
<td>Millimetres</td>
</tr>
<tr>
<td>Diameter (where possible)</td>
<td>Millimetres</td>
</tr>
<tr>
<td>Weight</td>
<td>Grammes</td>
</tr>
<tr>
<td>Body colour</td>
<td>From a defined list (e.g. deep blue)</td>
</tr>
<tr>
<td>Rim type</td>
<td>From a defined list (e.g. rolled inwards)</td>
</tr>
<tr>
<td>Base type</td>
<td>From a defined list (e.g. rounded)</td>
</tr>
<tr>
<td>Decoration type</td>
<td>From a defined list (e.g. reticella trails)</td>
</tr>
<tr>
<td>Decoration colour</td>
<td>From a defined list (e.g. opaque yellow)</td>
</tr>
<tr>
<td>Decoration orientation</td>
<td>From a defined list (e.g. horizontal)</td>
</tr>
<tr>
<td>Bubbles or other manufacturing marks</td>
<td>From a defined list (e.g. few, elongated)</td>
</tr>
<tr>
<td>Sherd condition</td>
<td>From three categories (heavy, light, none) describing the degree of lamination</td>
</tr>
<tr>
<td>Chemical type</td>
<td>Soda or potash glass</td>
</tr>
</tbody>
</table>

The ‘defined lists’ for each category are supplied with the dataset on a CD at the back of the volume. I recorded the original vessel forms, colours and
decoration details as these were the details needed for characterizing and comparing assemblages and describing the national corpus. Dimensions and weights were required for assessments of fragmentation and quantity, and to ensure the dataset was as comprehensive as possible for future use. The latter was also the principal motivation for recording sherd condition and manufacturing marks. I did not need to use the information on bubbles and other manufacturing marks (e.g. pontil marks from the detachment of the pontil rod during manufacturing), but these details may be needed in the future. Chemical type, as judged by eye, was recorded as an important sherd characteristic for understanding probable forms and dates, and more broadly, production and supply processes. The overall condition of the glass in the corpus is excellent, as the vast majority is composed of chemically stable soda glass, which can be in such good condition that it looks new. In contrast, the few potash glass sherds can usually be identified visually by their yellow-green colour and the fact that they are laminating, meaning that the chemical structure of the glass is collapsing, causing flakes of glass to separate from the surface. In severe cases, the sherd edge will show that the glass has separated into layers throughout. Lamination can obscure the original colour of the glass and other features (e.g. any decoration, the original form).

The small size of sherds is one of first aspects of Anglo-Saxon vessel glass that people notice, and is the most significant challenge to studying Anglo-Saxon vessel glass from settlement contexts in a meaningful way. Sherd size may make some site assemblages either even more challenging or particularly useful to study if their sherds are above or below average in this regard. Sherd size can also be an indicator when analyzing site taphonomy – perhaps reflecting the degree of redeposition or the extent of glass recycling locally.

Another aspect of the material that immediately strikes the observer is colour. Although judgement of colour is highly subjective and no quantitative method of colour categorization has been established, it is still an area with sound research potential when working with such fragmentary material. When
embarking on the data collection phase of this project, I chose to eliminate one major area of confusion in regard to colour identification by regarding the blue-green colour spectrum as one category, rather than dividing these sherds into pale blue, pale green, blue-green, green-blue etc. as in the majority of specialist reports. This makes sense because all of the shades within this spectrum represent ‘natural’ glass – i.e. this is the range of colours created by the impurities in the raw materials used to make the glass, and nothing has been added to alter it deliberately. Even colourless glass was usually the result of the deliberate addition of decolourisers antimony or manganese.

While recording data relating to the glass itself, I noted as much site information as possible, including small find numbers, context numbers, feature numbers, and site maps. While it was important to maintain as much consistency as possible, it was inevitable that the variety of conditions interfered. Assessment of colour, for example, which is subjective at the best of times, is an activity particularly unsuited to gloomy store rooms, so I sought natural daylight wherever possible. I also used the same set of digital calipers and scales for taking measurements in an effort to ensure accurate and standardized data. However, there are also sites for which access to information is the difficulty rather than date or excavation or recording methodology. Barking Abbey, Essex, is an example: the site’s paper archive has been in a state of disarray for twenty years that renders it very difficult to use, and the excavation has never been fully published. Unpublished site archives in general are often difficult to locate, access and employ to any useful purpose.

The database design for this project is as simple as possible. The aim was to help characterize the site assemblages within the scope of this study and compare them in both qualitative and quantitative ways. The basic unit of recording is the sherd, with unique sherd numbers being assigned to each in a ‘letter-numeral-numeral-numeral’ format, in which the letter identifies the site and the number the sherd number within that assemblage (e.g. A101 is Lyminge sherd 1). The site letters correspond as follows:
A single spreadsheet was capable of storing the 500+ lines of sherd data and the 68 columns of information describing each one. The categories used for rim types were the following, all of which have been illustrated in the typology of fragments (Fig. 3.16): fire-rounded, rolled inwards, rolled inwards with cavity, and rolled outwards with cavity. Equally, the base types used were conical, rounded, concave – globular beaker, and concave – claw beaker. Examples of all are illustrated in the fragment typology. Illustrations of the complete form of all the vessel types identified in the sample can be seen in Evison’s typology for the period (Fig. 2.1). For photographic examples of the full range of decorative techniques and colours, see Fig. 3.1a, and Figs. 5.83 to 5.141.
Typological approaches to the study of Anglo-Saxon glass from settlement contexts

It is important to describe research methodology as explicitly as possible so that the results can be understood by a wide audience and also to enable others to conduct comparable research at a later date. In the case of the field of middle and late Anglo-Saxon glass studies, it is particularly important to lay the foundations for work in the future as there is so much more to be done, and because new discoveries will add to our understanding if they can build on this study in a meaningful way.

The typology of complete vessel types used is almost identical to Vera Evison’s most recent one in order to maintain continuity with the existing body of work and avoid unnecessary explanations of new terminology (2000, Fig. 4). Updates would have been made if necessary, but that was not the case. A full typology of diagnostic fragments including illustrations and descriptions of features of form and decoration that can help to identify and date sherds was not possible within the parameters of this project. However, illustrations of rim and base types and examples of the colours and decoration found are included (Figs. 3.1a and b), and a broad framework detailing the frequency of forms, colours and types of decoration has been established for the first time.

To characterize the corpus as a whole (Chapter 4) I queried the Excel database to produce pie and bar charts to display information about the nature of the assemblage, e.g. a pie chart showing the breakdown of the full corpus by colour (Fig. 4.3), and a bar chart showing the relatively small percentages of all the deep colours (Fig. 4.4), and a line chart to show frequency of sherd lengths (Fig. 4.2). To analyse the nature of the relationship between the vessel sherd characteristics I used correspondence analysis to help answer questions such as, which forms are most likely to have which colours, and vice versa? Correspondence analysis (CA) is a multivariate method, meaning that it can interrogate the relationships between more than two variables. The technique
can be very useful for quantified typological analysis because it measures the inter-dependence of a variety of artefact characteristics – for example, in the case of Anglo-Saxon glass vessels, it could answer a question such as were the globular beaker form and black coloured glass often found together? Correspondence analysis helps to reveal any structures within the data without relying on any presuppositions (Høilund Nielsen and Jensen 1997, 37; Martin 2011, 26-7). This approach was recently used in a similar context and with great success by Toby Martin in his PhD thesis on Anglo-Saxon cruciform brooches (Martin 2011), later published in a volume entitled *The Cruciform Brooch and Anglo-Saxon England* (Martin 2015). Previously Høilund Nielsen is an excellent example of a researcher who has used the technique extensively, particularly when studying chronologies, burials and grave goods (Høilund Nielsen and Jensen 1997; Høilund Nielsen 1995; Høilund Nielsen 1991). To ensure a comprehensive and thoroughly accurate view when applying CA to the corpus of fragments of Anglo-Saxon vessel glass, I plotted the data on the first and third and second and third factorial axes as well as the first and second.

To investigate the geographical distribution of sherd characteristics, I mapped the relevant sherd counts for each using ArcGIS, a well-known Geographical Information Systems platform. Geographical Information Systems (GIS) are in widespread use across archaeology, in academia, local government, non-governmental organizations and commercial archaeological units for mapping sites, features and finds. Within the context of academic research, Toby Martin’s work on Anglo-Saxon cruciform brooches (Martin 2011 and 2015) again constitutes an excellent example, this time of the use of GIS for mapping the distribution of artefact types and characteristics across Anglo-Saxon England. Other examples of the use of GIS in research on early medieval Archaeology include the current Leverhulme-funded project on Travel and Communication in Anglo-Saxon England (2014-17) led by Andrew Reynolds from UCL, which is part of the early medieval Atlas project, and a previous research project called Landscapes of Governance, led by Reynolds and Stuart Brookes at UCL, which looked at assembly sites in England from the fifth to
eleventh centuries. In the case of this project, sherd count was the only option for a universal measure of quantity to map, as weight information was only available for assemblages recorded in person specifically for this project. It is important to be aware of the risk that sherd count is partly a result of vessel fragmentation and site taphonomy, as the aim is to reflect the quantity of vessels present originally.

Percentage bar charts are the principal tool used to characterize and compare assemblages (Chapter 5), to show the proportions of each vessel form, body colour, and decoration types represented. As with the national corpus, these were produced by querying the Excel database. Once the site assemblage form profile, colour profile and decoration profile were established, these profiles were compared with the ‘whole corpus’ profiles. The third stage involved creating average profiles of forms, colours and decoration for emporia, and the same for documented ecclesiastical sites, so that these could be compared with each other, with the corpus as a whole and with individual site assemblage profiles.

**Contextual approaches to the study of Anglo-Saxon glass from settlement contexts**

The first contextual approach taken was to study all of the sites where Middle and Late Anglo-Saxon vessel glass were found and develop the first typology of this kind (Fig. 6.3). As it was not feasible to incorporate every feature of every site, I have followed Campbell’s example (2007, 12-13; 110-111; 115-124) and focused on items and characteristics significant to identity (including, status, economy and trade). These comprise the topographical location (especially the proximity to emporia and to navigable rivers or coastal trade routes) and the presence and number of other key artefact types (pottery described as imported, Ipswich ware, Rhenish lava quernstones, window glass, and styli). Pottery from northern France and the Rhineland and lava quernstones are clearly identifiable international imports likely to be from similar sources to
imported glass, and the pottery is even more worthy of comparison with the presence of glass as a closely related object type also used for serving and dining. Ipswich ware is included as a regional import (significant at least outside Suffolk and Norfolk) that also falls into a similar use category as glass vessels. Window glass and styli are included partly because both have often been regarded as ecclesiastical indicators in the great debate over identification of sites as monastic or secular. However, even when one allows that styli were not exclusive to monasteries, both speak regarding wealth and status, and styli indicate literate people and activities (be they clerical or religious in some way).

Of course window glass also has the material factor in common with glass vessels, and the manufacture of the two seems sometimes to have been connected (e.g. at Glastonbury Abbey, Wilmott and Welham 2013 and 2015). For consistency, distances from rivers, coasts and emporia were measured as the crow flies using interactive maps available online. The result is a qualitative summary of patterns and themes amongst the sites featured in this study, and a number of questions for future research to answer.

On an intra-site scale, the technique used involved plotting and interpreting the horizontal distribution of the sherds across the case study sites, which were all selected partly for their suitability for this analysis in terms of available data. Where possible I have also made use of information relating to stratigraphical distribution, and the relationships between the respective locations of sherd-linked fragments – i.e. sherds from the same vessel that join. Again, both were used extensively by Campbell when working on imported pottery and glass from Atlantic Britain (2007, 12, 92-97; 1991, chapters 2-8 and appendices 8-9). Campbell’s work on the stratigraphy of glass deposition at Whithorn makes an excellent case study (ibid., 106-7, Fig. 76), while at Dinas Powys he successfully mapped sherd linked glass fragments (ibid., Fig. 64) and proposed major revisions of the phasing for the whole site based on taphonomic study of the imported pottery (ibid., 96-7). Finally, I gathered and used any information available about the nature of contexts (pit fills, ditch fills, occupation layers),
the other artefacts contained within, and the relationships with any other significant features (particularly buildings and boundaries).

Site-based contextual and taphonomic studies of glass have great potential for interest from outside the field of glass studies, and are ripe with possibilities for the future. This is especially the case where new research excavations are launched with this glass work included in the initial project design, meaning appropriate excavation and recording methods are employed from the start. In the meantime, this project involved working almost exclusively with past excavation reports and archives (here the only exception is Lyminge), meaning that the challenges are greater. Some glass reports exist where the description and analysis of the glass finds themselves is reasonably comprehensive but problems arise when in search of information within the publication on the contexts in which glass was discovered. A typical example of this is the report on the excavations at Lurk Lane, Beverley: the catalogue lists five sherds of glass from five separate ninth- to eleventh-century contexts, but the main text only contains information on the character and location of two of them (Armstrong 1991). Overall, the quality of accessible (published and unpublished) information is varied in the extreme, and this is one reason for studying taphonomics and context via selected case studies – there are only a small number of sites where the contextual information available is comprehensive enough to withstand such analysis.

**Compositional Analysis**

18 sherds of Middle Anglo-Saxon vessel glass from Lyminge, Kent were sampled and analysed using a Scanning Electron Microprobe (SEM). Recent examples of use of this and other very similar techniques to analyse the composition of glass are numerous. The most relevant include studies on glass from the monastery at Jarrow (Freestone and Hughes 2006), the Abbey at Glastonbury (Willmott and Welham 2013 and 2015) and the monastery at San Vincenzo in Molise, Italy (Schibille and Freestone 2010). Vessel glass from the emporia at Hamwic was
analysed by Hunter and Heyworth (1998), and efforts to understand glass recycling across the Roman Empire and Medieval successor states through studying chemical compositions are continuing apace (e.g. Freestone 2015; Schibille et al. 2016). Following Evison’s section in the 2008 British Museum volume is a very interesting chapter on the composition and production of the glass by Ian Freestone, Michael Hughes and Colleen Stapleton, which concludes that the increase in coloured glass in the eighth and ninth centuries is ‘likely to represent an increasing dependence upon old Roman material’ (Freestone, Hughes and Stapleton 2008).

Sample preparation is a slow process, involving cracking a small chip of glass from the sherd, mounting it in resin, and grinding the surface down to create the largest possible flat surface of glass to analyse. The Scanning Electron Microprobe scans the surface using a focused beam of electrons, which produces a much more detailed image of the surface than light microscopy because electrons have shorter wavelengths. The electrons in the beam interact with the sample, producing signals that identify the surface composition. The results for each sherd comprise a list of the elemental compounds present, and the proportions of the whole surface that they represent. It is important to note at this point that the detection limit of the SEM used (at the Wolfson Archaeological Science Laboratories, UCL) is 0.02% - i.e. the proportion of Na₂O present in the amber ridged sherd from LYM 09 C1001 is 15.94%, plus or minus 0.02%. Equally, the CuO and ZnO results for the same sherd are 0.01% - as this is less than 0.02%, these results are equivalent to zero presence of those compounds in the surface of the sherd. The next stage is to compare the compositional profiles of each sherd with a growing bank of reference information regarding the characteristic compositions of glass from different time periods and geographical locations. The real skill is in comparison and interpretation of the compositional profiles, and I am very grateful to Professor Ian Freestone for his help in this regard.
**Colours**

- Olive Green
- Deep Blue
- Deep Blue-Green
- Colourless
- Black
- Brown

**Decoration**

- Amber
- Opaque Red
- Deep Green
- Purple
- White (with gold foil)

*Fig. 3.1a. Typology of fragments: colour and decoration*
### Typology of Fragments: Rim and Base Types

<table>
<thead>
<tr>
<th>Rims</th>
<th>Bases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heat-softened</td>
<td>Rounded</td>
</tr>
<tr>
<td>Rolled inwards</td>
<td>Conical</td>
</tr>
<tr>
<td>Rolled outwards</td>
<td>Concave</td>
</tr>
<tr>
<td>Cavity rim inwards</td>
<td></td>
</tr>
<tr>
<td>Cavity rim outwards</td>
<td></td>
</tr>
</tbody>
</table>

*Fig. 3.1b. Typology of fragments: rim and base types*
Chapter 4: The corpus overall: form, colour and decoration

The total number of sherds included in this study is 2847, showing that mid and late Anglo-Saxon vessel glass has been excavated from settlement contexts in a significant quantity, although this figure is still small in comparison to many other contemporary find types (pottery in particular). The sherds are from a total of 23 sites that are mainly in the south and east of England (Fig. 6.1). It is interesting to note that glass from Hamwic (Southampton) alone makes up more than half of the corpus with 1675 sherds or 59% of the total, highlighting once again the importance of the Hamwic glass for Anglo-Saxon glass studies. A complete breakdown of the number of sherds and percentage of the total corpus from each site is shown in Table 4.1 below.

<table>
<thead>
<tr>
<th>Site Name</th>
<th>Number of sherds</th>
<th>% of corpus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hamwic (Southampton)</td>
<td>1678</td>
<td>58.9</td>
</tr>
<tr>
<td>Ipswich, Suffolk</td>
<td>332</td>
<td>11.7</td>
</tr>
<tr>
<td>Brandon, Suffolk</td>
<td>171</td>
<td>6.0</td>
</tr>
<tr>
<td>London</td>
<td>161</td>
<td>5.7</td>
</tr>
<tr>
<td>York</td>
<td>114</td>
<td>4.0</td>
</tr>
<tr>
<td>Lyminge, Kent</td>
<td>86</td>
<td>3.0</td>
</tr>
<tr>
<td>Jarrow</td>
<td>79</td>
<td>2.8</td>
</tr>
<tr>
<td>Flixborough, Lincs.</td>
<td>71</td>
<td>2.5</td>
</tr>
<tr>
<td>West Heslerton, Yorkshire</td>
<td>30</td>
<td>1.1</td>
</tr>
<tr>
<td>Butley</td>
<td>26</td>
<td>0.9</td>
</tr>
<tr>
<td>Sedgeford</td>
<td>18</td>
<td>0.6</td>
</tr>
<tr>
<td>Monkwearmouth</td>
<td>16</td>
<td>0.6</td>
</tr>
<tr>
<td>Canterbury</td>
<td>14</td>
<td>0.5</td>
</tr>
<tr>
<td>Northampton</td>
<td>11</td>
<td>0.4</td>
</tr>
<tr>
<td>Portchester</td>
<td>11</td>
<td>0.4</td>
</tr>
<tr>
<td>Barking, Essex</td>
<td>8</td>
<td>0.3</td>
</tr>
<tr>
<td>Beverley, Yorkshire</td>
<td>7</td>
<td>0.2</td>
</tr>
<tr>
<td>Whitby</td>
<td>4</td>
<td>0.1</td>
</tr>
<tr>
<td>Cheddar</td>
<td>2</td>
<td>0.1</td>
</tr>
<tr>
<td>Eynsham Abbey, Oxon</td>
<td>2</td>
<td>0.1</td>
</tr>
<tr>
<td>Pevensey</td>
<td>2</td>
<td>0.1</td>
</tr>
<tr>
<td>Shakenoak, Oxon</td>
<td>2</td>
<td>0.1</td>
</tr>
<tr>
<td>Trowbridge</td>
<td>1</td>
<td>0.0</td>
</tr>
</tbody>
</table>

Table 4.1. Breakdown of corpus by site assemblages
Meanwhile, Fig. 4.1 displays the site assemblage percentages, and demonstrates the dominance not only of Hamwic, but also of the four emporium assemblages collectively (Hamwic, Ipswich, London and York) – together they comprise 80% of the dataset. The non-emporium are of particular interest precisely because of their minority status. The study of these assemblages both as a sub-group and in conjunction with the glass from emporia represents a new area of archaeological enquiry. Within this sub-group of glass assemblages from non-emporium settlement sites, Brandon, Lyminge, Jarrow and Flixborough are of notable size and proportion. Of those two of the four (Lyminge and Jarrow) are documented ecclesiastical sites, while the other two (Brandon and Flixborough) are of unknown status.

Fig 4.1: Site assemblages as percentages of the corpus
The sites and site assemblages will be discussed in more detail in Chapters 5 and 6. The purpose of this chapter is to study all of the known mid and late Anglo-Saxon vessel glass from settlement contexts together as a group for the first time, creating benchmark values against which the characteristics of individual site assemblages can be compared in Chapter 5, and to study distribution of forms and characteristics at a national level. The results support many of the established ideas within the field, which can now be quantified for the first time (that funnel beakers are the most commonly identified form, representing 22% of sherds, for example), and also raise a few surprises (e.g. that arcading is the second most common orientation of applied trails, comprising a significant 21% of the examples).

The average sherd length within the corpus is 20.4mm, a figure that exemplifies the difficulty of extracting meaningful information from glass from settlement contexts. The graph in Fig. 4.2 adds further information by showing that the vast majority of sherds are between 8 and 21mm long. The minimum sherd length is 1.3mm, and the maximum is 94mm (Y434, a palm-funnel rim sherd from Hamwic), although it can be seen from Fig. 4.2 how unusual these extremes are. The average width is 12.5mm, and the average thickness is 1.8mm, although in the case of thickness there is huge variation – from 0.1mm to 11.8mm (E207, an undiagnostic sherd from Brandon). The average sherd weighs 1g, although the sample size for this measurement is much smaller than for the others as the weight of small glass sherds has often not been recorded in the past (for comparison, the majority at Dinas Powys weighed less than 0.5g, Campbell, pers. comm.). The range runs from 16 sherds weighing less than 0.1 of a gram to one weighing 9 grams (E393, Fig. 5.110 a black claw sherd from Brandon).

It is now possible to state with reasonable accuracy that around 80% of the glass in this corpus falls into the natural blue-green spectrum, and only around 20% were deliberately coloured or decolourised (Fig. 4.3). Within the group of other colours there is a wide variety, although all individual colours within it can be described as unusual – if olive green is discounted based on the fact that it too
may not have been a deliberate choice in many cases, then the largest sub-group in this category is deep blue, which comprises only 3.07% of the overall corpus (Fig. 4.4; E160, Fig. 5.107; E190, Fig. 5.109; B109, Fig. 5.112; G109, Fig. 5.118; J112, Fig. 5.135; U105, Fig. 5.138). Glass was naturally a blue-green or sometimes olive green – the colours created by the impurities in the sand used to make it – which is why colourless glass was a deliberate choice that involved the addition of decolourants such as antimony or manganese to the melt. Deep blue required cobalt, red the addition of copper-rich material (E179, Fig. 5.101; J124, Fig. 5.133 and Fig. 5.134), and amber iron (A158, Fig. 5.92; G104, Fig. 5.119; G108, Fig. 5.120; G105, Fig. 5.121), the latter with the added requirement of a reduction atmosphere (a very low oxygen environment) in the furnace (Broadley 2015). Similarly, if the lone grey sherd is discounted as certainly not deliberately coloured (it may have been a potash sherd and therefore suffered some decomposition while buried in the soil), then the rarest colours are opaque white (e.g. W196, Fig. 5.85), yellow (M103, V133), and pink/purple (e.g. G118, Fig. 116 and Fig. 117) (0.11-0.07% of the total). This profile of the colour spectrum of the corpus has enabled direct comparison with each individual site assemblage, which highlights the colours that are more or less common at each site than usual (chapter 5).

Fig. 4.2. No. of sherds of each sherd length
Fig. 4.3. Blue-green spectrum vs. other colours within corpus

'Non-blue-green spectrum' colours as % of corpus

Fig. 4.4. Non-blue-green spectrum colours as a percentage of the corpus
A study of form reveals firstly that more than half (52%) could not be securely allocated to a form type (Fig. 4.5). Experience of approaching these fragmentary assemblages suggests that often a possibility or two present themselves, but unless one is at least a probability, the sherd has to be labeled as non-diagnostic in a database or catalogue context. Normally, these possible options could then be discussed in the body of a report, something that is not possible when working with the whole corpus in a database format. Sherd size is also a factor, and so are the areas of overlap between forms – for example between the bodies of bowls, palm cups and globular beakers – and the difficulties of determining body sherd orientation. Finally, there is the fact that rim and base sherds are much more likely to retain diagnostic features. Within the corpus, rim and base sherd groups together represent only 28% of sherds (Fig. 4.6).

Fig. 4.5. Vessel forms as a % of the corpus

Regarding the remainder of the results in this area, it is important to note that part of what the analysis reveals is which of the vessel forms are the most or least
identifiable when in a fragmentary condition. For example, it is almost impossible to firmly identify a sherd as being from a claw beaker, unless a claw itself or a base with a separately blown foot survives (see Figs. 5.84, 5.109, 5.110, 5.116, 5.117, 5.118, 5.139 and 5.140 for sherd photographs). It is possible that a form type chart would look quite different if all of the unidentifiable sherds could be allocated to a group accurately. However, we have to treat these results as at least a guideline to the relative frequency of vessel type sherds present and vessel forms in use in the middle Anglo-Saxon period as there is no viable alternative. Late Anglo-Saxon vessel forms of the tenth and eleventh centuries are much less well known generally, as so few have been found.

We can clearly see that the palm-funnel form series – comprising funnel sherds, palm-funnel series sherds, and palm sherds - is dominant, and that within that series the funnel beaker sherds form the largest sub-group (e.g. Y1769, Fig. 5.83; X154, Fig. 5.91; J116, Fig. 5.131; J118, Fig. 5.132; U111, Fig. 5.139). Relative to the funnel and palm-funnel series sherds, the group of palm beakers sherds is very small, representing only 2% of the total corpus, compared to 22% and 11% respectively for the other two sub-groups (e.g. A168, Fig. 5.96; A170, Fig. 5.97; A167, Fig. 5.98; G115, Fig. 5.123). This is probably largely a matter of chronology – the palm beakers are the earliest part of the form series and were at their peak in the early Anglo-Saxon period (c. sixth and early seventh centuries). By the eighth century, tall palm cups and funnel beakers were more common, and by the ninth century vessels from this form series seem to have been almost exclusively funnel beakers. Other vessel types appearing in small numbers for largely chronological reasons include cone beakers (1%, see e.g. A110, Fig. 5.93; A107, Fig. 5.95), claw beakers (1%), bag beakers and bell beakers (less than 1% each). The appearance of these earlier vessel forms within site assemblages is interesting, as it suggests an earlier than usual start date for glass use and deposition on that site, or later than usual retention of early period forms. However, research in recent years has now established that some form of claw beakers continued much later than originally thought – until at least the middle of the eighth century. These late claw beaker sherds can be identified by colour – often the deep colours characteristic
of eighth-century vessel glass – and by the shape of the claw being flat and not inflated (e.g. Y117, Fig. 5.84; E193, Fig. 5.110; G118, Figs. 5.116 and 5.117; Fig. U103, Figs. 5.139 and 5.140). The overall vessel shape of late claw beakers is not known.

Meanwhile, bowls (2%, see e.g. A163, Fig. 5.92; B119, Fig. 5.114; G107, Fig. 5.124; G102, Fig. 5.125) seem to have been a minority form throughout, and glass bottles (less than 1%, see e.g. E206, Fig. 5.105 and E204, Fig. 5.106) were very rare indeed throughout the entire Anglo-Saxon and Medieval periods. Grape beakers (less than 1%, see e.g. E160, Fig. 5.107) are a distinctly early Medieval form, but are also very rare throughout their period of use and deposition. Therefore, other than those within the palm-funnel series, the only form that appears in significant quantities is globular beakers (9% of the total; e.g. X101, Fig. Fig. 5.89; A160, Fig. 5.92; E179, Fig. 5.101; E139, Fig. 5.102; E174, Fig. 5.103; E167, Fig. 5.104; B109, Fig. 5.112; B121, Fig. 5.113; G104, Fig. 5.119; G105, Fig. 5.121; G113, Fig. 5.130; U105, Fig. 5.138; U101, Fig. 5.141). This may be because globular beakers were used in a different or complimentary way – in contrast with the palm-funnel series they are a stable form that could be set on a table, and may have been used for a wider variety of contents.

Fig. 4.6. Sherd types as a % of the corpus
The range and percentages of rim and base types are shown in figs. 4.7 and 4.8. The most frequent are heat-softened or fire-rounded rims (43%), which are the simplest to manufacture, and are also often associated with funnel beakers and globular beakers (the most frequent vessel types). The majority of the remainder are either rolled inwards with a cavity (29%) or simply rolled inwards (15%), types that are also found on palm-funnel series vessels and globular beakers. Rims that are rolled outwards with a cavity (8%) have a strong association with the bowl form (almost all bowl rim sherds are of this type), and also with palm cups. The final two rim types, those rolled outwards with no cavity (1%) and rims finished by grinding (less than 1%) are very rare. The latter are generally associated with first and second century Roman vessels and there is only one sherd of this kind within the corpus. Overall, there are some similarities between late Roman and early Anglo-Saxon glass vessels – olive green and colourless glass and forms such as the claw, for example – but some features such as cracked off rims and engraved decoration completely disappear.

Fig. 4.7. Rim types as a % of total rim sherds
Base sherds are more difficult to describe and divide into types: for this project, I chose ‘rounded’, ‘conical’, ‘concave’, ‘separate foot’ and ‘not known’. The balance between types is also more even than for rims (Fig. 4.8), with rounded and conical base sherds both representing 33% of the total. The main difference between these two groups is that conical base sherds are associated exclusively with tall palm cups and funnel beakers, whereas a rounded base sherd could hypothetically be from a palm cup, globular beaker or bowl. The third major base sherd type used here is ‘concave’ (13%), meaning a concave base, which are mainly from globular beakers, although in rare cases it is possible that they are from claw beakers, especially as the complete forms of late claw beakers are not known. The rarest base forms are those consisting of a foot that was blown separately and attached to the main body afterwards (1% or two sherds), and those that have a completely flat surface (0.6% or only one sherd). The former are very likely to be claw beaker bases, while the latter are not diagnostic in the same way but may be from bottles, inkwells, or even globular beakers or bowls.

Fig. 4.8. Base types, as a % of total base sherds
Fig. 4.9. Decorated and undecorated sherds of all types, as a % of corpus

The final significant area of information that even a tiny sherd can yield to us is decoration. Nearly a third of sherds in the corpus (31%, Fig. 4.9) feature some form of decoration ranging from simple self-coloured trails (e.g. A110, Fig. 5.93; G101, Fig. 5.126; G120, Fig. 5.127; G113, Fig. 5.130; J118, Fig. 5.132) to patterns of applied gold leaf (W196, Fig. 5.85; W191, Fig. 5.86 and Fig. 5.87; W273, Fig. 5.88; Broadley 2016). On a site assemblage level decorated sherds can tell us more about the status of the glass on site and also about the character of the assemblage in comparison to others – in particular the appearance of types and colours of decoration that are rare on a national level, or more typical of another region, for example.

Unsurprisingly, the simplest form of decoration is more prevalent than all of the others combined: applied trails, comprising 56% of the corpus of decorated sherds (Fig. 4.10). Of these, a total of 98% are either self-coloured (40%), opaque yellow (36%; e.g. U105, Fig. 5.138) or opaque white (22%, Fig. 4.11; e.g. B125, Fig. 5.115). Therefore, any contrasting colours other than yellow and white are very rare – examples within the current corpus are red (C101, H106, U112), yellow-brown (W203, W224), blue (Y836), green-blue (Y115), brown (V147) and opaque red (J104). In some cases, the orientation of the trail on the vessel can also be
determined, and where possible this information was recorded for applied trails in the project database. As one would expect, the majority (64%) of those for which that trail orientation could be identified are horizontal (Fig. 4.12). However, a surprise is that the next largest group is arcaded (21%) rather than vertical (only 8%), meaning that the former is more common and the latter less common than I predicted based on anecdotal impressions. This situation is further enhanced when one considers that trails identified as vertical on smaller vessel sherds (based on the shape of the sherd itself and any bubbles present) may have come from vertical sections of an arcaded or looped pattern – genuine vertical orientation for applied trails is very unusual. As expected, all other forms of patterning for applied trails are rare: 2% are combed and arcaded (where the trails are combed down; e.g. E126, E127, Y836), 2% are looped (where the trails are combed up; e.g. D129, Fig. 5.100), and 1% or less are combed and feathered (where the trails are combed up and down alternately; F108, S101 and S102), diagonal (e.g. B116, B117 and B118), and rim trails (e.g. B125, B126 and C101). One of the few Jarrow sherds to be photographed (Fig. 5.100) is an example of rare combed and looped trails that had in this case also been marvered (flattened into the wall of the vessel by rolling on a flat, hard slab during manufacture).

The remainder of decorated sherds comprises three main types and several very unusual ones. The three other types found in significant proportions are reticella trail decoration (16%), swirls of another colour within the body of the vessel (13%), and moulded – usually optic-blown – decoration (12%). The former two of these can be sub-divided by colour, and the latter by pattern, as follows. 90% of reticella trail colours are either opaque yellow on body colour (e.g. E174, Fig. 5.103; E 167, Fig. 5.104; B119, Fig. 5.114; G102, Fig. 5.125; G108, Fig. 5.120) or opaque white on body colour (e.g. E179, Fig. 5.101; B122, Fig. 5.111), with each group forming 45% of the total (Fig. 4.13). All other colour combinations are very unusual and of great interest where they do occur. Those known so far include white and opaque
Fig. 4.10. Decorated sherd types, as a % of total decorated sherds

Fig. 4.11. Colour combinations, as % of applied trailed sherd group
yellow on body colour (P101, R104, Y504), opaque red on body colour (V148 and W262), opaque yellow on colourless glass (Y405 and Y849), white on green-blue (V151 and V154), opaque yellow on blue (B124), opaque yellow on black (1 sherd, B121, Fig. 5.113), white and opaque yellow on blue (W173), white and opaque yellow on green (E172), opaque yellow on pale green (F105), and black on body colour (1 sherd, U101, Fig. 5.141). With the benefit of hindsight, the database design for this project should have allowed for the recording of reticella orientation as well, as was the case for applied trails, but unfortunately did not at the outset. We can observe subjectively that almost all reticella trails are either horizontal or vertical and on the vessel body, with a rare exception being the Hamwic group of funnel beaker rims that have white and self-coloured trails on the tip of the rims (Hunter and Heyworth 1998, 56, Fig. 4-8 and Pl. 2). Vertical orientation is much more common for reticella than for applied trails, particularly on the walls of bowls and globular beakers. Finally, bands of horizontal reticella trails with vertical reticella trails underneath, in the style of the Valsgärde bowl, represent a significant minority of reticella sherds overall (e.g. B119, Fig. 5.114; G102, Fig. 5.125).
Swirling another colour into the main body colour of the vessel was another relatively popular technique, appearing on 13% of decorated sherds. The range of colours used for this is wide, although the number of colours used frequently is few (Fig. 4.14). Black or ‘dark’ swirled glass, probably the easiest to achieve, makes up almost half the group (45%), with red swirls being the second largest group (27%; e.g. A160 and A176, Fig. 5.92; B121, Fig. 5.113; G133, Fig. 5.130) and black and red the fourth largest (8%). Light green swirls are the only other group of significant size (third largest, 11%), and as with applied and reticella trails there is a wide range of other colours and colour combinations represented that are all very rare: swirls of blue-green (D115 and D116, Y1378), blue and red (E158 and E159), pale blue (E154 and E155), dark brown (F105), dark green (J126), light yellow (W427), red and white (W136), yellow-brown (Y115), and one extremely interesting sherd featuring layers of yellow-green and blue-green glass (Y643). It is unlikely that any of these are Islamic imports, as the key groups of Islamic glass in the eighth to tenth centuries were vessels with relief-cut decoration and lustre-
ware vessels featuring a type of painted decoration (Henderson 2012, 257, Figs. 9.3 and 9.4), and forms were restricted to a narrow range influenced by Roman and Sasanian glass (ibid., 260). However, it would be interesting to reexamine the sherd described as featuring layers of yellow-green and blue-green (Y643, SOU2, from Hamwic) as that is a potential candidate for import from the continent.

The final major category of decoration is moulding, and it is dominated by ribbed patterns, which are found across most vessel forms. Vertical ribbing alone accounts for 60% of moulded decoration, and if one adds the group of ribbed sherds for which the orientation of the ribs could not be determined (15%) and the diagonally-ribbed sherds (4%), then the group of ribbed sherds totals 79% of moulded sherds (Fig. 4.15; e.g. A167, Fig. 5.98; G105, Fig. 5.121; G114, Fig. 5.122). Reasons for this may well include ease of production, aesthetic appeal, and the practical benefit of providing extra grip on the glass. Based on this analysis, all of the other moulded patterns are relatively rare. The most numerous is base crosses (8%), which are exclusively found on palm cups, followed by bosses (6%), which are also associated with the palm cup form to a lesser extent. The remaining patterns are all extremely rare or even unique to individual sherds within England, and have good potential as imports or imported technology. These are the grape pattern - or Traubenbecher (four sherds, e.g. E160, Fig. 5.107), sherds with a pronounced linear ridge (A158, D160 and D165), sherds with a diamond pattern (J105, Fig. 5.136), and the unique sherd with a trefoil design from Butley in Suffolk (J112, Fig. 5.135). The trefoil as a symbol has a fascinating history, and the sherd itself is one of the most enigmatic in the corpus. Trefoils are known from many cultures and religions across history as symbols of unity and faith, and in Christianity specifically of the holy trinity. The trefoil shape was familiar to Franks and Vikings as demonstrated by ninth-century sword belt fittings and tenth-century trefoil brooches respectively. Valerie Fenwick, the excavator of Butley, recalls that she showed this sherd to Donald Harden in the early 1980s and he suggested the possibility of an Islamic origin (Valerie Fenwick, pers. comm.) although the reasoning is unknown. I would like to raise the possibility that the
symbol represents Christian iconography, perhaps from the Frankish world. Research into parallels continues.

Finally, amongst the very rare types of decoration (claws, gold foil decoration, applied blobs or prunts), only one can be effectively categorized further: bichrome untwisted trail colours, the much more unusual relation of reticella trails (that have two trails twisted together). There are only eleven in total, and interestingly, the colour red is dominant, with self-colour and red comprising 46% of the group (five sherds, e.g. F102), and white and red being the next largest at 27% (three sherds, B125, B126 and F108), contrasting with only 1% of reticella trails featuring red (Fig. 4.16). Meanwhile the colours dominating reticella trails (white and opaque yellow) appear together here in the third of four groups (18%, two sherds, W309 and W311).

![Pie chart showing colour groups](image)

*Fig. 4.14. Colour groups, as % of sherds with streaking in metal*
Anglo-Saxon potash glass poses a great challenge to archaeologists today for a number of reasons, principally that it is structurally much less stable in the ground than soda glass, and also that glass was made in England in the same way for many
subsequent centuries so typological dating is difficult. These factors mean that some of this glass may have degraded completely or to the point where it is not noticed during excavation; also that corrosion renders the shape and colour of the glass difficult to determine; and that unless very distinctive rim or base shapes are discernible or a sherd comes from a securely stratified Anglo-Saxon context then Anglo-Saxon potash glass is very difficult to firmly identify. The number of sherds listed in the entire corpus for this project is only 10, or 0.35% of the total. However, Evison was of the opinion that there was a much-reduced quantity in circulation in the first place: ‘the amount of vessel glass in use in England appears to have diminished in the tenth and eleventh centuries with the introduction of potash as the alkali, in contrast with France where it became plentiful’ (2000, 91).

The average potash sherd measures 29mm in length, 18mm in width and 2mm in thickness. The figures are larger than for the corpus as a whole, although the potash sample size is very small for making an accurate judgement. Seven out of ten are olive green in colour, with the other three being yellow, grey and brown. It is likely that none were deliberately coloured as with middle Saxon soda glass. The level of surface lamination is high in six out of ten cases, with all but one sherd showing some degradation. Only three out of ten sherds are decorated (M101, M103 and W225), and all three of those featured self-coloured applied trails – the only form of decoration known on late Saxon potash vessel glass. In one case, the trails are both horizontal and looped (M103, Northampton). In terms of sherd types, of the ten sherds only two are base sherds (H101 and M103) and the remainder are unidentified body sherds. There are no rim sherds in the group at all. One of the base sherds is from a globular beaker (M103), and the other is a concave base that is probably also from a globular beaker (H101). There are three sherds from Jarrow (D167, D168, D169), two from Lyminge (A180, A181), two from Northampton (M101, M103), and one each from Beverley (H101), Ipswich (W225) and Hamwic (Y589). In addition to these sherds within the dataset for the present study, one sherd from London is mentioned by Vince (1994, 173), one from Thetford in Norfolk is now lost (Harden 1984, 116), and Evison illustrated a globular beaker sherd from Waltham Abbey (Fig. 2.1) but made no other mention.
of it. Most importantly, Evison mentions two additional sherds from Ipswich, one from a globular beaker (2000, 89) and the other from a claw (1982, 71, Fig. 4.13). The latter is currently unique in England. A potential sherd was found at the late Anglo-Saxon settlement at Bishopstone, East Sussex, although reassessment will be needed before it can be counted with certainty.

It is probable that the principal factor in the great lack of tenth- and eleventh-century vessel glass in the archaeological record is that the availability of glass itself declined dramatically in the late Anglo-Saxon period, although the lower chemical stability and the increased difficulty of identification have probably also played a role. This begs the question, why? It is very interesting that the transition to potash compositions seems to have begun on the continent with window glass for grand monastic construction campaigns (Van Wersch et al. 2015). One possibility is that the ease of pointing to Viking disruption and a reduction in soda glass supply has obscured reduced demand for glass vessels in late Anglo-Saxon England, although it is difficult to explain why this would be so different to the situation in France as described by Evison. Production in England may have ceased for centuries (there is no evidence for it continuing at least), only beginning to resume in the twelfth century. Perhaps this lack of glass vessels in late Anglo-Saxon England relates to powerful social change in England as well as shifts in the international trade environment – for example, the transition away from portable wealth and towards the holding of lands – although again, the contrast with France is hard to explain. There are more questions than answers relating to late Anglo-Saxon vessel glass in England.

**Correspondence analysis**

Thus far, each aspect of the dataset has been assessed individually, but we can learn much more by using correspondence analysis (CA) to statistically analyse the nature of the relationship between the variables. This technique is ideal for the comparison of two sets of qualitative data in a quantitative way, and enables us to address questions such as, which forms are most likely to have which colours,
and vice versa? The results are presented here in the form of symmetric plots showing all the aspects of the data in question plotted on two axes, with the intersection point indicating the average result. The data has been observed comprehensively in three dimensions by plotting the data on the first and third and second and third factorial axes as well as the first and second, to view the relationships between the variables from all possible angles. The plots featured here are those that show the key connections most clearly, and the connections discussed are all those that stand out clearly.

The first three graphs show the relationship of vessel forms with vessel colours on the first and second factorial axes in increasing detail. The most obvious feature of the first plot (Fig. 4.17) is that the categories ‘cone’ and ‘colourless’ (deliberately de-colourised glass) are clear outliers in relation to the rest of the group. This indicates that cone beaker sherds are most likely to be colourless, and colourless sherds are most likely to be cone beakers (although as an early form that only appears at the beginning of the middle Saxon period, the latter also depends on excavation context). In order to probe further, these two characteristics were excluded in order to focus in on the remaining forms and colours and produce the second plot (Fig. 4.18), which shows two more outliers from the central cluster, although this time they are further apart. There is a connection, albeit a weaker one, between deep purple sherds and claw sherds, meaning that the deep purple sherds currently known are most likely to be claw beaker sherds. However, as the ‘claw’ marker is much closer to the main group, claw beaker sherds are actually more likely to be olive green, deep blue-green, deep blue, amber and pale blue than deep purple, which accurately reflects the rarity of deep purple sherds overall. Both the colourless/cone and purple/claw relationships are equally clearly visible when plotting the first and third and second and third axes, so these can be regarded as strong and unequivocal connections. Finally, the ‘deep purple’ outlier was also excluded to focus in on the central group (Fig. 4.19), which illustrates a more complex network of relationships between the more common form types and colours.
We can see that around the convergence of the two axes is a cluster of points representing the vessel forms palm beakers, funnel beakers, the palm-funnel series, and bowls, and the colours blue-green and pale green. These colours and forms are closely related to each other, with palm-funnel and funnel beaker sherds being extremely likely to be blue-green, or if not then pale green, and equally with a blue-green sherd being most likely from a palm-funnel or funnel beaker, or if not then from a palm cup or bowl. On the right hand side of the plot, the other colours and forms are arrayed in a more scattered formation. The position of the marker for globular beaker sherds is interesting, being loosely surrounded by deep colours. According to this viewpoint, a globular beaker sherd is most likely to be black, followed by deep green, then pale blue, amber, deep blue, deep blue green,
and then there is a cluster of overlapping points that represent red, brown, yellow and white sherds. Black, deep green, pale blue, red, brown, yellow and white sherds are all most likely to be from globular beakers. This association between globular beakers and deeply coloured glass is even clearer on a plot of the first and third factorial axes (Fig. 4.20), where the closest colour points are pale blue, amber, deep blue, olive green, black, red, brown, yellow, white and deep green. Finally, in the top right-hand quadrant of the first and second axes chart (Fig. 4.19) is a cluster of colours (pale blue, amber, deep blue, deep blue-green, and olive green), with bag, bottle, grape and claw forms in an arc above. On the first and third axes chart (Fig. 4.20), a particular connection between rare bottle and grape sherds and deep blue-green glass can be seen, although the sample sizes are very small indeed.

The next three graphs address the question – what are the relationships between form types and decoration? In the first two plots, of the first and second axes (Fig. 4.21), the clearest connection is the obvious one between claw beakers and claws.
as a form of decoration. More surprising, however, is the apparent clarity of the connection between the palm-funnel series and moulded decoration, which must be caused in part by the number of tall palm cups with ribbed decoration. That this link is significantly stronger than the link with palm cups – the earlier part of the same series – is interesting as palm cups are well-known for the variety of moulded patterns that feature on them, but clearly the frequency is not as great as with the middle stage of this form sequence, in which the variety of moulding is reduced massively but the frequency is greater. Meanwhile, the final stage in the series, funnel beakers, are much more likely to be decorated with swirls in the glass, applied trails or reticella trails in that order, with moulded decoration being unusual. When plotted on the second and third factorial axes (Fig. 4.23), palm and palm-funnel beakers appear to have a more equal relationship to moulded decoration, and a similar differentiation between those two forms and funnel beakers can be seen, whereby funnel beakers are associated with swirls, applied trails, bichrome and reticella trails. However, it should be noted throughout when considering the relationship between the palm-funnel series and moulded decoration that moulded ribbing often fades towards the rim of a vessel, so that may affect this analysis. The decoration may not be noted when only rim or upper body fragments survive, and this is more and more likely as the form series progresses, vessel walls become thinner and rims larger.

In the next graph (Fig. 4.22), the outliers (claws, and claw beakers, bell beakers and grape beakers) are excluded in order to expand the tight central group of form and decoration points. Now it is much easier to see the connections between bowls and reticella trails, and globular beakers and applied trails in particular (which are also clearly visible in Fig. 4.23). Reticella sherds are most likely to be from bowls, then funnel beakers and then globular beakers (the surprising position of funnel beakers perhaps due mainly to the group of funnel sherds from Hamwic with reticella trails mounted on the rims). Meanwhile, in Fig. 4.22 applied trails are most likely to be from globular beakers, followed by funnel beakers, and then the much more distant possibilities of cone beakers, bags, bottles and bowls, while the picture is very similar in Fig. 4.23 except for the inclusion of claw beakers
Fig. 4.19. Form v. colour 3

Fig. 4.20. Form v. colour 4
Form v. Decoration
(axes F1 and F2: 92.17 %)

Form v. Decoration 2
(axes F1 and F2: 90.86 %)

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Fig. 4.21. Form v. decoration

Fig. 4.22. Form v. decoration 2
**Fig. 4.23. Form v. decoration 3**

**Fig. 4.24. Form v. rim type**
in the list. Finally, bichrome untwisted trails are very rare, but it is useful to note that in Fig. 4.22 they appear closest to the rare forms of bottle and bag beakers, followed by cone beakers and then globular beakers. However, in Fig. 4.23 a close connection with globular beakers can be seen, followed by funnel and claw forms. The lack of consensus is caused by the very small numbers of bichrome-trailed sherds, and the fact that many of those are from sherds that are not diagnostic in terms of form.

When form and rim types are compared with each other on the first and second axes (Fig. 4.24), we can see a predominance of very close relationships: outward cavity rims with bowls and palm cups; inward cavity rims with palm-funnel beakers; rolled inward rims with globular beakers; heat softened rims with funnel and cone beakers; and ground and heat-softened rims with bottles. The only point isolated on the chart is that for rims that are rolled outward, which are most likely to be from bowls, palm cups or palm-funnel beakers, but do not have a tangible connection with any particular vessel form. They are, however, a very rare form representing only 1% of the corpus (only ground rims are rarer in this period). Plots of the relationships on the first and third and second and third axes both show bottles and ground rims together as outliers from the remainder of forms and rim types. After these two have been excluded, the charts demonstrate a very similar set of relationships to the F1/F2 chart above, with the addition of a link between claw beakers and heat-softened rims, although heat-softened rims are most likely to be from funnel beakers than claws or cones. Again, outward cavity rims are the only outlier, although this time, the closest (albeit tenuous) associations are with globular beakers and then bowls. This underlines the view that this is the only rim type with no close connection to specific vessel forms.

Comparison of rim diameter with form also shows some clear quantitative trends,
the bowl form (Fig. 4.25). These two categories were then excluded and the analysis done again (Fig. 4.26). We can see that the rim diameters of funnel and palm-funnel beakers were also fairly standardized to between 90 and 119mm, with funnel beakers particularly likely to measure in the range 100-109mm in diameter. Palm cups had larger rims mainly in the range 120-129mm, which is a larger and more standardized outcome than expected. Finally, globular beaker rims are most likely to measure 60-69mm in diameter. Viewing this data from the point of view of the first and third axes highlights the exclusive relationship between bottles and rims of 20-29mm, which is expected and balances the equally close connection between bowls and diameters of 130-139mm. When these outliers are excluded, it is possible to see that claw beakers as well as palm cups are mainly 120-129mm, and globular beakers are almost as likely to be 70-79 as they are 60-69 (Fig. 4.27).

Correspondence analysis of sherd thickness and vessel form shows initially that thicknesses of 7mm or more are very unusual, and that of the vessel forms, palm cup sherds are the thickest and the farthest from the norm (Fig. 4.28). The first and third and second and third axes charts also show more clearly the link between claw sherds and the thickest sherds of 10mm or more – the explanation of this is that the thickness of a claw sherd depends greatly on the portion and type of claw in question, and many have very thick sections. When the outliers are excluded, we can see that bowl and palm-funnel sherds can be relatively thick on average, both probably elevated by the numbers of cavity rim sherds (Fig. 4.29). In contrast, funnel and globular beakers sherds can be seen to be much thinner, which may also be related to the predominant - heat-softened - rim type as well as the delicacy possible with the bodies of these forms. The chart plotting points on the first and third factorial axes shows very similar patterns, but the chart of the second and third axes presents a different perspective (Fig. 4.30). The palm-funnel and funnel beaker points are indicated as mid-range, closest to 2-3mm thick, while globular beaker and bowl sherds are both closest to the 1mm and less than 1mm markers. It is likely that the confusing picture surrounding the thickness of bowl sherds is a result of the huge variety of thicknesses on different parts of
Fig. 4.25. Form v. rim diameter

Form v. Rim diameter
(axes F1 and F2: 90.59 %)

Fig. 4.26. Form v. rim diameter 2

Form v. Rim diameter 2
(axes F1 and F2: 91.97 %)
Form v. Rim diameter 3
(axes F1 and F3: 91.63 %)

Form v. sherd thickness
(axes F1 and F2: 80.57 %)

Fig. 4.27. Form v. rim diameter 3

Fig. 4.28. Form v. sherd thickness
Fig. 4.29. Form v. sherd thickness 2

Form v. sherd thickness 2
(axes F1 and F2: 93.57 %)

Fig. 4.30. Form v. sherd thickness 3

Form v. sherd thickness 3
(axes F2 and F3: 16.99 %)
the bowl form – a vessel can have a thick cavity rim, thick reticella trails, and yet very thin body walls.

Initially, analysis of the relationship between body colour and decoration (effectively trail) colour produces such a dense scatter of points on the first and second factorial axes chart that only a few outliers can be seen (Fig. 4.31). White and red and opaque yellow on blue trails are both very unusual, resulting in their positions far from the convergence of the axes. The only relationship that can be seen at this stage is between colourless body glass and green-blue trails. Even after an initial exclusion of outlying points, the cluster is still confused and only unusual trail colour combinations – opaque yellow on colourless, white and opaque yellow on blue etc. - are displayed clearly (Fig. 4.32). Finally, after a second filtration of outliers, it is possible to focus on the key characteristics and the relationships between them (Fig. 4.33). In terms of trail colour, opaque yellow and white are by far the most important as between them they dominate the corpus almost completely. Opaque yellow is surrounded by the body colours deep green, pale blue, pale green, blue-green, red and black in ascending order of distance away, while opaque white is closest to body colours olive green, red, and blue-green. Meanwhile, analysis via the second and third factorial axes (Fig. 4.34) promotes the connection between opaque yellow trails and amber and brown body colours as well as pale blue and deep green again; and highlights the link between opaque white trails and deep blue body colour, as well as blue-green, olive green and red.

Given that the differences between pale blue, pale green and blue-green are minimal, this analysis is highlighting the connections between yellow trails and deep green, amber/brown, red and black glass, and between white trails and olive green, deep blue and red glass. However, a chart plotting the points on the first and third factorial axes (Fig. 4.35) provides an excellent summary of the relationships between trail colour and body colour: almost all the principal body colours are clustered in a tight knot around the opaque yellow and white trail points, which are themselves very close together and close to the intersection of
the axes. This means that all combinations of the above are very likely amongst polychrome glass vessels of this period, with only a few exceptions – for example, deep blue body colour appears as an outlier because any trails are very likely to be self-coloured, and red trails also because they are very rare. Overall, the Anglo-Saxon preference for bright colour combinations that contrast with each other and are aesthetically pleasing is clear.

From every perspective (F1/F3 and F2/F3 as well), bichrome trails are most likely to appear on deep blue-green and deep blue body glass (Fig. 4.36). Once the furthest outliers have been excluded, we can explore the core group of points on the chart in more detail (Fig. 4.37). We can see that moulded sherds are likely to be amber, deep blue-green, blue-green, olive green or brown, in that order, although olive green and pale green are more likely than amber according to a plot of the first and third factorial axes (Fig. 4.38). Viewed from the other direction, amber sherds are most likely to be moulded if decorated, but deep blue-green sherds are slightly more likely to be decorated with reticella trails than with moulding (Fig. 4.37). Meanwhile, reticella trailed sherds are most likely to be on blue-green glass, which is unsurprising because they provide colour and interest on their own. The next most likely body colours are olive green, brown, pale green, and then pale blue, while the first and third factorial axes plot (Fig. 4.38) highlights black. It is surprising that olive green and brown are higher on this list than pale green and pale blue. It is very surprising indeed that blue-green and olive green sherds are more likely to feature reticella trails than simple applied trails (Fig. 4.37), although this perspective is counteracted by the first and third factorial axes plot (Fig. 4.38), which shows olive green sherds are much more likely to have applied trails than reticella, and blue-green sherds slightly more so. Applied trailed sherds are most likely to be pale green, then olive green, brown, blue-green, deep blue, deep green, colourless and black. As the points for most of these colours spread upwards and to the left across the chart, so pale green, deep blue, deep green, colourless and black sherds are all more likely to be decorated with applied trails than any other technique.
Fig. 4.31. Vessel colour v. decoration colour

Fig. 4.32. Vessel colour v. decoration colour 2

Vessel colour (blue points) v. decoration colour (red points) (axes F1 and F2: 41.64 %)

Vessel colour (blue) v. decoration colour (red) 2 (axes F1 and F2: 59.56 %)
Fig. 4.33. Vessel colour v. decoration colour 3

Fig. 4.34. Vessel colour v. decoration colour 4
Fig. 4.35. Vessel colour v. decoration colour

Vessel colour v. decoration type
(axes F1 and F2: 74.12 %)

Fig. 4.36. Vessel colour v. decoration type
Fig. 4.37. Vessel colour v. decoration type 2

Fig. 4.38. Vessel colour v. decoration type 3
In summary, the results from correspondence analysis have demonstrated key quantitative connections between sherd characteristics. Most were expected from empirical observation, and have now been supported via statistical evidence. Palm cups, palm-funnel beakers, funnel beakers and bowls are strongly linked to blue-green glass, while globular beakers are more likely to be deeply coloured, and cone beakers to be colourless. Outward cavity rims are linked with bowls and palm cups; inward cavity rims with palm-funnel beakers; rolled inward rims with globular beakers; heat softened rims with funnel and cone beakers; and ground and heat-softened rims with bottles. Bowls have the largest rims, mainly within the 130-139mm range; palm cups and claw beakers had rims mainly between 120-129mm; funnel and palm-funnel beakers were relatively standardized to between 90 and 119mm, with funnel beakers tending towards the top end of that range; and globular beakers are almost all between 60-79mm. Palm cup and cone sherds are the thickest, and funnel and globular beaker sherds the thinnest. There is an obvious connection between claw beakers and claws as decoration, but beyond that, between the palm-funnel series and mould-blown decoration, bowls and reticella trails, and globular beakers and applied trails. There are observable connections between yellow trails and deep green, amber/brown, red and black glass, and between white trails and olive green, deep blue and red glass, but all combinations of the above are very likely amongst polychrome glass vessels of this period, with only a few exceptions. Meanwhile, reticella trailed sherds are most likely to be on blue-green glass, perhaps because they provide colour and interest themselves and are easily seen on a pale background. All of the conclusions above aid interpretation of fragments, particularly regarding frequency or rarity of features and combinations.

**Geographical distribution**

To study the distribution of the various forms and other vessel characteristics I have mapped the distribution of all variables relating to colour, form and decoration, using sherd count data (e.g., 22 red sherds were found at Hamwic). This gives us a picture of the sheer numbers of different sherd types in different
regions. The problem of counting fragments as a measure of quantity for a task like this must be acknowledged: using sherd counts risks measuring the degree of fragmentation rather than the quantity of vessels present originally in a particular location. The total weight of each category would be a more effective measure of quantity. However, sherd count data is all we have to work with at present, because historically sherd weight has not been recorded or published for vessel glass.

Beginning with colour, we can see that amber sherds are concentrated in the north-east (especially at West Heslerton, Broadley 2014), at the four emporia, and in Kent at Lyminge and Canterbury (Fig. 4.39). The fact that none at all were found at Brandon is surprising, as this is the third largest assemblage in the corpus after Hamwic and Ipswich. It is also noteworthy that none were found at Jarrow or Flixborough despite a significant concentration of amber sherds in Yorkshire at York and West Heslerton. Some of these unexpected absences may be partially accounted for by a difference in colour categorization, as amber sherds may be described as ‘brown’, rather than having two categories to distinguish between sherds that are lighter, brighter and more orange in tone from those that are dark brown. The distribution of brown sherds appears to reflect this, as Brandon and Flixborough stand out as the largest groups of brown sherds, with the other sites with brown glass being the emporia and Jarrow, Beverley, and Barking in Essex (Fig. 4.40). It is likely that some of the large numbers of ‘brown’ sherds at Brandon, Flixborough and Jarrow could be allocated to the ‘amber’ category, thus explaining the absences of amber sherds at those sites. If these two categories are taken together, they are mainly found at the emporia and Brandon (the five largest assemblages overall), and in the north-east (Yorkshire and Northumbria). Amber and brown sherds are fairly unusual, so it may be expected that they are more likely to be found in large assemblages from trading hubs, but the concentration in the north is more surprising because it spreads beyond the emporia in multiple directions: this may reflect production in the area or a distinct trade link with a source elsewhere, and then exchange among the sites in the region.
Black sherds (Fig. 4.41) are only found in significant quantities at Hamwic, Brandon and Ipswich, with the numbers at Brandon being particularly noticeable given that the total assemblage size there is one fifth of the size of that from Hamwic, and that Brandon was not an emporium. It is also worth noting that Brandon and Ipswich are both in East Anglia, and that there is a scatter of black sherds in the north-east (Flixborough, York, West Heslerton and Whitby). Together these create a focus for black sherds in the east and north, with the exception of Hamwic, suggesting that these two separate site groups were either acquiring glass from a common source or exchanging it in their regions. This distribution of black sherds provides clues to the regional connections of both Ipswich and York. Meanwhile, no black sherds have been found in the south-east, in London or in Kent, although one sherd was found at Barking Abbey in Essex. The distribution of deep blue-green sherds (Fig. 4.42) is also very interesting: the glass of this colour shows a surprising concentration in the north-east, particularly at York, Flixborough, and Monkwearmouth and Jarrow. Even at Whitby, where only four sherds in total were found, one was deep blue-green. Equally, there is a relative lack of this colour in the south, and at emporia: the sherd numbers at Brandon, London, Ipswich and at Hamwic in particular are lower than one would expect. This is perhaps related more to geography and the sources available rather than to site type (emporium or non-emporium). It is possible that deep blue-green glass was produced at one of the sites in the northeast.

Meanwhile, there are two colours, deep green and red (Fig. 4.43 and Fig. 4.44) that show clear concentrations in the south and a lack in the north. Deep green appears at all four emporia, three of which are in the south. However, the deep green sherd from York is the only one known so far from north of Ipswich. The only non-emporium site to produce a sherd of this colour so far is Lyminge, Kent, in the far southeast. Red sherds are also present at all four emporia, but are much more in evidence at Hamwic and Ipswich – London and York have only yielded one sherd each so far. In terms of non-emporia, one red sherd was found at Barking (near London) and one at Butley (near Ipswich), both in the southeast, and two were found at Jarrow in the far north. The two from Jarrow and one from York are
the only red sherds known from the north of England. It is also worth noting that there are a large number of red sherds from Brandon (19) – almost as many as from Hamwic (22), which is a much bigger assemblage. Together, these two groups of red sherds form 75% of all red sherds known. Red sherds also link the colour profiles of Ipswich and Brandon again – the case for a common source or trade between the two is strengthened.

The largest concentration of colourless glass (Fig. 4.45) is at Lyminge in Kent, which is likely to be related to continuous occupation of the site from the Early Anglo-Saxon period and the discovery of a large number of colourless cone beaker sherds from sunken-featured buildings of the sixth and early seventh centuries would also exclude some of this material if sixth century or borderline sixth to seventh century. Colourless glass is generally more widespread in the later part of the early period and may be regarded as reduced in importance on purely Middle Saxon sites. In either case the glass had to be deliberately decolourised to remove the effects of natural impurities in the sand (or silica) used to manufacture glass, so colourless glass represents high-quality tableware from the Roman period onwards. The other sites in this corpus that produced colourless glass in quantity are three of the four emporia (Hamwic, Ipswich and York, but not London), and Brandon and Flixborough. Small amounts were found at Sedgeford in Norfolk, Jarrow in Northumbria and Portchester, which may be significant for interpretation of those sites. A regional concentration is not apparent, merely the expected focus upon larger assemblages and the emporia, with the exception of London.

Deep blue sherds have a more scattered presence (Fig. 4.46), with most of the southern and eastern costal assemblages containing at least one sherd. There are, however, none at all from York and only one from London. The three substantial assemblages are Hamwic (18), Jarrow (12) and Brandon (11) – one in the south, one in the east, and one in the north. Lastly, there are the very rare colours: opaque white, purple and yellow (Fig. 4.47, Fig. 4.48, and Fig. 4.49). Single opaque white sherds have appeared on three sites (Hamwic, Ipswich and Brandon); single
purple sherds on two sites (Hamwic and West Heslerton, Yorkshire, G118, Figs. 5.116 and 5.117, Broadley 2014) and single yellow sherds on two sites (York, and Northampton, although the Northampton ‘yellow’ sherd is actually late Saxon potash glass, usually described as olive green and probably not deliberately coloured). There is a limit to the potential for analysis when the samples are so small, but it is still worth highlighting the unexpected discovery of rare purple sherds at West Heslerton (G118, Figs. 5.116 and 5.117), located at a distance from the emporia that produced the only other examples of the colours in question (Hamwic and York respectively). The sherd probably travelled via York, and may well have reached this section of the Vale of Pickering via a (monastic?) estate centre nearby.

When one moves on to the distribution of form types via sherd count, more patterns emerge. Bowls are more prevalent in the north of England and East Anglia than in the Midlands or the south (Fig. 4.50). Although bowl sherds are present at Hamwic and London, there are fewer than one might expect, while Ipswich and York have the largest assemblages of bowl sherds (15 and 8 sherds respectively). Other than Hamwic and London, only two sites in the south produced bowl sherds – one each from Barking, Essex, and Pevensey, in Sussex. At Pevensey the bowl sherd was one of only two sherds found, making it a surprising find. Meanwhile, in the east and north, in addition to the large groups at Ipswich and York, other assemblages of bowl sherds come from Brandon, Flixborough, West Heslerton, Whitby and Jarrow. In particular, there is a cluster surrounding the emporium site at York. Were bowls being made or imported in York or nearby? Claw sherds produce a similar pattern (Fig. 4.51). The largest assemblages are in the east, at Brandon (10), and in the north, at West Heslerton (4). Claw sherds are also present at Flixborough (2) and Sedgeford (1). Meanwhile, in the South, the only claw sherds known are two from Canterbury and one from Hamwic (at least as far as the corpus for this project goes, although in fact one more has been found at Hamwic since the dataset was closed). It seems likely that claw beakers were either manufactured in the east, perhaps in Suffolk, or imported into the area across the North Sea, perhaps from Scandinavia.
In contrast, mapping the distribution of cone beaker sherds demonstrates that the majority are found in the south and east (Fig. 4.52). The largest assemblages are at Lyminge, Kent (17), which is by far the biggest, and Brandon (6), Ipswich (4), Canterbury (4) and Hamwic (4), while individual sherds were found at Portchester and Pevensey. Meanwhile, the only sherds known from elsewhere are single examples from Northampton, West Heslerton and Monkwearmouth. Cone beakers are amongst the earliest of the forms included in this study, and it seems that glass consumption in the earlier part of the period was focused on Kent and the south-east, with East Anglia and the north-east becoming more dominant later on. Interestingly, this general trend is supported by the distributions of palm, palm-funnel and funnel beakers (Fig. 4.54, Fig. 4.55, and Fig. 4.56), which represent the gradual evolution of a form series over time. Palm beakers are the earliest variant, followed by palm-funnel (or tall palm cups), and finally funnel beakers. A subtle northerly and westerly progression can be observed, with palm beakers having a more significant presence in Lyminge than palm-funnel and then funnel beakers, in comparison to the numbers of sherds of each type found elsewhere. Meanwhile, Hamwic and York show the opposite progression, having a smaller proportion of palm cup fragments (none in the case of York), and greater numbers of palm-funnel and funnel beakers. The figures for Hamwic are astonishing: three palm cup sherds, 238 palm-funnel sherds and 486 funnel beakers sherds. In the cases of London and Ipswich, which could be perceived as the intermediary zone of this transition, both show actual numbers of sherds rising, but the percentage of the national corpus falling as the series develops over time (e.g. for Ipswich, 26, 40 and 83 sherds respectively, which translates as 55%, 13% and 13% of the national totals). This suggests not only a shift away from Kent and towards the emporia around the beginning of the eighth century as palm cups were being replaced by ‘tall palm cups’ or palm-funnel beakers, but also a shift in balance from London and Ipswich towards Hamwic and the north of England during the course of the eighth century, as ‘tall palm cups’ gradually became funnel beakers.
Globular beakers (Fig. 4.53) have perhaps the most even distribution of all the forms, with most sites featuring at least one sherd from this vessel type. Only four very small site assemblages had none – Beverley (seven sherds), Pevensey (two sherds in total), Cheddar (two sherds) and Trowbridge (one). However, there are some interesting variations in quantities present. The largest group of globular beaker fragments is from Brandon (67 sherds), followed by Ipswich (39, both in Suffolk), then Jarrow (37) and Hamwic (32). The sites that produced fewer than expected include London (7) and York (3). The quantity found at Jarrow is the most surprising: the 37 sherds form 47% of the site assemblage and 15% of all globular beaker sherds known nationally, which is astonishing. Why did Jarrow have so many and York so few of this vessel type? The numbers at Brandon are also unexpectedly high – was there a source or usage practice in common with the ecclesiastical site at Jarrow?

Finally, there are two extremely rare vessel forms present within the corpus: grape beakers (or ‘traubenbecher’; Fig. 5.107) and bottles (Fig. 4.57 and Fig. 4.58). There are only seven bottle sherds and three grape sherds known in England, and both forms have been found at just two sites. In the case of grape beakers, the two sites are Ipswich (two sherds) and Brandon (one). Bottle sherds have been found at Jarrow (four sherds) and Brandon (three; Fig. 4.57 and Fig. 4.58). Grape beakers sherds are very distinctive as the grape-like moulded pattern covers most of the surface, and even a tiny amount of it is enough for definite identification. Therefore, we can be more confident than usual that very few, if any, have been missed. It seems likely, even with only three sherds over two sites, that the location of all in Suffolk was the result of a source specific to the area. As these are a known type on the Continent, the presumption is that they were imported (Tester et al. 2014, 377), meaning that their presence is further evidence for overseas mercantile activity in Ipswich. It also forms another part of a case for the transfer of glass from Ipswich to Brandon. Bottles are different in a number of respects – they are also very rare, but are harder to identify. The two find spots are far apart – one in East Anglia, and the other in the far north. Finally, the
function was probably also very different to grape beakers, which were drinking vessels. In the Roman period, bottles were utilitarian items transported more for their contents than for the intrinsic value of the bottle. Although Anglo-Saxon period bottles are very rare, it is still possible that they reached their destination as a by-product of the import of their contents (alcohol – perhaps wine). The other possibility is that they were used as decanters, to serve drinks such as wine at table that may have been imported in larger containers. Therefore, the disparate locations at which they have been found so far must be a reflection of the activities taking place on those sites (one documented ecclesiastical and one with a widely accepted monastic phase).

The final aspect of these vessel glass sherds for distribution analysis is decoration. Beginning with single applied trails (as distinct from reticella or bichrome trails), one can see that applied trails are ubiquitous (Fig. 4.59)– almost every site has at least one sherd featuring this type of decoration, including three of the four with only two sherds apiece (Pevensey, and Eynsham Abbey and Shakenoak, both in Oxfordshire). The only sites with no applied trailed sherds are Cheddar, an assemblage of two sherds, and Trowbridge, where only one sherd was found. The variation in quantities seems to be linked approximately to the size of the site assemblage (see Table 4.2). The average difference between the percentage of applied trailed sherds and the percentage of the corpus at each site is -0.7%, meaning the average site has a slightly smaller percentage of applied trailed sherds than one would expect if using the site corpus percentage as a guide. However, 15 of 21 sites have a higher proportion of the applied trailed sherds than one would expect on this basis. Those with a higher than expected level of applied trailed sherds are Ipswich, Brandon, Lyminge and Canterbury – two pairs of sites with clear geographical connections. Meanwhile, Hamwic has 26% fewer applied trailed sherds than the assemblage size would suggest, which is a large discrepancy and by far the most significant information to emerge from the analysis of applied trailed sherd distribution. Overall, there is a much lower level than expected of applied trailed sherds at Hamwic; lower levels at London and Jarrow; and higher levels in East Anglia and Kent. This generally suggests a
southeastern bias for this decorative technique, although the negative figure for London disrupts this pattern.

Reticella trails are also relatively evenly distributed (Fig. 4.60), although not as comprehensively as plain applied trails. In this case, the absences are the most interesting aspect of the distribution: there are no reticella sherds known in Kent, very few in the midlands (only one at Trowbridge), and none at Monkwearmouth or Jarrow despite a presence at almost all the sites in Yorkshire. Meanwhile, Hamwic has produced more than half of all reticella sherds (55%), and seems to have been the only site where reticella trails have been found on the rims of funnel beakers. The other significant groupings of non-rim reticella decoration are from Brandon (11%), Ipswich (10%) York (7%) and Flixborough (7%), connecting these two pairs of sites yet again. Only three sherds are known from London, however, representing only 2% of all reticella sherds, which perhaps fits with the total lack of this type of decoration in Kent. It is likely that there was a specific source of these vessels reaching Hamwic, whether glass workers working locally or traders importing the vessels from a continental source perhaps located in northern France. Evison knew of ‘a few examples’ from St Denis in France, ‘one at La Londe near Rouen… and one at the Peabody site in London’ (2000, 85). It seems there was also a source of non-rim reticella decorated vessels reaching the middle of the east coast, from East Anglia to Yorkshire, which was probably distinct from the one at Hamwic – perhaps linked with Scandinavia rather than continental Europe.

In contrast to plain applied trails and reticella trails, bichrome trails are rare, and only found at four sites in England (Fig. 4.61). Bichrome trails are trails with two threads of different coloured glass that are untwisted – this is the feature that distinguishes them from reticella trails, where the two trails are would around each other. The four sites on which bichrome trails are found are Jarrow (five sherds), Flixborough (two), Ipswich (two) and Barking (two). These sites are not particularly close to each other, although they are all on the east coast, and it is interesting that only
<table>
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<th>Site</th>
<th>% of applied trail sherds</th>
<th>% of national corpus</th>
<th>Difference</th>
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<td>67.9</td>
<td>-25.6</td>
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Table 4.2. Relationship between the percentages of applied trailed sherds and the percentage of the corpus at each site

Ipswich is an emporium site. It is notable that the largest group is from Jarrow, given the absence of reticella sherds there. However, the reticella and bichrome groups are not exclusive, as Ipswich and Flixborough produced the third and fourth largest groups of reticella sherds (16 and 10 sherds) respectively, and Barking produced three sherds. All three site assemblages feature both reticella and bichrome trails, leaving Jarrow as the only site with bichrome trailed sherds but no reticella decoration. Meanwhile, despite producing over half of all reticella sherds and an overall assemblage of 1675 sherds, not a single bichrome trailed sherd has been found at Hamwic. Along with the reticella-rimmed funnel beaker sherds from Hamwic, this distribution again suggests that Hamwic (and probably nearby Portchester) were being served by a separate source from the sites on the
east coast, where the bichrome-trailed sherds are found at isolated points throughout the eastern reticella zone.

Regarding the distribution of sherds featuring mould-blown or optic-blown decoration, it is immediately noticeable that these are focused on the emporia (Fig. 4.62). 34% are from Hamwic, 29% from Ipswich, 9% from York and 8% from Ipswich, meaning 80% of sherds with this type of decoration are from one of the emporia. This increases the importance of moulded sherds from other sites, particularly West Heslerton, where the five mould-blown sherds found represented 17% of the site assemblage, as it suggests trade into the hinterland from the emporia, or with a common source. The non-emporium with mould-blown sherds are well distributed across the area of study. Many are close to one of the emporium (Portchester to Hamwic, Butley and Brandon to Ipswich, and Flixborough and West Heslerton to York). However, the exceptions to this are Lyminge and Jarrow, where four and two sherds were found respectively. The former may be related to the quantity of sixth- and seventh-century glass from Lyminge, making the presence of two such sherds at Jarrow perhaps the most unexpected.

Finally, the distribution of swirled decoration, meaning glass with a contrasting colour swirled through the body of the glass, has some similarities with the distribution pattern of reticella sherds (Fig. 4.63). This is another form of decoration for which more than half of known examples are from Hamwic (51%). The other sites with significant groupings are Brandon (22%) and Ipswich (10%), providing further evidence of a strong link between the two, while there is only one sherd known from London. However, in this case, there are also very few from York (two). The remainder were found in very small groups at sites from Lyminge to Jarrow.

**Conclusion**

For the first time, the national proportions of all the vessel glass variables (forms, colours, decoration types, etc.) included here are quantifiable. For example, we
now know specifics such as that only 31% of sherds are decorated, and that self-coloured trails account for 40% of all applied trails. We are now able to describe both rare and common attributes in a concrete way, and this opens a whole new world of possibilities by enabling characterization and comparison of assemblages (Chapter 5), both now and in the future. In other words, for example, we can now compare the percentage of cone beakers, or decorated sherds, or deep blue sherds in an assemblage, to the percentage represented in the national corpus and ask questions such as why there are more or less than expected.

Furthermore, correspondence analysis has confirmed links between various vessel glass characteristics in a statistically reliable way, and has highlighted numerous anecdotal and some previously unseen connections. Examples include the strong link between globular beakers and deep body colours; between the palm-funnel series and moulded decoration; between colourless glass and green-blue trails; between yellow trails and brown and pale blue glass; between moulded decoration and amber, deep blue-green and blue-green glass; and between reticella decoration and blue-green glass. This means we can show how typical or atypical combinations of vessel attributes are – for example, a red claw sherd would be unprecedented, while opaque yellow trails applied to blue-green glass can be described as a classic decorative scheme.

Finally, this is the first time that the national distribution of sherds of each form type, colour and decoration type has been mapped, and this has revealed previously unknown spatial patterning. We now know of a concentration of amber/brown sherds in the north-east, and of deep green and red sherds in the south; that bowls and claws are more prevalent in the north and East Anglia, and cone beakers in the south-east; and that mould-blown sherds are focused on emporia. Two exciting new theories were inspired by the distribution of palm-funnel beaker forms and reticella sherds: that palm, palm-funnel and funnel beakers gradually moved from the south-east to the north and west as the form series developed, and that reticella sherds on the south and east coasts may reflect two separate sources. This information enables assemblage characteristics
to be placed in their regional as well at national context – i.e. deep green sherds seem to be concentrated in the south, so the lone sherd from York takes on an extra significance, as would any future sherds found north of Ipswich. Finally, some clear regional connections have emerged between emporia and sites in the surrounding regions. The best example is Ipswich and Brandon, where matching concentrations of vessel characteristics are found repeatedly. This constitutes new evidence for the integration of at least some of the emporia with their regional economies.

In summary, it is finally possible to compare and contrast both individual sherds and site assemblages in the context of the national corpus of middle Anglo-Saxon vessel glass, and accordingly offer much more detailed interpretations than ever before.
Fig. 4.39. Distribution of amber sherds

Fig. 4.40. Distribution of brown sherds

Fig. 4.41. Distribution of black sherds

Fig. 4.42. Distribution of deep blue-green sherds
Fig. 4.43. Distribution of deep green sherds

Fig. 4.44. Distribution of deep red sherds

Fig. 4.45. Distribution of colourless sherds

Fig. 4.46. Distribution of deep blue sherds
Fig. 4.47. Distribution of opaque white sherds

Fig. 4.48. Distribution of purple sherds

Fig. 4.49. Distribution of yellow sherds

Fig. 4.50. Distribution of bowl sherds
Fig. 4.51. Distribution of claw sherds
Fig. 4.52. Distribution of cone sherds
Fig. 4.53. Distribution of globular beaker sherds
Fig. 4.54. Distribution of palm cup sherds
Fig. 4.55. Distribution of palm-funnel sherds

Fig. 4.56. Distribution of funnel sherds

Fig. 4.57. Distribution of grape sherds

Fig. 4.58. Distribution of bottle sherds
Fig. 4.59. Distribution of sherds with applied trailed decoration

Fig. 4.60. Distribution of sherds with reticella trailed decoration

Fig. 4.61. Distribution of sherds with bichrome trailed decoration

Fig. 4.62. Distribution of sherds with mould-blown decoration
Fig. 4.62. Distribution of sherds with swirled decoration
Chapter 5: Assemblage analysis

In this chapter, the assemblages are analysed one by one and compared with the national corpus in terms of form, colour and decoration. We can see which aspects of each site assemblage stand out and which are typical, and analyse patterns by region and site type. Firstly, the emporia are discussed individually and summarized as a group, and then the same process is applied to the documented ecclesiastical sites. Finally, all the remaining assemblages are analysed individually too, and then compared to the emporia and ecclesiastical site averages as well as the national average and described within this context. These analyses will help with exploring research themes two and three (Chapter 3) – the role of glass vessels in Anglo-Saxon society, and the part they played in networks of trade and exchange. In particular, this approach will reveal whether different site types (especially emporia and monastic sites) have noticeably different assemblage profiles that might indicate differences in the procurement or use of glass vessels.

Assemblages from emporia

Hamwic (Southampton)

Hamwic (Anglo-Saxon Southampton) has been a giant in both the field of Anglo-Saxon settlement studies and Anglo-Saxon glass studies for decades. A great deal has been written about Hamwic as an emporium, in particular by Hodges and those responding to him, and particularly between the publication of his immensely influential Dark Age Economics in 1982 and Dark Age Economics: A New Audit in 2012. The excavations at Hamwic has also been the subject of two important monographs (Morton 1992 and Andrews 1997), monographs reporting subsequent excavation works in key areas (e.g. Birbeck 2005), and even an entire monograph on the vessel glass (Hunter and Heyworth 1998). Hamwic is located on the west side of the River Itchen, which itself flows into Southampton Water and thence to the Solent and the Channel, so it was very well-placed for international trade. The approximate location of the Anglo-
Saxon settlement was known from the nineteenth century as a result of finds made during brickearth extraction, but no systematic excavation was possible until the time came for post-World War II regeneration. When Morton produced the first summary volume in 1992, covering all 73 excavations within and around Hamwic between 1946 and 1983, he estimated that this still represented only around 5% of the original settlement (Morton 1992, 16). The settlement was bounded by ditches, at least in places, and had a planned road layout on a grid system. Craft working has been represented by ‘remains from smithing, copper-alloy working, bone and antler working and textile manufacture’ (Stiff 1996, 161). It seems to have been occupied for two centuries from c. AD 700-900 (Andrews 1997, 13), and was ‘remarkable for its size, layout, density of buildings, and concentration of crafts and industries’ (ibid., 254). Imported objects were widespread and not confined to particular areas (ibid.). The size of the glass assemblage is also exceptional for Anglo-Saxon England, as it represents nearly 60% of all the glass found on settlements, although it is well matched by the larger glass assemblages from Continental and Scandinavian emporia, particularly Ribe and Dorestad (Chapter 7). The glass has been found at a large number of sites across Hamwic (many are featured in Andrews 1997, Fig. 2), although the 475 sherds from SOU 169 listed by Hunter and Heyworth (1998, Table 1) are worthy of mention. A significant contribution to the high number of sherds there was made by glass from the western boundary ditch, suggesting a possible bias towards peripheral disposal (Andrews 1997, 218). Andrews also notes the ‘very few fragments from occupation surfaces within buildings, though a small number survive’ (ibid.).

The Hamwic assemblage of 1678 sherds (see Figs. 5.83 and 5.84 for sherd photographs) contains a significantly above average proportion of both funnel beaker sherds and palm-funnel series sherds – 63% compared to 47% funnels and 31% compared to 23% from the palm-funnel series. These increases are matched by a lower proportion of globular beaker sherds – only 4% at Hamwic compared to 18% nationally (Fig. 5.1). All other vessel forms are only present in minimal proportions and at lower levels than nationally: out of an
assemblage total of 1676 sherds only seven are from bowls (Y166, Y206, Y215, Y329, Y347, Y563, Y1256), four from cone beakers (Y1248, Y1249, Y1250, Y1251 – all from Pit 53 of SOU 38) and three from palm cups (Y180, Y1061, Y1464). The bias towards the mid and later stages of the palm-funnel form series (tall palm cups and funnel beakers) is extraordinary and is the outstanding feature of the assemblage – 94% of identifiable Hamwic sherds (44% of the total) fall into this category. The lack of palm cups – the earliest form in the palm-funnel sequence - suggests that the glass assemblage did not start to accumulate until the eighth century was under way, in contrast to London and Ipswich. This fits with the current view of the wider picture at Hamwic. This profile also suggests a very homogenous source of glass vessels (whether imported or made locally), and the way glass was used in this settlement (the nature of the demand) was probably a factor. The full significance of the bias will emerge as other assemblages are analysed below, and profiles compared with other site types (in this case, for example, other emporia). It is particularly interesting to compare the bias towards funnel beakers with assemblages dominated by globular beakers (e.g. Monkwearmouth, Barking, Brandon and Flixborough among others).

Fig. 5.1. Hamwic form profile
Hamwic has a significantly lower percentage of deliberately coloured sherds – 8% compared to 19% nationally (Fig. 5.2). When one looks at the proportion of each colour within the ‘coloured’ group, olive green is both the largest sub-group and shows the greatest increase of 15% when compared to the national corpus – 36% compared to 21% (Fig. 5.3). Other colours elevated at Hamwic are red (16%/9%), black (13%/10%), deep green (4%/1%), purple-pink (1.5%/0.4%) and white (0.7%/0.6%). However, it is worth noting that the Hamwic assemblage contains one of two purple-pink sherds (Y848; the other is from West Heslerton, G118) and one of three opaque white sherds (Y299; the other two are from Ipswich and Brandon), so in some cases the numbers involved are very small. All other colours are less frequent at Hamwic than elsewhere, especially deep blue-green (4%/15%), colourless (4%/12%) and brown (3%/8%). Perhaps the residents of Hamwic were served by a source of primarily blue-green glass, but also had access to some of the rarest colours, probably via cross-channel trade routes.

Fig. 5.2. Hamwic comparison of blue-green and coloured sherds
As well as being less colourful than average, the Hamwic vessel glass is less decorated than average too – 24% compared with 31% nationally (Fig. 5.4). However, the comparison of different types of decorated sherds shows that Hamwic has a very standard decoration type profile (Fig. 5.5), which is not surprising given that the assemblage represents more than half of the national corpus. Hamwic is known for an unusual arrangement of reticella glass, where the reticella trail is mounted on the rim of funnel beaker sherds, but in fact, the proportion of decorated sherds that are reticella sherds is only 2% greater at Hamwic than nationally (20%/16%).
Ipswich

Ipswich was one of the principal emporia of Anglo-Saxon England, and is usually viewed as the main port and trading hub for the East Anglian kingdoms of the seventh to ninth centuries. The settlement was located 15 kilometres southeast of Sutton Hoo, on the north side of a bend in the River Orwell near the head of the Orwell estuary and near the confluence with the River Gipping. It is thought that Ipswich was one of the earliest emporia to become established: a large cemetery at the Buttermarket has been dated via grave goods to AD 610/20 to AD 640/50, while radiocarbon dates indicate AD 595-640 at a 95% probability (Scull 2013, 220). This is significant because the cemetery went out of use and the area became a central part of the emporium settlement by the end of the seventh century, and perhaps c. AD 680. Subsequently, Ipswich was remodeled and expanded on an ambitious scale, a move described by Scull as very probably ‘a royal initiative’ (2013, 228). Ipswich was also the production centre for Ipswich ware, a wheel-thrown and mass-produced pottery type found across eastern England, which represents a unique phenomenon in Anglo-Saxon England (Blinkhorn 2012). Meanwhile, imported pottery reveals that Ipswich’s main trading partners were the Rhineland and Flanders, and northern

Fig. 5.5. Hamwic decoration-type profile

 Applied trails
 Moulded decoration
 Reticella trail
 Claws
 Swirls of colour
 Bichrome untwisted trail
 Gold decorated glass
 Applied blobs

%Hamwic
%NC

146
France (Wade 1988, 93, 96). Ipswich is also one of only two sites to produce gold foil decorated vessel glass, and the only side to produce more than one sherd (two were found at the Buttermarket and one at Wingfield Street-Foundation Street) (Broadley 2016). These are almost certainly imports from the Rhineland.

Due in part to an absence of documentary references (Stiff 1996, 136), recognition of Ipswich as an emporium and a site of international archaeological importance did not occur until the 1970s, around the time of the creation of the Suffolk Archaeological Unit and Keith Wade established in a new urban archaeologist post, c. 1974. The excavation at the Buttermarket (IAS 3104) was one of the largest and most significant amongst a total of 36 major interventions between 1974 and 1990, and produced extensive evidence of middle Anglo-Saxon occupation. Naturally, there have been more since, most recently a joint project between Pre-Construct Archaeology and Oxford Archaeology on the southern side of the river at Stoke Quay/Great Whip Street where mid-to-late Anglo-Saxon occupation evidence has been found. However, unfortunately, inadequate funding for post excavation and restructuring of staffing has heavily impeded publication from the 1970s onwards. Summaries have been published where possible in local and regional journals, mention made of available information on Ipswich in papers and books on the subject of emporia, and in 2009, the earliest seventh century cemetery phase of the Buttermarket excavations published (Scull 2009), but a cohesive overview of Anglo-Saxon Ipswich remains elusive. Fortunately, ‘English Heritage is currently supporting work... preparatory to an expert synthesis of the town’s archaeology’, which will hopefully allow a ‘more nuanced understanding of Ipswich’s overseas trade, craft and industry, and material culture usage (Scull 2013, 229). The only information on the vessel glass available is the study Matthew Stiff made in the mid-1990s for his unpublished PhD thesis (Stiff 1996, 136-137). The glass is from Westgate Street (ISA 0703; 3 sherds), Tower Ramparts School (IAS 0802; 8 sherds), the Buttermarket (IAS 3104; 129 sherds), 32-38 Buttermarket (IAS 3201; 4 sherds), Tacket Street (IAS 3410; 3 sherds),
Wingfield Street-Foundation Street (IAS 4601; 26 sherds), School Street-Foundation Street (IAS 4801; 31 sherds), Franciscan Way (IAS 5003; 9 sherds), St Peter’s Street (IAS 5203; 68 sherds), Greyfriars Road-island site (IAS 5204; 12 sherds), 15-16 Lower Brook Street (IAS 5502; 14 sherds), Smart Street (IAS 5701; 13 sherds), Foundation Street (IAS 5801; 3 sherds), Fore Street (IAS 5902; 1 sherd), Bridge Street (IAS 6202; 4 sherds), and IAS 6704 (4 sherds). As the material has been largely inaccessible since the 1990s, Stiff’s records form the basis of the following analysis. The glass assemblage, the other artefact groups and the excavation archives are long overdue for review, synthesis and publication.

The Ipswich assemblage of 332 fragments (see Figs. 5.85 to 5.88 for sherd photographs) contains a comparatively high level of diagnostic sherds - 63% compared to a national average of 48% - so the form profile is very reliable. The form analysis from Ipswich (Fig. 5.6) shows significantly higher proportions of palm cups (12%/3%) and bowls (7%/3%). Meanwhile, there are slightly lower although still substantial proportions of both funnel (40%/47%) and palm-funnel series sherds (19%/23%). The relative proportions of globular beakers are almost exactly the same (19%/18%). It is likely that the major cause of the differences between the Ipswich form profile and the national one is temporal – that the higher proportions of earlier forms like palm cups and bowls, and lower proportions of later forms, is because vessel glass trade or production and use began in the first half of the seventh century at Ipswich (Scull 2013, 22), especially amongst the sites that have produced large assemblages.

Ipswich has a very similar proportion of coloured sherds as the national corpus (17%/19%, Fig. 5.7), but the profile of individual colours is more varied (Fig. 5.8). The proportions of deep green (18%/1%), red (14%/10%) and black (13%/10%) are higher than nationally. These are all colours that were also elevated at Hamwic, although the additional 17% of deep green sherds at Ipswich is very large. Meanwhile, deep blue (4%/16%), olive green (13%/21%) and colourless (7%/11%) are all reduced here. The main contrast with Hamwic
is that olive green was significantly higher there rather than lower as here, although it is also worth noting that deep blue sherds are a much smaller proportion of the total at Ipswich than at Hamwic (4% compared to 13%). The discrepancies between a site profile and the national profile are most interesting when they are very large, as in this example where there are so many more deep green sherds and so many fewer deep blue ones at Ipswich than one would expect based on the size of the assemblage. This could be related to production, supply, or usage – it seems likely that the sources of glass vessels were different for Hamwic and Ipswich, but also very possible that the settlements and people had differences too that may have included the colours they chose and the ways in which they used glass vessels.

In contrast to the relative lack of decoration at Hamwic (24%/31%), Ipswich sherds form a significantly larger proportion than nationally (46%/31%, Fig. 5.9). This 15% increase is a large margin. Looking at the different types of decoration (Fig. 5.10), one can see that applied trails (61%/56%) and moulded decoration (19%/12%) are up, and reticella trails (9%/16%), swirls in the metal (8%/13%) and claws (0%/1%) are down, although none of these discrepancies
are huge. It is interesting to note that Ipswich is one of four sites to produce very rare bichrome trailed glass (the others are Jarrow, Barking and Flixborough), and one of only two in England where glass decorated with gold leaf has been found (Figs. 5.85 to 5.88; Broadley 2016).
London

London (or Lundenwic) was undoubtedly an emporium, and even ‘the best documented of the Middle Saxon emporia’ (Cowie and Blackmore 2012, 7), but as recently as the mid-1980s its location remained unknown. It was during an excavation at Jubilee Hall, Covent Garden in 1985 that identification of its site was confirmed, and by the end of the decade ‘field work had established the
approximate size, outline and chronological development of Lundenwic (ibid., 5-7). Naturally, further information has continued to merge in piecemeal fashion, largely following commercial development projects: ‘by 2008 stratified deposits of known or probable Middle Saxon date had been recorded at some 70 sites in Lundenwic’ (ibid., 9). Museum of London Archaeology recently published a monograph collating evidence from 18 sites (ibid.), which is excellent, and Pre-Construct Archaeology published Tatberht’s Lundenwic in 2004, named after a bone fragment on which someone had scratched their name (Leary 2004), although there is undoubtedly a great deal languishing in other backlogs. The recent synthesis of eighteen sites suggests, based on a variety of dating evidence including coinage, pottery and radiocarbon dating, that Lundenwic was occupied from the third quarter to the seventh century, and that decline had begun by the last quarter of the eighth century. Cowie and Blackmore describe ‘at least three distinct zones’: a waterfront area and possible beach market south of a Roman road followed by the Strand today; a ‘central core of dense settlement to the north of the Strand; and a peripheral zone ‘where there may have been farms and open areas used for horticulture’ (Cowie and Blackmore 2012, 2-3). Almost all of the glass known to date (see Figs. 5.89 to 5.91 for sherd photographs) has been found in the ‘central core’, although there are exceptions to this, including glass from the National Portrait Gallery basement and Shorts Gardens (Fig. 6.19, A and F respectively). However, it is important to highlight that retrieval has been an issue: of the eighteen sites covered by the 2012 MOLA monograph, only sites where ‘substantial amounts of Middle Saxon strata were fully excavated and sampled’ produced glass (six in total, F = Shorts Gardens, H = Floral Street, J = Longacre, N = Charter House, P = Kemble Street, and R = Maiden Lane) (Fig. 6.19; ibid., 10).

Regarding the form profile for London, palm cups and funnel beakers form a higher proportion of the assemblage than nationally (13%/3% and 54%/47% respectively, Fig. 5.11). Given that the palm-funnel series figures are also similar (22%/23%), this shows an overall bias towards the palm funnel series similar to
that at *Hamwic*, except that at *Hamwic* palm cups (the beginning of the series) are almost completely absent. Another similarity between the London and *Hamwic* groups is the corresponding reduction in the proportion of the London assemblage identified as globular beaker sherds – 11% compared to 18% nationally. All other vessel forms are completely absent from London so far, although the assemblage has a below average proportion of diagnostic sherds (39%/48%).

![Fig. 5.11. London form profile](image)

The similarities with the *Hamwic* assemblage continue as far as the London group also having less than half the percentage of coloured glass present in the national corpus (9%/19%, Fig. 5.12). However, analysis of the individual colours shows a different profile (Fig. 5.13). Amber (20%/6%), olive green (27%/21%) and deep blue-green (20%/15%) are present in larger proportions at London than nationally. The amber is particularly elevated by a 14% margin. Meanwhile, colourless (0%/11%), deep blue (7%/16%), black (7%/10%) and red (7%/10%) glass are less frequent here than elsewhere. Olive green is also elevated at *Hamwic*, but in contrast with London, blue-green and amber are present at lower levels there and red and black at higher levels. The London colour profile is also quite different to that of Ipswich, with a completely
different set of colours showing increased presence. Further discussion is included below in a summary of the emporium site profiles.

**Fig. 5.12. London comparison of blue-green and coloured sherds**

![Bar chart showing the comparison of blue-green and other sherds in London and the national corpus.](image)

**Fig. 5.13. London coloured-sherds profile**

The proportion of decorated sherds is 11% lower at London than in the national corpus (20%/31%, Fig. 5.14). 20% is the lowest figure for proportion of decorated sherds for all the emporia. Both swirls of colour (3%/13%) and reticella trails (9%/16%) are below average, and claws are missing completely...
(0%/1%), although the latter are much harder to identify when the material is particularly fragmentary as with the London glass. Moulded decoration (27%/12%) and applied trails are both represented on a larger scale than nationally (Fig. 5.15). The 15% increase in the proportion of moulded sherds in comparison with the national corpus is a very large difference, probably caused in part by the number of moulded palm cup fragments found in London.

**Fig. 5.14. London comparison of decorated and undecorated sherds**

**Fig. 5.15. London decoration-type profile**
York

The majority of evidence for Anglian York came from Fishergate, an unusually large open area excavation conducted on the site of the former Redfearn glass factory in 1985-6 (Kemp 1996, 4). Fortunately, an extensive programme of sieving was also possible. We know that there was Anglian occupation ‘of some density both within the Roman fortress and within the Roman colonia’ (ibid., 3), while Fishergate represents a third centre of a polyfocal settlement. The structures and sunken-featured buildings found had been ‘laid out according to a plan of some kind’ (ibid., 67). The function of the Fishergate settlement was described in the main monograph published as trade and industry, to supply ‘the everyday needs of the royal and ecclesiastical settlements’ (ibid.). Evidence was found for bone working, metalworking, textile manufacture and use of quern stones (ibid., 71), while a variety of artefacts attest to regional and international connections. These include Ipswich ware pottery and sceattas from East Anglia, pottery from France and the low countries, Mayen lava quernstones from the Rhineland, two Frisian series D sceattas, a decorated comb case or mount and two bone combs with Frisian parallels, and (some of) the vessel glass (ibid., 72-73). Interestingly, in the eighth century contexts, 40% of the pottery was imported, but in the ninth century contexts the proportion is down to 20%, showing that ‘the network of international contacts was less important by this time’ (ibid., 73). Glass was found in the secondary fill of the main ditch, alongside domestic waste and craft working debris, including 30-40 bone and antler fragments, tools, slag, and a 243mm long length of gold wire (ibid., 22). Later excavations nearby at Blue Bridge Lane in 2000-2001 revealed a little more of the same settlement and very similar material culture, including more ‘Rhenish glass’ and even some slight evidence for glass working - ‘small, misshapen blobs of glass’ (Spall and Toop 2008, 13-14).

Regarding the York form profile, most noteworthy is the proportion of bowl sherds present at York – 24% in comparison to 3% nationally, which is a large 21% increase (Fig. 5.16). This must indicate a factor of either supply or demand
at work, and represent a local source of bowls, whether via international trade or local manufacture. Palm-funnel sherds are also more prevalent here by a significant margin of 10% (33%/23%), while funnel beakers (33%/47%) and globular beakers (9%/18%) are both down, and palm, claw and cone beakers are completely absent. The large rise in the proportion of palm-funnel beakers and even larger fall in the presence of funnel beakers may be related in part to the relatively fragmentary nature of the assemblage (29%/48%), thus making palm-funnel series sherds harder to attribute securely to either the palm or funnel categories. The lower proportion of globular beakers is also a point of interest, as lower levels were also present at London (11%) and Hamwic (4%). Meanwhile, the proportion present at Ipswich was in line with the national average (19%/18%).

Fig. 5.16. York form profile

The York assemblage is the most colourful of the emporia groups, with 29% of sherds belonging to the ‘coloured’ group, compared to 19% nationally and 17% at Ipswich, 9% at London and 8% at Hamwic (Fig. 5.17). The colour groups present in significantly greater quantities than usual are deep blue-green (39%/15%), amber (18%/6%) and red (15%/9%) (Fig. 5.18). The 24% increase between the proportion of deep blue-green sherds at York and that present in
the national corpus is huge. As with the above-average proportion of bowl sherds at York, this also must indicate a specific local source of blue-green glass, whether via trade or local manufacture. Amber sherds also show a large increase of 12%. Meanwhile, there is no deep blue or olive green glass present at all. Interestingly, deep blue glass has a lower than average presence at all the emporia, but is above average at all documented ecclesiastical sites except Lyminge and at some other high-profile sites (e.g. Flixborough).

![Fig. 5.17. York comparison of blue-green and coloured sherds](image)

**Fig. 5.17. York comparison of blue-green and coloured sherds**

![Fig. 5.18. York coloured-sherds profile](image)

**Fig. 5.18. York coloured-sherds profile**
The York glass also has a high percentage of decoration – 39% of sherds featured some form of decoration, compared to 31% nationally (Fig. 5.19) and 20% at London and 24% and Hamwic. Only Ipswich has a higher proportion of decorated sherds at 46%. Amongst the decorated sherds, there is a greater proportion of moulded (20%/12%) and reticella sherds (20%/16%) at York, and exactly average proportion of applied trailed sherds (56%), and fewer than expected sherds swirled with colour (4%/13%) (Fig. 5.20). None of the rare forms of decoration (claws, applied blobs, bichrome trails or applied gold) are present. Overall, there are no discrepancies in the decorative profile at York that really stand out, with an 8% increase on the proportion of moulded sherds being the most significant shift from the profile of the national corpus.

![Fig. 5.19. York comparison of decorated and undecorated sherds](image1)

![Fig. 5.20. York decoration-type profile](image2)
**The emporia**

Overall, the emporia are less colourful than average, with three out of four in each case being below the national level (Fig. 5.21). The exception to this is that York has a higher proportion of brightly coloured sherds than the national corpus overall (29%/19%). Meanwhile, in the case of decoration, Ipswich and York are above average and *Hamwic* and London below, so the collective picture is mixed (Fig. 5.22). The only potentially meaningful trend here is that York and Ipswich are both more colourful and more highly decorated than *Hamwic* and London. For example, deeply coloured sherds form 29% of the York assemblage, 17% at Ipswich, 9% at London, and 8% at *Hamwic*, and this progression is more likely to be related to geography than site type (more evidence to support the idea that southern and southeastern England had a different balance of supply routes from the eastern and northeastern coast). Variation in demand is also a possibility. It is interesting to make a comparison to Kaupang and note that the assemblage there was also more colourful that the national corpus for England (Chapter 7; Gaut 2011, Fig. 9.3), indicating a northern parallel with York in particular. One potential reason for this that these northern towns were further away both culturally and geographically from the Carolingian culture of wine consumption that favoured palm-funnel series beakers in pale colours. They may well have retained to a greater extent the communal use contexts associated with globular beakers, bowls and late claw beakers (ibid., 252), all forms more likely to be made from deeply-coloured glass.

The most interesting information to emerge from a collective analysis of the emporia assemblage profiles is that they all have a proportion of palm-funnel series vessels that is well above the national average, but fewer than expected globular beakers (Fig. 5.23). The proportions of funnel beakers present are 63% at *Hamwic*, 54% at London, 40% at Ipswich and 33% at York compared to 47% nationally. Meanwhile, the globular beakers present are 19% at Ipswich, 11%
at London, 9% at York and 4% at Hamwic compared to 18% overall. This is particularly significant because documented ecclesiastical sites (Barking, Lyminge, Jarrow, Monkwearmouth and Whitby) display the opposite pattern even more clearly, whereby globular beakers are over-represented, and the palm-funnel series under-represented (see below). Meanwhile, a comparison of the four colour profiles shows higher proportions of amber, red and deep green, but much lower proportions of deep blue than the national corpus (Fig. 5.24). The decoration profiles show that there are more moulded sherds at the emporia but fewer swirled sherds than one would expect (Fig. 5.25).

![Fig. 5.21. Comparison of blue-green and coloured sherds at emporia](image1)

![Fig. 5.22. Comparison of decorated and undecorated sherds at emporia](image2)
Fig. 5.23. Form profiles of emporia

Fig. 5.24. Colour profiles of emporia

Fig. 5.25. Decoration profiles of emporia
Ecclesiastical site assemblages

Lyminge, Kent

Lyminge is recorded by history as ‘the site of a Royal Anglo-Saxon monastery founded in the seventh century AD’ (Thomas 2013, 109). An academic research project was initiated in Lyminge after some interesting finds of middle Anglo-Saxon date (including fragments of vessel glass) were found during test pitting on the chalk promontory above the present church in 2007. Three seasons of excavation on the promontory between 2008 and 2010 revealed fascinating evidence of the periphery of middle Anglo-Saxon monastic settlement: as Thomas noted in the abstract of his paper in The Antiquaries Journal, Anglo-Saxon monastic archaeology has previously concentrated on core buildings (ibid.), making the discovery at Lyminge of an area of small domestic cells and pits and agricultural and light industrial activity very significant indeed. The location in east Kent, in a valley south of Canterbury and close to the Channel coast near Folkestone also enhances its importance... Subsequently, following a year’s hiatus, four seasons of excavation followed from 2012 to 2015 on Tayne Field, an area of open ground in the centre of the village, below the church and on the opposite side of a fresh water spring and chalk stream from the monastic settlement. To date, Thomas’s paper in The Antiquaries Journal is the principal publication on the project, but a full volume of Anglo Saxon Studies in Archaeology and History on the project and its results so far is forthcoming.

At Lyminge (Broadley 2011 and forthcoming), only 25 of 86 (29%) glass sherds (see Figs. 5.92 to 5.99 for sherd photographs) are diagnostic, in comparison to 48% nationally. However, these figures are not the most significant influence on the Lyminge form profile. The most obvious feature (Fig. 5.26) is a 65% difference in the proportion of cone beaker sherds present (68%, Figs. 5.93 and 5.95), in comparison to the national corpus (3%). This is a direct result of the occupation at Lyminge spanning the entire Anglo-Saxon period, and a much greater quantity of late sixth- and seventh-century glass present than in the
majority of assemblages. The effect is so strong that the remainder of the form profile is distorted (for a view without cone beakers, see Fig. 5.27). There is also an above average proportion of palm cups present (12%/3%, Figs. 5.96 to 5.98), which are also an earlier form within the middle Saxon range. The proportion of globular beakers equals that of palm cups (12% of the assemblage; Fig. 5.92), although this figure is slightly below the national average of 18%. Finally, the smallest form group within the diagnostic sherds is palm-funnel series vessel sherds (8%) from the middle phase of the palm-funnel form series. This suggests the possibility that the whole assemblage is of earlier date than most in the corpus, perhaps phasing out as early as the middle of the eighth century rather than the middle of the ninth century as in most other cases. We can see that the ecclesiastical bias towards globular beakers and away from the palm-funnel series has not yet fully emerged – although there are no funnel beaker sherds present, there are also fewer globular beakers than expected, and those are outnumbered by

![Lyminge form profile](image)

*Fig. 5.26. Lyminge form profile*
Fig. 5.27. Lyminge form profile without cones

the combined total of palm and palm-funnel sherds. Similarly, Lyminge has a much higher than average proportion of ‘coloured’ glass (58%/19%, Fig. 5.28), although this is enhanced significantly by the large number of cone beaker sherds, which are all colourless. The assemblage colour profile shows that 66% of ‘coloured’ sherds at Lyminge are in fact colourless (deliberately decolourised) compared to 12% nationally (Fig. 5.29). The next largest colour group at Lyminge is olive green (24%/21%), and this with the size of the colourless group support the idea of the Lyminge assemblage as earlier overall than most in the corpus. The deeper, brighter colours typical of middle Saxon vessel glass are present only in small quantities if at all: amber 4%/6%, deep blue 2%/17%, deep blue-green 2%/15%, and deep green 2%/1%. Black and red are absent completely.

The Lyminge assemblage is also more decorated than the national corpus (42%/31%, Fig. 5.30), with 84% of the decoration being applied trails in comparison to 56% nationally (Fig. 5.31). The cone beaker sherds, many of which feature applied trails, are again an important influence on this figure. The only other decoration types present are moulded sherds (11%/12%) and sherds decorated with swirls of colour in the metal (5%/13%).

165
As the Lyminge assemblage came from a current academic archaeological project, it was possible to analyse the composition of a sample (18 sherds) of the middle Saxon vessel glass. The glasses were analysed by electron microprobe, as described in Freestone et al. (2015). The results are included in the appendix to this volume (on CD). As expected, all are soda-lime-silica glasses with low magnesium and low potassium compositions. A pattern of recycling very typical of eighth- and ninth-century assemblages emerged: all were manufactured using recycled glass, most commonly glass that was itself
the result of numerous previous cycles of recycling. This reflects exactly a widespread increase in recycling beginning ‘early in the eighth century or possibly sometime in the seventh century’ (Freestone 2015, 35). A correlation between potassium oxide (K₂O) and phosphorous pentoxide (P₂O₅) in the Lyminge glass reflects the presence of contaminants from the fuel ash in many of the samples, with higher levels indicating repeated re-melting. Equally, a low level of chlorine indicates repeated recycling as a proportion escapes as a gas
with each reheating (Al-Bashaireh et al. 2016). As is often the case, traces of copper oxide (CuO), lead oxide (PbO), and antimony pentoxide (Sb₂O₅) reflect incorporation of old coloured glasses (including mosaic tesserae) into the mix.

Freestone and colleagues (e.g. Freestone et al 2009, 2015, Price et al 2006, Schibille et al 2016) have pointed out that if vessels of closely similar formal characteristics and from the same archaeological context are of identical chemical composition (i.e. identical within the errors on the analysis) then they are likely to have been produced as part of the same batch of glass. If this is the case then they are likely to represent a group of glasses acquired at the same time, i.e. a set. In the Lyminge assemblage sampled for analysis, we have detected five pairs of glasses that meet this criterion. In addition to the two pairs coloured olive green and deep green respectively by elevated levels of copper, three more pairs comprise a thin pale green sherd (08-152) and a yellow-trailed cavity rim (09-1468); a blue-green sherd with a self-coloured trail (09-1707) and a deep green base with a red swirl (09-1277); and an amber ridged sherd (09-1001) and a pale green sherd (09-1037). Each pair is likely to represent two samples from the same batch of glass, that were probably blown into vessels within hours of each other or few days at most, and by the same person in the same place. The presence of five separate pairs suggests that the monastic community at Lyminge were either acquiring glass vessels as sets, or manufacturing them as such on site.

An amber sherd (A158) shows a lack of manganese oxide (MnO), a characteristic of amber glass. Amber glass was difficult to make from previously made green-blue glass and the colour probably derived directly from the initial primary melting of raw materials. Re-melting would probably have modified the colour. High levels of chlorine (Cl) in this sherd and its pair shows that these samples have not been re-melted frequently, as each re-melting makes loss of the chlorine as a volatile more likely. Therefore, it is probable that amber coloured glass such as this was deliberately collected and curated for reuse. In addition, two pairs (08-507 and 07-TP8, and 09-1049 and 12-3640) and a fifth
sherd (12-3306) produced results that suggest they were coloured olive green, deep green and turquoise via the addition of copper, which appears to have been added to the batch as scrap gunmetal or bronze, based upon the associated elements.

A small group of five sherds (the amber sherd 09/1001 and its pair 09-1037, with a very thick blue-green sherd with a self-coloured trail 09-1049, a large curved pale blue-green sherd 09-1166, and a turquoise sherd 12-3306), have low levels of antimony pentoxide (Sb$_2$O$_5$) and potassium oxide (K$_2$O) and are likely to have undergone the least recycling. They represent just over a quarter of the assemblage analysed, and were made from recently recycled old glasses (Roman glass of the first to third centuries AD). They appear to correspond closely with their original primary compositions. Research on the composition of vessel and window glass from the monastery at San Vincenzo al Volturno in Italy (Schibille and Freestone 2013) provides a model for procurement of the material required to produce these vessels: there the analysis clearly showed that most of the glass used in the monastic glass workshop is likely to have come from a large Roman building and then been re-melted only once (‘one-step recycling’).

Heavily recycled Roman glass would have been the most widely available type, although would also have been more difficult for glass workers to use. ‘Fresh’ glass, recycled only once, may have been regarded as superior by the glass workers, as they would have had more control over how it melted and worked and therefore the outcome, presumably producing a clearer and more consistent and therefore ‘quality’ product for the consumer. However, as suggested for San Vincenzo, the ‘fresh’ glass vessels may have simply preceded the working of more heavily recycled glass – i.e. the ‘fresh’ glass vessels were made first, and the more heavily recycled vessels later, perhaps even including waste or fragments from the first phase of production (ibid, 10). It is also likely that the ‘fresh’ glass vessels were produced when the materials required had been sourced for a glazing campaign, as has been suggested for Glastonbury
and Jarrow in England and San Vincenzo in Italy (Wilmott and Welham 2015, 236; Schibille and Freestone 2013, 1-2).

It is important to note that there are a variety of ways to achieve compositions by recycling, and the conclusions drawn here may be subject to some modification as our understanding improves. With that in mind, the key findings from the compositional analysis of the Lyminge glass are firstly that a quarter of the glass was freshly recycled Roman glass, and secondly that more than half belong to a series of matching pairs. Although some of the batch pairs could be two sherds from the same vessel, the occurrence of five pairs in a sample of eighteen sherds points clearly to the manufacture or purchase of glass vessels in batch groups or sets. Meanwhile, the group made from freshly recycled glass suggests that Lyminge was the beneficiary of an organized procurement system at some point during the life of the monastery, as removal of the window glass and tesserae from a series of Roman buildings would have entailed a significant effort (ibid. 11-12), and there were no likely contenders for the source or sources in the immediate vicinity. Although the sample sizes are smaller than at San Vincenzo, the parallel with the results from there is fascinating – the question now is, will this pattern be replicated at other early medieval monasteries in Britain and Europe?

**Jarrow and Monkwearmouth**

The monastic sites at Jarrow and Monkwearmouth were described as ‘one monastery in two places’ (Cramp 2005, 15), located at the mouths of two major rivers, the Tyne and the Wear and beside ‘sheltered harbours with good lines of communication by sea’ (ibid., 5, fig. 1.1). Benedict Biscop founded Wearmouth in AD 674 and Jarrow in AD 681, and the joint entity dominated the region in terms of land-holdings, education and cultural influence until gradual decline set in during the ninth century. Two large monographs published in 2005 consolidate results from all the areas excavated at both sites between 1959 and 1988. Cramp underlines that conditions throughout were
far from ideal, and that during the long timeframe involved, ‘excavation
techniques and recording changed rapidly and radically’ (ibid., 15). There was
no sieving, for example, which ‘no doubt resulted in the loss of very small
artefacts and fish bones’ (ibid. 20). Monkwearmouth in particular was beset by
the usual problems of an intensively-occupied urban site, and patches of Anglo-
Saxon ground surface only survived in the centre of the Medieval cloister, while
no Anglo-Saxon occupation levels or rubbish pits survived at all (ibid., 15, 18).
The work at Jarrow was comparatively more comprehensive and the site less
disturbed, and so excavations revealed the Anglo-Saxon church, cemetery, and
‘large stone buildings both domestic and industrial’ (ibid., 18). Despite all of the
difficulties of circumstance, a complete sequence of finds from the seventh to
the twentieth centuries was retrieved and archived (ibid., 20). However, it is
important to note ‘how limited were the excavated areas in relation to the
potential scale of the Anglo-Saxon monasteries’ (ibid., 363). It is very likely that
the churches stood in the centres of each site, yet no large-scale investigation
has occurred to the north of the churches in either case; and missing features
such as small cells, novice houses, infirmaries guest houses and workshops may
have been ‘sited at some distance from the main communal buildings’ (ibid.,
363-4).

The Jarrow form profile (Fig. 5.32) is unusual due to the percentage of bottle
sherds present: four sherds, representing 50% of all known bottle sherds from
the middle Saxon period. Glass bottles were very rare indeed at this time,
representing only 0.6% of the national corpus, and only having been found
elsewhere at Brandon, Suffolk (Figs. 5.105 and 5.106), a site with a likely
monastic phase. The remainder of the diagnostic glass is more typical of an
ecclesiastical site, with globular beakers dominating the assemblage as they
represent 82% of the 45 diagnostic sherds – a very high figure compared to the
national average of 18%. Meanwhile, funnel beakers are only represented by
three sherds, or 7% of the diagnostic sherds at Jarrow (compared to 47%
nationally). The final component of the diagnostic assemblage is a single bowl
sherd (2%/3%).
Fig. 5.32. Jarrow form profile

Although the Jarrow assemblage is not as colourful as the Lyminge group, it is still significantly more colourful than the national corpus overall – 36% of sherds are coloured compared to 19% nationally (Fig. 5.33). The most noticeable feature of the Jarrow colour profile is clear: 44% of the coloured sherds are deep blue, compared to a national average of only 17% (Fig. 5.34). There are also more deep blue-green sherds than usual (22%/15%), and slightly more brown (11%/8%). Meanwhile, there is no black vessel glass, and less olive green (11%/21%), colourless (4%/12%), and red (7%/9%) than elsewhere. Deep blue and deep blue-green are both noticeably more prevalent on the ecclesiastical group sites, and deep blue-green is also more common in the northeast of England (Chapter 4, Fig. 4.46 and Fig. 4.42), so the elevated level present at Jarrow comes as no surprise. However, identifying whether this higher proportion of deep blue-green glass is related to the location or site type or both is difficult. Essentially, we are asking whether deep blue-green glass was bought and used here because it was available locally via regional trade routes, or whether the religious community were making a deliberate aesthetic choice appropriate to their needs. It is likely that demand from the monasteries played a role: all deep blue and deep blue-green sherds here were from
globular beakers and it seems the community was expressing a preference for both the globular form and the deep blue and deep blue-green colours.

This begs some questions: what was the Anglo-Saxon, and particularly the early Christian, view of the colour blue? Did it have a liturgical role? According to Pastoureau, Chair of History of Western Symbolism at the Sorbonne, who is well-known for a series of works on the histories of colours, there was in fact a ‘lack of interest in blue in ancient and medieval societies’ (Pastoureau 2001, 11), and a ‘lack of lexical precision for blue’ in Greek and Latin (all romance languages eventually borrowed either the Germanic ‘blavus’ or Arabic ‘azureus’, ibid., 26). Most significantly in this context, ‘blue was essentially absent from Christian worship during the thousand years preceding the creation of blue stained glass in the twelfth century’ (ibid., 35). According to Pastoureau, the association with the heavens and the Virgin came much later, developing from the twelfth century onwards (ibid. 44). The surprising answer to the question of whether the colour blue had an ecclesiastical connection in this period is that the opposite is true: blue had been associated with ‘barbarians’ by Roman culture, ‘a vestige of the Celtic and Germanic practice of using woad’ (ibid., 32) and in the early Anglo-Saxon period is found in glass form in secular royal contexts, in the form of the famous pairs of deep blue globular beakers found in ‘princely’ graves at Sutton Hoo, Prittlewell in Essex, Broomfield in Essex, and Aylesford in Kent, and the more recent find of a fragment close to the royal halls excavated in Lyminge. Therefore, the choices of both globular beakers and deep blues is in fact culturally conservative in middle Anglo-Saxon England, and not at all an ecclesiastical innovation.

Although the Jarrow assemblage is more colourful than average, it is less decorated that the national corpus as a whole (15%/31%, Fig. 5.35). Of most interest is the relatively high proportion of the very rare bichrome untwisted trail method – five sherds or 36% of the fourteen decorated sherds. Only eleven bichrome untwisted sherds are known nationally, so the five from Jarrow are
almost half of the total (Fig. 5.36). This technique must have been a small-scale variant of reticella (twisted) trail decoration. Finds are distributed along the east coast from Barking to Jarrow and most have been found on these two ecclesiastical sites, although sherds also appeared on two emporia and one of unknown status (Flixborough).
At Monkwearmouth, six out of sixteen (38%/48%) sherds were diagnostic. Two early forms were represented by one sherd each: a bag beaker and a cone beaker. The remaining four sherds were all from globular beakers, making a proportion of 67% compared to 18% nationally (Fig. 5.37). This compares to an ecclesiastical site average of 56% and an emporia average of 11%. Interestingly, both Monkwearmouth and Jarrow were dominated by globular beakers. However, none of the forms found at Jarrow (bottles, funnel beakers, bowls)
are repeated at Monkwearmouth, or vice versa (cone and bag beakers), even though the monasteries were only seven miles apart and were sister foundations to each other regarded almost as one in the late seventh century. The explanation for these differences amongst the minor forms in each assemblage must be partly chronological, as funnel beakers are a later form within the middle Anglo-Saxon period (usually ninth century), and cone beakers and bag beakers are very early (both fading out of use by the end of the seventh century). Monkwearmouth received and used glass vessels at an earlier date than Jarrow, which is unsurprising as it was established first, but seems to have ceased these activities earlier too, before funnel beakers were widely available.

![Fig. 5.37. Monkwearmouth form profile](image)

As with the Jarrow glass, the Monkwearmouth assemblage is both more colourful (31%/19%, Fig. 5.38) and less decorated (6%/31%, Fig. 5.40) than average. Out of five coloured sherds, two were olive green (40%/21%), two deep blue-green (40%/15%) and one deep blue (20%/17%, Fig. 5.39). All of these figures are above the national averages, but the 25% elevation in the proportion of deep blue-green sherds amongst the coloured group is the most pronounced. Jarrow also has higher than average levels of deep blue (44%) and
Fig. 5.38. Monkwearmouth comparison of blue-green and coloured sherds

deep blue-green (22%). Deep blue sherds in particular have much greater presence on ecclesiastical sites than on emporia (averages of 20% compared to 6%). Meanwhile, only one sherd of the sixteen found was decorated, and that was a blue-green sherd featuring the most common technique, applied trails (Fig. 5.41). However, the red colour of the trails is very rare, as is the position of one of the trails on the rim. Only two sherds with applied red trails are known, the other being a brown body sherd from Beverley, almost certainly also from a globular beaker.
Meanwhile, this is the only known example in England of a sherd with an applied trail on the rim. Reticella trails on the rim are slightly more common, but still extremely unusual and found mainly at Hamwic. A sherd of this quality and rarity speaks volumes about the nature of glass use at Monkwearmouth, and the status and context of the site itself.

_Barking, Essex_
The site of Barking Abbey was the subject of a number of antiquarian finds during gravel extraction in the eighteenth and nineteenth centuries, and excavations in 1724 by the Society of Antiquaries, in 1910, 1967, and by the Passmore Edwards Museum in 1971, 1985 and 1990. Unfortunately, the modern excavations have never been fully published, so the only sources of information are an article published in *Current Archaeology* in 1996 and a paper archive that was difficult to access and use in 2005. Today, Barking is a suburb of east London, but in the Anglo-Saxon period it was the site of an important nunnery on the edge of the Thames, founded in AD 666 ‘by Erkenward, later Bishop of London (MacGowan 1996, 172). It was not until 1985 that evidence of the Anglo-Saxon monastic occupation was found, with the main features comprising ‘a line of structures constructed with beam slots and postholes’ (ibid., 174) and a series of successive clay floors containing sceattas dating to AD 710-730. A large number of finds related to weaving were found, and evidence for a very early mill (ibid., 175). The leat for the mill was built around AD 700, and last repairs to the leat and to two wells indicate that ‘the site was abandoned in the mid ninth century’ (ibid., 178). Other significant finds included fragments of gold thread, a ‘bone whistle and a tuning peg from a stringed instrument’, numerous pins, manicuring sets and three styli (ibid. 175).

In 1990, the stand-out discovery was of an Anglo-Saxon glass furnace, 50m to the south of the 1985 excavation and adjacent to the later Medieval precinct wall (ibid., 178). The suggestion is that these excavations together found ‘the workshops that provided the goods and services required by the abbey’ (ibid.).

Barking has a high proportion of diagnostic sherds: seven out of eight, or 88% compared to 48% nationally, although this low sherd total makes a weaker foundation for conclusions than at Jarrow or Lyminge. Of the seven diagnostic sherds, five, or 71%, are from globular beakers (Fig. 5.42). The remaining two are from a bowl and a palm cup (14% each). All are well above the national averages for these forms, especially the 53% elevation in the presence of globular beaker sherds. This form profile is very similar to the average for documented ecclesiastical sites as a group, reflecting both the high levels of
globular beakers and the lack of the middle and later stages of the palm-funnel sequence. Based on current knowledge of the findings from Barking, this appears to be a difference in consumption and not chronology, as the other occupation evidence from Barking continues into the ninth century.

Fig. 5.42. Barking form profile

Fig. 5.43. Barking comparison of blue-green and coloured sherds
The Barking assemblage is more colourful than the national corpus as a whole, with 50% of the assemblage falling outside the ‘natural’ blue-green spectrum compared to 20% of the corpus (Fig. 5.43). Within this group of four coloured sherds, we have one deep blue-green, one black, one brown and one red, all of which give Barking an above average proportion for each of these colours (Fig. 5.44). It is interesting that deep blue green is elevated again, similarly to Jarrow and Monkwearmouth, although also worth noting that deep blue is absent. Unsurprisingly, all four deeply coloured sherds are from globular beakers, while the bowl and palm cup sherds are blue-green.

All eight sherds from Barking featured some form of decoration, making it the most decorated group within the corpus (Fig. 5.45). The two sherds with bichrome untwisted trails are the most unusual (18%/1%), and are only found elsewhere at Flixborough, Jarrow and Ipswich. Reticella trails are also more prevalent here than usual (27%/16%, Fig. 5.46), while levels of plain applied trails are less common than elsewhere (27%/56%). Bichrome untwisted trails are found more on ecclesiastical sites than elsewhere, and reticella sherds very slightly more so (e.g. Fig. 5.58), but generally decoration-type profiles are much more uniform across the board than those of colour or form.
Fig. 5.45. Barking comparison of decorated and undecorated sherds

Fig. 5.46. Barking decoration-type profile

Whitby, Yorkshire

Briefly, Anglo-Saxon Whitby was a double monastic house, famously founded and led by Abbess Hild from AD 657-680 and host to the Synod of Whitby in AD 664. It was one of the most important Christian centres in the country, and was enormously influential ‘in the shaping of the material culture of Northumbria in the Anglo-Saxon period’ (Cramp 1993, 64). It must have been central to the networks of communication and exchange along the east coast of England.
According to Cramp, Whitby has sculpture and metalwork at least comparable to ‘any of the well documented monastic sites’ (ibid.). However, it was excavated in the 1920s (Peers and Radford 1943) and not recorded or published in accordance with modern methods. The site ‘is not sortable into any temporal sequence’, although the site as a whole can be broadly dated by coinage to the late seventh to mid ninth centuries (Cramp 1993, 64). The circumstances of excavation may also have affected retrieval of glass fragments, as only four were recorded. Interestingly, English Heritage have a monograph in preparation at present regarding works conducted at Whitby Abbey between 1993 and 2008 (Willmott, forthcoming).

All four Whitby sherds are diagnostic, so 100% are identifiable forms compared to 48% nationally. This makes the form profile for this very small assemblage more useful than it would otherwise be. Of the four, two sherds are from globular beakers and two from bowls, meaning the percentages of both types present at Whitby are much higher than the national average (50%/18% and 50%/3% respectively, Fig. 5.47).

![Fig. 5.47. Whitby form profile](image-url)
This fits well with our knowledge of Whitby as a monastic site, and with the cluster of bowls in the northeast of England (Chapter 4, Fig. 4.50).

As at Barking, Whitby is both more colourful and more decorated as a group than the national corpus, with three out of four sherds falling into the ‘coloured’ and ‘decorated’ categories (Figs. 5.48 and 5.50). Regarding the three coloured sherds, we have one deep blue, one deep blue-green and one black, which is interesting in such a small assemblage (Fig. 5.49). Deep blue-green glass is found on every documented ecclesiastical site, even Lyminge, where the majority of glass in the ‘coloured’ category is colourless or olive green. Deep blue is also found on all except Barking, and in much greater proportions than on emporia or nationally (Figs. 5.54 and 5.56). Finally, black glass was also found at Barking alongside deep blue-green sherds, and is slightly more common on ecclesiastical sites than others (Fig. 5.56). Meanwhile, as at Barking, reticella has a greater than average presence at Whitby, with two of the three decorated sherds falling into this category (67%/16%), while normal applied trails are less evident, with only one sherd present (33%/56%, Fig. 5.51), although this does not seem to apply generally across the documented ecclesiastical site group (Fig. 5.55).
Fig. 5.49. Whitby coloured-sherd profile

Fig. 5.50. Whitby comparison of decorated and undecorated sherds
The ecclesiastical sites

As a group, the documented ecclesiastical sites of Barking, Lyminge, Jarrow, Monkwearmouth and Whitby are much more colourful than the national corpus as a whole. This trend spans the larger groups (e.g. the 88 sherds from Lyminge or the 79 sherds from Jarrow) as well as the very small (e.g. the four sherds from Whitby, of which three are coloured). This contrasts with the overall pattern for the emporia, which are less colourful than the national average, with the exception of York, but may relate to or have developed from a seventh-century correlation between deep blue glass vessels and royalty (Campbell 1989, 239, 241-3). Meanwhile, as with the emporia, the picture for decoration is mixed, with Lyminge, Barking and Whitby having above average proportions of decorated sherds, and Jarrow and Monkwearmouth having below average levels. It seems that of the three comparative categories of form, colour and decoration, decoration is by far the least useful for identifying significant trends.

Comparison of the form profiles of documented ecclesiastical sites produces a fascinating and very clear result: these assemblages as a group are strongly biased towards globular beakers, while the palm-funnel form series is almost

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Fig. 5.51. Whitby decoration-type profile
absent (Fig. 5.53). The proportions of globular beakers present are 82% at Jarrow, 71% at Barking, 67% at Monkwearmouth, 50% at Whitby, and 12% at Lyminge, in comparison to 18% in the national corpus. Meanwhile, the lack of funnel and palm-funnel beakers in particular is striking: the only funnel beaker sherds of any of these sites are 7% of the diagnostic group at Jarrow, in comparison to 47% nationally, and the only palm-funnel series sherds present are 8% of the Lyminge assemblage in comparison with 23% nationally. These two assemblages are the two largest amongst the ecclesiastical sites, which may help to explain why these are the ones with at least some representation from the palm-funnel form series. This is in sharp contrast to the emporia, which have a collective bias in the opposite direction. The higher proportion of globular beakers at documented ecclesiastical sites fits with the assemblages from these sites being more colourful than average, as globular beakers were the form most often made in deep colours. Whether these vessels were selected for their form (or function) or colour, or both, remains difficult to prove, but I suspect form was the primary factor.

The colour profiles for these known ecclesiastical sites create a more complex pattern, but there are still some interesting trends, especially when contrasted with those of the emporia group. There is a bias towards deep blue-green in particular at the ecclesiastical sites, with four out of five of the ecclesiastical group having significantly greater proportions of deep blue-green glass than the national corpus (Fig. 5.52). Monkwearmouth has 40%, Whitby 33%, Barking 25%, Jarrow 22% and Lyminge 2%, compared to 15% in the national corpus. As stated above, it was a culturally conservative choice (179-80), and may represent some production at one of the monasteries on the eastern seaboard. Meanwhile, amber and deep green are under-represented at these sites. Both amber sherds (4%/6%) and deep green (2%/1%) are found at Lyminge only, in contrast to the emporia, where they are present in greater quantities than usual. Overall, Lyminge is emerging as unusual amongst the ecclesiastical group, which may be related to its location in Kent, or temporal factors,
especially the presence of early Anglo-Saxon vessel glass within the assemblage.

Several key questions emerge from this analysis, in particular, why are the forms and colours present different on emporia and ecclesiastical sites? Were the monastic communities using glass in a different way? On the other hand, did they simply have the resources to buy the best quality vessels? Or both? Were they using different sources, whether via trade routes or local production? However, before reaching any conclusions, it is important to analyse the remaining assemblages, and compare the characteristics of assemblages from sites whose status remains unknown with the emporia group and the ecclesiastical group to assess whether the glass assemblages are more similar to one site type or the other.

Fig. 5.52. Comparison of blue-green and coloured sherds across ecclesiastical sites
Fig. 5.53. Comparison of form profiles on ecclesiastical sites

Fig. 5.54. Comparison of colour profiles on ecclesiastical sites
Fig. 5.55. Comparison of decoration type profiles on ecclesiastical sites

Comparing emporia and ecclesiastical averages

Whether ecclesiastical and other elite secular site types can be differentiated from each other will be tested by comparing the average profiles of emporia and ecclesiastical sites and the national average profiles with all of the remaining assemblages containing more than two sherds each. This will be done in descending order by size, and within each assemblage by category, starting with form, then colour and then decoration. Do the remaining assemblages exhibit a variety of patterns, with some being similar to the emporia or ecclesiastical profiles and some in between? Or do all non-emporia exhibit similar profiles? And then, are these differences a function of supply, or do they reflect different patterns of use, or both?

Brandon, Suffolk

Brandon, located on an island on the edge of the fenland in Suffolk, is a key site within Anglo-Saxon archaeology, particularly as part of a growing body of evidence for rural estate centres and settlement networks. The site was excavated in sections between 1979 and 1988, analysed gradually over many
years, and finally published in a monograph in 2014 (Tester et al. 2014). The excavations uncovered an estimated one-third of the island, so they do not by any means represent a complete view of the settlement. However, they revealed at least thirty-five buildings, ‘a raised causeway, a wooden bridge, two cemeteries and two churches’, a textile-processing area, a smithy and a possible bakery, all dated to between the mid seventh century and the late ninth century (ibid., xii). A rich and extensive catalogue of objects and bulk finds were retrieved, including the third largest vessel glass assemblage from Anglo-Saxon England (only the Ipswich and Hamwic assemblages are larger), 185 fragments of window glass (Cramp 2014, 139), several silver and gold dress fittings, 100 bone objects, 20 coins, 24,000 sherds of pottery and 416kg of slag (Tester et al. 2014, xii). Here, the glass (e.g. Figs. 5.101 to 5.110) is regarded as largely ‘the work of English glass blowers’ – an interesting assertion, partly as proof either way is lacking, but also because it is rare so far. There are many more unsubstantiated claims that glass vessels were imported (e.g. Loveluck 2014, 148). However, in the Brandon volume, the authors do identify an example of a few sherds that were ‘certainly imported’: ‘a monochrome beaker with moulded bosses for which there is a single comparative fragment from Ipswich, the remainder coming from the Rhineland’ (Tester et al. 2014, 377) (Fig. 5.107, E160).

As highlighted in the summary, an unusual feature was the ‘compelling evidence for literacy’, including ‘a number of objects bearing runic inscription’ and eight glass and on antler inkwells (ibid. xii, 260, Fig. 8.17; Evison 2014b, Pl. 8.8). It is argued in the monograph that ‘Brandon was a monastic estate centre where many of the activities of a small town would have occurred, with disparate elements of society providing a range of services to support an aristocratic elite in residence’ (Ibid., 357, 392-393). However, the nature of the settlement at Brandon has been much-discussed, and others have argued that differentiating between monastic and secular estate centres in the middle Anglo-Saxon period is extremely difficult – for example, Loveluck wrote in ‘Excavations at Flixborough volume 4’ that the two churches and grave groups
at Brandon could be interpreted as mortuary chapels within a secular rural estate centre (Loveluck 2007, 150).

The assemblage of 171 sherds (102 diagnostic sherds or 61%) from Brandon, in Suffolk (Evison 2014), is the largest group from a site that is not documented as being ecclesiastical, but is not a known emporium or royal site either (see Figs. 5.101 to 5.110 for sherd photographs). This site and Flixborough in Lincolnshire (71 vessel glass sherds, below) are frequently raised in discussions about elite settlements of this period whose nature is a mystery. These assemblages are therefore ideal for answering the question, is it possible to compare assemblage characteristics of sites whose status remains unknown with the emporia and ecclesiastical groups and assess whether they are similar to one site type or the other, or perhaps neither?

Starting with the vessel forms present at Brandon, it is immediately clear that the high proportion of globular beakers at Brandon (66%/18%) and the under-representation of the entire palm-funnel vessel series (palm cups 2%/3%, palm-funnel series vessels 7%/23%, and funnel beakers 3%/47%) closely matches the ecclesiastical site group, and contrasts completely with the emporia group. This alone does not necessarily demonstrate that Brandon was an ecclesiastical settlement. However, it does show that the profile of the assemblage is strongly dissimilar from the emporia profiles, and matches well with the ecclesiastical form profile. This is consistent with our knowledge of the site and its location (Chapter 6) – the surprise is how clear the match with the ‘ecclesiastical’ group is when studying form, and especially the cases of globular and palm-funnel series sherds.

It is also important to note the presence of four extremely rare glass bottle sherds at Brandon (Fig. 5.105 and 5.106). The only others known from England are four sherds from Jarrow. These independently strengthen the case for Brandon being an ecclesiastical site similar to Jarrow. It is likely the bottles would have been associated with the consumption of wine, and may have been
used as decanters as well or even instead of as containers for transportation. Finally, grape (traubenbecher) sherds are even scarcer than bottle fragments, with only three known from England, one of which is from Brandon, while the other two were found at Ipswich. This is further evidence for the high quality and variety of glass present and Brandon, and of a trade link between Ipswich and Brandon.

**Fig. 5.56. Brandon form profile compared to ecclesiastical, emporia and national averages**

Regarding colour, the Brandon assemblage is very colourful indeed, with 55% of sherds belonging to the ‘other colours’ group and only 45% to the blue-green spectrum, in contrast to the national corpus where only 19% of sherds are coloured. The Brandon assemblage is very large at 171 sherds, which makes the group of coloured sherds here particularly large. It includes an unusual variety of colours (Fig. 5.57), with deep blue (e.g. E160, Fig. 5.107; E190, Fig. 5.109), deep blue-green (e.g. E219), olive green (e.g. E191), black (e.g. E139; Fig. 5.102), colourless (e.g. E270-272), brown (E174, Fig. 5.103), red (e.g. E179, Fig. 5.101) and even an extremely rare white sherd present (E161). White sherds are extremely interesting as unlike blue or green the colour does appear in early Christian symbology, representing dignity, purity, and innocence, and was
associated with Easter and feast days (Pastoureau 2001, 35, 37). These sherds are also amongst the most likely to have been imported, as a case has long been established for production of opaque white glass objects in the Rhineland in the eighth century (Lundström 1971, 62-65). Indeed the only colours that do not appear at Brandon are amber, deep green, deep purple, yellow, pink and grey, of which the latter four are also very rare. Proportions of red (21%/9%), brown (17%/8%) and black (22%/10%) are especially high at Brandon. Meanwhile, deep blue-green (3%/15%), deep blue (12%/17%) and colourless (7%/12%) sherds are present in lower than average proportions.

Colour seems to have less clear trends regarding emporia and ecclesiastical site types than form. However, the colour profile at Brandon does have similarities with the emporia average profile and dissimilarities with the ecclesiastical average profile, which contrasts with the analysis of the assemblage form profile. For example, red, which is elevated at Brandon, is present in greater proportions on emporia than ecclesiastical sites on average, while deep blue and colourless, which are less prevalent at Brandon, are represented more strongly on ecclesiastical sites. However, deep blue-green is at a much lower level here than either the emporia average, the ecclesiastical average or the national average would lead us to expect, and black much higher, so these at least are localized phenomena and not related to site typology. Deep blue-green is concentrated in the northeast (Chapter 4, Fig. 4.42), which is may be part of the reason why the proportion at Brandon is low. Meanwhile, Brandon has the highest proportion of black sherds and the second highest proportion of red sherds nationally, which may again reflect a trade link or common source between Brandon and Ipswich. It may be that colour is related more closely to regional trade links (i.e. what was available locally) than to site types, and also influenced by form as globular beakers, for example, are by far the most likely to be made in deep colours and vice versa. A high level of coloured sherds corresponds here with a very high level of globular beaker sherds. Perhaps the choice was made to consume globular beakers, and then they were bought in the particular bright colours available in the area at the time.
The only decoration types that differ significantly between emporia and ecclesiastical sites are moulded decoration, which is more prevalent on emporia, and bichrome untwisted trails, which are found mainly on ecclesiastical sites. Generally, however, decoration profiles seem to be much more homogenous across assemblages and site types than form or colour profiles. Therefore, only clearly distinctive features will be highlighted, which in the case of the Brandon assemblage comprise the elevated levels of swirled decoration (25%/13%) and claws (9%/1%), and the minimal presence of moulded decoration (2%/12%, Fig. 5.58). Other than *Hamwic*, which produced over half of all swirled decoration, Brandon and Ipswich (8%/13%) are the key assemblages for this technique. This may suggest that the swirled glass at least was coming to Brandon via Ipswich, or that they were both stops on the same trade route, as a waterfront was found at Brandon. Moulded decoration is heavily concentrated on emporia (Chapter 4, Fig. 4.62), further evidence that Brandon was not an emporium-type settlement itself. The claw sherds from Brandon are interesting (Figs. 5.109 and 5.110), as most are the later form of flat claw, and this was one of the first sites where they were identified.

![Graph showing colour profile comparison](image)
Flixborough, Lincolnshire

Flixborough is an incredibly important site for Anglo-Saxon archaeology, and one of the key reasons is that layers of sand protected the archaeology of a previously unknown seventh- to early eleventh-century settlement to an unusual degree. Excavations between 1989 and 1991 revealed ‘an unprecedented occupation sequence from an Anglo-Saxon rural settlement’, which features six main periods of occupation and additional sub-phases (Loveluck and Atkinson 2007, xiii). Flixborough was a very complicated site and project in a number of ways, so the publication of a series of four monographs on the occupation sequence (Loveluck and Atkinson 2007), the artefact evidence (Evans and Loveluck 2009), the environmental archaeology (Dobney, Jacques, Barrett and Johnstone, 2007) and a thematic overview of Flixborough in its wider context (Loveluck 2007) was a significant achievement.

The settlement was located ‘on a belt of windblown sand, overlooking the floodplain of the River Trent, eight kilometers south of the Humber estuary’.
(ibid.), and probably housed elements of the contemporary social elite amongst its inhabitants’ (ibid.). As is often the case, only a small proportion of the likely extent was excavated by the principal intervention in 1989-1991 (ibid., 24-34, Fig. 2.17). However, approximately forty buildings were discovered, alongside large and well-preserved refuse deposits containing ‘approximately 15,000 artefacts and hundreds of thousands of animal bone fragments’ (ibid., xiv). Perhaps most importantly of all, detailed analysis of all of the evidence retrieved from the Flixborough excavations provided indications of radical change in the nature of the settlement as it was ‘incorporated, in chronological order, within the Kingdom of Mercia, the Danelaw, and finally, the West Saxon and then Anglo-Danish kingdom of England’ (ibid., xiii). All of the above, plus certain key features such as a building used as a focus for burials, an inscribed lead plaque, and a number of styli has made Flixborough a second key focus (alongside Brandon) for the debate over identification of monastic sites from Anglo-Saxon England. Loveluck described the eighth century phase as follows, under the sub-heading ‘feasting, hunting and conspicuous consumption’: ‘the totality of the archaeological remains reflects the support of a lifestyle that can be described only as “aristocratic”; and this is best placed within the context of a secular rural estate centre’ (Loveluck 2007, 150). The best example of the counter view is Blair’s paper ‘Flixborough revisited’ (Blair 2011a), where he presents a thorough case for Flixborough as monastic for at least part of its life. Returning to Loveluck’s overview in volume 4, the early to mid-ninth century has the sub-heading ‘a settlement housing specialist artisans and a partly literate community’, but even here, Loveluck argued that the archaeology ‘could represent an estate centre’ that may or may not have been linked to a monastic institution and not necessarily a monastery itself (ibid., 153). He noted that the clearest change visible was the disappearance of ‘the trappings of a secular aristocratic lifestyle’, including ‘luxury dining vessels’ (ibid.). The vessel glass assemblage forms a key part of the evidence for this shift, as highlighted by Loveluck, who discussed the fragments as the first tranche of evidence for ‘feasting and conspicuous consumption’ in the eighth century phase (ibid., 148), where he also described the original vessels as ‘probably
imported from the Rhineland, Belgium or northern France’ (see Figs. 5.111 to 5.115 for sherd photographs).

The overall form profile at Flixborough, where 71 fragments of vessel glass were found and 37 were diagnostic (52%/48%), can be seen at a glance to be similar to those of Brandon and the documented ecclesiastical site assemblages. The proportion of globular beaker sherds present is 9% lower than the number at Brandon – 57% compared to 66%. However, this still correlates well with the range amongst the ecclesiastical sites, whose group average proportion of globular beakers is 56%, and contrasts with the national average of 18% and the emporia group average of 11% (Fig. 5.59) for this form. Meanwhile, as at Brandon and the majority of ecclesiastical sites, the palm-funnel vessel series is very poorly represented, with only 5% of sherds from palm cups, 8% from palm-funnel series vessels, and 5% from funnel beakers. These figures are again slightly less extreme than at Brandon (3%/7%/3%), but correspond relatively well with the ecclesiastical site averages (5%/2%/1%) and contrast with the emporia averages (6%/26%/47%) and the national averages (3%/23%/47%). Regarding the palm-funnel series, it is clear that the differences between emporia and ecclesiastical sites grow much greater over the life of the series. Proportions of palm cup sherds are very similar across the board, but large differences emerge between percentages of palm-funnel sherds (26% at emporia, 2% at ecclesiastical sites) and funnel beakers (47% at emporia, 1% at ecclesiastical sites). This suggests that the nature of demand and the use contexts for glass were diverging over time at these groups of sites: the nature of the settlements and the ways that they were using glass vessels became more and more different over time. The growing difference may have been both cultural and chronological.

The other interesting feature to emerge from the form profile of Flixborough is comparatively high proportion of bowls: 19% compared to 3% nationally (B119; Fig. 5.114). However, it appears that this is the result of regional distribution rather than site type, whereby bowls were concentrated in the central eastern
coast (see Chapter 4 and York section above). The Whitby assemblage has 50%, York 24% and West Heslerton 18%, although the Whitby assemblage contains only four sherds.

**Fig. 5.59. Flixborough form profile compared to ecclesiastical, emporia and national averages**

**Fig. 5.60. Flixborough colour profile compared to ecclesiastical, emporia and national averages**
Flixborough is also a colourful group, with 39% of sherds (twenty-seven sherds) in the coloured category compared to 19% nationally. In contrast to Brandon, deep blue-green (41%/15% or eleven sherds) and colourless (19%/12% or seven sherds) glass dominate the Flixborough assemblage (Fig. 5.60), alongside brown (26%/8% or five sherds), which is also elevated at Brandon. However, Flixborough is in the northeastern area in which distribution of deep blue-green glass seems to be concentrated (Chapter 4, Fig. 4.42), so geography is probably a principal causal factor for the 26% increase in proportion at Flixborough. Meanwhile, although ecclesiastical sites have a higher average proportion of this colour than the national corpus (25%/15%), emporia do too (19%/15%) albeit to a lesser degree. It is likely that glass of this colour was unusual and perhaps expensive, so is more likely to appear on elite site types with good trade links. Brown glass also shows a concentration in the northeast (Chapter 4, Fig. 4.40). The elevated levels of blue-green and brown match the profile at York, and as with Brandon and Ipswich, suggest a trade relationship between the two or a common source. The elevated proportion of colourless glass might suggest similarity with the ecclesiastical site assemblages, but might also point to a higher than usual proportion of comparatively early glass, as is undoubtedly the case at Lyminge. Meanwhile the relative lack of deep blue and the presence of some deep green both point in the opposite direction, towards the average colour profile for an emporium. This suggests again that local availability, and to a lesser extent wealth and period of occupation, have influenced the colour profile here, but site type has not to any discernible degree.

As well as being a colourful group, the Flixborough assemblage is more decorated than average (44%/31%), with above average presence of reticella decoration in particular (26%/16%, Fig. 5.61). Reticella sherds are well distributed along the east coast, although are absent from Kent, and the Flixborough group is part of a cluster in Yorkshire along with sherds from York and West Heslerton. There is a corresponding reduction in the level of applied trails (42%/56%), although applied trails are still by far the most common type.
of decoration within the assemblage. Perhaps most significant is the combination of a lower than average level of moulded decoration (8%/12%) with a higher level of bichrome untwisted trails (5%/1%). This presents a decoration profile that is closer to the ecclesiastical site average than that of the emporia. The ecclesiastical average for moulding is 6% compared to 8% at Flixborough, and for bichrome-untwisted trails is 10% compared to 5% here. This supports the clear trend towards an ecclesiastical form profile at Flixborough.

![Graph showing decoration type profile](image)

*Fig. 5.61. Flixborough decoration type profile compared to ecclesiastical, emporia and national averages*

**West Heslerton, Yorkshire**

West Heslerton is located on the southern side of the Vale of Pickering in North Yorkshire. It is a site well known for the Anglo-Saxon cemetery containing and estimated 300 Anglian burials, which has been published in two monographs (Houghton and Powlesland 1999), but is less well known for the associated settlement, which has not. The cemetery was discovered by chance during mineral extraction in the autumn of 1977, and was then followed by a large-scale series of rescue excavations, conducted seasonally between 1977 and 1987 (ibid., 1). The rescue excavations were undertaken as part of the wider...
research framework of the ‘Heslerton Parish Project’, which was supported by English Heritage and also included examination of extensive prehistoric deposits, the associated Anglo-Saxon settlement, and the wider landscape, amongst other things. Part of the significance of West Heslerton is that it is a rare example nationally where the settlement and cemetery have been extensively investigated together, so it would be a significant development if the companion monograph on the settlement reaches publication in the future. One question that that would help to address is regarding the extent to which the cemetery and settlement were contemporary with each other. The cemetery was ‘in use between the late fifth and early seventh centuries’ (AD 450-650) (ibid., 1, Fig. 46 and 47). Interestingly, no glass vessels were found in the cemetery, although only 201 burials of an estimated 300 were excavated. This perhaps fits with the vessel glass assemblage from the settlement being broadly later than the cemetery, albeit with an overlap – there are a number of sherds within the assemblage that match seventh century glass typologically, but many others featuring colours (e.g. deep purple) and decoration (e.g., reticella trails) that do not appear until the eighth. The introduction to the cemetery monographs mentions briefly that the cemetery’s period of use did not cover ‘the full period of the occupation of the associated settlement’ (ibid., 4) – they may have only briefly overlapped.

The most striking feature of the West Heslerton assemblage of 30 sherds (Figs. 5.118 to 5.130; Broadley 2014) is that the proportion of claw beakers is extraordinary in comparison to the national corpus (36%/1%, Fig. 5.62). Part of the reason for this is that four of the five claw sherds from West Heslerton are so similar in colour and form that they must have come from either the same vessel, or from parts of a set. The chance survival of several of these raises the proportion of claw sherds in the assemblage. More importantly, the level of cone beakers and palm cups are also elevated (both 9%/3%), and these three are all earlier forms on the temporal spectrum, so it seems likely that the period of glass import and use at West Heslerton began earlier than at most sites within the corpus, and this has also shaped the site’s vessel form profile.
The picture regarding globular beakers, palm-funnel and funnel beakers is less clear-cut than at Brandon and Flixborough (Fig. 5.62). At West Heslerton, globular beaker sherds represent 27% of the assemblage, which is significantly higher than the national average of 18% and the emporia site average of 11%, but much lower than the ecclesiastical site average of 56%. Meanwhile, there are no palm-funnel or funnel beaker sherds present at all, which is similar to the ecclesiastical sites (with averages of 2% and 1% respectively) and in sharp contrast to the emporia (27% and 46%). Given that three earlier vessel forms have a greater than usual presence at West Heslerton, it is important to ask whether the lack of palm-funnel and funnel beakers was caused by an early phase of glass use on the site that ceased before palm-funnel and funnel beakers were prevalent elsewhere, or whether it is a partial reflection of the site type or trade relationships in question. However, it is thought that the site was occupied from AD 450-850, and middle Saxon glass contemporary with the palm-funnel and funnel forms is present, so this does not appear to be the case.

The West Heslerton form profile in terms of globular, palm-funnel and funnel sherds is clearly more similar to the ecclesiastical sites, particularly Lyminge, and could be described as a muted version thereof, simply with a slightly smaller proportion of globular beakers than one would expect.

Although date may have been a minor factor, it is likely that the site type and its position in a network of trade and exchange were more important. West Heslerton is currently regarded as a middle-ranking rather than elite settlement that was probably paying a cattle tithe to a parent-community nearby (Dominic Powlesland, pers. comm.). This interpretation is based in part on the absence of market-age cattle bone at the site. At the same time, the community may have received glass vessels and other imported items via the same exchange network. A potential candidate settlement situated approximately 4 kilometres along the valley has been identified via geophysics as a probable minster, although no excavation has yet taken place (ibid.). Meanwhile, the form profile indicates a subtler version of the bias of ecclesiastical site assemblages towards
globular beakers and away from the latter stages of the palm-funnel sequence.

A fitting conclusion would be that in its latest phase West Heslerton was part of a monastic estate, some of which are known to have been huge, although the evidence presently available does not prove this.

**Fig. 5.62. West Heslerton form profile compared to ecclesiastical, emporia and national averages**

**Fig. 5.63. West Heslerton colour profile compared to ecclesiastical, emporia and national averages**
57% of sherds at West Heslerton are coloured (seventeen sherds), which is very high. Amber is the outstanding feature of the West Heslerton colour profile, with 41% of the assemblage or seven sherds falling into this category compared to only 6% nationally (Fig. 5.63). Also of interest are the above average proportions for deep blue (24%/17%) and deep blue-green glass (18%/15%), and for the very rare colour of deep purple (6%/0%). The very high level of amber glass present is so much higher than the national average or even the emporia site average of 12% that it must be related to local production or supply. It is a result of the general concentration of amber/brown glass in the northeast as seen at Flixborough. Meanwhile, the above-average presence of deep blue sherds (7% higher than nationally or four sherds) is a small support to the theory that the elite site that controlled West Heslerton was ecclesiastical in nature and perhaps the potential monastic site 4km along the valley. The deep purple glass (G118, Figs. 5.116 and 5.117) is only one sherd, but it is very rare in both colour and decoration as the decoration is a type of flat claw, so on its own this sherd makes a strong statement about the networks of trade and exchange involved. It is likely that most of the deeply coloured sherds were manufactured locally.
glass here was from globular beakers, but there were also at least two claw beakers present, one of which was deep blue with blown claws and the other deep purple with flat claws (G118, Figs. 5.116 and 5.117). On a rural mid-level settlement this shows interesting connections, whether with merchants, trading settlements or a regional estate centre.

The West Heslerton assemblage is more decorated than most (63%/31%), but within the decorated group the proportions of applied trails, reticella trails and swirls in the metal are all below average (Fig. 5.64). In contrast, moulded decoration (25%/12%) and claws (10%/1%) are both significantly elevated. Unfortunately, although all the moulded decoration takes the form of ribbing, only one is from a diagnostic sherd, which is from a palm cup. One is amber and one deep blue-green, and the chances are very high that these two were globular beakers, but the other two are not identifiable. The proportion of moulded sherds here (25%) is closer to the average for emporia (19%) than the ecclesiastical (6%) or national averages (12%). Furthermore, over 80% of moulded sherds are found at emporia, and the percentage at West Heslerton is the highest proportion at any non-emporium site, so the five moulded sherds in an assemblage of thirty may represent a connection with the emporium at York. The high proportion of amber sherds supports this. However, both could be the result of an earlier chronology for the assemblage than the majority in the corpus: moulded decoration is more common in the earlier part of our period. It is also possible that these groups came to West Heslerton via another intermediary elite centre, possibly of an ecclesiastical nature, as indicated in particular by the bias towards globular beakers and also by the above average presence of deep blue glass. The West Heslerton assemblage is contradictory and enigmatic, perhaps due in part to complex local trade networks. Glass vessels could have arrived at this site from more than one direction, and may well also have travelled along linear trade routes with a series of stops.
Butley, Suffolk

Burrow Hill was once an island on the west bank of the Butley River, just above the confluence with the River Alde and very close to the North Sea. It is located only 10km south of Sutton Hoo and less than 20km north-east of the estuary of the River Orwell, which leads up to Ipswich. Stray finds from the site and the results of a series of small excavations between 1978 and 1981 showed that it was ‘intensively used in the Middle Saxon period’, with radiocarbon dates, coins and metalwork find pointing to occupation of the settlement between the late seventh and early ninth centuries AD (Fenwick 1984, 35). The site has ‘extensive views in all directions, particularly seawards’, and was known in the medieval period as *Insula de Burgh*, a name that suggest at least ‘a domestic enclosure with a defensive element’ (ibid., 37). The site had both strategic importance and potential as a port. Meanwhile, the topography, ‘particularly the causeway, is reminiscent of other known or postulated monastic sites, such as Lindisfarne, Ardwall, Iken and Brandon’ (ibid., 41). However, only a tiny portion of the site was excavated and a large section of that had already been subjected to gravel extraction. There are also no contemporary documentary records of the settlement, so it is impossible to build a clear case for either trading settlement, defensive *burh*, or monastic community. Given its various attributes, the site could have had sequential phases or concurrent components of all of the above.

A cemetery containing more than 200 inhumation burials was recorded, which provided a radiocarbon date of AD 780 for an early phase, and the fascinating detail that a ‘mainly male population is represented’ (ibid. 37). To the south of the cemetery a series of ditches were excavated, all of which contained Ipswich ware, including twelve sherds from a ‘globular pitcher or jar with stamped decoration’ (ibid., 38). Two different types of imported pottery have been identified within the site assemblage, one of which Fenwick compares to ‘Class 14 French imports at Hamwih’ (ibid., 39). From a typological standpoint, it seems likely that the settlement was present before the cemetery. Alongside
Ipswich ware pottery, ditch C contained a Maxey type strap-end for which a seventh century parallel is cited, and ditch E a sceatta dated to AD 740-750 and a silver Vandyke dated to the end of the seventh or beginning of the eighth century (ibid., 38, 50). The Vandyke features repoussé decoration in an interlace design and probably came from a bronze bowl (ibid., 39). Other coins from the site include four other sceattas dating between AD 690 and 750 (ibid., 50-52), five coins of Beonna (documented much later as king in part of East Anglia c. AD 749-758, ibid., 44-50) and a coin of Cuthred minted in Kent c. AD 798-807 (ibid., 51). Lead droplets and scraps indicate lead working, and slags, smithing operations. Local stone ‘clearly used in a kiln or furnace construction’ is important evidence of production here, while a Mayen lava quernstone can be placed alongside the imported pottery as another example of evidence for international trade at the site (ibid., 40). Unfortunately, the initial interim publication of a paper in Anglo Saxon Studies in Archaeology and History in 1984 has remained the only one, and the glass has not been reviewed since it was initially looked at by Harden in the early 1980s, so any new research on material from this site is significant for the field of Anglo-Saxon settlement studies.

The form profile of the Butley assemblage (see Figs. 5.131 to 5.137 for sherd photographs) contrasts completely with Brandon, Flixborough and West Heslerton, which is very interesting for two reasons: firstly, this suggests that non-emporia do have varied form profiles and they are not all similar to the documented ecclesiastical site assemblages, and secondly because of the probable connection with the nearby emporium at Ipswich. Of twenty-six sherds found at Butley, twelve were diagnostic, and of those 83% were funnel beaker sherds (e.g. J116 and J118, figs. 5.83 and 5.84) and 17% globular beaker sherds (Fig. 5.65). For funnel beakers, 83% compares to 40% of the Ipswich assemblage and emporia and national averages of 47%, while the ecclesiastical site average is 1%. Meanwhile, the figure of 17% for globular beakers compares to 19% at Ipswich, 18% nationally, 11% at emporia generally, and 56% at ecclesiastical sites. It is interesting that the palm cup, bowl and cone beaker
forms present in small proportions at Ipswich are absent at Butley. However, as palm cups and cone beakers were both earlier forms in the middle Saxon panoply and funnel beakers are later, it may well be that Butley was established or began to benefit from the vessel glass trade into Ipswich at a date after some of the earlier forms had faded from circulation. Butley is 16 miles east of Ipswich, so a trade relationship between the two or both accessing the same trade route seems likely, especially in light of the bias of the Butley assemblage towards funnel beakers and away from globular beakers.

Fig. 5.65. Butley form profile compared to ecclesiastical, emporia and national averages

The proportion of coloured sherds at Butley is exactly average (19%), but in this case that represents only five sherds: two deep blue-green (40%/15%), two olive green (40%/20%), and one red (20%/9%, Fig. 5.66). It is interesting that Butley features at least one red sherd (J124, Fig. 5.83 and 5.84), as red sherds are also over-represented at Ipswich (14%) and Brandon, (21%) both also in Suffolk (Figs. 5.8 and 5.57). These three groups of red sherds form a focus for red glass in the east of England – this is the only significant presence of red sherds other than a high proportion at Hamwic (Chapter 4, Fig. 4.44) – and illustrate either local production or import and regional exchange. However, deep blue-green sherds are present only at an average level at Ipswich, and
Fig. 5.66. Butley colour profile compared to ecclesiastical, emporia and national averages

Fig. 5.67. Butley decoration type profile compared to ecclesiastical, emporia and national averages

much less than average at Brandon, and Butley is not located within the regional concentration zone in the northeast. Therefore, the deep blue-green sherds (J105 and J112, Figs. 5.85 and 5.86) are probably representing the percolation of a few luxury vessels from whichever elite centre controlled the settlement at Butley, as at West Heslerton.
Butley is around average in terms of the proportion of decorated sherds (35%/31%), with the outstanding feature of the decoration type profile being the above average percentage of sherds with swirled decoration (30%/13%, Fig. 5.67). This is similar to the proportion at nearby Brandon (25%), but rather different from the amount at Ipswich (8%). Meanwhile, the level of moulded decoration is also elevated to a level matching the average for emporia assemblages (20% compared to 19% at emporia and 12% nationally), and compares with proportions of 19% at Ipswich and 2% at Brandon. This could mean that the Butley community received their moulded vessels from Ipswich and their swirled vessels from Brandon, although other possibilities include both Butley and Brandon receiving most of their glass vessels via Ipswich, or Butley trading with Ipswich and Brandon with Butley. Overall, the picture is of an interconnected network of sites and assemblages in Suffolk. The most interesting individual moulded sherds from Butley are one with a very rare diamond pattern (J105, Fig. 5.136), and the other with an unparalleled mould-blown trefoil design (J112, Fig. 5.135). The trefoil sherd is also a bright deep blue-green colour, and so is high quality in every aspect. Both of these sherds demonstrate the calibre of some of the glass vessels present, and the resources and connections necessary to acquire them. What kind of site was Butley? Monasteries preferred island sites, and the dominance of deep blue-green and the design of the trefoil sherd could support that; however, high proportions of olive green and red glass would suggest the emporia colour profile, and so would the proportion of sherd with moulded decoration. In addition, the forms at Butley are clearly dominated by funnel beakers, while the smaller proportion of globular beakers also matches the profile of emporia. There may well be a chronological factor in the dominance of funnel beakers, but overall the glass suggests a secular trading centre, albeit on a smaller scale than the nearby emporium at Ipswich.
Sedgeford, Norfolk

Sedgeford Historical and Archaeological Research Project (SHARP) has been investigating the multi-period archaeology of the village of Sedgeford in Norfolk every summer since 1996, and as such is ‘one of the largest and longest-running archaeological research and training projects in Britain’ (Faulkner, Robinson and Rossin 2014, ix). The site is located near the north Norfolk coast, approximately 6km inland from Hunstanton on the southeastern corner of the Wash, at the northern end of the Icknield Way and just to the east of the Roman road that came to be known at Peddlars Way (ibid., Fig. 4.4). The early Saxon occupation is ‘ephemeral and fragmentary’, but ‘there is enough to say that the Middle Anglo-Saxon nucleated settlement and associated cemetery in the centre of Sedgeford had its origins in the years around AD 700 at the latest’ (ibid., 86-87). It ‘seems to appear suddenly, de novo’, and seems to have been ‘loosely structured within a curving boundary’ in the eighth century (ibid., 226-227). This phase, 4c, is described as ‘an Anglo-Saxon rural settlement’ from AD 725-?775/825 (ibid., 87-91). At the end of the eighth century or the beginning of the ninth, the settlement was ‘completely reorganized’ (ibid., 227), described as phase 5, ‘an Anglo-Saxon grid-plan settlement’ dating to AD ?775/825-850/925 (ibid., 95-108). The first (interim) monograph has only recently been published (Faulkner, Robinson and Rossin 2014), although more information is gradually being made available online. There is still much more post-excavation work and publication to be done in addition to plans for future excavation.

18 sherds of vessel glass have been found so far during the ongoing research project at Sedgeford in Norfolk, the majority of which belong typologically to the eighth century and to the loosely structured rural settlement phase described above (see Figs. 5.138 to 5.141 for sherd photographs). Of these, ten are diagnostic (56%/48%), with claw beakers and palm cups comprising 6% (or one sherd) each, compared to 1% and 3% nationally. However, most interesting is the fact that even an assemblage of this size with only ten diagnostic sherds
can demonstrate a bias in terms of form. In this case there is a greater than average proportion of globular beakers (33% compared to 18% nationally, Fig. 5.68), which is similar but less pronounced than at Brandon and Flixborough (66% and 56% respectively), and contrasts with Ipswich (19%). However, the difference between the proportion at Sedgeford and in the national corpus is smaller than Brandon and Flixborough, and this is also the case with the reduced percentage of palm-funnel beakers (11%/23%). This is only moderately low in comparison with the ecclesiastical site average of 2%. It is difficult to make a case of any kind regarding the nature of demand for glass vessels at the site based on only ten diagnostic sherds. However, the presence of both palm-funnel series vessels and globular beakers with the latter forming a clear two-thirds majority does show that Sedgeford was using both vessel types. It also gives an indication that there was a learning towards the old ways regarding the use of glass vessels, which one can imagine fitting with the broader archaeological picture of a rural estate centre.

![Graph showing Sedgeford form profile compared to ecclesiastical, emporia and national averages]

*Fig. 5.68. Sedgeford form profile compared to ecclesiastical, emporia and national averages*
Sedgeford is another relatively colourful assemblage, with 44% of sherds in the ‘coloured’ category, although that represents only eight sherds. The number is swelled by a large proportion of colourless glass (25% of the coloured group compared to 12% nationally), although again this figure represents only two sherds (Fig. 5.69). The other two colours whose proportions are well above average are deep blue and deep blue-green, both with two sherds or 25% of the coloured group each. Deep blue and colourless glass are the only two colours that are noticeably more prevalent on ecclesiastical sites, and as discussed previously, deep blue-green glass is more common on both emporia and ecclesiastical sites than average. Meanwhile, amber sherds are at a level exactly equivalent to the emporia average and above the national and ecclesiastical averages. Therefore, the picture at Sedgeford is mixed, with a significant presence of some deep blue and deep blue-green vessel glass, showing some contact with an elite trading partner. The identity or type of that partner is not clear – all we can say for certain is that the colour profile is very different from the nearest site assemblage Brandon, where there is no amber glass, very little deep blue-green, and both colourless and deep blue.
proportions are well below average (Fig. 5.57). The profile is perhaps more similar to that of Ipswich (Fig. 5.8), where amber and blue-green glass are more in evidence, although deep blue and colourless are still below average there.

One claw sherd and two reticella sherds at Sedgeford are enough to ensure that both of these decoration types have above average representation within the decorated group (Fig. 5.70). However, as the numbers are so small and the proportions of applied trails and moulded sherds are close to average, the Sedgeford decoration type profile is not of great interest.

![Fig. 5.70. Sedgeford decoration type profile compared to ecclesiastical, emporia and national averages](image)

**Canterbury**

Evidence for Anglo-Saxon Canterbury has emerged very gradually as the evidence is ephemeral and the archaeological record is extremely crowded within and around the city walls. The extent of occupation between the end of the Roman period and the arrival of St Augustine in AD 596 is open to question, but the city was undoubtedly invigorated by the arrival of St Augustine’s mission, the patronage of King Ethelbert and the development of the Cathedral, St Augustine’s Abbey and the church of St Martin’s. The Canterbury assemblage
recorded for this project contains fourteen sherds of vessel glass. The true number may be higher, as John Shepherd knew of twenty sherds in 1995 (Shepherd 1995, 1250), although it seems that that number included a scatter of fifth and sixth century fragments, and there have also been a few recent discoveries. For example, one olive green sherd with opaque yellow trails came from the site of St Augustine’s Abbey’s outer precinct, where part of an extramural trading settlement was located (Hicks 2014, 38, 260, Pl. 62). The fourteen sherds are from three large commercial excavation projects: two from the site of St Gregory’s Priory, Northgate (founded c. AD 1084 by Lanfranc and excavated in 1988-1991, Hicks and Hicks 2001), which was located just outside the city walls; six from the same small area in the heart of the city, just to the east of the Roman theatre ruin and the Roman road Watling Street (excavated 1978-1982, Shepherd 1995); and six from Whitefriars nearby, just inside the city wall and north east of Watling Street (1999-2004, Hicks 2015).

Only seven of the fourteen sherds from Canterbury are diagnostic (50%/48%). Of the seven, four are from cone beakers (57%) and two are from claw beakers (29%), both of which are early forms within the middle Saxon range (Fig. 5.71). It appears that the majority of the middle Anglo-Saxon vessel glass found in Canterbury to date is from the seventh century – the sherd from St Augustine’s that was identified too late to be included is the only sherd so far that may have an eighth century date. As they are predominantly sixth to seventh century types it is not surprising that the proportions of cone beakers and claw beakers are vastly higher than the national corpus percentages of 3% and 1% respectively, although the cone beaker figure compares well with the 68% at Lyminge, 12 miles south of Canterbury. Both claw beaker sherds are amber in colour and from the same area of the city, so there is a small possibility they are from the same vessel. The remaining diagnostic sherd is from a blue-green globular beaker, the only sherd typical of the middle Saxon period (c. 700-850 AD). Only three sherds are coloured, two of which are the amber claws, with the third being an unidentified olive green sherd (Fig. 5.72). Canterbury is a much-decorated assemblage, with only one sherd of fourteen having no
decoration at all, although the decoration present is dominated by plain applied trails (Fig. 5.73). Two thirds of these were self-coloured, one third opaque white, with one example of opaque yellow trails. There were claw beakers present, and also one sherd with an applied blob.

Anglo-Saxon Canterbury is still an interesting archaeological conundrum, with more than fifty early Anglo-Saxon sunken-featured buildings found within the Roman city walls suggesting that the city ‘may never have been wholly depopulated’ (Blair 2013c, 469). However, the relative lack of vessel glass presently known is part of a broader dearth of finds within the walls of the old Roman city in the middle Saxon period. Evidence of a possible extra-mural emporium near the later site of St Augustine’s Abbey is emerging, although only one sherd of olive green vessel glass with applied yellow trails has been found so far, and that in a residual context. This may be part of the reason why there is a lack of evidence for activity within the walls prior to the Viking incursions of the mid ninth century, although the lack of middle Saxon vessel glass here also seems to be part of a wider picture in which Kent has produced a great deal of early Anglo-Saxon glass, but much less than expected in the middle Anglo-Saxon period, although the cause of this is unknown. It seems likely that this pattern is a result of the ebb and flow of international trade and the movement of relative wealth.
Fig. 5.71. Canterbury form profile compared to ecclesiastical, emporia and national averages

Fig. 5.72. Canterbury colour profile compared to ecclesiastical, emporia and national averages
Northampton

Northampton is situated at the meeting point of two branches of the River Nene, on a spur of high ground – a location noted by Blair as ‘especially favoured for the siting of Anglo-Saxon minsters’ (Blair 1996, 98), and certainly of strategic and practical value. The eleven sherds from Northampton are from two sites, both excavated in the 1970s in the same part of the town: nine are from Marefair, excavated in 1977 (Williams, F., 1979), and two from St Peter’s Street, excavated between 1973 and 1976 (Williams, J. H., 1979). St Peter’s Street is a side street leading off Marefair (Williams, F., 1979, Fig. 1), and both streets are adjacent to St Peter’s church. A large middle Anglo-Saxon timber hall and a subsequent middle Anglo-Saxon stone hall and associated features were found and dated to between the mid eighth century for the timber hall and the early ninth century for the stone hall to c. AD 875 when Danish occupation began (Williams, J. H., 1979, 7, 26-27). The subsequent phase (c. AD 875 – 1100) had ‘lost the high stratus of the preceding phases’, comprising sunken-featured buildings, post holes, pits and layers (ibid.). The presence of a ‘spectacular sequence of halls’ (Blair 1996, 98) is not disputed, but their nature

Fig. 5.73. Canterbury decoration type profile compared to ecclesiastical, emporia and national averages
and purpose is (see Chapter 6, 270, within this volume). The stone hall in particular is noted by Blair as ‘exceptional’, without parallels in England, and best compared to Carolingian palaces, although also associated with ‘a configuration of churches and an assemblage of finds best paralleled among Anglo-Saxon minsters’ (Blair 1996, 103, 108).

The Northampton assemblage features eleven sherds, and unfortunately, only two are diagnostic (18%/48%): one cone beaker sherd and one globular beaker sherd (Fig. 5.74). The cone beaker sherd must be relatively early in date (c. late seventh century or earlier). However, the globular beaker sherd is the opposite – one of the latest sherds in the dataset for this project, and a rare example of late Anglo-Saxon vessel glass (c. 850-1050). Globular beakers seem to have been one of the very few vessel forms that survived the schism in vessel glass production and consumption in the second half of the ninth century and continued through into the late Anglo-Saxon period. Was this because they were used in a different way, or were more flexible in their functionality – more multi-purpose? Perhaps the cultural setting for the unstable vessel forms like funnel beakers evaporated, or indeed the supply if they were imported? Given that emporia seem to have consumed the most, and were badly disrupted at this time, both reduced supply and demand seem very possible.

Regarding colour, although nine of eleven sherds are coloured, the group is dominated by eight olive green sherds (Fig. 5.75). One of these is the early cone beaker sherd, with the others all being of unknown form. The ninth coloured sherd is the late potash globular beaker sherd mentioned above, which has been described as yellow. At least one of the unidentified olive green sherds is also made from potash glass and is also from a late-period vessel, probably a globular beaker. It seems likely that at least some and probably most of the other six unidentified olive green sherds are late potash glass, and it would be very useful if they could be found and re-examined. The presence of several late-period potash glass sherds is the distinctive feature of the Northampton
assemblage – these sherds are of great value as so few seem to have survived to be correctly identified and entered into the archaeological record.

Out of the eleven sherds of vessel glass found at Northampton, five were decorated (36%/31%), and of those five, four had applied trails and one swirls in the metal (Fig. 5.76). The swirled decoration was red swirls in the pale green body of the cone beaker, which also featured applied self-coloured trails. This is typical of an elite vessel of the mid sixth to seventh centuries, and is a decorative scheme most often paralleled in East Anglia. The question of how this high quality cone beaker travelled to Northampton is a very interesting one. A likely possibility is that it came from the eastern coastal zone, probably via the Fenland and the River Nene, and perhaps to a royal vill in Northampton at the time (although the nature of the buildings, settlement and activity at Northampton throughout the Anglo-Saxon period has been the subject of great debate and evidence for the early period is sparse). Of the other three sherds with applied trailed decoration, one is the late Saxon potash globular beaker sherd, decorated with the only form of decoration that clearly survived into the later Anglo-Saxon period – self-coloured trails. Another applied trailed sherd is olive green and also potash glass, so it is certain that this sherd is from the same period, and probably also from the same vessel type. The final applied trailed sherd is pale blue with opaque white trails, which is a classic middle Saxon soda glass scheme, thus showing that the Northampton assemblage spans the Anglo-Saxon period in its entirety, despite being so small.
Fig. 5.74. Northampton form profile compared to ecclesiastical, emporia and national averages

Fig. 5.75. Northampton colour profile compared to ecclesiastical, emporia and national averages
Portchester, Hampshire (Shore Fort)

Portchester was first a Saxon shore fort in the Roman period, then a ‘thegnly’ centre, held by a member of the aristocracy for the King, and then from the tenth century onwards a burh. It was, therefore an elite secular site with royal connections, but below the designation of a ‘palace’ or royal vill. Barry Cunliffe excavated eleven sherds of middle Saxon vessel glass there between 1959 and 1975. Six are diagnostic (55%/48%), and comprise three from globular beakers, one from a cone beaker, one from a bag beaker and one from a bell beaker (Fig. 5.77). The latter three types are all more typical of the early Saxon period and are at the early end of the middle Saxon spectrum. Bag and bell beakers are particularly unusual. No sherds from any palm-funnel series vessels are present in the assemblage, and globular beakers were in use in the early, middle and late Anglo-Saxon periods meaning that those found here could be relatively early too. It would be worth revisiting the interpretation of the glass and middle Saxon activity on the site in light of this analysis – both appear to date from the seventh to early eighth century and are comparable with West Heslerton and
Canterbury but earlier than the majority of assemblages within the corpus. Although the number of diagnostic sherds is very small, they paint a general picture of high quality vessel glass in use on the site for a period spanning the early to middle Saxon periods, with an emphasis towards globular beakers and away from the palm-funnel series.

Portchester has a higher than average proportion of coloured sherds (45% compared to 19% nationally). However, this is a small assemblage so the coloured group consists of only five sherds. Two of those (or 40%) are deep blue (Fig. 5.78). The other colours present are olive green, black and colourless, all with one sherd or 20% each. This means that both black and colourless glass are also present at above average levels here, although represented by only one sherd each. Although it is difficult to draw conclusions from such a small group, the presence of a black sherd shows that the assemblage definitely stretched into the eighth century, despite the dominance of seventh century forms.
Portchester is a highly decorated assemblage, as eight of eleven sherds (73%/31%) are decorated. The decoration profile features an exactly average proportion of applied trails (56%). More interestingly, levels of reticella (22%/16%) and moulded decoration (22%/12%) are elevated (Fig. 5.79), both of which suggest links with the nearby assemblage from *Hamwic*. It seems highly likely that the glass at Portchester would have been connected to the *Hamwic* glass in some way – either coming via the emporium, or via the same trade route or glass working enterprise. This finding contrasts to a degree with the analysis of form and colour at Portchester, but does not necessarily contradict. One of the two reticella sherds is from a black globular beaker, and the other from an unidentified green sherd that was probably also from a globular beaker. Meanwhile, the moulded decoration is vertical ribbing in both cases, one sherd from a pale green globular beaker and one from a pale green bell beaker. Therefore, it remains the case that three of the four sherds in question were definitely or probably globular beakers, and the other was a form that is early in date and very unusual everywhere.

![Portchester colour profile compared to ecclesiastical, emporia and national averages](image)

*Fig. 5.78. Portchester colour profile compared to ecclesiastical, emporia and national averages*
Beverley, Yorkshire

The excavation at Beverley that we are concerned with took place from 1979 to 1982 and occurred within ‘an area of rough grassland on the south side of Beverley Minster, separated from the church by a thoroughfare known as Minster Yard South’ (Armstrong 1991, 1, Fig. 2). In the middle Anglo-Saxon period, there was a monastery at Berferlic juxta Hul and ‘it is traditionally held that... the site of the monastery and the site of the Minster are likely to be one and the same’ (ibid.). Seven glass vessel sherds were found in five separate contexts, four belonging to phase 4a, dated to the early ninth century and sealed by a hoard of ‘twenty-three coins in c. AD 851, buried in a purse’ (ibid., 5). The fifth context containing glass belonged to phase 5, described as a reoccupation of the site with a ‘new system of land divisions’, dating to c. AD 930-1070 (ibid.). In both periods, the area had an industrial flavour: in phase 4, a weir, fish traps and a building associated with metalworking; in phase 5, ‘timber workshops associated with lead and glass-working debris (?perhaps monastic glazier’s workshop)’ and other hearths and pit suggesting an intensive

Fig. 5.79. Portchester decoration type profile compared to ecclesiastical, emporia and national averages
period of industrial activity (ibid.). The work was published in a monograph in 1991.

Of seven sherds found at Beverley, none are diagnostic. However, it is likely that at least one of the four brown sherds from Beverley came from a globular beaker as it featured very rare red-coloured applied trails, and this colour scheme is unlikely to have featured on any other vessel type. The only other known example of applied red trails is from a blue-green globular beaker sherd from Monkwearmouth. The four brown sherds represent 67% of the coloured sherds from the site (Fig. 5.80), probably reflecting a local concentration of amber and brown glass in the northeast (Chapter 4, Fig. 4.39 and Fig. 4.40) and perhaps a trade connection with York. The other two colours present are deep blue and olive green, with one sherd or 17% of the coloured sherds each. Of these, the deep blue is more interesting, as this colour seems also to be concentrated in the northeast. The decoration present is limited to the one sherd with applied trails mentioned above (Fig. 5.81).

Fig. 5.80. Beverley colour profile compared to ecclesiastical, emporia and national averages
The smallest assemblages (Pevensey, Eynsham Abbey, Shakenoak, Cheddar and Trowbridge)

One Saxon shore fort site other than Portchester is included within the corpus: Pevensey, East Sussex. Only two sherds of vessel glass were found, although fortunately both were diagnostic. The first is a bowl rim (rolled outwards with cavity), and the second a cone beaker body sherd. The bowl sherd is blue-green, while the cone sherd is pale green. Both are decorated with applied trails: opaque yellow on the bowl and vertical self-coloured trails on the cone beaker. Both are sherds from good quality vessels, the bowl typical of the early part of the middle Saxon period and the cone beaker of an even earlier time, so although there are only two sherds present it is possible to observe that in these respects the assemblage is similar to that from Portchester. Perhaps there was a reduction in occupation or status of the shore forts early in the middle Anglo-Saxon period. The presence of a bowl sherd is particularly interesting, as these are unusual generally, forming only 3% of the national corpus.
The Eynsham Abbey site was a minster before a Benedictine monastery was established in AD1005 (Blair 1994, 63). Again, only two sherds were found there, both from globular beakers. One is a pale green globular beaker rim, rolled outwards, with no decoration. The other is a body sherd, also pale green, with self-coloured applied trails. These could be from the same or similar globular beakers, although neither the glass itself nor the contextual records were available for inspection. Nearby in Oxfordshire, at Shakenoak (excavated in 1967-70), two more pale green globular beaker sherds were found. Both have applied white trails that were ‘combed and feathered’, which is rare and means that these sherds are likely to be from the same vessel (for a similar example, see Fig. 5.100). As these two sites are only approximately six miles apart and have both produced evidence of middle Saxon occupation, including very similar vessel glass, it seems very likely that they were connected. The presence of globular beakers in particular at Shakenoak suggests that it was affiliated with the minster estate based at Eynsham: on both sites, the form present is the one that dominates known ecclesiastical assemblages.

Only two sherds were found at Cheddar and unfortunately, neither is diagnostic. Both are pale blue body sherds and have no decoration. As such, they could feasibly be from the same vessel, but close examination would be required to make progress in this area. The main interest value of these sherds is that they are from Cheddar, where a royal palace was established in the ninth century, especially given that no vessel glass was found at the other famous royal site at Yeavering in Northumbria (the publication mentions two fragments in the text, but they are not drawn or catalogued or otherwise mentioned anywhere else) and very little Anglo-Saxon vessel glass is found as far west as Cheddar. Royal centres are regarded as sites of occasional occupation by peripatetic kings and their courts, and Cheddar may have been particularly favoured for hunting. Finds are often sparse because the settlements were only occupied for a few weeks each year. However, it is not possible to connect the sherds with the royal phase at Cheddar reliably either via typological or contextual means. It is worth noting that these sites were excavated in the early
1960s (Cheddar 1960-62; Yeavering 1958-62) – it is possible that more small fragments of glass would have been found today.

Finally, Trowbridge (excavated 1986-8) is the only site in the whole corpus to yield only one sherd, and a high quality and highly decorated one at that. It is a non-diagnostic body sherd decorated with a white and opaque yellow on body coloured reticella trail. This decoration indicates that the sherd is from a globular beaker or bowl, very probably the former. The sherd was found in a ‘Saxo-Norman land surface’, and must be the sole survivor of at least a small-to-medium sized assemblage in use on the site in the middle Anglo-Saxon period. In the Saxo-Norman period, a stone church was constructed and the site developed into a recognizable manorial village. However, the nature of the settlement in the middle Saxon period is more enigmatic. There were several large timber buildings, evidence of metalworking, and other imported goods such as Rhenish lava quernstones, and the animal bone assemblage has an absence of market-age sheep in particular. Much of this is similar to West Heslerton. As the middle Anglo-Saxon settlement at Trowbridge would have been only three miles away from the monastery at Bradford-on-Avon that was founded by AD 705 (Graham and Davies 1993, 142), it seems probable that Trowbridge was also a middle-ranking settlement under the control of an elite site, and in this case, that would probably have been the monastery.

**Conclusion**

This analysis of all the assemblages of Anglo-Saxon vessel glass currently known has revealed new information in two important areas. The first is that such analysis and comparison, particularly with the averages for the site type groups of emporia and documented ecclesiastical sites, can help reveal information about the nature of the glass group and the settlement in question. The second is that it can contribute to identifying local networks of trade and exchange. The important role of the glass vessel form profile in determining the nature of occupation was previously unknown, and will be very useful for future analysis. Emporium assemblages show a strong bias towards the middle and later stages
of the palm-funnel form series and away from globular beakers, while documented ecclesiastical sites are the opposite, dominated by globular beakers and with few or no palm funnel and funnel beakers (Fig. 5.82). It seems that funnel beakers had limited distribution outside the emporia. The situation regarding colour profiles is less clear-cut in relation to site-type, although there are some indicators – for example, deep blue and deep blue-green glass being more common on ecclesiastical sites. However, there is a strong link between deeply coloured glass and the globular beaker form, with ecclesiastical sites often featuring both and emporia neither. Vessel form was probably the primary factor in selection as form has a more direct impact on function than colour or decoration, but it is likely that both were also part of the choice made. For example, in the case of the deep blue-green globular beaker sherds at Jarrow, blue-green globular beakers may even have been a local product, made here because ability and demand coincided. Some vessel glass may have been produced at monasteries as happened at Glastonbury Abbey in the seventh century (Willmott and Welham 2013 and 2015), and if so their output would naturally have been heavily influenced by the nature of demand from the monastic communities, which may have inclined towards the globular form. Meanwhile, decoration type seems to be by far the least useful of the sherd characteristic for indicating site-type.

A key question regarding site type is why do form profiles differ between emporia and ecclesiastical sites? The answer to this may be related to the fact that palm-funnel and funnel beakers were unstable forms, while globular beakers could be placed flat on a table and thus had a wider range of possible uses. According to Gaut, assemblages dominated by the palm-funnel series must be linked to wine consumption, ‘Continental table etiquette’ and a related preference for ‘personal drinking glasses’ (2011, 252, 255). These forms were innovative, whereas the globular beaker form had already been in use for centuries, and echoed the form of vessels such as the Maplewood ‘bottles’ with silver gilt mounts from Sutton Hoo, amongst others. As Gaut says, they ‘can be related to drinking ceremonies that have a root in domestic culture’ (ibid., 255)
and were the culturally conservative choice. However, the globular form is also paralleled by rare silver gilt cups such as those from the Vale of York hoard and Halton Moor in Yorkshire, although the cups are larger, with diameters of 110-120mm (in glass terms the size of bowls). This is interesting because the Vale of York cup has been interpreted as church plate, probably a pyx or ciborium obtained from a monastery in France. It is known from documentary references that glass vessels were sometimes used in churches, as otherwise there would have been no reason for sources to comment against it. The skeuomorphic connection with church plate and the useful feature of a flat base for setting on the altar suggest that globular beakers and bowls are the most likely contemporary glass vessels for such use. This may be another reason why globular beakers were preferred on ecclesiastical sites.

Fig. 5.82. Graphical comparison between a typical ecclesiastical assemblage dominated by globular beakers (left) and a typical emporium assemblage dominated by funnel beakers and palm cups (right)

However, the fact remains that the distinction is there - it can be seen clearly in Fig. 5.82 - and must have had a cause rooted in the planned function or use context of the glass vessels. Applying knowledge of the form profiles typical for both emporia and ecclesiastical sites to the study of assemblages from sites of unknown or disputed status produced a varied picture – they do not all have form profiles similar to the ecclesiastical sites, meaning that the ecclesiastical form profile is specific and not just a ‘non-emporium’ model. The result of analysis of existing assemblages in this category is one site with an emporium-type profile (Butley), three with ecclesiastical profiles (Brandon, Flixborough,
and Portchester) and two that do not match either closely and were probably mid-level estates (West Heslerton and Sedgeford). In particular, it is exciting to find some more evidence that the much-debated settlements at Brandon and Flixborough were both ecclesiastical in nature and probably monastic communities during the periods when most of the glass vessels were bought and used.

It is equally fascinating to observe several localized and probably emporium-centred trade networks as a result of this analysis. In the north-east, it appears that glass bowls probably travelled from York to Flixborough and Whitby, amber or brown glass from York to Flixborough, West Heslerton and Beverley, deep blue-green glass from York to Flixborough, and perhaps also reticella-decorated vessels from York to Flixborough and West Heslerton. Meanwhile, in Suffolk we can see that red glass probably reached both Brandon and Butley from Ipswich, with swirled and black sherds at Brandon and funnel beakers and moulded sherds at Butley probably also moving through Ipswich. Furthermore, it is very likely that the moulded and reticella sherds at Portchester arrived there via nearby Hamwic; and possible that palm cups and deep blue-green glass at Barking came from London. And in addition to the emporia dispersing glass vessels directly to regional elite centres within their sphere, we can see probable candidates for small quantities then travelling on from those centres into the hinterland – West Heslerton and Sedgeford may be examples of this, and it is very likely that the sherds at Shakenoak came from Eynsham and the sherd at Trowbridge from the nearby monastery at Bradford-on-Avon. However, it is important to remember that some monasteries may have been at least occasional producers of vessel glass as well as consumers, and some of the glass may have travelled in the opposite direction to that suggested above. Reliable evidence has recently emerged at Glastonbury Abbey that glass-working kilns and waste excavated there were in use in the seventh centuries and were producing glass vessels specifically (Wilmott and Welham 2013 and 2015). Meanwhile, glass-working waste excavated at Barking in the 1980s may prove to represent similar vessel production in this period but has not yet been
thoroughly analysed and published, and it is also possible that other discoveries will be made.
Photographs of the glass

Fig. 5.83. Y1769, conical base from a blue-green funnel beaker, Southampton City College (SOU1484)

Fig. 5.84. Y117, a flat claw containing a dark brown-black streak, from a pale blue claw beaker, Southampton City College (SOU1484)
Fig. 5.85. W196, sherd with very rare opaque white colour and applied gold foil decoration, Buttermarket, Ipswich.

Fig. 5.86. W191, pale blue-green funnel beaker sherd with applied gold foil decoration, Buttermarket, Ipswich.
Fig. 5.87. W191, pale blue-green funnel beaker sherd with applied gold foil decoration, Buttermarket, Ipswich

Fig. 5.88. W273, pale blue-green body sherd with applied gold foil decoration, Foundation St/Wingfield St, Ipswich
Fig. 5.89. X101, two joining rim sherds from a black globular beaker decorated with horizontal opaque yellow trails, Southampton Street (SOT89), London (Clark 2005, Fig. 6)

Fig. 5.90. X128-X130, pale blue-green vessel fragments, all decorated with horizontal opaque yellow trails, Bruce House (BRU92), London (Clark 2005, fig. 7)
Fig. 5.91. On the left, X154, a blue-green heat-softened rim from a funnel beaker; on the right, X153, a blue-green cavity rim from a palm-funnel series vessel; both from Maiden Lane (MAI86), London.

Fig. 5.92. Clockwise from top left: an olive-green body sherd with a red swirl in the metal and opaque white applied trails (A176); an amber body sherd featuring a moulded ridge across the middle (A158); a pale blue-green cavity rim sherd decorated with horizontal opaque yellow applied trails (A163); and a deep blue-green convex base from a globular beaker, featuring red swirls in the metal (A160). Lyminge. (Photograph courtesy of John Piddock)
Fig. 5.93. A110. Colourless cone beaker fragment with self-coloured horizontal applied trails, Lyminge

Fig. 5.94. A109. Pale green body sherd, Lyminge
Fig. 5.95. A107. Colourless body sherd, Lyminge

Fig. 5.96. A168. Blue-green body sherd from a palm cup, Lyminge
Fig. 5.97. A170. Blue-green body sherd from a palm cup, Lyminge

Fig. 5.98. A167. Pale blue body sherd from a palm cup featuring vertical mould-blown ribbing, Lyminge
Fig. 5.99. A165. Deep blue-green body sherd, Lyminge

Fig. 5.100. D129. Pale green body sherd decorated with opaque white applied trails in an unusual 'combed and looped' pattern, Jarrow (Cramp 2005, Fig. 32.2.4; reproduced by permission of Historic England)
Fig. 5.101. E179. Base of a deep red globular beaker with reticella decoration, Brandon

Fig. 5.102. E139, rim of a black globular beaker with opaque yellow trails, Brandon
Fig. 5.103. E174, brown globular beaker body sherd with opaque yellow reticella trails, Brandon

Fig. 5.104. E167, blue-green globular beaker base with opaque yellow reticella trails, Brandon
Fig. 5.105. E206, bottle fragment with opaque yellow trail, Brandon

Fig. 5.106. E204, bottle fragment, Brandon
Fig. 5.107. E160, deep blue grape beaker body fragment, Brandon

Fig. 5.108. E181 and E182, body fragments with opaque red swirls in the metal and an opaque yellow trail, Brandon
Fig. 5.109. E190, deep blue hollow claw fragment, Brandon

Fig. 5.110. E193, black and solid claw fragment, Brandon
Fig. 5.111. B122, from the base of a blue-green globular beaker featuring a marvered opaque white reticella trail, Flixborough

Fig. 5.112. B109, a rolled-in rim from a deep blue globular beaker decorated with horizontal opaque yellow trails. Flixborough
Fig. 5.113. B121, from the concave base of a blue-green globular beaker, decorated with red swirls in the metal and an opaque yellow on black reticella trail, Flixborough

Fig. 5.114. B119, body sherd from a pale blue-green bowl decorated with opaque yellow trails and half-marvered opaque-yellow reticella trails, Flixborough
Fig. 5.115. B125, fragment from a rare blown applied foot in deep blue-green, decorated with an opaque white trail with a slight red streak, and a fine red streak or marvered trail on the opposite side, Flixborough.

Fig. 5.116. G118. Deep purple solid claw, West Heslerton, in reflected light
Fig. 5.117. G118. Deep purple solid claw, West Heslerton, in transmitted light

Fig. 5.118. G109. Fragment from a hollow blue claw, which is heavily laminated, West Heslerton
Fig. 5.119. G104. Cavity rim fragment from an amber globular beaker, West Heslerton

Fig. 5.120. G108. Amber body fragment from a globular beaker decorated with an opaque yellow reticella trail marvered into the body, West Heslerton
Fig. 5.121. G105. Body sherd from an amber vessel with vertical ribbing, West Heslerton

Fig. 5.122. G114. Deep blue-green body sherd with vertical ribbing, West Heslerton
Fig. 5.123. G115. Pale blue-green body sherd from a palm cup with vertical ribbing, West Heslerton

Fig. 5.124. G107. Cavity rim from a blue-green bowl decorated with horizontal opaque yellow trails, West Heslerton
Fig. 5.125. G102. Body sherd from a blue-green bowl decorated with opaque yellow and self-coloured horizontal reticella trails and an opaque yellow trail, West Heslerton

Fig. 5.126. G101. Rim sherd from a thick olive green cone or bag beaker decorated with horizontal self-coloured trails, West Heslerton
Fig. 5.127. G120. Pale green heat-softened rim sherd from a vessel with horizontal self-coloured trails below the rim, West Heslerton

Fig. 5.128. G117. Pale green heat-softened rim sherd, West Heslerton
Fig. 5.129. G106. Cavity rim from a black vessel featuring horizontal opaque yellow trails, West Heslerton

Fig. 5.130. G113. Body sherd from a turquoise globular beaker with an applied self-coloured trail and a red streak in the metal, West Heslerton
Fig. 5.131. J116, blue-green funnel beaker sherd, Butley

Fig. 5.132. J118, blue-green funnel beaker sherd with self-coloured applied trail, Butley
Fig. 5.133. J124, deep red vessel sherd, Butley, in reflected light

Fig. 5.134. J124, deep red vessel sherd, Butley, transmitted light
Fig. 5.135. J112, deep blue-green vessel sherd with moulded trefoil decoration, Butley

Fig. 5.136. J105, blue-green with mould-blown decoration in a diamond pattern, Butley
Fig. 5.137. J126, olive green vessel sherd with dark green swirls in the metal, Butley

Fig. 5.138. U105. Body sherd from a deep blue globular beaker decorated with opaque yellow trails, Sedgeford

Fig. 5.139. Top row, left to right: U113, a blue-green cavity rim from a palm-funnel series vessel; U105; U111, the base of a pale green funnel beaker; U116, a deep blue-green body sherd. Bottom row, left to
right: U112, a body sherd from a pale green globular beaker with red trails; U102, a body sherd decorated with an opaque white reticella trail; an opaque red rim sherd not included in the corpus (SH05 BYD OT SF1439); U103, a deep blue-green flat claw form. All from Sedgeford

Fig. 5.140. U103, a deep blue-green flat claw form, in transmitted light, Sedgeford

Fig. 5.141. U101, a body sherd from an olive green globular beaker decorated with a black on self-coloured reticella trail, Sedgeford
Chapter 6: Consumption: vessel glass in context

The central function of this chapter is to set the consumption, use and disposal of vessel glass in context, especially at individual site level. An introductory section offers a brief summary of the difficulties of distinguishing monastic settlements from secular ones, and for the first time addresses the topography of sites that have produced vessel glass in eastern England, and the degree of coincidence with a selection of other material culture categories found on the same sites (imported pottery, Ipswich ware, window glass, lava quernstones). A detailed intra-site analysis of the taphonomy of vessel glass distribution on seven case study sites follows: Brandon, Lyminge, Jarrow, Flixborough, West Heslerton, Sedgeford and London. Overall, this chapter addresses who used glass, when, where, why and how?

Minsters or palaces: the site-type debate

In the past, there has been a great deal of debate over the precise nature of enigmatic and undocumented elite sites, such as Brandon (Suffolk) and Flixborough (Lincolnshire). To cite one instance, a number of books and articles have advanced arguments that the middle Anglo-Saxon archaeological discoveries close to St Peter’s Church in Northampton can be interpreted either as a palace or as a minster (Williams 1985; Blair 1996). Vessel glass has been found on the documented ecclesiastical sites at Monkwearmouth and Jarrow (Tyne and Wear), Barking (Essex), Lyminge (Kent) and Whitby (North Yorkshire), at all four emporia and also at a number of undocumented sites. All of the ecclesiastical sites listed above were royal foundations, and some evolved from secular royal (e.g. Lyminge, Kent) or elite (e.g. Flixborough) centres, while other minster sites appear to have made the transition in the other direction from minster to secular estate, or from minster to palace (e.g. Cheddar, Somerset, Blair 1996). Furthermore, the emporia must have operated according to some form of relationship with the kings within each kingdom, and all contained minster churches (Chapter 7, 327-8). Thus, it is unsurprising that the boundary
between secular elite and ecclesiastical is difficult to determine archaeologically.

The key factor regarding vessel glass is that the form profile for emporia is very different to that for documented ecclesiastical sites, and some of the other sites fit much more closely with the ecclesiastical profile than the emporia profile. This suggests that regardless of the precise nature of the non-emporium and their position in the social hierarchy, people in many of these places were undertaking different activities to those living in the emporia, and that this can be partially illustrated by the fact that they were using different types of glass vessels and in different ways.

**Landscape locations of sites with glass vessel assemblages**

Twenty-one of the twenty-three sites on which vessel glass has been found (and 97% of the total national vessel glass corpus for the period in question here) are either coastal or beside a navigable river (Fig. 6.2), with the two exceptions being West Heslerton and Shakenoak, which represent 2.8% of the vessel glass corpus between them (thirty sherds and two sherds respectively). Both are approximately five miles from the nearest river, and West Heslerton is also only five miles from the modern coastline over land. Meanwhile, seven sites are both coastal and beside a river (e.g. *Hamwic*, Ipswich, Jarrow, Butley, Sedgeford, Monkwearmouth and Portchester), and five are beside the confluence of two or more rivers (York, Butley, Barking, Cheddar and Eynsham). Two were virtually or periodically islands (Brandon and Butley). In addition to proximity to water-based trade routes, all twenty-three sites were within a few miles of Roman roads. However, the national distribution of vessel glass by sherd count is focused on the eastern and southeastern seaboard, and that there are many roads inland and to the west with no vessel glass known.

In summary, all of the sites where vessel glass has been found were in locations that are convenient for trade and communication, especially by water,
suggesting that glass vessels were transported mainly by boat. In some cases the locations are strategic from a defensive point of view – the ‘island’ sites and

Fig. 6.1. Sites with Anglo-Saxon vessel glass
the Saxon shore forts at Portchester and Pevensey are good examples. However, in the middle Anglo-Saxon period it is likely that defence was a side issue in comparison to the importance of controlling communication routes and positions of prominence in the landscape, and often simultaneously associating settlements with revered features from the past.
Review of associated imported pottery and other material culture categories

When considering whether the distribution of vessel glass would overlap with other premium or imported goods, it is reasonable to expect that they would to a degree, especially in the case of imported pottery because of a broad similarity of purpose. No close attention has been paid to this previously, and it is useful now to be able to quantify these relationships. In the case of imported pottery, the surprise is the scale of the overlap: 98% of the vessel glass corpus came from sites that also featured imported pottery (Fig. 6.4). Of twenty-three sites, six (or 26%) had no imported pottery, but these are mainly sites with very small glass assemblages: Beverley (seven glass sherds), Cheddar, Eynsham Abbey, and Shakenoak (two glass sherds each), and Trowbridge (only one glass sherd). The largest glass vessel group with no imported pottery association is West Heslerton, which produced thirty vessel glass sherds but no pottery imports. However, the excavator reported one unparalleled glazed sherd of pottery, which in this period is likely to be an import of some kind, and also suggested that the lack otherwise may relate to the abandonment of the

Fig. 6.3. Percentage of vessel glass sites associated with key features in the landscape (blue columns)
site relatively early in the Middle Saxon period (D. Powlesland, pers. comm.). More detailed investigation shows that 94% of the glass corpus is associated with pottery from the Rhineland, and 88% with pottery from northern France. It is interesting to note that fourteen of twenty-three sites (61%) consumed pottery from both regions, and seven of the eight largest glass assemblages are from sites with both Rhenish and French pottery. Jarrow, Sedgeford, Monkwearmouth, Barking and Whitby (five sites or 22%) have only Rhenish pottery, while Butley, Northampton, and Portchester (three sites or 13%) have only French. It is clear that in the Middle Saxon period (eighth and ninth centuries), the distribution of glass vessels overlapped to a great degree with that of imported pottery, and it seems that glass vessels or possibly the materials to make them may have travelled the same trade routes, perhaps alongside wine and other archaeologically invisible commodities. However, the imported pottery cannot prove that glass was travelling from either the Rhineland or France, let alone indicate scale of which may have been the dominant source.

![Fig. 6.4. Percentage of sites and glass vessel sherds associated with imported pottery and other material culture categories](image)

Fig. 6.4. Percentage of sites and glass vessel sherds associated with imported pottery and other material culture categories
Although Ipswich ware was not an international import, it was certainly a regional import, particularly outside Suffolk, so it makes sense to consider the intersection of vessel glass and Ipswich ware on vessel glass sites. Ipswich ware was the only insular middle Saxon pottery ware thrown on a wheel, produced on a large scale and transported long distances, and 90% of the vessel glass is from sites where Ipswich ware was also found. However, more detailed analysis reveals a complex picture of the degree of overlap between the two vessel groups. Firstly, it is important to bear in mind that the significance of Ipswich ware is considerably reduced in its core distribution areas of Suffolk and Norfolk, where it was essentially the local everyday ware (affecting Sedgeford, Brandon, Butley and Ipswich itself). Then there are eight sites out of twenty-three in the corpus (or 35%) with vessel glass but no Ipswich ware: Jarrow, West Heslerton, Monkwearmouth, Portchester, Whitby, Cheddar, Pevensey and Shakenoak. Of these, the latter four have very small vessel glass groups (between two and four sherds each). Regarding the lack of Ipswich ware at West Heslerton, this site may have produced none for the same reason that it has little or no international pottery imports: that the site was abandoned early on the Middle Saxon period and very possibly, before the production of Ipswich ware had expanded sufficiently to enable vessels to travel this far north. Of the remaining three glass sites with no Ipswich ware, it would be fair to describe Monkwearmouth and Jarrow as geographically outside the sphere of influence of Ipswich ware (Blinkhorn 2012, Fig. 36). More significantly, only one sherd of Ipswich ware is known from Hamwic, so both Hamwic and nearby Portchester could be regarded as outside the distribution network for Ipswich ware, whereas more than half the national corpus of vessel glass is from Hamwic. All of this produces an overall impression of a strong degree of overlap between vessel glass and Ipswich ware within the zone of distribution for Ipswich ware along the east coast. However, vessel glass, like imported pottery, travelled further north and west along the south coast to certain key sites – Hamwic and Jarrow in particular.
Once we move on from pottery, which had an association with the consumption of food and drink like glass, in addition to functions such as storage and cooking, then the connections become more complex. Window glass, for example, is worth investigating in this context as it shares production connections - it is made using similar materials and equipment as glass vessels and may well have relied upon the same imported materials or expertise or both. However, the functionality is very different – window glass is an architectural component, and one with a strong correlation with stone buildings and ecclesiastical sites. Despite this, 72% of the vessel glass, or nearly three-quarters, is from sites with window glass as well, although just over half of the sites with vessel glass produced no window glass at all. The largest vessel glass assemblages from sites with no known window glass are from London, York, and West Heslerton, but the remaining eight of the ten largest vessel glass assemblages are all from sites with window glass. It is also highly likely that window glass would have been present at York and London, especially in the area of York Minster, and the absence is probably an absence of evidence rather than evidence of absence. Meanwhile, the only documented ecclesiastical site with no window glass so far is Whitby, but the discovery of only four vessel glass sherds almost certainly reflects the extensive survival and retrieval problems there, which will have affected survival of any window glass originally present too. The connections between vessel glass sites and window glass are not as strong as for imported pottery or Ipswich ware, but are still observable, and would be even clearer if proof were found of window glass at London and York.

Meanwhile, Rhenish lava quernstones may have come from the same region as some of the vessel glass (particularly gold foil decorated sherds and grape beakers, although some scholars have made much broader assertions, e.g. Loveluck 2014, 148; Sode regarding all the glass from Ribe, Denmark, Sode 2004, 88), hence their inclusion in the discussion here. In this case, the figures drop again slightly to 65% of vessel glass coming from sites that also had lava querns and 44% of vessel glass sites also producing the quernstones. Although
these stones were imported, they seem to have been more widely distributed in Anglo-Saxon England than glass vessels, both geographically and across site types. After all, the functionality is very different to glass vessels – quernstones were used for producing vital staple foods and were needed everywhere, although access to them would have been controlled. An effective illustration of this point is that they were found at Eynsham, Pevensey, Shakenoak and Trowbridge – sites with only one or two sherds of vessel glass each, three of which are in the far west of the glass distribution network. Shakenoak and Trowbridge in particular are profiled as small rural farming communities with few other imports.

Finally, we consider the extent to which styli are found on the same sites as glass vessels. Although styli were probably not usually imported as with the majority of other artefact types discussed far, they are similar to glass vessels in the sense that they are very evocative of particular use contexts. Styli are indicative of literacy, the presence of clerks or scribes, and an immediate need to keep records, whether ecclesiastical or secular. They are markers of literacy, which was restricted and concentrated at administrative centres and monastic communities in particular. More than a third of the vessel glass fragments (36%) were found on sites that also produced styli, and nearly half of the sites with vessel glass also have styli (48%). This is the first case where the glass corpus figure is lower than the site figure, due to styli appearing alongside a variety of vessel glass assemblages ranging in size from some of the largest (Hamwic and Brandon) to some of the smallest (Whitby and Eynsham). However, given that vessel glass is unusual and styli even more so, this degree of overlap between the two is still interesting, and perhaps alludes to the association of both artefact types with control of information, commodities and power and speaks about the kind of site on which they are found.

The link with imported pottery is clearly demonstrable, but connections with other types of material culture are more complex. The overall picture that emerges is of glass vessels arriving, usually by water, at a variety of
administrative centres, and then frequently being used alongside imported pottery (and one imagines alcohol) for drinking and dining. This seems to apply even to monastic sites, although at those liturgical functions are possible as well.

**Intra-site consumption of glass: case studies**

The only previous major attempt to study the taphonomy of early medieval vessel glass in Britain is Campbell’s work on western British sites and assemblages (Campbell 2007). His Dinas Powys case study in particular is an excellent example of the potential of such exercises. The data available enabled Campbell to map the distribution of glass vessel fragments across the site, both horizontally and vertically, which led to some very interesting conclusions.

Firstly, the areas of concentration by sherd count and weight are peripheral and are typically areas of refuse disposal (ibid., Fig. 63). Almost all large sherds of over 1g are concentrated in the southeast area (ibid., 93, fig. 63), where a large midden was located. Furthermore, sherd links within the principal midden area in the southeast support the case for use and breakage of at least three separate vessels nearby and within the settlement (G97, G98 and G117, ibid., fig. 64). These vessels also have high proportions of the original rims surviving – 90, 120 and 190 degrees (ibid., 94).

In contrast, small sherds in central areas have extra significance for interpretation of glass use, breakage, and contemporary cleaning practices. Small sherds found in the gullies of Building 2 at Dinas Powys are thought to have been swept there when cleaning took place and missed when flooring materials were removed, as the building areas are otherwise devoid of finds, and the larger sherds of glass were all deposited in peripheral refuse deposits. Campbell suggests that much of the broken glass was removed from occupation areas when organic floor coverings and bedding were discarded and replaced (ibid., 99), with the smaller sherds remaining in crevices. Meanwhile, larger rim and base sherds were probably removed immediately and either
recycled or discarded due to their high nuisance value and the greater quantities of glass for reuse (ibid., 96).

Small-scale craft recycling and production (probably of beads, ibid., 95) is visible, as is the de-selection of the majority of glass that entered the historical record for reuse in this capacity (this was the glass not selected for recycling). Almost all of the fused glass was found in one trench (Cut 18, ibid., fig. 65), and almost all of it is deeply coloured, while 60-80% of deeply coloured glass on the site is fused. These coloured sherds were clearly chosen, while the colourless, pale yellow and opaque white sherds were discarded, and are thus over-represented in the archaeological record.

The Dinas Powys case study demonstrates the potential value of taphonomic studies of early medieval glass assemblages, especially when investigating where and how glass vessels were used, where and how they were discarded, and the effect of selective recycling on the archaeological record. Similar analysis of key glass assemblages from Anglo-Saxon England is long overdue. In most cases the data quality and overall potential for a taphonomic study is not as great as at Dinas Powys. However, seven sites were chosen from within the corpus that had enough information to create worthwhile primary case studies: Brandon, Suffolk; Lyminge, Kent; Jarrow, Northumbria; Flixborough, Lincolnshire; West Heslerton, Yorkshire; Sedgeford, Norfolk; and the Royal Opera House site in London. In the majority of these cases, it was possible to see and handle the glass itself, with the exception of Jarrow, which was relatively well published and significant as the seventh largest assemblage and the second largest from a documented ecclesiastical site. Access to detailed excavation records was equally important, which is why it was not possible to include Butley, even though it is a very interesting assemblage (the tenth largest), and from an enigmatic site, and I had seen the glass and recorded it myself. The case study list spans a range of site types, from known ecclesiastical sites (Lyminge, Jarrow), through probable ones (Brandon, Flixborough), to smaller rural settlements of unknown nature (West Heslerton, Sedgeford) and
to part of an emporium (London). It also includes the third, fourth, sixth, seventh, eighth, ninth and eleventh largest assemblages nationally. Other than Butley (tenth largest), the assemblages with the highest sherd counts that are not covered in this section are Hamwic, Ipswich and York (first, second and fifth respectively). London was chosen as the emporium case study partly because an interesting area of glass distribution within the settlement was available and well documented. Conversely, in the case of Ipswich in particular, both the glass and the relevant paper archives were inaccessible at the time, and it was not possible to see all of either relating to York or Hamwic. I also chose to avoid Hamwic precisely because of its past dominance in the sphere of middle Anglo-Saxon archaeological study – in retrospect the sheer size of the glass assemblage should have been balanced against that, but at the time I wanted to shine the spotlight elsewhere, and particularly on glass from outside the emporia.

These cases studies will be compared with each other, with the available information from other sites within the corpus, especially the emporia, and to the case studies from western Britain.

**Brandon, Suffolk**

The importance of Brandon as a case study for the intra-site distribution of glass is three-fold: firstly, the vessel glass is the third largest site assemblage currently known and the largest not from an emporium at 171 sherds; secondly, the site was not subsequently occupied after the Middle Saxon period, enabling greater preservation of the Anglo-Saxon occupation layers; and thirdly, the location of every sherd found was recorded and mapped, and the map has been published (Fig. 6.5, Tester et al. 2014, Fig. 4.72). It is important to notice at the outset that only the portion of the site under threat from development was excavated, so the majority of the evidence for the settlement still lies underground. The known settlement area comprised 34 post-hole buildings, industrial areas, and a church and related cemetery, all contained within an
island equipped with a stake-lined causeway and timber bridge to higher ground.

Brandon developed from a dispersed settlement in the late seventh to early eighth century (phase 1), to a nucleated settlement of the eighth to ninth centuries (phases 2.1, 2.1.1 and 2.2), and then suddenly declined in the mid to late ninth century (phases 2.3 and 2.4). The most intensive occupation occurred between the early eighth and early ninth centuries (phases 2.1, 2.1.1 and 2.2). During this *floruit*, two consecutive churches, a cemetery, and several series of grand halls were constructed, and all were surrounded by several successive enclosures. The key features of phase 2.3 were the abandonment of the second church on the site, and the climactic rubbish deposition both across the site and in between the latest hall buildings in the mid to late ninth century. The latter is important for studying the vessel glass from the site, as the final rubbish dumps yielded many of the glass sherds found in the occupation area.

A plot of all the glass (Fig. 6.5) shows a marked concentration over the waterfront to the north, and a background scatter across the centre of the excavated area, which was occupied by a range of timber halls. Meanwhile, very few sherds were recovered from the area of the two church buildings in the southeastern quadrant, on the opposite side of the excavated area from the waterfront. The relatively even scatter of glass sherds across the central section of the site matches the general distribution of a number of other find types, and together these probably represent a thin layer of settlement waste across the ground surface, perhaps via spread from middens and possibly around the point of abandonment. However, the loose concentration in the area of the high status buildings is interesting. It bears resemblance to the distribution of horse and cow bone in the same part of the site, suggesting that the find spots are mainly areas of primary deposition of dining waste in the immediate vicinity of the halls. Meanwhile, the strong concentration of glass sherds in the waterfront area is matched by the distribution of Ipswich ware pottery. Overall, the deposits above the waterfront have been interpreted as
refuse dumped over the top of the industrial features, which are thought to have been used for linen and other textile production (Bob Carr, pers. comm.). The fragments there may reflect the deliberate removal of sharp sherds of pottery and glass from the habitation areas where possible, for disposal on the settlement fringe. The glass sherds left behind near to the point of usage (the halls) were perhaps overlooked amongst the food remains. Interestingly, horse and cow bone are largely absent from the waterfront area, so no trouble was taken to remove them. Another potential interpretation of this distribution at Brandon is that some of the glass and pottery at the waterfront were vessels broken during delivery or even export, although the assemblages seem large for this to be the sole explanation for their presence and would represent a great deal of broken stock. Furthermore, although there are some sherd links, there are not as many as one might expect with this scenario.

sixteen sherds from this vessel are easy to recognize because of the distinctive colour (e.g. E179, Fig. 5.101), but even in this case probably less than a third of the original vessel is present. However, the survival of multiple sherds from individual vessels is more in evidence at Brandon than at most of the other sites that have produced vessel glass from Anglo-Saxon England, and they present a rare opportunity to discuss vessel sherd scatters across the settlement.

An interesting pair of sherds appear right on the southern edge of the site, at the opposite end of the excavated area from the concentration of vessel glass by the waterfront, and also isolated from the loose scatter in the area of the central range of buildings. The sherds have the unusual decorative scheme of ‘black’ glass and opaque yellow trails and are very likely to be from the same vessel even though they do not actually join. They were found near to building 2921 in contexts dated to phase 2.3 (Fig. 6.6), or the mid-to late ninth century. It seems very likely given the circumstances, that these were deposited very close to where they were used and broken – probably in the only building in the vicinity. By this stage, the cemetery had moved to the northern half of the
site, and there were only two buildings to the south of the boundary ditch. 2921 is the more complex of the two, with two sections. These sherds were among a proportion of the vessel glass assemblage deposited in ‘climax’ refuse deposits, laid down just before the settlement was suddenly abandoned. Perhaps this is why they are close to buildings - these dumps might have been moved elsewhere at a later date if the site had not been deserted shortly afterwards.

Meanwhile, two pairs of sherds came from the phase 2.2 (mid eighth to early ninth century) halls enclosure in the centre of the excavated area (Fig. 6.6): two
rare grape beaker sherds (E115; E160, Fig. 5.107) and two pale green sherds with white decoration in a distinctive combed arcaded pattern (E126 and E127). It is difficult to pin down the exact relationships of the find spots within the features based on records currently available, but in both cases one sherd is within or just outside the wall of a hall, while the other is within the same area, but slightly further away. Both cases suggest use of these rare vessels within the halls, probably alongside the imported pottery that was found in the enclosure but virtually nowhere else (Blinkhorn, 2014) and the deposits of large animal bones. The image that this presents of activity on the site in second half of the eighth and early ninth centuries is compelling.

In addition, a set of four sherds from a vessel of green metal containing deep red swirls were found in the waterfront area (Fig. 6.6), scattered along a 25 metre stretch spanning most of the shoreline (E179, E181, E182 and E183, Fig. 5.108). However, it is only in the case of four sherds from a black globular beaker with opaque yellow trails that we can see evidence of a direct link between the halls enclosure to the waterfront. One sherd was found just to the east of the phase 2.2 and phase 2.3 buildings in the centre of the site, and the other three were located at the waterfront, in an area spanning approximately 60 metres squared. Thus far, only one pottery sherd link demonstrates the same transfer from one area to the other (Blinkhorn 2014), so the evidence for such movement of material is scant, but valuable. Indeed, analysis of the pottery has demonstrated clearly that refuse was first dumped on middens in a single event, and then disposed of more permanently away from the settlement area. Only that disposed of on site was found during the excavation, and the proportions of pots present suggest that most was moved further away (ibid.). The waterfront was the only area of the site with significant stratigraphy, with seven phases of deposition identified (1.2, 2, 2.1.1, 2.2, 2.3, 2.3.1, 2.4) spanning the entire period of Anglo-Saxon settlement on the site. This produces a rare opportunity for phase-by-phase analysis of the glass sherds, producing results that are both expected and unexpected.
Fig. 6.6. Edited phase maps illustrating the principle features of each phase of the Anglo-Saxon settlement (after Tester et al. 2014, Fig. 2.2)
As might be expected, globular beaker sherds are numerous throughout the phases, but bowl sherds only appear in phases 1.2 and 2.1.1 (one in each – contexts 4891 and 5097 respectively) and not in later phases. Phase 2.1.1 is a single layer in the waterfront area, dating to the second quarter of the eighth century, and overlying a backfilled ditch of the seventh century. Therefore, a glass bowl or bowls were in use on the site at the very turning point when the character and scale of the settlement changed dramatically from dispersed to nucleated. Initial information suggests that the stratigraphy is secure, which may mean that the bowl sherd found in the late seventh century context (phase 1.2) is an early example of its kind. The alternative is that the dating of the context and phase is moved to the turn of the eighth century. Meanwhile, there is no evidence of palm cup or funnel beaker sherds until two sherds appear in phase 2.3 (E103 and E105) – while the earlier short palm cup forms are completely absent from the settlement. Therefore, the case of the palm-funnel form series is completely the opposite to that of bowls – funnel beakers only appear during the final flourishing of this community, prior to its collapse. Taken together with the stratigraphic distribution of bowl sherds, this may illustrate on a small scale a change in either the use of glass on the site, or perhaps in the availability of different vessel types to the site over time. Bowls were used at the very beginning of the nucleated Middle Saxon settlement, and funnel beakers at the end, while globular beakers seem to have been used continually, and were been deposited in all phases.

The stratigraphic relationships of some of the claw beaker sherds are more surprising. A flat, black-streaked and typologically eighth-century claw was found in a phase 1.2 context (E201), a phase of the site dated to the late seventh century. This means that either the sherd is intrusive, or the phase dating is incorrect, or the glass typology needs adjustment. In addition, a flat black claw was found in phase 2.3.1 (E203), and a blown olive-green claw in phase 2.4 (E191) dated to the mid-to-late ninth century. Current theory states that blown claws are generally earlier in date than flat claws, and that the stylistic progression was from blown to flat. However the find spots of these
Brandon sherds mean that either flat claws appear earlier and blown claws later than previously thought, and perhaps both types overlap for longer, or that one of the earliest sherds in the Brandon assemblage from a typological perspective has somehow reached the latest deposition layer in the waterfront area and vice versa. This could have happened due to some truncation of the stratigraphy or considerable movement of refuse around the site prior to successive dumps in the waterfront area. Meanwhile, if we accept the existing dating of the phases and the deposition of all of the claw beaker sherds as contemporary with their contexts, then these sherds show at least intermittent use of claw beakers within the settlement at Brandon, with definite examples both at the turn of the eighth century and in the mid and later ninth century, with a gap of a century and a half in between. In a way, this illustrates how little we know about the typology, dating and use of claw beakers after the end of furnished burials in Anglo-Saxon England. Even the very forms of the complete vessels in the Middle and Late Anglo-Saxon periods is unknown, although Evison has suggested that some may have been globular rather than beaker-shaped by the later Saxon period, based on a complete vessel found at St Denis in Paris (Evison 2000, 83). The evidence from Brandon is an indication that our knowledge of claw beakers and their development is increasing little by little, and that our overall understanding is likely to change as new evidence emerges.

**Lyminge, Kent**

Between 2012 and 2015 spectacular evidence emerged of Lyminge as a royal vill in early Anglo-Saxon period (the sixth and early seventh centuries). However, we will focus on the middle Anglo-Saxon (eighth and ninth century) monastic phase and area of occupation, and the vessel glass found there (Fig. 6.7; Thomas 2013, fig. 1; Broadley 2011 and forthcoming). In 2009, the area neighbouring both the modern churchyard and the Anglo-Saxon ecclesiastical precinct was excavated (Fig. 6.8). Although bisected by a large medieval ditch, Anglo-Saxon boundary ditches, post holes and pits survived in abundance. The area to the south of a major Anglo-Saxon boundary ditch has been identified as
an inner domestic zone. Meanwhile, the areas further south and southeast and further away from the church (excavated in 2008) were used for agricultural processing and light industrial activity. The most interesting glass from a contextual point of view is the few sherds found within the ‘domestic habitation sector’, where posthole arrangements consistent with individual cells have been identified. Three sherds of vessel glass came from the fills of three separate pits in this area (A161, A162, and A166). These comprise three very small fragments: a very pale green sherd with a fire-rounded edge, probably from the rim of an unidentifiable vessel type (A161, length 12.7mm, thickness 2.6mm); a cavity rim of blue-green glass with opaque yellow trails sealed within the fold, from a bowl or globular beaker (A162, length 8.3mm, thickness 4.9mm); and an undecorated blue-green body sherd (A166, length 15.1mm, thickness 2mm). These represent three separate vessels, probably used and broken in the immediate area, as the pits appear to have been latrine and refuse pits for primary deposition. The cavity rim sherd in particular is an indication of the presence and use of high quality decorated glassware here.

![Fig. 6.7. Map showing the spatial relationships of the test pits and trenches excavated in 2007-2009 (by permission of Gabor Thomas, University of Reading)](image-url)
Additionally, three vessel sherds (A160, A167 and A168) came from the fill of two major Anglo-Saxon boundary ditches on the northern edge of the domestic zone, dividing it from the ecclesiastical area. It seems that the domestic occupation gradually encroached on these boundaries, as they were filled in towards the end of their periods of use (ibid. 131). It is immediately obvious that the sherds from the ditches are larger and generally thicker than the first group, which follows the pattern seen at Dinas Powys and elsewhere, in which ‘nuisance’ sherds are more likely to be removed further from living areas. One is a thick conical concave base from a deep blue-green globular beaker with red swirls in the metal of the vessel (A160, length 34.6mm, thickness 6mm; Fig. 5.92). The second is a relatively large and thick body sherd from a pale blue vertically ribbed beaker (A167, length 25.9mm, thickness 1.8mm), and the third is an extremely thick blue-green sherd with a very broad self-coloured trail (A168, length 15.1mm, thickness 9mm). As with the occupation area group, these appear to represent three different vessels typologically. However, this time, A160 and A167 are compositionally very similar, meaning that they are from the same vessel or set (Pair D, see Chapter 5 and CD). All are distinct from the three vessels represented in the first group, making a total of five or six unique vessels from this area of the settlement. The ditch sherds indicate a globular beaker (A160), a ribbed beaker of unknown form (A167) and a cruder vessel of unknown form (which may even have been from a lamp form or unorthodox window setting; A168). The first two and the cavity rim sherd from the occupation area (A162) show that a diverse range of well-made and detailed glassware was in use in the domestic zone.

Meanwhile, a total of five vessel glass sherds were found within the ‘extra-mural’ agricultural processing and light industrial zone. Of these, only one (A179) was found in 2008 Trench One (Fig. 6.10). This sherd is very thick green glass, and is probably from a vessel base warped and pitted by heat damage, which severely hampers identification. The major feature of this trench was a structure interpreted as a granary, which would have been used in the management of agricultural surplus (Thomas 2013, 131) - one of the major
economic activities in the area. However, the find spots of the vessel glass sherds are all some distance away from the granary in locations that are peripheral to all evidence of activity on the site. This observation regarding peripheral find spots also applies to the sherds from 2008 Trench 2 (Fig. 6.10), comprising two unidentifiable blue-green chips (A173 and A174), an olive green body sherd with opaque white applied trails and a red streak in the vessel wall (A176), and a blue green body sherd of high clarity but no decoration (A178). The latter two are probably from globular beakers, albeit clearly two different vessels, thus providing further evidence for possession and use of globular beakers within the Middle Saxon settlement. Interestingly, two sherds very similar to A176 were found during the excavation of Test Pit 8 in 2007 (A185 and A186) – olive green with opaque white trails – and as the test pit was dug over the same area in which sherd A176 was later found it seems likely that

Fig. 6.8. Plan of 2009 trench at Lyminge (by permission of Gabor Thomas, University of Reading)
these two sherds were from the same vessel and were probably deposited in the same pit.

Other than the cavity rim sherd found in the occupation area (A162), which could have come from a globular beaker but is more probably from a bowl, all of the identifiable vessels from the eighth- and ninth-century monastic community are globular beakers, some of which were high quality. However, the most fascinating information to emerge from this contextual study of the vessel glass from the Middle Saxon settlement area at Lyminge is that there is sound evidence for the use of glass vessels of quality within an area of domestic occupation characterized by ‘diminutive rectangular timber halls’ and ‘zoned

Fig. 6.9. Plan of 2008 trench one at Lyminge (by permission of Gabor Thomas, University of Reading)
pit clusters used for managed disposal of... domestic refuse’ (Thomas 2013, 131). It is not possible to prove the exact nature of the relationship between the halls and the pit clusters stratigraphically, but the spatial and contextual evidence strongly supports a primary relationship (Gabor Thomas, pers. comm.). The pits are arranged in clusters around the buildings, and contain refuse that is overwhelmingly domestic in character (kitchen refuse and interior fitting such as hinges and keys). Further examination of the detail may be possible in advance of future publications. Meanwhile the remainder of the vessel glass sherds were found some distance away on the far edge of the excavated area, clearly representing secondary deposition of refuse. Pair B and C (recycled Roman glass) both show different depositional outcomes for sherds from the same batch of glass – either the same vessel or matching sets. Either multiple contemporary disposal areas, or primary and secondary deposition, or changing deposition areas over time. Possible movement of glass from habitation area to periphery is shown by pair C (2009 pit c1467 and 2008 T2 Pit C151) and from the middle Saxon settlement area to Tayne Field by pair B
(uppermost fill of 2009 pit C1048, and fill of 2012 pit C3825). Another indicator of middle Saxon glass ending up on Tayne Field is a sherd decorated with gold foil (SF130095) found in a Saxo-Norman ditch fill (C6427).

**Jarrow**

48% of the vessel glass found at Jarrow came from one context – 2018 – one of the layers of flooring in Building D (Fig. 6.11 and 6.12). This context assemblage contains thirty-eight sherds, which is astonishing, and acts as a reminder that our knowledge of glass use on a site may depend to a great extent on the survival of just one patch of flooring or rubbish pit. At least five other contexts within Building D contained vessel glass, totaling ten sherds to add to the thirty-eight from context 2018. This means that more than 60% of the Jarrow vessel glass came from within this structure, and very unusually, from a context close to the use of the vessels. Adjoining Building D were two structures interpreted as workshops, and these seem to have produced approximately eight sherds, or 10% of the site assemblage, from four contexts. This means that the proportion of vessel glass found within this range of buildings on the southeastern fringe of the settlement is above 70%.

This area on the south-eastern edge of the site, at the foot of the slope leading down to the River Don, is the only area of the site to preserve undisturbed Anglo-Saxon stratigraphy in quantity (Cramp 2005, 219), and this is likely to have been an important factor in the distribution of the surviving vessel glass. Building D had stone walls, was sub-divided inside, and had compacted clay floor in some areas and evidence of flagstones in others (ibid., 223-4). It seems clear that the eastern end comprised a series of workshops, but identifying the function of the remainder of the building has challenged archaeologists since the excavation. Complications abound, as the building was subjected to an intense fire during the Anglo-Saxon period, the whole southern wall was destroyed by a modern wall, and in a typical scenario many archaeologists will
Fig. 6.1. Plan of buildings laid over trench locations at Jarrow (Cramp 2005, Fig. 13.3; reproduced by permission of Historic England)

Fig. 6.12. Plan of Anglo-Saxon features at Jarrow, southern half including Building D (Cramp 2005, Fig. 16.5; reproduced by permission of Historic England)
recognize, the key contexts for glass were excavated right at the end of a season when time was short (Cramp, pers.comm.). The building was initially interpreted as a well-appointed guesthouse (Cramp 1975, 88), and a domestic function for part of the life of the building can still be supported (Cramp 2005, 224), based on the painted wall plaster, stone window surrounds, and the understanding that the window glass came from in situ glazed windows that fell inwards either during the fire or when the north wall collapsed. Given that many of the vessel glass sherds were interspersed with the window glass sherds in the floor surface, it is reasonable to state that if this window glass was in use within the building and was deposited when the building was damaged, then the same applies to the vessel glass in close association with it. Furthermore, many of the glass fragments were found in inaccessible locations within a linear cavity covered with stone slabs, as illustrated by a plan of window glass distribution (Fig. 6.13; Cramp 2005, Fig. 16.60), which supports the case for their loss during vessel use rather than during recycling of fragments. However, there is also evidence for glass working in this area (ibid.; Mills and Cramp with Bayley, 2006; Cramp 2006, Fig. 35.3.1 and 479-480), so was this industrial function subsequent to the domestic use of the building, and did the glassworkers reuse some of the previously discarded glass that was in situ? Dating of the vessel and window glass and of the context deposits more broadly places

Fig. 6.13. Distribution of Anglo-Saxon window glass in Building D, Jarrow (Cramp 2005, Fig. 16.60; reproduced by permission of Historic England)
the use of the complete glass vessels in the late seventh and eighth centuries, and the glass working in the ninth (Rosemary Cramp, pers. comm.). Perhaps the ready supply of raw materials was the reason why manufacture of millefiori rods was undertaken in the first place, or at least why it was done in this location. It certainly appears that area in which the glass was heavily concentrated was raked over for window leading and glass to recycle (ibid.).

Overall, the distribution at Jarrow appears similar to the context in which the majority of the vessel glass at Barking Abbey in Essex was found. At Barking, the main buildings excavated were aligned east-west, and one end of the row was built over a leat, although most of the vessel glass was found in the neighbouring section. These have been interpreted as workshops supplying the Abbey, or rather the Anglo-Saxon nunnery that preceded it (MacGowan 1996). Glass working evidence was also found here, and forms part of the case for the suggested workshop function for these buildings. It is possible that the buildings at Barking had a similarly complex history involving a shift from domestic to light industrial use, and that the latter obscured the former. Further exploration of this possible parallel would be very interesting, although the state of the Barking records and absence of full publication would be a major hindrance.

At Barking the central monastic complex has not yet been found, and at Lyminge it has not been possible to excavate closer to it, but the centre was found and excavated at Jarrow, which makes the few sherds of vessel glass known to have been found there of prime importance (nearly 30%). Unfortunately, the exact locations in which many of the other sherds were discovered are not traceable via published record. However, it is extremely interesting that two sherds came from in or near to Building A (D178 and D179) and one from near Building B (D171). Building A is interpreted as the monastic refectory, and was certainly the largest stone building on site and equipped with glazed windows, stone sculpture, and opus signinum flooring throughout (Fig. 6.14, Cramp 2005, 189, 192-4). Building B stood next to Building A and on
the same alignment. These are the only other locations in which vessel glass was definitely found, suggesting them as other locations in which glass vessels were used, although they survived on a much smaller scale.

Fig. 6.14. Distribution of Anglo-Saxon window glass in Building A, Jarrow (Cramp 2005, Fig. 16.35; reproduced by permission of Historic England)

A survey of the typological nature of the Building D assemblage reveals that all identifiable vessels were globular beakers, with the important exception of three sherds from an extremely rare bottle in deep blue-green glass. Although much of the glass was from the natural blue-green spectrum as one would expect, the number of deep blue sherds is noticeable, alongside significant numbers of deep blue-green and red-black sherds. It is possible that the range of glass colours and forms was affected by post-depositional factors, such as later collection of viable sherds for recycling. However, this would contrast with Dinas Powys, for example, where the glass selected and retained for recycling was almost exclusively deeply coloured (Campbell 2007, 95). There is also a distinct possibility that the characteristics of the assemblage reflects the objects originally used relatively accurately, and the dominance of blue-green glass may support this. The vision of monastery guests staying in a well-
appointed guesthouse at the entrance to the monastic enclosure, and drinking wine poured from a turquoise bottle (D112-D114) into deep blue globular beakers (D102-D111) is seductive. However, a detailed review of all of the archaeology from Building D would be necessary to develop robust conclusions regarding the function of the building and how the glass came to be there.

**Flixborough**

‘What makes the site [of Flixborough] truly exceptional is the preservation of large quantities of artefacts’ (Hamerow 2011, 124). The summary for the monograph on the artefacts also emphasizes the variety and implications of the 10000-plus site assemblage, providing a rare ‘window onto the daily life of people living at an important rural settlement, between the seventh and eleventh centuries AD’ (Evans and Loveluck 2009, xviii). As with Jarrow, the first striking feature of the distribution of vessel glass assemblage from Flixborough is that a significant proportion of the sherds came from a single context. 16 of the 71 sherds were found in context 3758 (Fig. 6.15), which represents 23% of the total assemblage. However, the vast majority (83%) of the contexts containing glass yielded only one sherd each. Therefore, the 3758 context assemblage and its position within the features and chronology of the site is very significant. The context itself is one of a series of large refuse deposits placed in the small valley at the centre of the excavated area. The deposit dates to the early to mid-ninth century, and contains both residual and potentially contemporary vessel glass and imported pottery (Loveluck 2007, 15). Also found were imported sceattas minted in the early to mid-eighth century, local pottery, a late eighth- or early ninth-century gilt-silver disc brooch, and the large quantities of animal bone and weaving debris that were the defining characteristics of the context (ibid., 14). This large refuse deposit, and others close by, may represent the demolition of all contemporary buildings within the excavated area in the mid ninth century (ibid., 26), with the implication that those buildings were the use context for the glass vessels. Results of analysis of the context led the excavator to conclude that the huge volume of loom
weights and animal bone within were deposited at around the time of their use, ‘between the early and middle decades of the ninth century’ (ibid., 27), and that the same could apply to most of the glass

Fig. 6.15. Period 4, phase 4ii, mid ninth century (Loveluck and Atkinson 2007, Fig. 5.7), showing context 3758 in the centre, and also Building 3, with its central hearth

and the imported pottery. It is possible that the extensive ash and charcoal inclusions represent clearance of domestic hearths within the buildings that were demolished - two sherds were apparently found within in situ hearth deposits elsewhere on the site (see below).

Context 3758 contained three rim sherds, five base sherds, one reticella sherd and seven other body sherds. The base sherds all join each other, and are from the base of a tall palm cup, but other than these there is very little commonality within the group. The three rims are all of different types; there are four unique
decoration types and the two sherds with yellow trails have different body colours (brown and dark green), while the two globular sherds are also different colours (light green-blue and brown). Twelve of the sixteen sherds are within the blue-green spectrum, but there are also one of each of the following colours: black, brown, dark green and colourless. There are probably at least two globular beakers (B128, B133), one reticella bowl (B119; Fig. 5.114) and one tall palm cup present (e.g. B103-B105), but from the diverse colours and decoration, it seems likely that twelve vessels are represented, with five of the sherds coming from one tall palm cup, but all of the others coming from different vessels. The presence of so many sherds from one vessel supports the use of the glass vessels nearby in the settlement, and the interpretation above that the refuse in this hollow had not been extensively re-worked. Meanwhile, the diverse nature of the rest of the context group indicates the presence of a wide variety of glass vessels on the site.

The next most significant context in terms of sherd numbers is 6300, which contained six sherds, followed by 2562 and 5319, which contained three each. The 6300 context was also a refuse context and dated to the mid tenth to early eleventh centuries, and was characterized as being of a very mixed nature as it featured residual artefacts, including the vessel glass, as well as contemporary tenth-century and intrusive material. The glass dates to the first half of the ninth century on typological grounds, and we know it represents redeposited refuse as three of the bowl sherds are from the same vessel as a sherd found in an earlier context of late ninth century date (Loveluck and Atkinson 2007, 108). This chance information provides an important lesson: redeposition of refuse may well have complicated the picture at other sites as well (e.g. Brandon). The 6300 glass is very different from the larger 3758 group as there may only be six sherds, but they are much more homogenous in colour and decoration. All are within the blue-green spectrum, and five of the six (including the three from the same vessel mentioned above) are from the same vessel type - bowls decorated with applied opaque yellow trails around the rim, and then opaque yellow on blue-green reticella trails below. The remaining sherd is
distinct as the reticella trail is black and yellow, and the metal of the body contains red streaks (B121, Fig. 5113) – the original vessel was probably a globular beaker.

Overall, there is a clear theme of deposition in large refuse dumps in the shallow valley in the centre of the site, frequently alongside or in between buildings. The published data indicates that at least 80% of glass sherds were found in this type of context, including almost all glass found in groups, with the exception of the two related sherds found in post hole 8708. Vessel glass sherds were deposited in rubbish dumps within the settlement over a long period - in Flixborough periods 3, 4, 5 and 6, from the mid eighth to early eleventh centuries. Much of this material appears to have been redeposited, with most originally discarded in the eighth century or the early ninth century (based on typological dating and associations such as the four bowl sherds mentioned above). On the same basis, it seems likely that the majority, if not all, glass in refuse deposits dating from the late ninth century onwards is residual. This makes the few sherds not from typical rubbish dumps particularly important, and can lend the greatest significance to the smallest and most physically non-descript sherds.

Examples include two sherds from different post holes belonging to building 16 (phase 1, Loveluck and Atkinson 2007, 53, 55), one sherd each from a floor deposit and post hole from building 6 (Flixborough period 2, late seventh to early eighth century), and two sherds from a post hole from building 9 (Flixborough period 3biv-3bv, mid eighth to early ninth century). The two sherds from building 9 match and must be from the same vessel, as they are both deep blue with white decoration, which is an unusual colour scheme (Evison 2007, 105). In period 4 (mid ninth century), fragments were recovered from within buildings 3 (Fig. 6.15 and 6.16; Loveluck 2007, 26) and 10 (a filled in foundation trench of building 10a, Fig. 6.15; ibid., 45). Finally, one sherd is from a post hole from building 14 (ibid., 94), and one is from a post hole belonging to building 36 or 37 (ibid., 86), all of phase 5b, or late ninth to early
tenth century. However, as the latter two sherds and contexts show, it can be
difficult to connect even artefacts from post hole fill contexts with the relevant
building, as they may enter during construction or after demolition, or from
post-demolition levelling deposits from elsewhere on the site. These two
sherds are almost certainly residual (the contexts are late ninth to early tenth
century and the glass is typologically approximately a century earlier).

Perhaps most interestingly, two possible hearth contexts produced one tiny
sherd each: one from the ash deposit of hearth 466 within building 3 (Loveluck
and Atkinson 2007, Fig. 6.16, 70) and one from above the fired clay hearth base
1671 within building 26 (Fig. 6.17; Loveluck and Atkinson 2007, 83-4). Also, the
site publication comments that glass fragments from the deposits interpreted
as floor surfaces at the eastern end of building 1a ‘help to confirm dining and
residential use for part of the building’s history’ (Loveluck 2007, 43).
Unfortunately, contemporary floor surfaces were absent from all buildings
apart from buildings 1b and 2, and the interpretation even of those as original
floor surfaces is open to question. However, these sherds and the locations in
which they were found are still the most interesting within the Flixborough
assemblage, as they are micro-refuse (the tiniest debris that accumulates over
time in habitation areas, and is not removed due to its size). In other words,
there is still a good chance that they represent use and breakage of the original
vessels within these buildings, exactly as seen at Dinas Powys and Longbury
Bank, both on the coast of south Wales (Campbell 2007, 94, 97-9, Fig. 63; 104).
Campbell explains: ‘almost all the distinctive finds will have been removed from
the main areas of occupation on these sites, with the original positions of
activity areas being indicated by “ghost distributions” of material fortunately
captured in hollows or too small to be swept away’ (ibid., 104).
Fig. 6.16. Plan of building 3, with hearth context 466 in the centre, Period 4, Phase 4i, early to mid-ninth century (Loveluck and Atkinson 2007, Fig. 5.2)

The few sherds recovered from within buildings were all confined to the eighth century (Loveluck 2007, 148). This corresponds with patterns amongst other artefact groups, the faunal remains and standing structures, indicating that there was a substantial shift in the nature of the settlement in the mid ninth century. The vessel glass in secure contexts is all clearly linked to the earlier phase, characterized by large-scale evidence for secular aristocratic occupation and activities, when Flixborough ‘was a rich and important place’ (Blair 2011a, 105). The glass vessels and animal bone profile are the most prominent components (the animal bone assemblage for the period is dominated by bone from large cattle and from wild game). Meanwhile, it is equally interesting to observe that there is little evidence for the presence of glass vessels in the subsequent phase, identified as a smaller-scale estate centre with an ecclesiastical profile (Loveluck 2007, 154-5).
Finally, as at Brandon, it is important to understand that the excavated area probably represents a small proportion of the overall settlement area, as illustrated by crop marks and the results of various surveys, and therefore the overall size of the area that has been scheduled (Loveluck and Atkinson 2007, Fig. 2.17). Differences between the contents of the valley rubbish dumps and the fill of the nearby ditch suggest ‘a much larger complex with internal zoning’ (Blair 2011a, 105). Blair argued later in the same paper that waste from a residential area to the east had been deposited onto a peripheral industrial zone (ibid., 102), which is exactly what appears to have happened at Brandon. Again, we must be aware that we are only viewing a section of the settlement via the medium of the archaeological record, and that we have ‘absolutely no idea what the main settlement looked like’ (ibid.). Were any future excavation to take place in the area, the picture of glass use on the site and the nature of the settlement might change.
West Heslerton, Yorkshire

In keeping with the emerging pattern for Middle Anglo-Saxon settlement sites, most of the vessel glass contexts on this site represent the locations for disposal of domestic refuse rather than the locations where the vessels were actually used and broken (Broadley 2014). Six sherds are from the fills of grūbenhauser, six from ditch fills, one from a pit fill, and the remaining seventeen from a spits or layers (Dominic Powlesland, pers. comm.). All are from the settlement area shown in the lower section of Fig. 6.18, below the associated cemetery, and in Fig. 6.19. The layers were thin and present across open areas within the settlement, which probably received material through spread from over ground middens (ibid.). No sherds were associated with floors or primary domestic deposits (ibid.). The near-absence of glass from pit-fill supports the interpretation that an alternative mechanism for waste disposal was in use here. The evidence suggests that primary disposal was in over-ground middens and that the number of surrounding ditches and abandoned grūbenhauser were sufficient for some secondary deposition of this type of waste without the need for pits (ibid.). It is also possible that some refuse was dumped further away from the settlement and outside the limits of the excavation.

The vessel glass was found most frequently alongside other dining waste—animal bone and pottery fragments in particular. However, a few of the contexts contained more varied assemblages—for example, the deep purple-pink claw fragment was found in a spit containing a high finds density, which also included a middle Anglo-Saxon bronze pin, a glass bead and a lump of amber (G118, Figs. 5.116 and 5.117). In another example, the two amber trailed sherds found in the fill of the same grūbenhaus (G119 and G125) were alongside a copper alloy strap-end, bone comb and pin fragments, and iron nails, as well as pottery and animal bone (Fig. 6.19).
Fig. 6.18. Plan of the West Heslerton settlement and associated cemetery (Haughton and Powlesland 1999, Fig. 4)
Fig. 6.19. Plan of the West Heslerton settlement, showing vessel glass distribution across occupation area (blue), craft/industrial area (green), and ‘multi-functional area’ (purple) (after Haughton and Powlesland 1999, Fig. 4)

Three distinctive sherds of blue glass, one of which is claw shaped and the others decorated with applied trails (G109, G110 and G111; Fig. 5.118), form a very tight group when plotted on the site plan (Fig. 6.19). Two were found in the fill of a single grübenhaus and the third in the fill of a nearby post-settlement field boundary on the western edge of the settlement, which was cut through an area that appeared to have held many midden deposits. This strengthens the typological case that these sherds are all from one blue claw beaker, and indicates that the vessel was probably in use and broken nearby. These sherds were located in the northwestern area of the site interpreted as the ‘craft and industrial zone’, along with two amber sherds with self-coloured
applied trails (G119 and G125), which may have originally belonged to a single globular beaker (Fig. 6.19). Both amber sherds were found in the fill of the same *grübenhaus*, meaning the same conclusion regarding local use and deposition applies.

In addition to the five discussed above, two other very small sherds were found in the northern section of the site: a turquoise sherd also from the craft and industrial zone (G124), and one tiny pale green rim sherd from the fill of a *grübenhaus* in the housing area (G120) (Fig. 6.19). This dearth of glass finds in the main occupation area corresponds with a pattern emerging from taphonomic studies on other sites, particularly the work of Ewan Campbell (Campbell 2007), who shows effectively that habitation spaces were carefully cleaned. The principal scatter of glass on the site was found across the ‘multi-functional area’ (a term coined by the excavator, Dominic Powlesland) to the south and south-west (Fig. 6.19), perhaps from a layer of refuse deposited over a relatively large area, as seen at Brandon. Sherds found here include all three Valsgärde bowl fragments (e.g. G102, Fig. 5.125; G107, Fig. 5.124), which form a loose group in the southwestern corner of the multi-functional area. The function of the area and the nature of contexts there may become clearer once the current programme of post-excavation research has concluded.

The intra-site distribution of this glass is typical of contemporary assemblages in the sense that almost all the glass was associated with other domestic refuse and found in contexts consistent with this. There is very little glass within the main occupation area (Fig. 6.19), also echoing patterns identified by previous distributional studies, which showed that areas of habitation were kept scrupulously clean, perhaps especially where items that would have been sharp when recently broken (e.g. Campbell 2007, 92-101). Meanwhile, the majority of sherds were found in the multi-functional area to the south and south-west, while a significant group came from the craft and industrial zone to the north-west, which is reminiscent of Brandon and Flixborough in particular. However, perhaps the most interesting aspect of the distribution of vessel glass at West
Heslerton is the interpretation that the primary deposition of the glass was in surface middens, which later contributed material to layers, grübenhäuser and ditch fills. This is a process that may well have occurred at other sites in this period, but is perhaps more visible here than elsewhere.

**Sedgeford, Norfolk**

Detailed interpretation of stratigraphy and distribution at Sedgeford is challenging, due in part to the complexity of the site and local geographic processes, in particular the role of active colluvium transporting and churning artefacts from numerous features in the Boneyard area (Fig. 6.20 and Fig. 6.21). Another factor is that the project is ongoing and open-ended, and all information available is provisional in nature. So far, contextual research has revealed that eight of the eighteen sherds are securely-stratified in Middle or Late Saxon contexts, of which five are fills of ditches or cuts of ditches, one is the fill of a possible pit feature, one the fill of an ‘irregular cut’, and one an occupation layer.

In the Chalkpit Field (occupation) area (Fig. 6.20 and Fig. 6.21), all four securely stratified sherds are from ditch-fills. U104 and U105 share a decorative scheme of deep blue glass decorated with applied opaque yellow trails aligned horizontally, and are so similar that it is likely they are from the same vessel, or at least a matching pair or set. They were found approximately 35 metres apart in the fills of separate ditches, both of which were securely stratified and Middle Saxon in date. The other two sherds from middle Saxon and mid to late ninth-century ditch fill contexts (U107 and U108) were tiny colourless and pale blue sherds of 4mm and 6mm lengths respectively. One of the deep blue sherds and the tiny pale blue sherd were both found in Trench 2, described as containing a Middle Saxon occupation phase not far from the actual settlement activity.
Other highlights of the artefact assemblage from this trench included a few sherds of Ipswich ware, lava quern fragments, metal slag and a fired clay loom weight and two iron spikes associated with the processing of textiles. The second of the deep blue sherds was found in Trench 11, approximately 25 metres east of Trench 2, the principal feature of which seems to have been a redeposited clay oven. Finally, the tiny colourless fragment (U108) came from Fig. 6.20. Plan of trench locations at Sedgeford (©SHARP), with trenches mentioned in the text circled
Fig. 6.21. Anglo-Saxon features within Chalkpit Field and Boneyard at Sedgeford, Norfolk (© Jon Cousins at SHARP), with approximate locations of glass finds highlighted.
Trench 4, situated another 25 metres east of Trench 11, in an area where the archaeology suggests ‘concentrated and constant settlement activity’ very close by. Trench 4 also featured Ipswich and Thetford ware, lava quern fragments and large quantities of animal bone and oyster and mussel shell. Overall, as one moves westwards the nature of the settlement becomes more industrialized, with the most easterly sherd (the tiny colourless fragment U108) being very close to the central settlement area and the other three being scattered across a transitional zone between the domestic area to the east and the industrial area to the west. The deposition of centrally produced domestic waste on liminal production zones is becoming a pervasive theme.

In the Boneyard (cemetery) area, of the four securely-stratified sherds so far, one is from ditch fill, one from a pit fill, one from an ‘irregular cut’ and one from an occupation layer. Although the area is named after the Middle Anglo-Saxon cemetery found here, it appears that the vessel glass comes from post-cemetery layers deposited at a time when the periphery of the nearby settlement was encroaching across the former cemetery. The cemetery of 161 inhumation burials is not dateable via typologies of artefacts, but an initial radiocarbon date of AD 662-881 has been recorded. The eighth- and ninth-century dates of the majority of artefacts from the post-cemetery settlement also provide a reasonable terminus ante quem for the cemetery, placing the cemetery in the late-seventh to mid eighth century. The density of features in this area has been described as ‘phenomenal for an apparently marginal location’ in an interim report on the Boneyard Field. The field is interpreted as ‘the margins of an area of residential or light industrial occupation’, and to the south appears to contain a heavily truncated timber hall structure. Other finds included eighth- to ninth-century bone combs and dress pins, an Anglian silver penny of King Eadwald (AD 769-798) and two styli. Meanwhile, the overlapping ‘New Trench’ (BYD NT in Fig. 6.20) contained a series of ditches, some further evidence for truncated buildings and one very large but currently unidentified structure. Other artefacts found included more dress accessories, but also a
significant quantity of lava quern fragments and slag, and unusual environmental remains of the sweepings from a bread oven.

A sherd found in an occupation layer in the Old Trench area of the Boneyard (BYD OT in Fig. 6.20) is particularly noteworthy: it is a late-stage claw sherd (U103; Fig. 4.139, bottom right, and Fig. 5.140), which although small is a good size for an occupation layer source. The pottery from the context has been spot-dated as late Saxon as well, perhaps ninth to tenth century, which supports the evidence from the glass sherd and helps to build a picture of activity in the immediate area at that time. An occupation layer context provides an immediacy that a peripheral ditch context does not: the former has a closer connection to the time and place in which the original vessel was used, whereas the latter may be secondary deposition at an unknown point in time after the breakage and primary deposition. However, the exact location of an occupation layer and the position of the find within it can be harder to determine as the thin spread over a wide area and both above and below other features is more difficult to record clearly on site plans.

Meanwhile, the contents of a pit have been cleared and disposed of deliberately, but are more likely to be primary and close to the occupation area than the fills of peripheral ditches. A sherd from the fill of a pit in the ‘New Trench’ is the rim from a tall palm cup or funnel beaker (U113; Fig. 139, top left) – one of the larger sherds in the assemblage which helps to explain why this one was noticed and actively thrown away, in contrast to the smaller claw sherd from the occupation layer. Again, the pottery has been spot-dated to the ninth century, which is interesting for two reasons: firstly, the combination again indicates the nature of the activity in the area at the time, and secondly this contributes to our knowledge of the evolution of the palm-funnel beaker form series. If the glass was deposited at the same time as the pottery, it had either been in use for some time, or was a late example of a cavity rim, meaning that the original vessel was either a funnel beaker with an unusual rim form or a very late tall palm cup. It may be that the vessel and rim forms within the
vessel form series overlapped considerably. However, the pottery date available is only provisional as the post-excavation work on Sedgeford is ongoing, while the glass sherd is only a single sherd and may have been residual in the context, so cautious interpretation is advisable at present.

In summary, glass found within the Chalkpit Field had associations with a variety of light industrial production processes – metalworking, textile manufacture and food preparation (quern fragments and a clay oven), and general domestic refuse (Ipswich ware pottery sherds for example). The find spots were near to the occupation area, but in a peripheral zone. The most easterly sherd was deposited very close to the core settlement area, a contention supported by the huge quantities of food waste (bone and shell) and pottery fragments that surrounded it. Meanwhile, the Boneyard contexts comprised peripheral encroachment of settlement into the area of the old cemetery, but of unusual occupation density. The area where the glass was found featured occupation indicators such as remains of several structures, and writing implements, dress accessories and coinage, but also quern fragments, metal working waste and evidence of another bread oven (similarly to the light industrial waste from the Chalkpit Field). Whether these two areas are contemporary with each other, or whether the Boneyard is a later equivalent is not yet clear.

Only one sherd from the Boneyard can be linked to its place of use at Sedgeford, within the late eighth- or ninth-century settlement area that spread across part of the old cemetery. Ultimately, the fact that more than half of the securely stratified sherds were found in ditch fill is of greatest interest. It is likely that the ditches in which five of the eight contextualized sherds were found are likely to have been boundaries between core living areas and light industrial areas, in which a mixture of domestic and manufacturing waste was deposited. Overall, the distribution of vessel glass at Sedgeford reflects deposition of vessel glass waste on the immediate fringe of the settlement, rather than within the occupation area or further away.
**Lundenwic (London)**

*The Royal Opera House Site*

The Royal Opera House site is important in this context because the vessel glass makes a good case study of intra-site distribution from within an emporium (Fig. 6.22). The eighty-four sherds of vessel glass found, and the extensive sieving and excellent post-excavation analysis of the glass (Fig. 6.26; Stiff 2003) make it the most valuable site to date for research on glass vessels in Anglo-Saxon London in general and their intra-site distribution in particular.

![Map of Lundenwic](image)

*Fig. 6.22. Map to show the location and extent of Lundenwic (©MOLA [Museum of London Archaeology]). The Royal Opera House site is the large site in the centre, just below site H (Floral St). Sites in pink were excavated by MOLA between 1987 and 2000. C = Maiden Lane; M = Peabody; P = Bruce House; The National Gallery is located just above site A (Trafalgar Square); R = Southampton Street.*

Considering the location of the site, underneath the centre of a modern city, the first striking aspect of the assemblage is the number of sherd links, both physical and typological. Two of three sherds from a light blue-green glass bowl share a definite join, while the third has very similar body fabric and decoration. The two joining sherds come from building 23 and open area 19, and the third
sherd also from open area 19 (Figs. 6.24 and 6.25). The second typological link also involves a bowl, this time two dark brown sherds that are an extremely rare colour for the bowl form (only one other example from Fishergate in York is currently known from all the emporia of northwestern Europe – Stiff 2003, 245). The yellow and white trailed decoration also matches well, meaning that these two sherds can be linked. They were found in building 23 and open area 14 (Figs. 6.23 and 6.24), indicating that both bowls were used in building 23, although in this case the refuse was then removed to a different open area for disposal.

The second typological link involves two light green-blue sherds decorated with white combed and feathered trailing, which probably came from a globular beaker. In this case, it is the exact pattern and unusual form of decoration, as well as the nature of the body glass that ties the sherds together. One is from the fill of a beam slot at the east end of building 24, while the other is from midden material in open area 16 (Fig. 6.24). The third typological link (and fourth overall) connects two heat-distorted palm cup sherds from building 50 and open area 19 (Fig. 6.25). These four sherd link cases show that two rare glass bowls, a globular beaker with unusual decoration, and a palm cup were all used in the immediate area between c. 730 and 770 AD. It is also noteworthy that in each case one sherd was found in a building and one or more in an open area, neatly illustrating both the location of use and disposal.

The most interesting aspect of the intra-site distribution of the glass is the unusual association with both domestic habitation and light industrial activity. The best example of this is the area featuring building 23 and open areas 17 and 19 (Figs. 6.24 and 6.25), both of which were directly associated with building 23 and a few other structures. One sherd each from the two glass bowls discussed above were found in building 23, while open area 19 produced the largest glass group from a single feature on the Royal Opera House site – twelve sherds, representing at a minimum a palm cup, a tall palm cup, a reticella bowl and three funnel beakers. Open area 19 (Fig. 6.25) belongs to the
very end of site period 5 (‘Consolidation and prosperity, AD 730-770’) and just prior to site period 6 (‘Decline and defence, AD 770-850’) (Malcolm et. al. 2003, 72). Building 23 (Fig. 6.24) was dated to the middle of period 5 (phase 3), and is described as ‘an intriguing structure’ due to the apparent combination of domestic and industrial activities and the ‘scale and variety of crafts carried out’ (ibid., 69). The former is indicated by a domestic pottery assemblage and floral and faunal traces of food storage and preparation; the latter by hearths, in situ slag and associated stake-hole structures representing blacksmithing, and 89 loom weights, including a row found next to a possible loom structure (Malcolm et. al. 2003, 68). Several important status markers were also present within this small area, including two imported pitchers and an imported cooking pot, and bone from hare and roe deer (Malcolm et. al. 2003, 67, 69). The building had the largest plan area of all the buildings found, which prompted the suggestion that ‘it may have been purpose built as a large workshop with storage facilities’ (ibid.). Its uses may have rotated with the seasons as the excavators suggest: ‘weather conditions may have affected access to continental markets, and a minimum level of may have been necessary for textile production, while access to raw materials such as smelted iron ore and wool may also have been seasonally determined’ (ibid.). Whether the glass was there as goods in storage or in use as part of food preparation remains open to question. The latter is perhaps more likely, but evidence of food preparation in such a setting is itself very unusual and does not necessarily mean that the building was actually lived in. ‘Intriguing’ is the word.

Meanwhile, a number of smaller sites excavated within Anglo-Saxon London (e.g. Jubilee Hall, Maiden Lane, the Peabody Site and the National Gallery, Southampton Street, and Bruce House, Fig. 6.22; Figs. 5.89-5.91) add supporting detail to the information from the Royal Opera House. Themes reappear: sherd links; isolated pits; and association with building debris, domestic and light industrial refuse, and status markers. At Jubilee Hall, just south of Covent Garden, two of seven sherds are from the same light blue-green vessel with opaque yellow trails, and probably from the rim of a globular
Fig. 6.23. Plan of early Period 5 features at the Royal Opera House site, with Building 24 and Open Area 14 highlighted (after Fig. 50, Malcolm et. al. 2003, ©MOLA [Museum of London Archaeology])

Fig. 6.24. Plan of Period 5 Phase 3 features at the Royal Opera House site, with Building 23, Building 24 and Open Area 16 highlighted (after Fig. 51, Malcolm et. al. 2003, ©MOLA [Museum of London Archaeology])

313
beaker. The context for these sherds demonstrates the problem of isolated pits, as contractors unfortunately removed the associated occupation levels and structures before the archaeological investigation began. However, we do know that the ‘dark earth’ within the pit contained animal bone and was rich in organic material, collectively suggesting domestic refuse. Other sherds from the site came from similar pit fills, one of which was lined with oyster shells and also contained a series V sceat dating to AD 720-725 (Cowie and Whytehead 1988, 65). One sherd came from a layer of grey clay, which was interpreted as debris from a structure in the immediate vicinity, and another from a clay layer containing charcoal flecks and animal bone.

In the Maiden Lane area (Fig. 6.22), three sites were excavated separately but are treated together here due to their very close proximity. In total, nineteen
sherds were found across the three sites (e.g. Fig. 5.91). The principal feature of the fifteen badly weathered sherds excavated in 1988 (Evson 1988, 119) is a single physical sherd link between two dark brown opaque fragments from the fill of an isolated pit. Overall, this glass came from an area characterized by rubbish pits (Cowie and Whytehead 1988, 67 and 69). Fortunately, the contexts of the four remaining sherds excavated in 1996-7 (Leary 2004) are more informative, demonstrating associations with domestic and craft refuse and nearby buildings. One sherd came from a layer thought to be a midden deposit, which contained a large quantity of animal bone, some pottery, and an antler spindle whorl. Another was found in an eighth-century well that also produced daub from a nearby building, pottery, and a crucible fragment. Meanwhile, the final two sherds were found in a late eighth- to early-ninth century pit, alongside high quality imported pottery.

Of thirty-seven sherds found at the Peabody site (Fig. 6.22), eight were found in clearly domestic contexts (pits containing food waste, including animal bone and Ipswich-type pottery) and nine were associated with building materials. The latter contexts comprised three ‘dark earth’ layers and six pit fills, described as ‘occupation debris, particularly organic building materials’ (Whytehead and Cowie 1989, 56). Meanwhile, the National Gallery assemblage included one sherd link, between two dark blue fragments decorated with yellow and green reticella trails. These sherds were from an upper layer of a large pit that was one of the main features found. It also yielded a light green and white-trailed glass fragment and a large group of Ipswich ware sherds. Lower layers contained two light blue-green glass sherds, one of which was decorated with arcaded trails, and a great deal of domestic waste. The only other notable features at the National Gallery were two more large pits, both of which produced glass sherds (one sherd in one case, and two in the other), but which were isolated from any relevant archaeological associations. Finally, the glass from Southampton Street (Fig. 6.22; Fig. 5.89) is largely relevant here due to a sherd-linked vessel found in destruction debris from building R2 (Stiff 2005). Three fragments from the base of a tall palm cup all join, and a fourth
A fragment was also found in the same context. It is possible that the vessel was broken when the building collapsed, making it a rare example of fragments representing a substantial portion of the original vessel that were probably found in their use context.

Pits divorced from their original surroundings (e.g. at Jubilee Hall and the National Gallery) are symptomatic of the challenges of interpreting emporia under modern cities. However, despite these circumstances, this collection of excavations has revealed some astonishing detail about the context in which glass vessels were used and discarded in Anglo-Saxon London. The number of sherds recovered from within buildings generally is surprising, especially given the urban setting. At the Royal Opera House site six sherds were found in five separate buildings, while four sherds came from one building at Southampton Street, one from a building destruction deposit at Jubilee Hall and three from layers composed of organic building materials at the Peabody. Furthermore, at the Royal Opera House there are four sherd pairs or groups (representing a reticella bowl, a blue-green bowl, a vessel with combed and feathered trails, and a palm cup) featuring one sherd found in building and one or more others in an ‘open area’ nearby, suggesting removal of most of the broken glass from one to the other.

Meanwhile, the continuation of the association with craft production is very interesting. At the Royal Opera House in particular the connection is the closest yet found, with three sherds, two of which are from the same vessel, found in a multipurpose building used for both domestic occupation and the crafts of blacksmithing and weaving. In London, there are significant challenges involved in attempting to sub-divide the Anglo-Saxon layers of occupation, so it is difficult to prove that the food remains and craft working debris were contemporary with each other. However, it is noteworthy that in the monograph the botanical remains are described as indicating that ‘some food storage and preparation was taking place in the building’ (Malcolm et al. 2003, 69). In this case, it is clear as it can be that these vessels were in use in a multi-
functional space, whereas elsewhere it has not yet been possible to distinguish between usage in the industrial areas and mere deposition of refuse there from elsewhere (perhaps distinct domestic zones), or combined deposition of industrial and domestic waste in shared disposal areas.

In many cases from Lundenwic, the glass was associated with domestic refuse, particularly pottery and animal bone, which demonstrates a clear connection with food preparation and consumption. In some cases, glass was also found in close proximity to evidence of industry, and not just industrial waste, indicating that people working in craft production here did have access to glass vessels. On a number of occasions, glass was excavated alongside imported pottery and in one case elite foodstuffs as well (Royal Opera House site). This combination may mean that a proportion of the people using glass in Lundenwic were not members of the elite, and that artisans and traders in this emporium context had a degree of access to glass vessels and to imported and luxurious produce. When the setting is a trading enclave, it is worth noting the possibility that both imported pottery and the glass vessels themselves could have been personal possessions transported from home, and as such would not qualify as ‘imports’ in the usual sense. However, the roe deer and hare found in association with vessel glass combine to form a clear indicator of the consumption context in which the glass vessels were used, one probably sponsored by the aristocracy.

Conclusion

So what are the disposal patterns for vessel glass in Middle Saxon England? What can this tell us about who was using this glass, and when, where, why and how? And do the answers to these questions vary across regions and site types within England?

Disposal was usually as part of dining waste, sometimes alongside craft production debris, and most commonly in pit or ditch fills or as part of spread from over-ground middens. There are also examples of casual loss and deliberate re-deposition – for example, a few sherds were found in beam slots
and drains or covered channels (e.g. the former at the Royal Opera House, and the latter at Barking). Few, if any, original floor surfaces survive, at least until the late Anglo-Saxon period. On some sites, high proportions of the vessel glass assemblages depended on the survival of a single pit or heap (e.g. the central midden at Flixborough, or the gulley in the guesthouse at Jarrow). The expected pattern of peripheral deposition is indeed common, and dominates the distribution at Brandon, West Heslerton and Sedgeford. However, there are also a number of instances of central deposition – either cases of loss, or more frequently deliberate and probably short-term but convenient disposal (key examples of the latter include Brandon and Flixborough).

It is almost certain that the vast majority of vessel glass within this corpus represents vessels used and broken somewhere on the sites where the surviving sherds were found. Sherd links (literal and typological) are evidence for this, as are the most common contexts of discovery – domestic or mixed waste, rather than exclusively industrial deposits. Nothing similar to the glass-working refuse at Dinas Powys (Campbell 1997, 95-6, Fig. 65) has yet been found within Middle Anglo-Saxon England. The distribution of vessel glass across Anglo-Saxon England suggests that the vessels travelled principally via coastal and riverine trade routes (Figs. 6.1 and 6.2). They were concentrated in both ecclesiastical and secular administrative estate centres with good access to water transport. There is also evidence of glass vessel use emerging from middle-ranking foci in similar geographical locations, such as Sedgeford and West Heslerton.

Study of the site types where vessel glass was found and intra-site distribution of vessel glass shows that the vessels were used by a variety of people in middle Anglo-Saxon England, but in subtly different ways. In London (an emporium), Flixborough (an important estate centre with probable secular and monastic phases) and Brandon (another important estate centre with a likely monastic phase), vessel glass sherds were closely associated with dense deposits of animal bone, especially large cattle and game, both categories frequently
associated with secular and ecclesiastical elite feasting practices (e.g. Holmes 2014, 60-63; Dobney et al. 2007, 224, 237). Meanwhile, at Jarrow (a known monastic site), fish bone was found in the same areas of Buildings A and D as the vessel glass sherds (ibid., Fig. 37.3.1). At Jarrow, cattle dominated in the later Saxon period when the site was secular, but prior to that the salmon family and shellfish were of prime importance (Jones and Hutchinson 2005, 579) and sheep and goats were more commonly slaughtered than cattle (Noddle and Stallibrass 2005, 575). At Lyminge (also a documented ecclesiastical community), thousands of fish bones represented one third of all bone found, with the remainder dominated by sheep or goats and domestic fowl. Wild mammals were rare (less than 1% of mammal bone). Thus, glass vessels were used by secular elites engaged in the conspicuous consumption and dispensation of meat, aimed at underlining and maintaining their position in the social hierarchy, and in a similar way by monastic communities, albeit alongside a diet with a larger marine component, and in slightly different social circumstances.

It is also interesting to note, even with such a small sample, that on the few sites with churches, no vessel glass fragments have been found in the vicinity of church buildings. The best example of this absence is at Brandon, but the same observation applies to Jarrow and Whitby. Unfortunately, at Barking, the central monastic complex has not been found, and at Lyminge, the footprint of the Anglo-Saxon church is almost completely underneath the modern church. Therefore, as yet there is no taphonomic indication that glass vessels were used within churches in this period.

Vivid and contrasting contextual pictures have emerged of drinking glasses and rich meat consumed within the home of a metal worker, in an area of London inhabited by other craft workers within an organized trading settlement; and of glasses used alongside meals of fish in a monastic guesthouse and refectory at Jarrow. Some secular scenarios can be linked to elite or sponsored feasting, while the social context of ecclesiastical use may have been different. At
Jarrow, the distribution indicated use predominantly for hosting guests, which one could argue has similarities with secular conspicuous consumption, although Christian ideas of hospitality and recognition of the expectations of wealthy and powerful guests must have played a part. However, the picture is not complete and there are indications of glass vessel use in the well-appointed refectory at Jarrow as well. Meanwhile, the use of glass vessels at Lyminge appears to have been completely different to secular settings: sherds from rubbish pits within the domestic enclosure populated with individual cells suggests that the vessels were used by monastic inhabitants here as part of their daily lives. Even allowing for the possibility that many of those living within monastic communities may have been from the upper echelons of society, this is a glimmer of evidence that ecclesiastical use of glass vessels was distinct. The patterns of use and disposal seem to be remarkably consistent across the regions of Anglo-Saxon England, based on the evidence currently available, but a possible difference in the way glass vessels were used between ecclesiastic and secular contexts is emerging.
Chapter 7: Discussion

This chapter discusses the broad economic, social and geographical context of glass vessels and their use firstly in Anglo-Saxon England, and then across the rest of the northern Europe. Beginning with the three principal settlement groups from which vessel glass has been recovered (wics/emporia, monasteries and the emerging third category of middle-ranking rural centres), I will describe past debates and the current state of knowledge regarding these settlement types and explain how the vessel glass contributes to understanding the nature of the settlements and vice versa. I will consider how the use of glass vessels helped to construct or consolidate the identities of several different social groups within Anglo-Saxon society, and then how discarded fragments of glass vessels can throw light on regional as well as international networks of trade and exchange. Finally, I will compare the situation in Anglo-Saxon England to that in northern France, Belgium, northern Germany and Scandinavia, particularly in terms of the settings in which glass vessels were used – the sites types and social contexts.

The vessel glass in context (vessel glass meets settlement studies)

‘Wics’ or emporia

The four emporia in England are all under modern cities (Southampton, London, Ipswich and York), which complicates both access to and interpretation of the archaeology, and there have been other complications and controversies to compound the problems (a point well made by Cowie, 2001, 14-21). The resulting statistics on the percentage of the English emporia that had been excavated at the time of Cowie’s article are revealing: a total of 7-8% at Southampton (of which only 5% is post-1946); 3.2% at Ipswich; and 1.5% at London (too little was known of the total size of the settlement at York
for a reliable estimate to be made, ibid., 18). However, using the information currently available, I have shown that 80% of the current national corpus of vessel glass came from emporia, and 59% from Southampton alone, making the four sites of Southampton, London, Ipswich and York central to the study of Anglo-Saxon glass vessels and their social and economic context. It has been widely accepted that a significant proportion of the glass in emporia represent glass vessels in use in the settlements (e.g. Hodges 1982, 57-60; Stiff 1996; Hunter and Heyworth 1998, 60-61): the thin scatter of glass sherds through domestic areas and within refuse pits represents use within the settlements by the inhabitants. However, we must consider the possibility that a proportion were ‘intended for trading on to royal, church and aristocratic sites’ (Hinton 2005, 88). So what were the emporia, these places where so many glass vessel fragments were found? How did they function and who controlled them? And who were the inhabitants using these glass vessels? Here (and elsewhere, below), research on vessel glass meets and contributes to the wider world of early medieval studies. Academic discourse in the spheres of settlements, society and economy form the setting and context for this study.

There has been a great deal of debate on the nature of the emporia over the last several decades, in particular in the thirty years between the publication of Richard Hodges’ seminal work *Dark Age Economics* in 1982 and his *Dark Age Economics: A New Audit* in 2012. All of the English and northern European emporia were type B emporia (permanent trading settlements) according to Hodges’ original classification system, with the possible exceptions of York and Kaupang, which may have been seasonal (Stiff 1996, 197). Hodges’ system built on key works of the 1960s and 1970s, principally Polanyi (1963), who proposed the idea that the emporia were tools of the elite for control of international trade and were in a sense separate from the rest of society and the settlement network. Type B emporia were identified by Hodges as permanent settlements representing ‘a major attempt to maximize... long distance trade’, and distinguished by planned streets and structures (Hodges 1982, 51-2). York has sometimes been seen as type A, defined as enigmatic seasonal boundary fairs
(ibid., 50-1, and 73-4), although this partly relates to a lesser body of evidence in comparison to the other three. However, in *A New Audit*, Hodges moves away from a rigid classification system, and indeed emphasizes repeatedly that the emporia were not homogenous, and did not form a particularly cohesive group as past viewpoints have implied. ‘The histories of the emporia cannot be reduced to a common story’ (2012, 114). It is important to retain this idea, as recent research and thought suggests that there may have been significant differences between the economies of the respective English emporia, even though much of the subsequent discussion here inevitably focuses on commonalities. This should form part of a wider awareness of the counter arguments to long-established views, such as Samson’s provocative declaration that ‘emporia did not even exist’ (1999, 88), at least not in the way they had often been conceived (‘special trading settlements on the borders of kingdoms, far from the main centres of secular and ecclesiastical politics… inhabited by commercial merchants engaged in the first proper capitalist trade and industry of Europe’, ibid.).

Following extensive research on documentary sources referring to tolls, trading practices and controls over foreign traders, Middleton defined emporia as settlements ‘on the frontiers of kingdoms’ (2005, 313) involved in large-scale international trade, which functioned as ‘centres of exchange for imports and exports of bulk commodities’ and were linked to both international counterparts and ‘a network of inland markets’ (ibid., 351). He suggests fish, wine and woad as examples of the bulk imports, and wool, cloth and hides as the bulk exports, based partly on the situation in the later Middle Ages. According to Middleton, specialist items, including glass vessels, ‘rode piggyback on a volume trade which underpinned the economy of the wics’. Middleton concludes that detailed trading regulations were developed under the protection of rulers in the various areas concerned. Of course, much of this detail based on interpretation of documents is difficult to distinguish archaeologically, although new material and exciting developments are emerging all the time.
Emporia are distinguished archaeologically by (at least) three factors according to Cowie (Cowie 2001, 17): their size, which was much larger than other Middle Saxon settlements; highly homogenous faunal assemblages (O’Connor 2001; Bourdillion 1994); and the potential for specialization and industrial manufacturing (although the principal proof of this so far is the Ipswich ware pottery centre at Ipswich) and evidence is also emerging at a variety of rural settlements. Scull also places much larger settlement size at the top of his list of distinguishing characteristics, and includes the fact that these settlements were ‘net consumers’ of agricultural produce (Scull 1997, 280). However, he emphasizes evidence for ‘direct and large scale exchange contacts’ over craft production, and argues powerfully that long-distance trade must have been the key function of the emporia (ibid., 284, 289), with the ‘exclusively riverine and estuarine locations’ strongly supporting international trade as the key function.

In 2004 Naylor observed that there were fewer other trading sites in regions where a large emporium was located, while in others (e.g. Kent and Lincolnshire) the model was one of numerous smaller trading settlements (Naylor 2004a, 127). Naylor’s implication is that emporia dominated their local regions in both international and local trade and that their appearance reflects elite control. Six of the ten royal charters regarding toll remissions discussed by Kelly (1992) refer to tolls ‘levied by Mercian kings in London’ (ibid., 4), which supports Naylor’s argument. However, seven of the ten royal charters show that royal control was also exerted on trade conducted by communities in Kent, as they relate to religious communities in Kent receiving exemption (five are in favour of Minster-in-Thanet, one Rochester and Reculver, with the remaining three relating to St Paul’s in London and Worcester) (Kelly 1992, 3-4). Most importantly, two of the charters grant exemptions for ships based in Kent, ‘at the Kentish ports of Sarre and Fordwich’ (Fig. 7.1; ibid., 6), both situated to the east of Canterbury, with Fordwich on the River Stour, which links Canterbury to Sarre, and Sarre itself located at an important point on the Wantsum Channel between mainland Kent and the Isle of Thanet (Fig. 7.1). This shows that there
were ‘ports’ in Kent, although probably smaller both originally and in terms of surviving archaeological footprint, and that they were also subject to royal controls in the same way as the much larger emporium at London.

Fig. 7.1. Map of Kentish emporia, with solid symbol sites continuing into the late Anglo-Saxon and Medieval periods and open symbols not (Brookes and Harrington 2010, Fig. 24)

Meanwhile, absences in the archaeological record are also of interest: there is no evidence (so far at least) for variation in building size, high status buildings, or defences at any of the emporia in England. Aspects that are still not well understood from archaeological point of view include the size and composition of the population, how much of the sites were occupied at any one time, the degree to which occupation and activity were seasonal, and the organization of rubbish disposal, including the nature of the relationship between pit fills and buildings (Blackmore 2001, 38-39). Seasonality in particular may have had an extensive impact on the nature and functions of emporia: seafaring trade must have been concentrated between spring and autumn, while craft production could have operated a complimentary cycle that peaked in the winter, or been an active sideline on a continual basis. Such fluctuations may have been dramatic, and if so, dictated the numbers present and their occupations.
However, seasonal activity within the emporia is very difficult to detect archaeologically.

Emporia are perhaps best seen as components of both the economy and the settlement network in Anglo-Saxon England that were of great importance but for a comparatively short space of time. In *New Audit*, Hodges describes them as ‘mushroom cities’, short-lived and ultimately unsustainable experiments in urbanism that were ‘nodes in a dendritic regional system that owed their genesis to the maritime engagements of the late sixth and early seventh centuries’ (2012, 114), and depended on demand mostly limited to the elite (ibid., 115). They may have been bartering internationally with the collective produce of multiple networks of estates and on a constant basis, although the aspect overlooked by Hodges even in *New Audit* is that this was alongside some other coastal settlement types who were engaging with international trade networks directly, but exchanging their own produce or produce from their local network only, and perhaps on a seasonal or occasional basis. This means that the system was not ‘dendritic’, and the emphasis on elite demand as a driver may also be misplaced. However, Hodges is right to indicate rapid expansion and a focus on international trade. The genesis in maritime engagements indicates that international trade was probably the first and always the more important function of the emporia, although in Ipswich pottery production became a major co-existing activity.

The emphasis on international trade as the primary function of the emporia has been repeated many times by high-profile academics and in major scholarly works. In a recent example, John Blair described them in his volume on the church in Anglo-Saxon society (Blair 2005, 257) as ‘primarily entrepôts for overseas trade’, which were unlikely to have held monopolies, and whose integration into regional economies is questionable. However, in contrast, Hill states that ‘much of the commerce was local, and... the internal trade chains accounted for the majority of the activity’ (Hill 2001, 81). Meanwhile, in 2004 Naylor cited the quantities of local materials found at Fishergate as an example.
of evidence showing the place of emporia in ‘burgeoning regional networks’ (Naylor 2004a, 126). A balanced view would be that the emporia dominated international trade in their regions and at the same time were involved in local trade – that they were, as Loveluck states, ‘complex communities of artisans and merchant traders’ (2013, 3).

When considering trade and exchange as a key function of emporia, it is important to remember that most of the imported and ‘luxury’ artefacts surviving in the archaeological record have a high profile now but may have been on the fringes of activity at the time. According to Scull, they are ‘the surviving fossils of a bulk movement of perishable organic commodities’ (1997, 285), and potentially other goods that are hard to trace today, such as glass cullet or fresh glass ingots. So far it is only in rare cases, for example the three gold-foil decorated sherds from Ipswich, that we can definitely say that glass vessels were imported into the English emporia, and we have little indication of scale thus far, but there are known examples and compositional analysis has great future potential in this area. We also have only slim circumstantial evidence regarding production or export of glass vessels from England in the middle Anglo-Saxon period, but it is not impossible that the vessels or the glassmakers and their materials travelled onwards from England too, perhaps to Scandinavia (e.g. Evison’s theory regarding claw beakers of the sixth and seventh centuries, 1982, 57-60). It seems a viable theory that glass vessels travelled from the Rhineland to English emporia on a regular basis, for a number of reasons. The vessels are similar enough across all the North Sea emporia to suggest a standardized product and a key common source, and the source proposed for key assemblages such as Ribe and Kaupang is the Rhineland. This suggestion is often made without any reasoning, but one could indicate the late Roman glass working industry in the area that may well have continued, the wine production and export from the inland Rhine region, and the very existence, size and nature of Dorestad as starting points. However, Sode admits that there is a lack of direct evidence relating to glass production centres in the German and Frankish area for this period (2004, 88). All vessel
glass in this period seems to have been heavily recycled, meaning that conclusions regarding vessel sources based on glass compositions such as those of Hinton - that all of the Hamwic glass was from the same source, and a source similar to the Ipswich glass but different to glass from Quentovic and London (2005, 88) – are not sound. Glass vessels may have been, in Scull’s words, ‘surviving fossils’ of bulk trades, perhaps following the wine trade coming in to England, although provision may also have been dictated to some degree by glass workers present for glazing programmes during major (monastic) building programmes. As with imported pottery, it is likely that a number of the glass vessels used in the emporia in particular travelled as or were acquired as personal possessions. Glass vessels have also been found at other sites and site types, so the scale of emporia assemblages was probably affected by preferential access, superior population size and the nature of the people present. Broken trading stock may also have been a factor, but it will be very difficult to prove this unless perhaps a large single deposit is discovered, ideally in a waterfront location. The presence of significant quantities of vessel glass outside the emporia as well as within positions vessel glass at the interface between the emporia and the rural secular and ecclesiastical estate networks, both in England and across the North Sea. As such, vessel glass is a useful medium through which to explore those connections.

The role and scale of craft production within the emporia has also been debated vigorously in recent years. Hodges himself had begun to review the role and importance of a craft production element at the emporia by 1989, when he noted in *The Anglo-Saxon Achievement* that evidence from Southampton shows that craft activity took place in almost every building (Hodges 1989, 84). By the time of the publication of his *Towns and Trade in the Age of Charlemagne* in 2000, he wrote with certainty that craft production was central to the functioning of the emporia, stating ‘the engine of activity was craft production on an impressive scale’ (Hodges 2000, 81). He proposed a dual function, at least in the case of Southampton: ‘Southampton was a monopolistic centre for regional craft production as well as... exchange in prestige goods’ (ibid., 82).
Meanwhile, in his view the role of international trade was less than previously thought, with the trading community probably limited to the shoreline at the southern end of the town (ibid., 81).

There is some evidence for spatial organization of bone working, in particular at Southampton, where there are three principal zones, and at Ipswich, York, London, Dorestad and Hedeby (Riddler 2001, e.g. 61; Riddler 2004, 145-8). Holmes also points to ‘the prevalence of horn cores at urban sites’ as an indication of a trade in horn from rural areas and the ‘presence of an artisan population’ within the emporia (2014, 100). Similar, and often noted, is the clustering of pottery production at Ipswich. Based on her animal bone evidence, Holmes described the bone working at Hamwic as ‘an obvious focus for many’ (2014, 117) based on the scale represented. However, she found no evidence of a significant industry in middle Saxon London, pointing to smaller scale activities as more likely (ibid. 118). Indeed, she proposes the possibility of part-time butchers and part-time bone workers (ibid.), a concept also suggested by van Es and Ambrosiani in relation to artisans present at Dorestad (van Es 1990, 175 and Ambrosiani 1981). Meanwhile, Scull underlined that the same range of craft manufacturing known from the emporia are also evidenced at ‘contemporary higher-status settlements such as Brandon, Flixborough, Jarrow and Barking’ (1997, 284). Interestingly, the examples given by Scull all had either definite monastic status (Jarrow and Barking) or archaeologically very likely monastic phases (Brandon and Flixborough), and all have produced significant assemblages of vessel glass. More recently, Thomas has added that although there is a question mark over whether zoning of craft activities were organized by the practitioners themselves or a higher authority, the zoning itself points to ‘a level of organization that can only have been equaled (if at all) at larger monastic complexes’ (Thomas 2011, 414).

Assistance is provided by Sindbæk, who identified a fascinating feature of all seven ‘nodal points’ (emporia) in Scandinavia (Ribe in Denmark, Kaupang in south Norway, Birka and Åhus in Sweden, Truso in Poland, and Groß
Strömkendorf and Heðby in Germany; 2007, 121): evidence for specialized craft production that ‘consumed raw materials imported from a distance’ (2007, 126-127, Fig. 5). Examples include copper-alloy casting, glass working (bead manufacture) and the finishing of lava quernstones, whereas iron forging, textile production and comb making are more widespread across sites types and rely on much more accessible materials. It is a very interesting distinction – a thorough review of equivalent evidence for Anglo-Saxon England would be a very useful exercise. The implication of a similar pattern would be that the craft production in the emporia was driven by the presence of the inhabitants (as in most settlements) but also, and more unusually, by access to imported materials. Hence, the bone working for example is a function of any substantial community, while copper-alloy casting or finishing lava quernstones were enabled by the primary function of long-distance trade. It is certainly true that craft production within the emporia should not be overlooked. However, this interpretation places international trade squarely as the core function of the emporia.

The nature and scale of both trade and craft production in the emporia is an area of ongoing debate, with a recent flurry of activity in defence of craft production, and others reasserting the importance of international trade. Palmer argues that production within the emporia was not ‘on a scale even close to the amount needed to support the trade which appears to have passed through them’, and places the emphasis on rural production, particularly of textiles (Palmer 2003, 55), while after examination of the spatial contexts of craft working in the emporia, Thomas drew the more subtle conclusion that ‘the time of the full-time professional had yet to come’ (Thomas 2011, 414). Recent work in London has suggested that production evidence from London is on a scale similar to contemporary rural sites and does not support London as a production centre (Leary 2004a, 143), although it is much more focused and concentrated. It is hard to trace production archaeologically, or the direction in which goods are travelling in many cases, and therefore very difficult to prove the movement of specific regional produce into the emporia. However, Holmes
has recently argued that secondary non-food animal products such as horns, skins and leg bones were delivered in a controlled manner to specialist craft workers (2014, 119-120). ‘The evidence suggests that organized suppliers acquired and redistributed new materials to the artisan population… indicating again the presence of a controlled collection and redistribution system, most likely based on estate centres’ (ibid., 120). Glimpses such as this reinforce the impression that internal trade networks were richer and more diverse that we can now see in the archaeological record, and that the growth of the emporia was a canalization and development of a great deal of pre-existing regional and international exchange and production. Glass may frequently have arrived in the emporia as an import from overseas, whether as completed vessels or ingots and expertise, but it is not possible to prove the scale of this at present, and it is not impossible that in some cases the glass vessels moved in the opposite direction from a regional production point to the emporia and perhaps beyond.

In his article on the importance of production in the eighth-century (especially rural) economy, Moreland argues that it no longer makes sense to understand the emporia as ‘active cores’ surrounded by ‘conservative, autarkic peripheries’ (2000b, 69). He illustrates how recently (at the time of writing) scholars had expounded the view that the emporia were ‘largely divorced from their hinterlands’ (ibid., 71), but also notes the recent shift in perception to focus on craft production in the emporia, and evidence of supply of these communities by food render. The essence of Moreland’s view on the function of the emporia specifically, is that the blend of functions was more varied and complicated (and interesting), than has previously been envisaged. Thus the classic model, focused exclusively on royal control of international trade, and Hodges’ more recent variant involving a gift exchange phase followed by a production phase, are both idealized, whereas in reality ‘gifts and commodities are not mutually exclusive’ (2000a, 31). Moreland describes major expansion of production in England at the same time as the early stages of Southampton, London and Ipswich, and proposes that ‘patterns of production [in England] had
dramatically altered long before the production phase of the emporia’ (2000b, 76). In summary, emporia had larger trading components than other settlements and were larger in size, but an additional role in craft production has been first understated and then in some cases overstated. The emporia were clearly focal points for international trade, but also had a role in regional commerce.

Foundation of the emporia, meanwhile, may have been a more organic process than previously thought. Recent discoveries at Heslington Hill outside York have provided the first direct ceramic links proving that the emporium at Fishergate was not a ‘de novo’ settlement but a direct move from a rural settlement with inter-regional and emergent international contacts, associated with the ‘middle Saxon shift’ (Spall and Toop 2008). The king could have instigated the move, or indeed the bishop based in the former Roman fort, but either way, this evidence supports the view that the leaders of Church and state were building on existing practices rather than creating the phenomenon from scratch. According to Naylor (2004a, 126), there is ‘no reason to suggest that emporia were founded through the action of kings’, while Scull (1997, 284-9) described overt royal control as ‘unlikely, with the Church, state and secular aristocrats involved in the overall running of trade’. Astill was one of the first to criticize the emphasis on the agency of kings in Dark Age Economics (1985, 215) and much more recently wrote that the king was ‘not an initiator of early medieval exchange, but rather… sought to exploit’ (2011, 505).

Sindbæk (2007) has argued that in Scandinavia, the ‘largely self-directed actions’ of international traders stimulated the ‘nodal points’ (i.e. the emporia) and there is no reason why his theories could not also apply to contemporary Anglo-Saxon England. Indeed Sindbæk notes that the Scandinavian pattern whereby imported pottery and Badorf ware in particular is rare outside the seven ‘nodal points’ also applies is England (ibid., 121; Brown 2003, 23). Loveluck supports the idea of mercantile initiative with ruling powers imposing an element of control to raise revenue in his volume on Northwest Europe in
the Early Middle Ages (2013, 362). Scull has argued recently, based on the seven high-status seventh-century burials from the Buttermarket at Ipswich, that the cultural affiliation signaled by the elite there ‘was continental until the middle or third quarter of the seventh century, and insular thereafter’ (Scull 2002, 314). The implication is that ‘Ipswich in AD 640 might seem as much an outpost of Frankish imperium as the emporium of the East Anglian kings’ (ibid.). In most regions, kings may have created the environment in which such economic endeavours were possible and benefitted from them too, but that is not the same as direct and literal foundation. The most likely exception is Hamwic, where another high status seventh-century cemetery has been found, featuring a very high proportion of weapon burials (Stoodley 2002, 322, 324). Stoodley concluded that this elite group ‘may have been associated with a royal estate from which the later administrative functions of the site, i.e. Hamtun, can be traced’ (ibid., 317), but even this would not infer royal foundation. Indeed the weapon burials compare well with one from the Buttermarket at Ipswich and with a number of Kentish examples (ibid., 324) – so perhaps all three were Frankish outposts in the early days? Blackmore’s assertion that occupation of Lundenwic may have been seasonal in the first and second quarters of the seventh century would fit very well with this radical suggestion (Blackmore 2002, 281).

Regarding the governance – i.e. who controlled the emporia once established – again, the Hodgean answer of 1982 was clear: the emporia and the international trade at their centres were under royal command. Historical (documentary) evidence of royal involvement is well-established (Hodges 1982, 55) at Southampton, Ipswich and London, and also Quentovic, Dorestad, Hedeby, and Birka. The idea that founding kings would have built a palace at each emporium as part of their peripatetic circuit has been discussed previously (e.g. Hodges 1989 at Southampton, 85, London, 94, Ipswich, 99-101, and York, 102). However, no hard evidence has been unearthed, although this is not necessarily evidence of absence – in the case of York the prevailing theory places the Anglo-Saxon palace or elite settlement within the Roman walls in the
vicinity of the present York Minster, where there was a major ecclesiastical centre (e.g. Scull 1997, 278, 280). Interestingly, recent emphasis has been on an episcopal power base at the former fortress at York, probably in liaison with the king, rather than a royal palace or significant royal presence (Spall and Toop 2008, 18-20; Moreland 2000b, 102-3, and a fascinating and thorough discussion from a documentary perspective by Rollason 2003, 202-207). Rollason describes York as ‘essentially an ecclesiastical city ruled by its archbishop, comparable to Trier, Mainz or even Cologne’ (2003, 205). He notes that in Alfrid’s Life of St Liudger (d. AD 809), when the colony of Frisian merchants are in trouble, the only sign of any protection from anyone is when Alcuin (a churchman), comes to Liudger’s rescue (ibid., 178-180). Meanwhile, regarding the emporium at Fishergate, he describes a lack of evidence to counter the understanding of the emporium as a ‘spontaneous settlement of merchants’ (ibid., 178).

In terms of archaeological evidence, Hodges lists metalled roads laid in an organized grid as another indicator of organization at the top level of society (1982, 55), and clear evidence for them has been found at Hamwic and London. By the late seventh century a grid of roads overlay earlier middens in London, implying that it was ‘conceived and organized as a single development, presumably by a central authority’ (Leary 2004a, 142). Riddler and Holmes have both recently identified evidence of the segregation of animal waste disposal in London and Hamwic, in the case of Holmes particularly an association between horse bone and skin and bone working evidence reflecting ‘differential treatment of food and non-food animals’ (Holmes 2014, 117-119, Figs. 6 and 6.3). These clear patterns imply either control over or collective collaboration within the settlement, as do the likely mints at London and Southampton. A mint at London is indicated by gold coins bearing the letters LONDVNIIV or LONDENVIS and dating to c. AD 640 (Gaimster 2004, 102-3), and a mint was operating at Southampton from at least AD 720 (Metcalf 1988). According to Hodges the topography at Hamwic is also consistent with Hamwic being a royal settlement (1989, 88), and the lack of evidence for property
boundaries at Southampton led him to suggest that each insula may have been run by a lord, as tracts of London and Winchester ‘appear to have been made over to the aristocracy’ (1989, 86-7). However, Scull pointed out that although it is assumed that series R sceattas were minted at Ipswich, we do not actually know that, and ‘nor do we know whether Ipswich itself was at any given time an administrative centre, or whether it was subordinate to a nearby estate centre where the mint may also have been located’ (Scull 2002, 314).

Generally speaking, the evidence available for Southampton is many times greater than that for the other three emporia in England, and it is important to be cautious when extrapolating information from Southampton to the others in advance of further excavation. Furthermore, Palmer describes Southampton as an anomaly, in the sense that it does ‘appear to have exhibited an unusual degree of royal control in its development’, and that it had a ‘very narrow hinterland’ (Palmer 2003, 58-60). Yorke argued in 1982 that the emporium at Southampton was established at a royal vill in existence by AD 650 (Yorke 1982, 80), and an elite cemetery has since been located that supports this archaeologically (Birbeck 2005), but the current picture suggests that this was the exception rather than the rule. Prior to the publication of the new evidence from Heslington, York, Scull suggested that ‘the early development of Ipswich and London was linked organically to the growth of existing exchange contacts, whereas at Southampton a greater degree of elite intervention was required’ (1997, 291). Palmer notes the irony that Southampton became the type-site for English emporia, principally because its archaeological record was very well preserved in comparison to the other known sites, which in itself is related to the fact that the settlement did not outlast the ninth century. Indeed, he suggests that this may be precisely because of the top-down impetus and control, an over-reliance on international trade, and a lack of interaction with its hinterland to fall back on when international trade suffered disruption (ibid.). This is a very interesting view that has a variety of implications for the study of vessel glass, given that 59% of the corpus is from Southampton alone. The settlement suspected of the most reliance on international trade also
exhibits the largest Middle Saxon vessel glass assemblage, although the roles of ‘survival bias’ and the quantity of excavation must also be factored in. Perhaps the majority of glass vessels were imported, especially at Southampton, given how similar the assemblage size and profile is to the assemblages from Dorestad and Ribe, how well placed Hamwic was for overseas trade, and the total absence of evidence for glass vessel production. On the other hand, however, if one accepts Southampton as abnormal in the context of the wider settlement landscape and the middle Saxon economy, that should counterbalance the importance given to it courtesy of circumstantial survival on a grand scale. Overall, one is reminded of Hodges’ statement that ‘the histories of emporia cannot be reduced a common story’ (2012, 114), and Sindbæk’s comment that ‘the implications are that paths towards urbanism wind on many trails, that trade is not a byword for politics, and that long-distance routes are sometimes more important than hinterlands’ (2007, 119).

Finally, what was the nature of the emporia communities? Who would have been using the glass vessels, and how? Who owned them? How did they arrive in the emporia? Early findings from analysis of burials indicate social differentiation at Ipswich, York and Southampton (Scull 2001, 67 and 74), thus supporting Hodges’ contention that elites established and administered emporia (1982), rather than the idea that the inhabitants were on the fringes of society (e.g. Randsborg 1991). The number of burial sites and the variety of practices ‘would be consistent with a diversity of social and cultural identities’ (Scull 2001, 73). When reviewing Scull’s paper, Reynolds commented that the diverse burial customs in evidence at Hamwic appear to provide ‘evidence for zoning, in this case as expressions of identity and status between individual sub-communities within the settlement’ (2005, 110), perhaps reflecting attempts to retain highly localized burial traditions from home settlements. However, these attempts seem to have been short-lived, both at Hamwic and Ipswich, due to growth of the settlements, indicating ‘a period of rapidly changing geography for the inhabitants of the town’ and forming ‘a distinct break with earlier burial traditions centred upon long-lived community cemeteries’. (Lucy
and Reynolds 2002, 13). Further work in this area has the potential to be fascinating and have significant implications for our understanding of emporia and their inhabitants.

Some must have been merchants, one step removed from the world of rural agricultural production and outside the established land-based social structure. In this sense, some of the inhabitants probably were ‘on the fringes of society’, and Samson argues that this, plus the high chance of conflict where money and exchange were concerned, was precisely why the agents of power were present: to keep the peace, not to have ‘the first choice of brooches for sale’ or hold ‘a regional monopoly on ceramic pitchers’ (1999, 88). Meanwhile, Hodges describes social change relating to craft producers too: ‘A factor common to all the type B emporia is the creation of a new order – urban craftsmen – leading to social interdependence and productive specialization which inevitably broke the ethos of a kin-based society’ (Hodges 2000, 82).

Malcolm and Bowsher argued that it is important to draw a distinction between merchants and specialist craft producers (2003), but so doing risks ignoring the possibility of some people engaging in both spheres either simultaneously or on a seasonal rotation. Gauging the scale of each group from the archaeological record is notoriously difficult, especially if one concedes that there may have been a complex overlap between the two, and variation in the balance over time. In either case, the inhabitants of the emporia were distinct from the majority of the population, who would have been farming the land and rooted within existing communities. The inhabitants may have had either sufficient skill or status to move themselves, or been chosen by their lord to work there under his banner, or alternatively have been merchants from overseas who claimed theoretical protection from the king. Scull argued that ‘a high proportion of the permanent inhabitants held the same status as the majority of the rural population, tied to an estate or estate centre’ (1997, 287). Everyone needed the protection of bonds or ties, and this is why foreign travelers claimed protection from the local king. However, suggesting that the majority of
emporia inhabitants had the same status as the majority of the rural population may be overstating the case, and overlooking the entirely different context.

Those living in the emporia were surrounded by different opportunities, connections and influences. Much greater likelihood of access to and opportunity to acquire glass vessels is one small example of the different environment, even if wealth or social status was broadly comparable with equivalent rural occupations. In another area of similarity, both craftsmen and traders must have been responding to demand from the rural estates of both monastic and secular lords in England and potentially their equivalents abroad. It is possible that representatives of rural estates were customers for and consumers of some of the glass vessels in the emporia, which were perhaps exchanged for bulk produce from the ecclesiastical and secular estate centres inland, and that first claim on them was not a key driver for the kings.

Debate continues over whether a foreign enclave is archaeologically identifiable at Southampton – Hodges argues in favour, Clarke and Ambrosiani against (1995, 35 and 201). Hill notes that a community of Frisians was known in York (also discussed by Rollason 2003, 178), and other foreigners in Birka, Hedeby and the emporia of eastern Germany (2001, 81). At Ipswich, the presence of imported domestic wares, particularly utilitarian handmade cooking pots, strongly suggests the presence of traders from Frisia, and at the same time shows that a proportion of the other imported pottery may have been personal possessions as well (Wade 1988, 96). Hill suggests that the men within the emporia were personally free (2001, 82), although whether this statement was intended to apply to craftsmen as well as merchants is not clear. Many may have been restricted to temporary stays, and residence with approved hosts – ‘secular and ecclesiastical landowners and their agents who themselves were actively involved in trade’ (Middleton 2005, 350). European emporium cemeteries analysed at the time suggested to Hodges that the native element represented a large proportion of burials, and foreigners very few (1982, 63) – however, people from overseas may have formed a significant
component of the living population, present on a seasonal or temporary basis. The discussions by Brown (2003) and Sindbæk (2007) argue that the vast majority of imported pottery vessels were ‘traders’ items rather than traded items’ (ibid., 121) and remained there to be used, which ‘may reflect the cosmopolitan nature of the maritime communities’ (Brown 2003, 23).

Further to evidence for foreigners in the emporia, it is often overlooked that there is place name evidence for the settlement of Frisians and Swabians in the countryside (Andrew Reynolds, pers. comm.), in East Anglia in particular. Freston and Friston, both in Suffolk, are recorded in the Oxford Dictionary of British Place Names as ‘farmstead or village of the Frisians’ (Mills 2003, 198), as is Freiston, Lincolnshire (ibid., 197) and Frisby on the Wreake, Leicestershire (ibid., 198). Fressingfield in Suffolk is possibly from ‘open land of the family or followers of a man called Frīsa (“the Frisian”)’ (ibid.), and Fryston Monk in North Yorkshire ‘farmstead of the Frisians’ (ibid., 199). Swaffham in Norfolk and Swaffham Bulbeck and Swaffham Prior in Cambridgeshire are all ‘homestead of the Swabians’ (ibid. 446-7), and Swavesey in Cambridgeshire ‘landing-place of a man called Swǣf (“the Swabian”)’ (ibid., 488). Interestingly, all of the Swabian place names listed here are on watercourses in East Anglia linking them directly to the Wash, while the Frisian place names stretch from Suffolk to North Yorkshire, but are all close to the east coast. The key point is that this is an important indicator that Frisians, Swabians and perhaps others were present at the emporia if, as this evidence suggests, they had also settled inland.

Finally, when considering the nature of the emporium communities, the likelihood that the Church had a foothold in each of the emporia is noteworthy. For example, maps of Middle Saxon Ipswich show four churches within the settlement (Hodges 1989, Fig. 31). Hodges discusses evidence for Southampton (1989, 83), and refers to the bishopric established in London (ibid., 94), and the variety of circumstantial evidence pointing to a monastery just outside York (ibid, 104). More recently, Birbeck (2005, 195) and Morton (1999, 56; 1992, 50-51) have pointed to St Mary’s Church and the Cook Street cemetery in
Southampton as the location of an early *monasterium*, and Malcolm and Bowsher tabulated all of the various documentary references to church land holdings and trade privileges in London (2003, Table 25). Middleton (2005, 349) suggests that traders were employed by monasteries actively engaged in international trade. It is probable that at any given time people with monastic affiliations would have formed a proportion of the population.

The dominance of emporium glass within the corpus suggests that the emporia were significant consumers of glass vessels in terms of conveyancing and actual use, and that they had the easiest access to them, even if one considers the excavation bias and the possibility of future monastic and rural assemblages. Context is key: in this case, the trading community and its carefully chosen coastal location was the most important factor determining availability of glass vessels in Anglo-Saxon England. This must surely relate to their position as hubs connecting regional with international trade (access), but must also have a connection to the nature of the community and their activities. The vessel glass assemblages point to at least a middle strata of society, probably comprising both tradesmen and craftsmen, and probably in contact with elite administrators. It makes absolute sense that traders consumed a surplus of traded goods within the emporia, especially as control of prestige goods does ‘not appear to have been a particular concern of kings and royal lineages’ (Loveluck and Tys 2006, 146). Hodges may be right when he states in *New Audit* that the ‘emporia were never centres of consumption, although consumption within their confines was conspicuous’ (2012, 137), and that ‘an element of neutrality... provided the opportunity for merchants and artisans to set their own operating rules’ (ibid.). The predominance of palm-funnel beakers indicates enthusiastic adoption of ‘Carolingian wine culture’ (Gaut 2011, 252, 255), perhaps in some cases to grease the wheels of business or diplomacy, and as a unifier in a diverse community. Loveluck considered the quantities of weapons, riding gear and glass vessels together and concluded that ‘a significant number of mercantile households had access to the material culture of warfare, mobility and luxury drinking previously associated only with the
highest secular aristocratic households at their rural estate centres’ (2013, 206).

The precise balance of traders versus craftsmen using glass vessels in the emporia, or their national origins, is not currently possible to know. However, we can say that a mixture of the two is possible, representing the emergence of a middle or merchant class. Equally, we cannot prove precisely the nature of control of these settlements. However, we can rely on a generalized view of operation through cooperation of various elite groups acting according to mutual interests. Overt royal governance is more likely at Southampton than elsewhere. Overall, the presence of great deal of glass vessels, many of a form associated with traditional secular feasting rituals used to reinforce status and social bonds, suggests the presence of feast sponsors and the transfer of mead hall traditions to these new proto-urban environments.

Although the emporia are important to the study of Middle Saxon vessel glass (and vessel glass is key for study of the emporia), it is important to retain some perspective on the centrality of the emporia to the society and economy of their time. For this, we finish with Samson’s blistering analogy of the Jurassic mouse:

‘…if it were true that they were inhabited by commercial merchants engaged in the first proper capitalist trade and industry of Europe, to say this was important to the economies of early medieval Europe is to look at the small shrew-like mammals that ran between the legs of the dinosaurs and mistakenly say that “these were the important creatures of their day”. Hindsight lets us glimpse the time when their descendants (mammals and capitalists) will rule the earth, but in their time Jurassic mice and Dark Age businessmen scuttled about unnoticed by the giants of their day’ (1999, 88-89).
Monastic sites

Debate surrounding the archaeology and history of Anglo-Saxon monasteries has also been intensive for decades, and it is equally important to set this work on glass vessels in that context and underline the contributions made by this study of the vessel glass from monastic sites. Long-running discussion has surrounded how to identify and define monastic sites archaeologically. Part of the challenge is the patchy nature of the archaeological and documentary evidence. Archaeologically, early churches are difficult to identify and often archaeologically sterile, and many aspects of monastic material culture overlapped with the secular elite (e.g. styli – large numbers can be argued as an ecclesiastical indicator, but secular estate centres probably had clerks and written records too). Another aspect is that the nature of settlements often fluctuated over time. Identification based on incomplete evidence is further complicated by factors relating to the original settlements, including the range of other interests and activities pursued by the monastic communities in addition to their core religious function, and that the communities themselves were drawn principally from the aristocracy – in other words, from the same pool of people as those occupying equivalent secular estate centres.

James Campbell described Monkwearmouth-Jarrow as ‘an island of assured knowledge in a troubled sea’ (Campbell 2003, 17), because we have no doubt over the scale of the library or the quality of the buildings that were there, and ‘the physical remains prove that Monkwearmouth-Jarrow was an immensely, and almost extravagantly, expensive enterprise’ (ibid.). However, the archaeological records from the remaining documented ecclesiastical sites all have their problems. At Lyminge the church is known to be partially covered by the modern church, and the areas of the site excavated recently are currently in a post-excavation phase. Barking Abbey was excavated in the early 1980s but never published and in the meantime the archive has suffered a great deal of disruption. Whitby was partially excavated between 1920 and 1925, was also never fully published, and produced very little material culture. The majority of
the occupation waste probably failed to survive - the prevailing theory is that most was tipped over the cliff edge or eroded by the sea. There are also a number of documented ecclesiastical sites that have never been excavated, and there must also be some sites, both excavated and unknown, that have not been identified as monasteries because no relevant documents survive. Thus there been intense discussion for the last several decades over how to identify monastic sites of this period based on archaeological evidence alone, whether this is even possible, whether there is any point in trying, and whether or not certain key sites can be identified as such (Flixborough, Lincolnshire, and Brandon, Suffolk in particular, e.g. Loveluck 2007, Blair 2005 and 2011a).

The function of a monastery may at first seem obvious, but it is important to note from the outset that Anglo-Saxon monastic communities were complex and varied, and had a significant role to play in the middle Anglo-Saxon economy. The early Church accrued a significant economic power base beginning in the seventh century and many monastic centres governed a disparate network of estates. Indeed Hodges commented that the church was ‘almost as economically motivated as the secular hierarchy’ (Hodges 1982, 55) and in New Audit he describes them as ‘complex and changing centres of monumental consumption and equally complex economic centres’ (2012, 90). Palmer commented that the ‘founders and later heads of some of these minsters were well aware of the trade potential created by the location of their abbeys’ (2003, 53), and indeed in some cases sited them in those locations for that very reason – e.g. the establishment of abbeys at Chertsey and Barking ‘at a time when Lundenwic was starting to expand’ (ibid.). When discussing the locations of minsters on hills and headlands overlooking seas and rivers, Blair wrote that such locations suggest the opposite of seclusion: ‘rather a proximity to the main communication arteries, and a centrality amid the dispersed settlement patterns of mid Saxon England’ (Blair 2013b, 326).

Foundation and endowment usually required substantial resources; hence the large number of documentary references to royal and noble involvement is
unsurprising (Foot 2006, 122). Blair considers that the endowment of the first English minsters mainly by secular rulers goes without saying (2005, 84). Kings were ‘enormously rich’ and also the proliferation of monasteries coincided with a boom in north-west European trade, providing new opportunities to those in control of the currency and recently established commercial emporia (ibid.). Widowed or unmarried royal women often became abbesses – as Campbell points out, it is illustrative of the close links between the two that the ninth-century Liber Vitae of Lindisfarne classed queens and abbesses together (2000, 95). The prosperity of minsters was then dependent on the empire-building skills of early leaders (for example the first abbesses of Minster-in-Thanet and Minster-in-Sheppey, Blair 2005, 87-88), and the continued support of the nobility, their lands and monetary resources. Numerous documents illustrate legal disputes over control of monasteries and their estates, often between kings and nobles but also bishops, so the autonomy of minsters was clearly under threat from both secular and ecclesiastical directions from the late seventh century onwards (ibid., 127).

Minsters formed ‘part of a pattern of trading and assembly places’ based on royal centres and monasteries (Astill 2006, 254). They were also often located on premium farmland, near ports or landing sites, and near existing emporia, or they attracted the development of trading sites because of the economic stimulus they provided (Blair 1988, 48). The monasteries of Wearmouth and Jarrow are both excellent examples of this, ‘established on estates with good land for cultivation’ (Turner et al. 2013, 96), and positioned to take advantage of thriving coastal trade and communication routes and access to other resources (e.g. stone for building). Jarrow was located by a ‘safe harbour’ in the tidal mudflats of Jarrow Slake (ibid., 99). Some settlements with large estates grew organically into towns because of the surplus they were liable to produce, and minsters had the additional advantage of attracting regular gatherings of people for social and spiritual reasons (Foot 2006, 120): they had what one might call a ‘ritual core’. Specific examples of regulated community engagement are provided by a number of surviving documents stipulating that
when land was gifted to minster communities, a proportion of the surplus produced must be retained to hold an annual feast for the local community to benefit the benefactors (ibid., 124).

Additionally, monastic communities had highly specific material demands for goods they could not produce - precious stones and metals, pigments, silks, and probably also wine (Foot 2006, 121), and therefore drew the mechanisms of trade towards them. Blackmore has noted the similarities between the imported pottery assemblages at Barking and Lundenwic; the presence of imported pottery assemblages at other monastic sites including Minster-in-Sheppey (Kent), Brandon and Whitby; and lack of imported pottery outside the emporia and monasteries (2001, 39). Indeed Hodges describes a relatively brief late eighth-century wave of intensive investment as the monasteries engaged in ‘materialization and substantiation’ on a large scale, via ‘music, paintings and an array of material culture’ (2012, 90). The peak period of vessel glass production and consumption in the second half of the eighth century coincides well with this wave, while later the disappearance of glass vessels, the decline in patronage and the shift in the focus of the monasteries from ‘investment in new materialization’ to the intensification of agriculture (ibid.) appear to have happened at about the same time. This transition paralleled the movement from ‘moveable wealth to landed wealth in the negotiation of king/lord relationships’ as discussed by Saunders (2001, 13), which played a part in the demise of the emporia. Indeed, Astill has recently commented that ‘the shift from prestige goods to the control of land as an expression of status was complete with the demise of the emporia in the ninth century’ (Astill 2013, 471) – implying that the shift was responsible for the demise. With such an understanding in mind, one can see how this dynamic would have reduced demand and therefore supply of glass vessels from the continent to England, which may have contributed to a lack of late Anglo-Saxon vessel glass in England (although it is impossible to quantify the loss of potash glass to determine whether the dearth relates to pre- or post-depositional factors).
The evidence of animal bone suggests that ‘there was a clear distinction in the species proportions recorded’ (Holmes 2014, 105-6) between ecclesiastical and high-status secular sites, with sheep predominant at the former and cattle and pig at the latter. Holmes concludes that these two site types were provisioned differently, and that ecclesiastical sites ‘occupied a different role to secular estate centres’ (ibid.). They were also clearly distinct from rural settlements when considering animal bone assemblages. Documentary evidence shows that some were involved in small-scale production and were also actively involved in trade – the examples given by Foot are salt production at Winchester and exemption from shipping tolls at Minster-in-Thanet (2006, 127), with others listed by Blair (2005, 257-9). Evidence of monastic involvement in trade has often been overlooked in the past, perhaps because the quantity of surviving documentary evidence is less than in France, although the scale of trade may well have been the same (ibid., 258). As economic and social centres, monastic communities had a strong gravitational pull in contrast to the peripatetic traditions of kingship, and were in a position to develop more intensive, innovative and organized production (Blair 2005, 253).

The coherence and intelligence of their estate organization was a notable strength, illustrated by documentary sources (Blair 2005, 254), including consolidation of landholdings into larger blocks and development of networks of cells and granges perhaps to manage outlying land holdings. The scale of labour available to minsters was also a factor, and all of the above means that the operation of major monastic estates was probably ‘significantly and visibly different’ from traditional territories by the end of the eighth century (Blair 2005, 256). ‘Ecclesiastical sites and particularly the old minsters do seem to have played a major part in the shaping of the hinterlands of the emporia’ (Palmer 2003, 52). Kings may have been the ultimate powers in their territories, but they were by no means alone in exerting economic control or reaping the rewards.
Campbell’s description of an eighth-century minster as a ‘special kind of noblemen’s’ club’ (2000, 97), in which many monks ‘drank and thought like noblemen, owned slaves and treasures and probably lived in halls like noblemen’ (ibid., 99) provides vivid imagery, although it focuses only on the principal actors and the historically visible. Meanwhile, Foot also describes monastic communities as essentially aristocratic in nature, but takes a broader view, noting that minster populations were drawn from the local area and had a mixed composition that would have been very similar to a local nobleman’s household, with high-born leaders, lower-born laborers, servants etc. (2006, 185). Another likely similarity would have been differential provision within: in both cases, the best quality resources would have been focused towards guests and leaders.

Taking this broader view of minsters helps to give the vessel glass found on these sites a social and economic context. Who would have been using the glass vessels, and how? Who owned them? How did they arrive? There are fewer question marks over the who now – with glass from the guesthouse and a few sherds near the refectory at Jarrow, and glass in the residential area at Lyminge (Broadley 2011 and forthcoming) suggesting both guests and at least some of the resident community used the glass vessels. Monastic settlements drew generous incomes from a variety of sources (endowments, intensive agriculture, estate management, exemption from food rents and other taxes etc.), were able to engage in specialist craft production, and produce both agrarian and industrial surpluses. They were well placed in terms of both wealth and access to involve themselves in international trade and consume glass vessels; either sourced in emporia and transported home or delivered directly depending upon location. Some may even have been manufactured at monasteries, although so far the evidence for monastic glass-working is limited to likely evidence found of vessel glass manufacture at Glastonbury (Wilmott and Welham 2015; 2013) and probable bead production at Barking. However, it is worth noting that there are some ecclesiastical sites where no vessel glass has yet been found, including a cluster in East Anglia: North Elmham, Norfolk;
Burgh Castle, Caistor on Sea and Castor, all located near the same east-west Roman road. There is also no vessel glass so far from a number of sceatta-rich sites that have not been subject to excavation (e.g. Barham in Suffolk) for obvious reasons, and it is likely that similar variations in both excavation and survival have influenced the ‘blank’ sites.

However, this research on the glass also contributes to our knowledge of middle Saxon monasteries and perhaps a clue to identifying them archaeologically. Given the blurred lines between ecclesiastical settlements, secular estate centres, and rural settlements, and given that church communities had similar access to networks of farms and estates and therefore similar resources, and had social and political influence equivalent to secular lords, the clear distinction of the vessel glass form profiles is very interesting and may aid future identification of monastic phases. If not related to wealth or ease of access, this must represent different choices being made at some point in the production or supply process, based on the social context and circumstances of use. The preference for globular beakers, a stable form that can function as tableware, indicates a very different culture of use to the unstable forms, one that may have been more conservative, more connected to mead or ale than wine, and perhaps more likely to be used in a communal setting. They would also be more suitable for placement on an altar.

**Royal settlements**

At present, very little evidence of middle Saxon royal occupation has been identified, and even less glass from this period has been found in a royal context. ‘Royal’ Anglo-Saxon glass of the seventh to ninth centuries is currently limited to two possible sherds from seventh century Yeavering, and two possible sherds from ninth- or tenth-century Cheddar (based on descriptions my view is that these may be residual Roman glass; however, it has not yet been possible to view them). In the sixth century, evidence is more plentiful due in part to glass vessels buried in ‘princely burials’ such as those from Sutton Hoo.
and Prittlewell in Essex. From settlement contexts there are three sherds of the late fifth and sixth centuries from Rendlesham, the royal settlement in Suffolk, five miles from Sutton Hoo (Prof. Christopher Scull, pers. comm.), and an outstanding assemblage of sixth century vessel glass discovered during excavation of the royal vill at Lyminge. Careful study of the Lyminge glass will be required to determine the exactly the scale of seventh-century glass at Lyminge, and to interpret the degree to which their contexts were still ‘royal’ at that time. My initial report on the Lyminge glass features two key sherds of deep blue glass that must be early seventh century in date and appear to be contemporary with the occupation of the timber hall complex (Broadley, forthcoming). However, by the eighth century, Lyminge was monastic and the eighth- and ninth-century Lyminge glass has an ecclesiastical context.

The absence of evidence for middle Saxon royal sites and associated glass vessels is worth mentioning, not least because the lack of glass on royal sites could call into question the association of glass with high status. However, the absence could equally be just that: and absence of evidence rather than a genuine absence. Rahtz pointed out recently the discrepancies between the documentary and archaeological records in this area: 193 palace sites are known from written sources, although they are difficult to identify archaeologically (Rahtz 2013, 412). Rahtz also noted that the written sources give few details of the material culture associated with palaces (ibid.). However, as suggested by Blair in the same volume, it is possible that ‘the itinerant lifestyle which food-circuits imposed on warrior aristocracies was not easily compatible with fixed residential strongholds’ (Blair 2013a, 196). Furthermore, Ulmschneider made an excellent point when she wrote that many settlements of this period now seem to have fulfilled a wide range of functions (often changing over time), and that ‘some royal functions may have taken place at sites other than royal vills’ (Ulmschneider 2011, 163).
Beyond estate centres – the middle-ranking foci

Discovery and exploration of middle-ranking rural settlements of the middle Saxon period is a relatively new and expanding area of enquiry, in which the vessel glass from these sites has a key role to play. Awareness of such settlements has expanded exponentially largely as a result of finds made by metal detectorists. ‘Recognition and acceptance’ of so-called ‘productive sites’ has been slow as a result of the methodologies used and the nature of the information produced (selective recovery resulting in limited archaeological context), meaning in turn ‘few opportunities to consider the archaeological nature of metal-detected “productive” sites’ (Ulmschneider and Pestell 2003, 2-3). However, the mere existence of the wealth of metal detecting data, alongside the few excavated sites, has increasingly indicated that the emporia were not the only markets participating in international and regional trade, has challenged ‘the notion that such rural sites were of little importance to the economic system as a whole’ (ibid., 1), and has alerted us to ‘a potentially much greater complexity and structure in early medieval settlements and the economy (ibid., 7). The discovery that several sites in this category produced substantial glass assemblages is an important one. The appearance of assemblage profiles that are distinct from both emporia and ecclesiastical groups is an addition to the slight evidence currently available for middle-ranking foci. Very few sites in this category have been thoroughly excavated, and most that produced glass assemblages are yet to be fully published (e.g. West Heslerton, North Yorkshire; Sedgeford, Norfolk). The principal exceptions are Flixborough and Brandon, if one includes them in this category.

A view of the hinterlands of the emporia (and probably other central places) as ‘overlapping and complex’ (Newman 1999, 45) has emerged. Several systematic studies have been completed on the penetration of continental and other traded goods into English hinterlands although unfortunately all are unpublished doctoral theses. The subjects were Mayan lava querns (Parkhouse 1977), imported pottery (Coutts 1992) and late Anglo-Saxon and Viking Age
strap-ends (Thomas 2000). Parkhouse and Thomas have since published articles building on their unpublished work (e.g. Parkhouse 1997; Thomas, Payne and Okasha 2008). Parkhouse provides a useful map showing the distribution of Mayan lava querns across northwestern Europe (1997, Fig. 1) showing an interesting concentration in central England and groups to the south of York and to the north of Ipswich and Hamwic. Interestingly, Parkhouse argues that lava is more widespread than Rhenish pottery due to a comparative lack of market competition (ibid., 104). Relative to glass vessels lava quernstones were also more physically robust and responded to a universal utilitarian need. Despite the fact that the sources of vessel glass are difficult to determine, this study of the glass has made a significant additional contribution to the picture by illuminating the presence of glass at several middle-ranking rural centres, and there is much future potential.

Middle-ranking centres were part of an integrated regional economy, along with the major emporia and monastic sites (e.g. Moreland 2000b, 96). Moreland proposes a four-tier rural settlement hierarchy (Moreland 2000b, 96-7). Palmer outlines a similar structure amongst sites with traded goods, featuring the ‘richest’ and usually ecclesiastical sites, followed by rural sites with strong evidence of production, then rural sites with ‘neither an ecclesiastical connection nor specialized production but which appear to have been involved in trade in some way, simply as a result of their location on major trade routes’ (e.g. Lake End Road near Maidenhead; Yarnton in Oxfordshire; Sandtun at West Hythe in Kent; Palmer 2003, 54-5). Astill observed several key points recently: that most documentary evidence for Anglo-Saxon trading references high social levels; that different trading methods, systems and localities probably existed simultaneously; and that occurrence at minster sites, hillforts (and assorted other middle-ranking rural centres) shows that ‘exchange took place inside kingdoms, on a scale which may not have been surpassed until the later tenth and eleventh centuries’ (Astill 2013, 471).
Hamerow outlines the evidence from animal bone assemblages to suggest that some of these sites (e.g. Flixborough) were supplied with a form of organized livestock render, and were probably in direct contact with the producers (2002, 151). More recently, Holmes found ‘greater numbers of cattle on wics compared to those from [comparable] rural settlements’ in all cases where both sets of data were available: York, Ipswich, London, Canterbury and Southampton (Hamwic) (2014, 100). She described this pattern as ‘typical of demand for meat from a concentrated population’ (ibid.), and as an effective strategy for delivering the largest possible amount of meat from the smallest possible number of animals (ibid., 104). Furthermore, mortality data shows that ‘at nearly all wic sites cattle and sheep were at optimal ages for meat production, yet data from rural areas were more indicative of a mixed regime (ibid., 100). Indeed Holmes concludes that it is likely that livestock travelled from rural sites to estate centres as food rents, ‘to be used by the elite both as food and as resources for the provisioning of wics’ (ibid., 102-3). This fits with the bone evidence from West Heslerton, in which all market-age livestock are absent, indicating that this was one of the subject communities that had paid their premium stock as food rent to a local centre (perhaps a monastic community further up the valley as suggested by Dominic Powlesland). West Heslerton and Flixborough represent rural ‘producer’ sites and estate centres respectively in their regional hierarchies, and it is a new finding that vessel glass reached some sites like West Heslerton (Broadley 2014), as well as top-tier sites like Flixborough, and the emporia.

Meanwhile, Moreland argues that rural production was a vital force in the rapidly expanding economy. Brandon ‘received grain in a semi-cleaned state’ and the importance of this and the textile (probably linen) production there is that they ‘make a connection between these high status sites, Ipswich ware, imported pottery, sceattas and production’ (Moreland 2000b, 89). The same link is demonstrated at Butley, where the products included metal and leather working (ibid.). Flixborough illustrates this connection again, and there it has been suggested that textile production was on an industrial scale (Moreland
2000b, 95), alongside (in this case a monastic one) lead from the Peak District and Ipswich and shelly ware drawn from regional procurement networks, and imported pottery from long-distance trade. Sites primarily engaged in large-scale food production also demonstrate a connection with production, but seem much less likely to provide any evidence of vessel glass consumption (e.g. Terrington St Clement in Norfolk and Wicken Bonhunt in Essex, both involved in meat production, and Raunds in Northamptonshire, which may have specialized in grain production or processing, Moreland 2000b, 90).

The scale and significance of rural production has been seriously underestimated, partly as a result of over-emphasis on exchange and partly due to a lack of evidence in the past. Developments in this area may have been the driving force behind economic change (Moreland 2000b, 69). The recent discovery of a plough coulter in a seventh-century context at Lyminge makes a good example of new agricultural technology capable of increasing production reaching estate centres (in this case a monastic one) and supports the contention that those linked to early churches were much more focused on agricultural exploitation (Brookes and Harrington 2010, 100). Another example is a description by Bede of how Bishop Wilfrid introduced new methods of sea fishing to Sussex (Historia Ecclesiastica iv, 13; Campbell 2003, 18). There was also a lack of evidence for light industrial production sites of all kinds, with the exception of Ipswich ware, which may have contributed to the level of production in eighth-century England being ‘massively underestimated’ (as argued by Moreland 2000b, 69). However, Hamerow points to two sites near Ipswich (Barham and Coddenham), as prime candidates, both known mainly from metal-detecting and neither from any large-scale excavation, the latter of which she indicates may have been a ‘metalworking and redistribution centre’ (2002, 187-9). In addition, she notes the discovery of a late eighth- and early ninth-century iron smithing and smelting site at Ramsbury, Wiltshire (ibid., 189). More recently, a metalworking site of the late eighth to late tenth century was found during excavations ahead of the High Speed 1 Channel Tunnel Rail Link in Kent (Reynolds 2011, 380-384), featuring a ‘substantial quantity of
metalworking debris (51.434 kg) resulting from both smelting and smithing activity as well as horn cores’ (ibid. 380). Reynolds cites in turn an early ninth-century iron-smelting site at Millbrook, in the Ashdown Forest in Sussex (Tebbut 1982); Catholme, Staffordshire (Brown 2002, 113-5); Faccombe Netherton (Fairbrother 1990, 244-54); and Cheddar (Biek 1979, 252-8). Reynolds notes that Faccombe Netherton is a manorial estate centre and Cheddar is high-status, but that Catholme appears ‘to lack a high-status component’ (ibid., 382). Sites such as West Heslerton and Sedgeford may well prove to be very important in this context – these and other future sites may provide equivalents to rural settlements clearly involved in both trade and production on the continent.

Both secular and ecclesiastical estate centres were heavily involved in the ‘intensified management of resources’ (Moreland 2000b, 96) at the centre of the economic transformation, and this is one reason why the archaeological signatures of both site types have so much in common. Blair states that a significant increase in the foundation of small aristocratic minsters in the first third of the eighth century is very plausible, because having seen the major impact of royal minsters, the nobility ‘would have sought access to their reflected cultural prestige as well as their financial benefits’ (2005, 106). It is a viable theory that some of the sites of unknown status within this study may have been smaller noble minsters of this type. For example, Hamerow recognizes that both Flixborough and Brandon probably had monastic phases (2002, 150). According to documentary evidence, Brandon (excavated) and Barham (metal-detected only) were both part of estates held by the monastery at Ely by the late Saxon period, and this arrangement may well have begun earlier (Moreland 2000b, 88). Meanwhile, Neil Faulkner has suggested that Sedgeford was a (secular?) estate centre in the Middle Saxon period, a major local distribution centre at a secondary level to the regional emporium at Ipswich (Faulkner and Snelling 2004). Evidence suggests that Sedgeford was part of an elite distribution system centred on Ipswich, and Faulkner suspected that ‘Sedgeford was ruled by feudal lords, members of a new elite of ealdormen.
and bishops, thegns and priests, who were the local representatives of the emergent Kingdom of East Anglia’. Whether secular or not, Sedgeford makes an excellent example of some percolation of the ‘moveable wealth’, which is very interesting, and an area for future work.

It seems, based on current evidence, that glass vessels were common only in the top tier of settlements. A very interesting question is the extent to which they appear in the second tier (centres with strong evidence for specialized production in Palmer’s scheme, 2003, 54-55), and whether or not they appear in the third at all. Answers will gradually crystallize with future research and excavation. Based on current evidence, glass vessels penetrated the upper parts of the networks but not the lower, reaching most elite centres and many upper-middle level producers of cloth, fine metal work and leather, but very few of those involved in large-scale food production that supplied settlements ‘up the chain’. As yet there is very little evidence that vessel glass reached Palmer’s third tier of sites with some trade activity but no specialized production, or rural farmsteads limited even in their trade activity.

According to Hinton (2005, 93) a single sherd of vessel glass was found at Wharram Percy, a site whose artefacts included northern French pottery, imported hone stones, Ipswich ware, which all ‘confirm participation in long-distance exchange systems’ (Moreland 2000b, 93); and two sword pommels and a hilt guard, indicating an elite presence; and which featured enclosures, a smithy, crucibles and moulds for making copper-alloy objects and textile manufacturing, all evidence of production (ibid.). Moreland describes it as ‘high status’ and definitely connected to York, and indicates it as a typical example of ‘high-status occupation from early in ‘the long eighth century’, linked with evidence for the intensification of production, craft production and participation in regional and long-distance trade systems’ (ibid.). Moreland suggests that these were ‘centres in and through which elites controlled the production and distribution of goods at the regional level’ (ibid., 94).
Meanwhile, Shakenoak in Oxfordshire, produced two sherds of vessel glass alongside early sceattas and weaving debris (Blair 1994, 82). Two sherds were also found at Eynsham Abbey in Oxfordshire (which may have been ecclesiastical already in the middle Saxon period), two at Pevensey in Sussex (an estate centre in a former Saxon shore fort like Portchester) and one at Trowbridge in Wiltshire (which may have had links to the nearby monastic centre at Bradford-on-Avon). These sites currently represent the fringe of glass vessel distribution in a hierarchical and in some cases a geographical sense as well. Hinton notes that items such as the occasional glass vessel fragment may have been left in these places as a result of occasional visits by elite owners, but also offers as alternative the possibility that access to trade and traded goods by ordinary rural communities has been underestimated (2005, 88). The former seems eminently possible, although difficult to prove – perhaps these outliers are part of the missing evidence for assumed use of glass vessels by peripatetic kings and lords. The latter is also a distinct possibility, particularly within reach of the east coast economic zone, and of course the two theories are not mutually exclusive scenarios – both may be true.

A third factor that had been overlooked until recently is that some small coastal settlements probably accessed international maritime trade directly (Naylor 2004b, 147), including some with key medium-sized assemblages of vessel glass (e.g. Brandon, Butley), although of course the scale of activity and the vessel glass assemblages within the emporia were many times greater. The imported pottery (and glass) at Barking Abbey ‘may have been shipped there directly’, although transshipment from the market at Lundenwic is also a possibility (Blackmore 2002, 292). Butley was probably an island in the Anglo-Saxon period, and ‘could easily have caught traffic moving along the east coast’ (ibid., 140). Interestingly, discoveries happening now at the Bronze Age settlement at Must Farm near Peterborough are leading the excavators there to make a similar proposal for a community just up the East Anglian coast but 1500 years earlier, controlling ‘the associated trade, benefitting materially in the process’ (Higgins 2016) – perhaps these glimpses indicate a reality that existed on the
east coast for a long time before the Romans and again for some time afterward. Such fringes of glass vessel distribution are a fascinating area to explore in pursuit of detailed knowledge of the social and economic fabric of Middle Saxon England.

Evidence of the penetration of vessel glass into a middle tier of settlements of both secular and ecclesiastical nature is one of the most interesting findings of this project, and small glass assemblages from rural sites will be amongst the most important discoveries in the future too. Almost as if to prove this point, several vessel glass sherds were discovered during initial excavations at Little Carlton, Lincolnshire in the summer of 2015 and with the help of a local metal detectorist, Graham Vickers. The site is a classic example of a ‘productive’ one identified via metal-detecting and the discovery of a scatter of coins, styli, hooked tags, pins and strap ends, which went public and appeared in print in April 2016 in *Current Archaeology* (Townend et al. 2016). Information on the vessel glass sherds had already been posted on Twitter without revealing the source (Willmott 2016 a, b and c). Townend et al. describe the site as a ‘marsh island community’ (2016, 28) ideally located for engaging in and controlling trade (ibid., 30-32) and provisionally identify it as a ‘previously unknown monastic or trading centre’ (ibid., 34). They argue that Little Carlton is one of the most important early medieval sites found in the region so far and nationally in recent years (ibid., 28 and 34). The project team are returning for further excavation in the summer of 2016 and with luck, more precious information will be revealed as a result.

**Social identities**

Vessel glass is usually found as part of dining waste deposits, or domestic waste containing flooring materials – this broad social pattern was universal. Many elements of noble life were ‘both communal and alcoholic’ (Campbell 2000, 94). There is also evidence of association with a subset of grander ‘feasting
deposits’, and therefore secular elite and elite-sponsored feasting practice – public consumption and beneficence to reinforce the social hierarchy. However, despite a comparatively homogenous function, evidence suggests that glass vessels were used by a variety of people within emporia, monasteries and probably elsewhere. It is likely that glass vessels were used by the peripatetic royal courts, but it is very difficult to prove archaeologically because they were not rooted in the landscape, and perhaps as a result glass has very rarely been retrieved from known palace sites. However, glass vessels were found in princely burials of the Early Anglo-Saxon period in England and in abundance at the sixth century royal vill at Lyminge (Broadley, forthcoming), and continental examples help to support the theory that use at this level continued (e.g. the ‘palace-monasteries at Paderborn, Germany, and St Denis, France).

Similarly, although it is likely that it did happen, there is little archaeological evidence yet for use in churches. Indeed, across all materials, ‘surviving items which had or might have had a liturgical function... are relatively few’, and ‘objects of recognizable church plate are rare survivals indeed’ (Coatsworth 2011, 785). Matthew Stiff summarized a range of documentary evidence for use of glass vessels as chalices and patens (1996, 322-3), but there is very little artefactual evidence for glass chalices. Stiff lists four possibilities from the whole of Europe, from a sixth-century church at Saint-André, France; Monte-de-Hermès, Oise, France; Villa Ruffi in Rimini, Italy; and a ‘handled palm cup’ found in a coffin within the precincts of Peterborough Cathedral. One could also add mention of the footed beaker from Flixborough (B125, Fig. 5.115) – a very rare form in glass with parallels to chalices – and the late tenth-century Shaftesbury bowl, found buried near the altar of Shaftesbury Cathedral, allegedly originally containing the heart of King Cnut. Aside from the two vessels in funerary contexts at Peterborough and Shaftesbury, there is no direct contextual evidence of glass use in churches at all – i.e. no complete vessels or fragments found within churches, chapels or other liturgical spaces. Of course,
survival of such evidence in treasuries or in the archaeological record is very unlikely.

Even if one turns to chalices made from metal, there are only two exceptional examples that survive: one found in the Trewhiddle Hoard in Cornwall, and the other probably made by an Anglo-Saxon goldsmith for the monastery at Kremsmünster, where it remains, between AD 777 and 788 (Dodwell 1982, 61). The Trewhiddle Hoard was buried near St Austell in the mid ninth century alongside other items suggesting that the hoard consisted of the portable wealth of a church, buried and never retrieved. The very similar ninth-century silver gilt ‘cups’ from the Vale of York Hoard and Halton Moor are also of interest here – thought to have been church plate originally from monasteries in France, they too are rare survivals found by chance, and show a similarity in shape to glass bowls and globular beakers of the eighth and ninth centuries. Wilson and Blunt point to the ransom of Richard I in the twelfth century, the Reformation of the Monasteries in the sixteenth century, and the Civil War of the seventeenth century as factors counting against the survival of Anglo-Saxon chalices (1961, 88-89). Small metal funerary or portable chalices from Hexham, Northumberland, and Hazleton, Gloucestershire, are much smaller and are not closely dated (Dodwell 1982, 90). The repeated documentary references suggest that glass vessels were used in churches on a scale worth addressing by contemporaries, but it is difficult to prove archaeologically. Even in ecclesiastical communities it is likely that most glass vessels were used in the context of dining.

Vessel glass as a status marker

The question of whether or not glass vessel fragments are markers of elite activity has been raised regularly in recent years. In the early days of my research, I argued that it was (Clark 2005), which was in turn used as an example by Gaut when he argued the opposite in reference to the glass from
Kaupang (Gaut 2007). The idea of vessel glass as an elite status marker may have been influenced, consciously or unconsciously, by the different role of glass vessels in the elite gift exchange systems of early Anglo-Saxon society or by the enduring concept of this period as a ‘dark age’. However, even if one accepts that a shift towards commodity exchange had occurred by the early eighth century, arguing for these objects as pure commodities (ibid, 36) is swinging too far towards the other extreme. The ‘hierarchy of valuation’, involving consideration of ‘properties of scarcity, diversity and quality, combined with social ‘added value’ attributes of genealogy and social use’ (Brookes 2007, 172), plays a role in establishing the worth of commodities as well as gifts. Evidence for access and use by merchants, traders and crafts people within emporia does not completely contradict the idea of glass vessels as a commodity with status, as these people were living in settlements under royal or aristocratic control and performing key functions for the economy, and, above all, they had contextual advantage and were subject to cultural influences from the continent. The drawing together of these specialized occupations in a controlled environment was an early phase of the emergence of a new tier of society, above those working the land but below the aristocracy in secular life. Furthermore, ‘in a world in which commodity production had diminished to a fraction of its Roman proportions, the status of these craftsmen should not be underestimated’ (Hodges 2000, 88-9).

The reality was surely more complex than a simple answer of ‘yes’, or ‘no’ to the question of vessel glass as a marker of elite status. The status of vessel glass must have depended on context: both the quality of the glass vessel in question, and the setting in which it was used. Was the vessel found within an emporium with many others, or much further along the network of exchange, perhaps on a smaller settlement deep in the countryside with only one or two others that may have come from a single vessel (as at Shakenoak, Oxfordshire, for example)? Glass clearly travelled beyond the elite occupiers of palaces and important monasteries, but not often or in large quantities. Although the occupants of the emporia, some of whom did have access to glass vessels, were
not aristocrats, they were distinguished by special skills and by residence in specialized communities located at nodal points on maritime trade routes. Occupants of the ‘middle-ranking foci’ could be regarded as forming a different section of the same middle space between the leaders of church and state and the rural farming majority. Glass is not found everywhere; it rarely appears on small farming settlements or away from the major transportation routes; and where found, vessel glass is still indicative of unusual activity. Activities under that umbrella might include engaging in the kind of trade or exchange systems required to access products whose production and transportation was so much more complicated and restricted than production of bulk agricultural produce. It is also important to consider the complications of fluctuations in the nature and status of communities and settlements where vessel glass is found. Flixborough appears to be a prime example of a settlement where vessel glass was used in some periods of occupation but not others, and where the nature and status of the settlement correspondingly changed dramatically several times (Loveluck 2007; Loveluck and Atkinson 2007; Pestell 2011, 565-566). Brandon, which has an even more significant glass assemblage, is similar in this sense (Pestell 2011, ibid).

Access seems to have been key, both in a geographical sense (coastal or riverine locations on established trade routes being a major factor in increasing accessibility) and in the sense of place in the socio-economic structure (a position as a secular or ecclesiastical hub in regional networks). Either coastal sites may have had their own hierarchy, or location or economic function may have been the key factors in the settlement hierarchy rather than social rank (Ulmschneider 2011, 164; Palmer 2002, 154, 175). Demand must also have been a key factor – the specialist imported goods, materials or expertise (glass vessels or glassmakers) were drawn past the emporia only to places with a sufficient pull of demand. As Brown noted (in relation to imported pottery outside the ports, which was confined to high-status sites), to the elite ‘the drinking of wine and the consumption of “Continental” goods and commodities would have been an integral part of the process of showing off one’s wealth
and learning’ (2003, 23). Loveluck agrees, arguing that the glass vessel fragments from Flixborough represent ‘exotic “feasting kits”’, bought directly from foreign merchants as part of ‘conspicuous consumption of the resources of the land’ (2013, 129). Put like that, one can easily see how this would have applied to ecclesiastical as well as secular communities. Hinton included glass vessels in his volume “Gold, Gilt, Pots and Pins: Possessions and People in Medieval Britain” because ‘they were very often used in ways that made them visible and a direct reflection of social standing’ (Hinton 2005, 1), sometimes by the elite, and sometimes by ‘aspiring elites’ (emerging middle classes).

**Defining monastic and secular identities**

We have only limited contextual evidence for which inhabitants within the emporia were using glass vessels, and in which circumstances. It may well be possible for further work to be completed in this area in the future. The number of documentary sources of information generated by the church community provides a whole sphere of material that can inform us about drinking and dining practices in monasteries that is does not exist for the emporium communities. Foot summarized the numerous references extolling abstemiousness regarding food and drink, and criticizing those people and places perceived to have fallen short in this area, but also states that the monks who bullied one of their fellows for refusing any alcoholic drinks at all were probably more typical of their time (2006, 237). In addition, of course, the more devoted religious writers would have seen no need to mention drinking as a vice had it not been commonplace. Indeed Foot makes an interesting reference to the possibility that some monastic estates may even have been producers of wine – Glastonbury Abbey owned a vineyard in the tenth century, and there were a number in southern England by 1066 (ibid., 239). Complaints were also made about secular entertainments of music and song in the guest halls, and even in a few cases about young recruits horse racing and hunting, highlighting the blurred lines between the ecclesiastical and secular worlds in this period.
and the problems facing strict religious leaders and thinkers. Religious culture became ‘enmeshed in the priorities and strategies of the warrior aristocracy which it was simultaneously transforming’ (Blair 2011b, 728). Blair made a very interesting point when he wrote that minsters ‘rivalled courts in extravagant display’ (ibid.) and that such behaviour and material possessions were expected by the secular elite who ruled, visited and patronized these communities.

Foot states that feasting and drinking were ‘as much a part of monastic life as they were central to contemporary aristocratic culture’ (ibid., 236), and notes that abbots were encouraged to offer good hospitality to guests (Regularis Concordia, 237). Campbell stressed succinctly that ‘conviviality mattered’ (2000, 97) in monastic settings. Glass vessels had a key place at the meeting point between the ecclesiastical and secular worlds, in the monastic guesthouse and in the aspects of life in a minster that mostly closely mirrored aristocratic households. It seems that the social context of the use of glass vessels in secular and monastic contexts had many similarities, but one key difference: the monastic predilection for stable vessel forms suitable for dining in the classical tradition (tableware), and the dominance of the unstable forms of Germanic tradition (drinking vessels) in the emporia. Monastic use was also alongside different foods and in a distinct cultural setting. It seems likely that these subtle differences between monastic and secular practice reinforced the religious identity of ecclesiastical communities and their connections to Roman social traditions, and their status as a separate section of society with its own considerable power and resources.

**Networks of exchange**

**Regional networks**

It is very difficult to prove in which direction glass was moving without proof of where production was taking place (e.g. from ecclesiastical estate centres to
the emporia, or vice versa, or both?), but distribution mapping is worthwhile, even in the absence of production evidence, as links can still be seen. Unfortunately, the difficulty of locating sites of glass vessel production ‘cannot be over-emphasized’ (Stiff 2001, 43), meaning that sites of both trade and use, particularly those with reliable stratigraphy, are very important. To date only slender evidence for glass working in middle Anglo-Saxon England has come to light, and only from monastic settlements. The glass working at Glastonbury Abbey and Barking Abbey are very different entities from a chronological perspective. The waste from Glastonbury Abbey, which appears to have included vessel production although the main purpose was glazing, is now dated to the seventh century (Wilmott and Welham 2013 and 2015), while the limited information available regarding the Barking furnace points to the ninth century and manufacturing of beads or inlays. As such, these isolated examples appear at the beginning and end of the middle Saxon period, and in different regions. There is a very small amount of evidence for possible glass melting at Hamwic (Hunter and Heyworth 1998, 61) and the circumstantial evidence of apparent deselection of some sherd types from the archaeological record, but this is a very long way from forming a case for glass vessel production there. Even the substantial and very well studied glass working waste at Ribe has been shown to relate exclusively to bead production (e.g. Sode 2004), which is a much simpler manufacturing process. It seems likely that the majority of glass vessels in middle Anglo-Saxon England came from the Rhineland and that the majority of those travelled to or through the emporia. Regional networks of production and exchange and the links with the international trade routes will be a major area for future study of Anglo-Saxon England, and study of vessel glass has a role to play in that.

Astill has argued that ‘attachment to the idea of a hierarchical system of exchange may mean we risk underestimating the importance of small-scale exchange systems for particular localities’ (2011, 510). Characterization of vessel glass assemblages can help to identify local networks of trade and exchange. For the first time, we have glimpsed vessel glass travelling around...
the interior networks beyond the emporia, at York, Ipswich and Hamwic. The most noticeable patterns link Ipswich and Brandon: the distribution maps show that both are connected by white, red, brown, black and deep blue-green glass, by globular beakers, bowls and grape beakers, and by quantities of applied trailed and reticella glass in comparison to the surrounding regions. In the cases of some glass attributes, glimpses of a micro-network also including Butley, north-east along the Suffolk coast from Ipswich are possible, including quantities of deep blue-green swirled and mould-blown glass (although Butley is more likely than Brandon to have engaged directly with the same flow of international trade, see p. 353). Indications of overlapping links in the northeast also appear when studying the distribution of vessel glass attributes. Amber and brown glass, bowls and moulded decoration appear to link York, Flixborough, West Heslerton and Beverley, while York and Flixborough stand out in the region when looking at reticella distribution, and deep blue-green links some of the sites within this loop to Monkwearmouth and Jarrow. On a smaller scale, the amber, brown black and moulded glass from Portchester may have been linked to nearby Hamwic. Indeed, Blackmore has suggested on the basis of pottery studies that future attention should be paid to the finds from these two sites and their connections, as they may represent a good example of linked emporia and royal or political ‘consumer’ sites (2001, 39).

It seems likely that patterns of regional exchange were also partially influenced by the ‘three provinces’ model proposed by Tom Williamson (2008, Fig. 66; 130-138), in which England was divided by river systems, watersheds and seas into the ‘North Sea province’, the ‘Channel province’, and the ‘Irish Sea province’. The Irish Sea province corresponds exactly with the regions of England where Atlantic type glass is found, while the Anglo-Saxon glass that is the subject here is found in both the North Sea and Channel provinces. In the future, it would be very useful to integrate this work on glass with similar studies of pottery and other artefact types. More recent excavation of glass from middle-ranking sites such as West Heslerton and Sedgeford is a further indication of regional
movement of these vessels, even if we cannot prove where the glass on these sites came from or exactly how.

**Water-borne trade**

As Stacey Klein notes in her introduction to the recent volume “The Maritime World of the Anglo-Saxons”, Bede underlines the importance of the seas and sea travel to Anglo-Saxon culture in the opening of his *Ecclesiastical History of the English People*. He begins, “*Britain, an island in the ocean… facing… the coasts of Germany, France and Spain….*”. They were ‘keenly aware that they inhabited an island surrounded by a seemingly limitless expanse of water’ (Klein 2014, 1). The North Sea and the English Channel were both boundaries and highways for transportation, and on an internal scale, the same also applied to rivers. Place names and contemporary documents provide a wealth of evidence for the importance of rivers and the variety of functions they served (Hooke 2014, 37). Hooke describes them as both ‘lifelines’ and ‘gateways to the early medieval kingdoms’ (ibid.). The poetic terms ‘whale road’ and ‘sea road’ are indicative of a deep-seated understanding of the seas as facilitating travel, communication and connection, while Alcuin’s description of the sea as a ‘voluptuous delight’ displays a positive familiarity (Carver 1990, 122). Klein gives English monasteries as an example of how close the cultural contact across the seas was, describing them as being ‘in constant contact with texts, visual culture, material artefacts, and ideas from the Continent’ (ibid., 9) – a broad view it is easy to lose sight of when focusing on one facet of the material culture.

The seas and rivers ‘shaped the initial patterns of settlement and much of the subsequent economic and political history of the Anglo-Saxon age’ (Pelteret 2013, 472). Maritime and cultural exchange were already flourishing between many centres fringing the North Sea zone in the sixth century (Hills, 2003, Brookes 2003 and Loveluck and Tys, 2006) and Carver argues that ‘the
appearance of monasteries... and trading centres...in the eighth century does not necessarily mark an up thrust in sea traffic or trade, but rather its canalization in the interests of regulation, tax, state profiteering, and restrictive practice’ (2014, 27). Carver also describes Anglo-Saxon England very adroitly as ‘a land of two halves with their backs to each other’ (ibid., 30) in his explanation of how the eastern half faced east and the western half faced west, and traded commodities of all kinds were targeted accordingly. It is hard to conceptualize now, but the people of eastern England really were more easily and closely connected to the people Francia, Frisia and Scandinavia than with those in western England, Scotland, Wales and Ireland. In 1990, Carver constructed a diagram of travelling times from Ipswich by land and sea, both by oar and under sail, illustrating how even a simple exercise can revolutionize our view of who was neighbours with whom (Carver 1990, Fig. 15.3). ‘Even under oars only, [from Ipswich] Quentovic is as accessible as Bury St Edmunds and Jutland is “nearer” than Tamworth’, (ibid., 122), and East Anglia’s neighbours were Kent, Northumbria and Francia, rather that the geographical neighbor, landlocked Mercia. Perhaps the Angles and the Franks could even be regarded as the same maritime people facing each other across the sea, as Ewan Campbell has argued for the Scots and the Irish (Campbell 2001 and 1997). Vessel glass is one of the artefact groups that illustrates this point effectively in both the eastern and western spheres, with the eastern glass showing links between the east coast of England, the Rhineland and the North Sea coast of Scandinavia (Carver 2014, 30). Their distribution (see Chapter 4) corresponds very well with the ‘generalized zone of monetized trade’ identified along the east coast via the mapping of ‘productive sites’ (Naylor 2004a, 133) and mapping distribution of single coin finds (Naylor 2004b, Figs. 2-4), and reflects ‘the importance of coastal location for active engagement in alienable exchange’ (Brookes 2003, 96). Wherever the vessels were being made (mainly the Rhineland), and whichever directions they were travelling in (mainly from the Rhineland to eastern England), they were a result of international cultural contact and dialogue across the sea. They are an indicator thereof, and reflect broader processes such as the spread of mead hall culture, and later the propagation of
Christianity and associated wine consumption via the same networks. It is no coincidence that Francia was also the principal producer of wine in the region.

The case for sites other than emporia, particularly those with favourable coastal or riverine locations, having direct access to long-distance trade networks has been investigated in the past decade or so by scholars including Naylor (2004a and 2004b), Loveluck and Tys (2006) and Brookes and Harrington (2010). Naylor noted that trading places were concentrated on transportation routes (Roman roads, rivers and the coast), and observed ‘relatively abundant evidence for non-urban coastal [trading] settlements in middle Saxon England’ (2004a, 125 – italics added). One particular example given of a coastal site that could have been engaged directly with international trade network is Butley, Suffolk (ibid.), a site with an interesting and unusual vessel glass assemblage. This phenomenon seems to occur particularly in regions employing a model of many small trading posts rather than a focus on one large emporium (ibid., 127). Naylor’s key examples of the former are Lincolnshire and Kent. In the case of Kent, Brookes and Harrington point to sites such as Sarre, Sandwich and Santun as ‘coastal communities periodically engaging in inter-regional trade’ (2010, 89), and the evidence does indeed suggest that some were, especially in Kent. Interestingly, documentary evidence suggests that Santun at least was subordinate to the monastery at Lyminge by the middle Saxon period (Gabor Thomas, pers. comm.) and was used as a coastal outpost supplying a large volume of marine fish and probably other goods as well. All of the Kentish trading sites, as with emporia elsewhere, were located on waterways, with the Wantsum Channel being especially important (2010, 84). They were often located at the crossing point of inland routes and waterways, although Lundenwic, Hamwic and Sandwich seem to have been located by beaches suitable for landing keelless boats (ibid., 85, and fig. 25).

The distribution of vessel glass consumers matches so closely to rivers and coastal locations along the eastern seaboard that it strongly suggests that the majority of glass vessels in this period were imported from the Continent. It
seems that at least some glass vessels were acquired directly by coastal settlements like Butley and Whitby. In fact, when this idea is applied to settlements where vessel glass has been found, as many as sixteen of the twenty-three sites (70%) may have directly sourced some of their vessels. At first glance Brandon seems landlocked, but it was in fact on the edge of the huge Fenland area spreading south and west from the Wash (Tester et al. 2014, Fig. 1.1), on a gentle rise within the floodplain of the Little Ouse river, and probably at the river’s lowest crossing point until recently (ibid., 1). In other words, the location of Brandon was actually ideal for waterborne trade to connect with regions inland and upriver. At Lyminster glass may well have arrived via its coastal dependency Santun (see below), just across the Channel from northern France. West Heslerton is an interesting case, as there ‘some form of redistribution from either York or the east coast is likely’ (Naylor 2004a, 68), in part due to its location approximately 30 kilometres from both. Canterbury had a link via Fordwich, the River Stour, Sarre and the Wantsum Channel to both the English Channel and the Thames Estuary. As with Brandon, Northampton seems a long way in land – literally in the midlands – but it is linked by the River Nene to the North Sea via the Wash. Indeed the Nene emerges only approximately fifteen kilometres along the coastline from Sedgeford, on the north Norfolk coast, another site with a vessel glass assemblage. Eynsham is on the Thames just upstream from Oxford, and Shakenoak on the River Everlode that flows into the Thames at Eynsham. Even Trowbridge, where only one sherd was found, is on the River Biss, which is a tributary of the Avon. Unfortunately, as is suspected at Whitby itself, a great deal of evidence has probably been lost to coastal erosion in the north-east (Naylor 2004a, 124). The dominance of water-borne trade in glass is supported by broader studies of internal trade. For example, in his work on the hinterlands of the emporia, Palmer makes a very effective point regarding the influence of navigable waterways on Middle Anglo-Saxon distribution with the inclusion of a map of navigable rivers c. 1750 (Palmer 2003, Fig. 5.2; 51) alongside a distribution map of sites in the south and east of England in receipt of traded goods (ibid., Fig. 5.1). He concluded that these were essential in shaping the inland networks of exchange (ibid.).
Regarding the specifics of shipping – envisaging how goods crossed seas and travelled along river systems - Hodges wrote in 1982 that there may not have been much distinction between ‘raiders’ and ‘traders’, or between sea and river-going vessels, and argued that ‘cargoes must have been very limited’ (1982, 94-100). The consensus in the field, confirmed by specialist Crumlin-Pedersen (2010) seems to be that Hodges was right about a lack of distinction in seafaring ship types in the Middle Anglo-Saxon period. A reviewer of Crumlin-Pedersen’s volume on *Archaeology and the sea in Scandinavia and Britain* commented on how pleased he was ‘that Ole, after some years of debate, agrees that the specialization of ships for war and ships for trade is a 10th century development, with the Gokstad ship as the last preserved example of an all-purpose ship’ (Christensen 2010, 452). The Gokstad ship was built c. AD 890 and buried in a grave c. AD 900 (Museum of Cultural History, University of Oslo). Even when crewed by a full crew of 34 oarsmen, there would still have been some room for trade goods in personal chests that the oarsmen sat on, and in the space underneath the floor (ibid.). However, describing cargoes as ‘very limited’ is probably a little harsh, especially if sail power could sometimes be employed and crews reduced. Most recently, Carver explained the importance of sail technology, thought to have been adopted around the turn of the eighth century, for maritime trade (2014, 25-26) in reducing the need for manpower and therefore increasing the space for goods. He also imagined vividly ‘rivers, lakes and estuaries as thronging with... small personal craft’ (ibid., 26). When one considers that the emphasis was on trading bulk goods (Naylor 2004a, 134), and also the proliferation of monastic communities and their smaller scale but specific demands for imported goods, one can well imagine the North Sea ‘thronging’ as well.
**International comparisons**

**Site types and glass in society**

Glass vessels have been found on a similar range of site types in northwestern Europe and Scandinavia, including emporia, palaces, monasteries, and others such as Develier-Courtételle in Switzerland, which appears to have been a specialist community of metalworkers. Evison mentioned sites that encompass a variety of characteristics in addition to emporia, including Borg in Norway, which can be described as an estate centre located in the far north; Liège and Maastricht, which are described as ecclesiastical sites; and Paderborn and St Denis, which were palace-monasteries (Evison 1990).

**Atlantic Britain and Ireland**

It is important to note that a scatter of later seventh to ninth century glass of the ‘eastern tradition’ or Frankish sphere have been found in Atlantic Britain and Ireland, although once in the principal period of vessel glass consumption in middle Anglo-Saxon England the numbers of sherds and sites is small. Campbell lists 45 examples in total (2007, Table 6), of which only a few parallel the material in the corpus of this project. Campbell and Bourke list two palm cups of the late seventh to early eighth centuries - G77 from Dalkey Island and G169 from Lagore, both near Dublin (Campbell 2007, 62; Bourke 1994, 173, Fig. 23), and in the case of the latter, Bourke mentions ‘good parallels amongst the Southampton material’ (1994, 174). Six definite or possible fragments from Scotland (Whithorn, Mote of Mark, Buiston crannog and Birsay) appear to be sixth century where it is possible to make an estimate (Campbell 2007, 62). However, the assemblages from Whithorn, Dumfries and Galloway, and Brough of Birsay, Orkney, each contain one sherd of reticella-decorated glass. Campbell notes that by this time ‘Whithorn was an Anglo-Saxon monastery and material of mid-Saxon origin is not unexpected’ and refers to a close parallel from ‘an 8th-century level at Barking Abbey’ (ibid., 63, Plate 26; Webster and Backhouse
Similarly, deeply coloured sherds are characteristic of middle Anglo-Saxon glass, of which ‘a number’ were found at the same two sites. G262 from Tintagel in Cornwall has a black rim, red sherds include G13 from the Brough of Birsay (Campbell 2007, Pl. 27) and G142 from Dundurn in Scotland, and turquoise G10 from the Brough of Birsay, G64 from Castle Hill, Dalry, and G137 from Dunadd, all in Scotland (ibid., 63, Plate 29). It seems that they may have travelled by indirect over-land routes in many cases (ibid., Fig. 48), although ‘those at Dundurn and the Brough of Birsay may have followed the eastern coastal sea route’ (ibid., 64).

The majority of glass in Atlantic Britain and Ireland, which corresponds well with the Irish Sea province of Tom Williamson’s ‘three provinces’ model (2008, Fig. 66; 130-138; Campbell 2007, Fig. 39), is Atlantic type glass, while the Anglo-Saxon ‘eastern’ glass that is the subject here is concentrated in the North Sea and Channel provinces. The characteristic features of Atlantic glass were ‘high quality, thin, very pale yellowish glass’, opaque white marvered trails, and the cone beaker form, although some bowls are also known (Campbell 2007, 54; Figs. 38 and 42-44, 46-47; Plates 31 and 34-37). The Atlantic glass vessels were brought to western Britain by a trade route ‘from western France in the later 6th and 7th centuries’ (ibid., xiv). The glass in Atlantic Britain is therefore broadly earlier than the glass of middle Anglo-Saxon England, typologically distinct from it, and seems to have come from a completely different source, so the remainder of this chapter will face firmly towards the Frankish realm and Scandinavia.

International emporia

The emporia in Francia and Scandinavia that produced vessel glass (Quentovic, France; Dorestad, The Netherlands; Hedeby, formerly in Denmark but now in Germany; Kaupang, Norway; and Birka, Sweden) have more in common with their English equivalents than they do to set them apart (e.g. Hodges’ discussion of the archaeology of the group, 1982, 56-65). Wickham describes a
common ‘raison d’être… as foci for import-export’ (2005, 685). However, the precise nature of some are subject to ongoing debate. Kaupang is an excellent example: was it Type A, or Type B, according to Hodges’ typology? In Dark Age Economics, Hodges declares that Kaupang was ‘undoubtedly a fine example of a Viking-period emporium (Hodges 1982, 81), whereas Gaut and others have argued that it was smaller, less organized and possibly seasonal (Stiff 1996, Gaut 2007). The latest view is that it was briefly temporary and then permanent for the majority of its existence (Pilø and Skre 2011, Fig. 2.6). Yet even debates such as these parallel the situation in England, where the status of Southampton and Ipswich as type B emporia is widely accepted, while that of London and York have often been questioned in the past (Hodges 1982; Stiff 1996).

The size of the emporia varied considerably, with the estimated sizes of Ipswich and Dorestad at their eighth-century maximum being over 100 ha, Southampton 42 ha, Hedeby 24 ha, Birka 11 ha and Ribe 10ha. Supply of traded pottery also has some known regional variations (e.g. Hodges, 1982, 57-60, 91), and methods of supplying meat surplus from the agrarian economy to these specialized centres may have varied (e.g. the supply of livestock to some English emporia contrasting with the apparent supply of butchered meat to Hedeby and Ribe, and ‘part-time farmers’ at Dorestad, Hodges 1982, 141-2 and Randsborg 1980, 54-9 and 87). It is probable that other aspects were subject to local variation as well – for example, the goods produced and imported and the nationalities represented. However, the large quantity of vessel glass found at trading sites is a broad theme common to all, and represents a change in (production and) trade patterns, which is similar to the situation in England (Näsman 2000, 38).

Fortunately, the glass from Kaupang in Norway has recently been published in great detail by Gaut (2011), and includes both intra-site distributional analysis and placement within its international context. Kaupang was located on the western side of the Oslofjord and occupied on a temporary basis from c. AD
800-805/810, and then as a permanent settlement until c. AD 840-850 (Pilø and Skre 2011, Fig. 2.6). Kaupang is a smaller glass assemblage than some of the larger emporia, with 322 vessel sherds reported by Gaut from Kaupang (ibid., 169), compared to 672 from Dorestad; 463 from Hedeby; 512 from Ribe; and 187 from Quentovic (figures from Stiff 1996), and 1678 from Hamwic, 332 from Ipswich, 161 from London and 114 from York (figures from this project). In reality, the current totals for Dorestad and Ribe are certainly in the thousands. However, the glass from Kaupang has been analysed and published in the greatest detail so far. Briefly, the form profile at Kaupang is dominated by tall palm cups and funnel beakers, which represent 70% of identified sherds, with globular beakers (or ‘squat jars’) the only other large group at almost 30%, although a small number of bowls and grape beakers were also noted (Gaut 2011, 169, 181-2, Fig. 9.8). Gaut used data from Stiff’s 1996 thesis (Stiff 1996) and Borg, Norway (Holand 2003) to produce a figure comparing the form profiles of Ipswich, London, York, Dorestad, Hamwic, Quentowic, Ribe, Haithabu, Kaupang and Borg (Gaut 2011, Fig. 9.61). All of these sites have a high proportion of palm-funnel series vessels, particularly Dorestad, Hamwic, Quentowic and Ribe, which Gaut’s chart places at between 85% and 92% palm-funnel series vessels. According to the same chart, only Ipswich, Kaupang and Borg (which was not an emporium) are below the 70% mark. Similarly, Dorestad, Hamwic, Quentowic and Ribe have the smallest proportions of globular beakers at c. 7% or less (with the exception of Borg, where there were none). Kaupang has by far the largest proportion of globular beakers amongst this group of site assemblages at 30%, with the majority of the emporia recording c. 10% or less. This very useful comparison illustrates that the bias towards the palm-funnel series in English emporia is matched in emporia across northwestern Europe.

The colour profile at Kaupang is brightly coloured (ibid., Fig. 9.3), with only 61.1% of the glass falling into the blue-green spectrum, compared to 81% of the English national corpus. Deep blue and red fragments were particularly well represented, comprising 8.1% and 6.8% respectively, compared to 3.1% and
1.4% in England. 34% of the glass features decoration, which is very similar to 31% in England, and the proportions of applied trails amongst the decorated sherds is also very similar (60% compared to 56%). The principal differences in decorative types between Kaupang and England are that Kaupang has more reticella decorated glass (24% of decorated sherds compared to 16%), much less mould-blown decoration (0.4% compared to 12%) and many more coloured ‘in calmo’ rim sections (12% compared to very few in England – Evison refers to rare examples from York and Southampton, Evison 2000, 85). Some of these differences probably have a strong chronological explanation (e.g. the reduced proportion of moulded decoration, or claw beakers, at Kaupang, a ninth-century settlement assemblage). However, taking a broad view, the similarities between Kaupang, other emporia and the English national corpus show ‘that a standardization took place in north-western Europe during the 8th and 9th centuries, in respect of both vessel forms and decoration’ (Gaut 2011, 182; Stiff 2001, 45-46; Hunter and Heyworth 1998, 58). It seems likely that a significant proportion of the glass at all of these sites emanated from a common source, for which the Rhineland is the principal nominee, although at present there is a lack of hard evidence. It is also very probable that they served a common cultural function, which Gaut and others identify convincingly as wine consumption (2011, 252, 255-256).

However, as Gaut says, a large part of value of the Kaupang assemblage lies in its ‘well-documented settlement context, allowing detailed spatial analysis’ (ibid., 170). One of the key points is that, particularly in comparison to Ribe (below), the distribution emphasizes ‘consumption rather than glass working’ (ibid., 250). The vessel glass finds ‘cluster around the house plots, in habitation layers and in zones of domestic refuse’, clearly pointing towards local use and breakage (ibid., 253). Additionally, no fewer than 24 sherd families have been identified (ibid., 215). Even more interestingly, spatial analysis revealed a ‘disparity in the presence of glass between the excavated plots’, suggesting that ‘some households owned sets of several glasses while others had none’ (ibid., Fig. 9.40, 255). In terms of detailed deposition patterns, there were few and
only small sherds from the centres of the plots, while more sherds and larger ones came from pits or plot boundary ditches. Waterlogged pit deposits showed that ‘many pits contained redeposited floor material’ (ibid., 214), although a significant few sherds were found in primary floor deposits, ‘e.g. SF12 and 13 and certain fragments from SF 2 and 10’ (ibid., 218, Figs. 9.37 and 9.38). So far, there has been a corresponding lack of vessel glass in the beach harbour area in front of the house plots, although comparatively little excavation has taken place to date and more would aid clarification on this point. Interestingly, there is also little evidence at present for channeling vessel glass onwards into the hinterland at Kaupang. The ‘hall site at Huseby close to Kaupang’ is the only other settlement site in southern Norway where vessel glass has been found (ibid., 253).

Regarding continental and Scandinavian emporia, based on currently available evidence Dorestad was the most important by far. It was probably the largest in terms of surface area, but more importantly, it seems to have functioned as a hub at the base of the Rhine, and acted as a key trading partner and source for a number of other emporia. According to Wickham, Dorestad was a ‘meeting place between the sea lanes and the spinal river traffic of the Rhine’ (2005, 689), while Willemsen described it as ‘one large harbour’, as ‘ships could moor over almost the full length of the town’ (2012, 70). Jetties were built on the site from c. AD 650 onwards, and land reclamation conducted on an extensive scale (ibid. 69). By AD 725, the platforms of reclaimed land formed a single line, and a continuous campaign of construction and expansion continued thenceforth until after AD 825 (ibid., 70). Unfortunately, in the past the excavations at Dorestad have suffered some familiar problems, with finds and records inaccessible, and publication of reports delayed by decades. However, between 2009 and 2013 a collective research effort was implemented and a high-profile exhibition organized. According to Willemsen, this recent research activity has shown that ‘Dorestad was definitely a metropolis, considered from the perspective of its time’ (Willemsen 2012, 65-66) and was ‘an exceptionally wealthy town’ (ibid., 67). Its ‘role as an
international trading port was always in the foreground’ (van Es 1990, 163), although alongside this the settlement had complex and interlinked involvement in regional trade, craft production, food production and perhaps administration. Wickham wrote more recently that ‘Dorestad’s basic role was to export finished goods, often prestige goods, and to import raw materials’ (2005, 691). He names both Dorestad and Quentovic as export funnels, and contrasts them with Hamwic, which was the opposite – an import funnel (ibid., 687). Contacts focused particularly on the eastern coast of England (van Es 1990, 172) and the western coast of Scandinavia, which is of particular relevance when considering the glass vessels found in all areas. Wickham describes the Merovingian kingdoms as ‘the superpower of the north’, and Frankish goods as very important ‘as the markers of status for all of the regions north of the Rhine mouth and the English Channel’ (2005, 817-818).

The comparative size of both settlement and harbour were very large, and fortunately, the ‘campaign of the National Archaeological Service in Wijk bij Duurstede in the 1960-70s was also the largest excavation ever conducted in the Netherlands’ at over thirty-five hectares (Willemsen 2012, 66). As a result of both factors, the artefact assemblages are of staggering size. Willemsen noted in particular ‘hundreds of thousands’ of sherds of ‘imported, luxury ceramics’, including ‘at least twenty-three thousand rim sherds of pots of Badorf ware and relief band amphorae from the Rhineland’ (ibid.) Verwers calculated that 80% of the pottery found was imported, compared to an almost inverse ratio at Kootwijk (70 kilometres to the north-east, 30% imported) (1988, 55). He also compared the huge volume at Dorestad (18000 sherds from 2 hectares) to Koudekerk, 64 km to the northeast, closer to the North Sea coast (2700 from 1 hectare), and stated that these figures indicate ‘the relatively great wealth of the inhabitants and the importance of trade in comparison to other settlements’ (ibid.). Most of the imports came from the Rhineland and Meuse regions, including the glass, and wine (transported in barrels reused as well lining, and made near Mainz, much further up the Rhine, ibid, 55). Willemsen does not offer an overall total for vessel glass sherds found at
Dorestad, but does emphasise that ‘during the excavation of a small section of Dorestad in 2007 alone, eight hundred and twenty-two fragments were found, including coloured glass... and sherds with gold-foil decoration’ (Willemsen 2012, 66). If these are added to the total of 672 known to Stiff in 1996 then the number reaches 1494, and this does not include glass found between c. 1995 and 2007 or 2007 to the present, and probably some other material too.

Glassware is specifically mentioned by van Es as an example of a commodity found in Dorestad, but whose origin and ‘passage through Dorestad can only be surmised’ (ibid., 168). The possibility of production there ‘cannot be completely excluded’ (ibid., 174), although that phraseology suggests it would be reasonable to view vessel production in Dorestad as unlikely based on evidence existing at the time, and nothing major has been found since to alter that view. Van Es wondered whether the raw materials for glass vessel manufacture were imported into Dorestad (ibid.), although it is more probable that they were made into finished articles in the Rhineland and transported to and probably through Dorestad. Finally, glass workers are mentioned by van Es as an example of a type of craftsmen who may have been full-time specialists but were perhaps also itinerant in order to construct a complete living (alongside comb makers, metal and stone working and gold smithing, ibid., 175, Ambrosiani 1981), which is an interesting theory. However, ‘it is conceivable that [the regional and superregional markets] offered a fairly considerable number of full-time craftsmen a partial or even a permanent living’ (ibid.), and this is more likely at Dorestad than anywhere else in the region in the seventh to ninth centuries. These questions remain in relation to the emporia in England too. Van Es suggested that the glass sherds found in Dorestad ‘may also be the remains of broken merchandise’ (ibid.), which contrasts with the prevailing view in England today that the emporia glass mainly represents vessels used by the inhabitants. It may be possible in the future to elucidate a combination of the two in various English and continental emporia by close contextual study – the first step being a gathering of this data for sites on the continent where available.
Verwers recognized three elements of the settlement at Dorestad: ‘agrarian production, industrial production, and commercial activities’ (Verwers 1988, 54). Regarding the other two, agrarian and craft production, similar problems exist with determining specific details, especially concerning scales of activity. Little is known for sure regarding sources of materials for craft production, range of crafts present, volume of production or intended destination (van Es 1990, 173). No industrial zone has yet been found – ‘we are undoubtedly dealing with household industries in Dorestad, geared primarily to local demand’ (ship building, house building, basketry, rope making, tanning and smithing, bone and amber working and textile manufacture, Verwers 1988, 54). The fact that the scale of production is difficult to determine is a problem that applies to many similar settlements across Europe. Regarding agrarian production and supply, Verwers reached the conclusion that ‘Dorestad produced a protein surplus’, and may have directed this to settlements in the local region as well as within the emporia (ibid.). However, van Es detailed the discovery of some farm buildings on the fringes of Dorestad, but describes the settlement as also dependent on a surplus from its catchment area (1990, 177).

Van Es emphasizes the dominance of merchants in the community at Dorestad, and describes the likely diversity amongst them - independent entrepreneurs, those tied to the court or church, and occasional merchant farmers or clergy mainly working on a local or regional level (ibid., 177-178). He reports Lebecq’s argument that numbers were small, but dominated by free merchants who worked together (van Es 1990, 178; Lebecq 1983, 254-263), a phenomenon for which there is also evidence in London. Regardless of exact scale or nature of merchant activity, we can be confident that en bloc they formed a significant presence in each. Meanwhile, royal involvement was significant, but not exclusive, and no mention is made of de novo royal foundation in either contemporary sources or modern scholarship. The king offered the merchants both protection and privileges in exchange for a supply of luxuries to the court, a market for the surplus from his estates, revenue from tolls and international
cultural penetration (van Es 1990, 178-179). ‘And what applied to the king probably also applied *mutatis mutandis* to the court nobility and certainly also to the church’ (ibid, 179). Similar evidence for guilds of merchants and church land ownership exists for the English emporia, especially London. It seems very likely now that understanding in England has been dominated by the case of *Hamwic* at Southampton, ironically perhaps the only emporia in northwestern Europe that still appears to have been established from scratch by a king. Meanwhile, Dorestad was at the heart of a new inter-regional system covering eastern England, northern and eastern Francia and western Jutland (Woolf 1999, 73). Woolf argued that ‘to understand the exchange systems operating in this period, we need to pay much more attention to the archaeology of the Frisian interior’, concluding that ‘only then will we really understand what is going on in middle-Saxon England’ (ibid., 74).

Ribe and Hedeby (also known as Haithabu) in Denmark also make excellent case studies because they effectively illustrate the vagaries of retrieval. The first traces of eighth-century Ribe were found in the early 1970s, and are today completely covered by the modern town, which is located on the western side of the Jutland peninsula (Feveile 2012, 111, Figs. 1a and b). The glass from Ribe is of enormous importance due to the size of the assemblage and the high retrieval rate (2970 fragments have been found so far, more than the entire corpus for Anglo-Saxon England), but this group of glass is also an excellent illustration of how assemblages are strongly influenced by survival and retrieval. Ribe began as market place that may have been seasonal in the early eighth century. In the market area, thick occupation layers were found, comprising ‘hundreds of thin cultural layers spanning from ca. AD 705 to ca. AD 850’ (Feveile 2012, 113), whereas in the residential area occupation deposits had only survived in deep features such as post holes, wells and ditches and contained few finds. ‘Thus the obvious importance of early eighth-century Ribe rests almost entirely on the excavations in the narrow zone of riparian activities’ (Näsman 2000, 54). From 1990 onwards, every single ‘cultural layer’ on all excavations was wet-sieved, which in some cases ‘multiplied the numbers
of finds ten-fold’ (Feveile 2012, 115, Fig. 5), providing us with a wealth of extra information. Meanwhile, a feature of great importance, the harbor, has not yet been excavated, or even located (Feveile 2012, 113), and the current limit of past excavations mean that it is also not possible to define the structure of the settlement – whether it has a ‘looser, open structure’ or ‘a much more densely settled area, as in Haithabu’ (ibid., 119) is unknown.

Feveile describes the dense layers of the marketplace at Ribe as giving us ‘an important insight into the roles of a trading place: to produce artefacts, to control trade, to act as a nodal point for goods passing in and out of the area’ (ibid., 115). The crafts evidenced in detail include antler working, comb-making, metal casting, smithing, amber working, and glass bead making. Significant groups of imported items include quernstones from the Rhineland, pottery from the Rhineland and the coastal zone of north-western Europe (Madsen 2004, 255, 269), soapstone and whalebone from further north in Scandinavia, and glass tesseræ from northern Italy (Feveile 2012, 115-7). Bencard describes the metalwork and wood in particular as dominated by workshop debris rather than finished objects in use (Bencard 2004, 16), which in his opinion helps to illustrate the character or the settlement, although really it only related to the ‘workshop area’. Although much of the glass in the workshop area may have been collected there for recycling into glass beads, Feveile notes that ‘some bare traces of use’ (ibid, 115). Meanwhile, a paper published on glass bead making technology in Ribe notes that the distribution of vessel glass was ‘largely concentrated at and around the market place, and occurs more or less in the same layers where most of the bead making waste is to be found’ (Sode 2004, 88). It is interesting to note that fragments of vessel glass were present in the earliest phase of the site, the brief and poorly understood phase prior to the parceling into plots that has been dated to a short period of only a few years in the first decade of the eighth century. Feveile describes evidence including that of a bead maker found at the Posthuset site that included two fireplaces and ‘hundreds of glass pieces in the associated layers’ (Feveile 2006, 72-74). It would be fascinating if the vessel glass could be fully studied and published,
including a review of distribution and full comparison with glass bead making evidence, and it will also be interesting to see whether any future finds are made in other areas of the settlement, particularly the residential zone and the harbour. Sode described the glass vessels as imported, probably from Frankish workshops, although also states as few others have, that ‘little is known about the glass production centres in the German and Frankish area from this period’, making it difficult to consolidate theories regarding imports from the region (this applies to at least a proportion of the vessel glass in middle Anglo-Saxon England too).

As with York, the question has been asked as to whether Ribe was a permanent settlement or a periodic market or fair. Bencard and Jørgensen presented evidence supporting both possibilities (1990, 581), but did not discuss the possibility that zones for both were present in different areas of the site. This has continued to be a topic of interest in recent years, and refinements have been made to our understanding. Following a brief initial phase of occupation lasting only a few years, a planned grid layout was established in the market area between AD 704 and 710, a situation described by Feveile as ‘completely unparalleled in 8th century Scandinavia’ (Feveile 2012, 114). According to Bencard and Jørgensen this ‘parceling out of the area must be interpreted as a planned laying-out of the area as a market-place’ (1990, 581). Although Feveile and his colleagues believe that ‘the workshop area was only in use on a seasonal basis’ for the first three-quarters of the eighth century, he is also ‘sure that regular, year-round occupation took place in Ribe from its beginning’ (Feveile 2012, 114). Permanent buildings were added to the plots in the workshop area ‘from around 780-90 at the latest’ (ibid.), and a perimeter ditch in the first half of the ninth century, clearly marking the boundary on the settlement. The ditch was also ‘a completely new element to Scandinavian archaeology’ (Feveile 2012, 119). ‘All indicate a strong royal presence in Ribe from its foundation in the early eighth century until the High Middle Ages. But... archaeology cannot prove whether Ribe was founded by a king or grew up following an initiative of the local elite, the presence of which is testified by the
magnate manor of Dankirké nearby’ (Näsman 2000, 56). Interestingly, Feveile advances the theory that the early initiative ‘came from abroad’, most likely ‘the area of Frisian influence’, although as he notes, ‘any hypothesis will be hard to prove’ (Feveile 2012, 115).

Meanwhile, Hedeby was the largest town of this period in Scandinavia, and was located at a significant confluence of trade routes on land and sea – between the North Sea zone on one side and the Baltic trade on the other. It was a political and military stronghold of the Danish kingdom, with the first Danish mint from the early ninth century. However, less is known of Hedeby than Ribe because only a portion of the residential area has been excavated and the presumed market and craft area has not yet been found. The smaller number of finds reflects the source: thin domestic occupation layers rather than thick refuse deposits. Hedeby is mentioned frequently in the Frankish annals from AD 804 onwards, which reveal that the Danish King Godfred was in power and influenced the settlement’s development (Näsman 2000, 57). They also refer to the presence of a comes, Hovi, obviously the king’s authority in Hedeby, which strongly suggests that ‘its administrative function differed from a normal rural settlement’ (Näsman 2000, 58).

As in England, there was a lack of research into the economic dynamic between emporia and their hinterlands until recently (e.g. Hedeby, Hamerow 2002, 170). The settlement of Schuby (6km from Hedeby) yielded virtually all of the same imported items, including glass (ibid., 171), and also evidence of textile production and metal and amber working. However, production of an agricultural surplus cannot be proven, nor can the delivery of any items produced to Hedeby. No ‘primarily agrarian settlement has been identified in the immediate hinterland of Hedeby’ (ibid.). Some of the inland settlements still located on trade routes like Schuby were clearly engaged in some production and trade, and Hamerow comments that we cannot assume that all long-distance trade was channeled through Hedeby (ibid., 172). However, not all settlements had access to the ‘importstrom’, and even amongst those that
did the distribution of vessel glass is far from universal. Schuby also had a separate craft working quarter (ibid., 175). It is possible that some types of production were more controlled than others (e.g., non-ferrous metal working versus iron working, ibid., 175-7), and that demand for imported good like glass vessels varied, with the details of both dependent on local and regional factors. Wickham was struck by ‘how targeted imports were in Denmark’, describing how they were ‘directed, dendritically, to political centres, and were little exchanged beyond them’ (2005, 817).

The less well-known (in England at least) settlement at Groß Strömkendorf, which is located on the Baltic coast of modern north-eastern Germany, and which has been identified as a probable match for Reric, mentioned as an emporium in the *Royal Frankish Annals* (Tummuscheit 2003, 208, 217), provides a further illustration of gaps in the evidence to date. Despite ‘systematic and intensive investigations’ (ibid., 209), the buildings found are all ‘pit houses’ (*grübenhauser*), which have been interpreted there and elsewhere as workshops rather than dwellings (ibid., 213-217). The people and their workshops have been found, but not their dwellings – not the area of the settlement where they actually lived, leaving a huge gap in current knowledge regarding even the core settlement. The grid of ‘pit houses’ suggest a significant degree of planning during the phase of their construction (ibid., 209, 213, 220), while a large cemetery of featuring a wide variety of burial customs has been excavated, indicating the presence of Danes, Slavonic Obodrites, other Scandinavians, Franks, Saxons and Frisians (ibid., 210-211). A typically large and diverse assemblage of finds has been retrieved here too, with a ‘significant proportion’ imported (ibid., 212). The artefact assemblage features Badorf and Tating wares, other typical items from the ‘Carolingian and the Saxon-Frisian areas’ including lava quern stones, glass funnel beakers, metal dress fittings and weapons, objects from Scandinavia such as Norwegian whetstones, and a few *dirhams* from further afield (ibid., 212-213), all indicating trading contact in several directions. Widespread evidence for a variety of manufacturing was also discovered, including of glass and amber beads and antler and bone
combs, textiles and ferrous and non-ferrous cast metal objects (ibid.). However, as has already been mentioned, only the ‘pit houses’ interpreted as workshops have been located, and if there were to be craft working debris this is the area where one would expect it to be and no interpretation is made of the scale of these activities. There has been limited investigation of the hinterland to date, although a distribution map of Early Slavonic finds and archaeological sites ‘based exclusively on surface finds’ (ibid., Fig. 16.6) revealed a concentration within 12 km and particularly to the north and east, which ‘possibly reflects the close interdependence of centre and hinterland’ (ibid., 218), although the exact nature and dates of the hinterland settlements is not known. Tummscheit concluded that ‘the marked changes of internal organization around the second half of the eighth century are linked to the formation of political structures in the immediate surroundings of the site, and to the frequent contacts of the Obodrites with the Frankish kingdom’ (ibid., 220).

Similarities and differences between the English emporia and their continental and Scandinavian counterparts, and between their glass assemblages and interpreted use of glass, are fascinating topics. Key advances have been made in recent years, particularly via the focused programmes of research and publication surrounding Dorestad and Ribe, and the detailed analysis and reporting on the vessel glass assemblage from Kaupang. The picture emerging regarding glass vessels on these sites emphasizes the similarities in typologies and form profiles, strongly suggesting standardization and a principal common source across the region. Aside from exploring possibilities for future excavations in the Rhine valley in particular, the fast-developing field of scientific analysis of glass composition holds great potential for the future here – perhaps we can begin to find evidence for the common source in this way. The other noticeable opportunity now involves reviewing and comparing glass assemblages from non-emporia settlement contexts around the North Sea zone to see how they compare with each other and the emporia.
Palace-Monastery complexes

As in England, the largest vessel glass assemblages from continental Europe in the early medieval period are all from emporia. The most well known amongst the assemblages from other site types are from the palace-monasteries of St Denis near Paris, and Paderborn in Germany. There was no known equivalent to the large-scale palace-monastery complex in Anglo-Saxon England. By the Carolingian period, St Denis had at least three churches, a palace, monastic buildings and an associated settlement. A large palace-hall was built during the eighth century, measuring 50 x 14m, possibly featuring a tower, and definitely decorated with painted wall plaster and marble floor tiles. A water management system was in use in the second half of the eighth century, and a lead trial piece for striking coins shows that there was a mint. The complex was fortified c. AD 870 (Loveluck 2005, 245-6). Loveluck compares the material culture from the palace-monastery zone to that from Paderborn: Tating ware jugs, glass drinking vessels, and reticella bowls (ibid., 246). However, there is little published information available even for the vessel glass from St Denis, so it is not yet possible to say whether there might be a direct connection between this material and the glass assemblage of Southampton, for example, as has been shown in the case of imported pottery at Southampton and eighth-century kilns at La Londe near Rouen (Lebecq 2000, 143).

Palace-church and palace-monastery complexes were essentially larger and grander equivalents of the hall-and-church model adopted by the aristocracy, and they ‘provided new fashions of status display as “theatres of kingship”’ (Loveluck 2005, 238-9). These were typically constructed in the eighth century and expanded in the early ninth century. Paderborn showed a very high proportion of pig bones among the domesticated species, probably due to provisioning via food renders, and also predominant slaughter of young animals, a pattern that contrasts clearly with the producing communities (ibid., 241). As observed at Flixborough, there was also a significant proportion of wild game, notably wild boar and bear claws. The 340 vessel glass fragments found,
described by Loveluck as mostly ‘cone or funnel beakers’ (2005, 242), were probably actually palm-funnel series rather than cones, as the cone form wanes in the middle of the sixth century and are much earlier in date than funnel beakers or the palace complex. This makes interesting comparison with the palm-funnel bias found by this study at the emporia in England – it is a pity that we do not yet have a palace assemblage of more than the odd sherd from England for comparison. However, it fits with the pattern of secular vessel consumption, contrasted with the bias towards globular beakers and away from the palm-funnel series on ecclesiastical sites. It also fits well with Loveluck’s contention that the long-distance movement of these vessels (and imported pottery and architectural materials like porphyry and marble) ‘reflect the support of Carolingian royal display and imperial aspirations, through rituals associated with food consumption and through architectural features linking the Carolingian emperors with their Roman antecedents’ (2005, 242). It is likely that dining rituals, often featuring high quality and imported glass, played a similar political role in Anglo-Saxon England. However, evidence is harder to come by as the elite were still focused on moveable wealth and had yet to root themselves in the landscape on the scale of Paderborn or St Denis.

Monastic sites

The existence of palace-monasteries adds a complication to the study of monastic vessel glass, and other material culture in France and Germany as the dividing lines between secular and ecclesiastical are blurred further by their presence. As well as having a palace component, St Denis is the most well-studied representative of a group of Frankish monasteries that evolved from basilicas that were both suburban and funerary, and had been controlled by colleges of clergy under the supervision of bishops (Lebecq 2000, 124). Other monasteries were either very early foundations (fourth to sixth centuries), or part of a wave of seventh-century foundations. St Denis was founded as a basilica in the late fifth century and transformed into an abbey in the mid seventh. The basilicas were integrated into a dense web of habitation, close to
urban markets that probably remained active from the late Roman period onwards, and also connected to a surviving network of communication routes over land and by river (ibid, 125).

St Denis had a famous annual market (primarily a wine fair) and levied tolls on access routes at the time of the market (Lebecq 2000, 138, 142). Documentary evidence proves that Anglo-Saxon and particularly West Saxon merchants attended this fair regularly in the first half of the eighth century (ibid., 143). St Denis was permitted to open rural markets on several of its estates in the eighth century (Lebecq 2000, 140). These were mid points between the producers and the urban markets, and would have enabled producers with a surplus to obtain rare goods (ibid., 141).

In France, as in England, monasteries often became economic centres very quickly after their establishment. The seventh-century foundations were almost always initiatives of the royal circle, and were endowed with pre-existing production centres, estates and people to work them. They were also connected to communication networks, often via a waterside location, for both religious and material access (Lebecq 2000, 127-9). Documentary evidence shows that Frankish monasteries were undertaking a huge range of peripheral activities (metalworking, fulling, tanning, milling, winemaking, etc.). The remains of settlements like Hamage (Département du Nord, 35km southeast of Lille), which had a documented monastic element from c. AD 877, are ‘all but indistinguishable from material culture profiles of palace and vill estate centres’ (Loveluck 2005, 251). Patterns of specialist production were also similar across these site types in Carolingian France (ibid., 252).

Hamage had two churches built between the mid seventh and mid eighth centuries, and a large building sub-divided into cells. Vessel glass was found in the nearby ditch fill, alongside female dress accessories, fine pottery and crucibles with glass-working debris. In ash dumps against the north wall of the building were pottery bowls and jugs, animal bone, textile-working debris and
more dress accessories (Loveluck 2005, 244). Here we see a similar juxtaposition of waste from dining and craft production to some sites in England (e.g. Sedgeford), with some peripheral deposition. Unusually, here, dumps survive right next to the building too. Three silver coins (of Pippin III, Charlemagne and Louis the Pious) illustrate further the integration of the settlement within inter-regional networks (ibid.). Interestingly, Loveluck argues that outside the religious enclosure, the archaeological record ‘might be indistinguishable’ from that of a secular estate centre. The implication is that it is the evolution of buildings of a religious nature that mark out the monastic area (a series of churches and residential buildings featuring cells), and not the material culture. It would be very interesting indeed to examine the glass assemblage from Hamage with this contention in mind.

All of the known monastic sites in northern France demonstrate connection to local and international networks, consumption of imported, luxury or otherwise specialist goods, and specialized craft production (Loveluck 2005, 247-8). A number of monasteries were endowed with lands at Quentovic – either plots within the settlement itself, or in the surrounding countryside, and in one known case, a church of St Peter (Lebecq 2000, 146-7). Full engagement with the markets of the north ‘most characterizes the political economy of the Frankish monasteries of the eighth century’, especially in the cases of suburban monasteries that were also close to big cities and markets for wine (Lebecq 2000, 148).

A knowledge gap exists regarding the numbers of European monastic sites on which vessel glass has been found – a thorough survey will make an excellent research task for the future. This may be partly related to past excavation strategies – Loveluck notes that his three monastic case studies were all subject to a focus on the core structural elements, and that we now ‘lack a commensurate understanding of the peripheral zones of monasteries and their attendant settlements’ (Loveluck 2005, 247). No doubt difficulties with progressing projects to full publication also apply.
Many known examples of such sites, particularly those where vessel glass has been excavated, are found in Scandinavia, where there were emporia, but no monastic presence at this time, and no known palaces comparable to the Frankish model. Näsman argues that the emporia did not in reality consume the majority of the glass vessels, as an initial reading of the archaeological record would suggest, and deems it unlikely that the ‘luxury vessels’ stopped there, and were not passed on to rural areas where most elite and royal residences are actually found (2000, 42). He writes that the bias in the archaeological record is easily explained by the contrast between the survival of thick occupation layers and rubbish pits on most trading sites with the likely disappearance of thinner layers and traces that are more ephemeral from rural sites long ago. ‘The few finds from sites in the countryside that do exist indicate that the use of glass was in fact more widespread than the archaeological record is able to reveal’. It is not ‘unreasonable to expect that a wealthy farmer at a hamlet like Omgård and Vorbasse in Jutland drank his ale from a glass vessel’ (ibid.). This provides an interesting perspective on the emerging picture of glass in rural areas of Anglo-Saxon England.

The settlement patterns in Jutland have been thoroughly studied, and we can see in the results a clear shift around AD 700, to a centralized system aiming to produce a large surplus, featuring larger farms and manors (Näsman 2000, 61). This change ‘by and large follows that of the north-western continental plain area down to the Rhine’ (ibid; see also Loveluck 2005, 232). As in England, improving technology and increased centralization produced the growing surplus that fed the emporia, where produce was transformed into specialized goods, which supported the position of the elites and the development of emerging kingdoms. ‘Power is accumulation and use of resources’ (Näsman 2000, 64). Meanwhile, local chieftains resident at traditional central places still controlled the economies in the northern and eastern regions of Denmark.
Näsman focuses on reticella as an easily identifiable sub-group, and divides the fifteen Scandinavian settlements on which it had been found into three types: ‘six sites are magnate manors or central places of a rural character, one is a fortified village and rural centre, and many shards come from nine central places/trading sites, proto-towns and early towns’ (2000, 38). The six magnate manors are Borg, Lofoten, Norway; Valsgärde, Uppland, Sweden; Slöinge, Halland, Sweden; Uppåkra, Scania, Sweden; Strøby, Zealand, Denmark; and Sorte Muld, Bornholm, Denmark. The fortified village is Eketorp on Öland, Sweden. The trading places are Kaupang, Norway; Birka and Helgö in Lake Mälaren, Ähus and Trelleborg in Scania, and Paviken on Gotland, all in Sweden; and Århus, Ribe and Hedeby, Jutland, Denmark. The distribution lies interspersed along the coastlines of all three countries, and on the Baltic islands of Bornholm, Öland, and Gotland. The significant outlier is Borg, on the Lofoten Islands off the coast of north Norway, which is approximately 1500km north of Kaupang and Birka.

Funnel beakers have also been found at fifteen settlement sites in Scandinavia, although this time the site types are ‘four sites that seem to be quite normal rural settlements, five magnate manors or central places of a rural character, one… beach market of a rural central place, and… seven central places/trading sites, proto-towns and early towns’ (Näsman 2000, 42). The four rural settlements on which funnel beaker sherds have been found are of the most interest: Hadsel in Nordland, northern Norway, and Andersminde, Darum and Elisenhof in Jutland, Denmark. These suggest that glass vessels, and funnel beakers in particular, were penetrating further into the countryside and further down the social hierarchy than previously thought, at least in Scandinavia. ‘The distribution of finds related to the increasing trade … reveals that frequent and varied exchange between rural settlements and proto-urban sites began already in the eighth century in the economically most developed part of the
Danish realm, i.e. south Jutland’ (Näsman 2000, 52). The contrast with the pattern of site types for reticella vessels is also interesting – the funnel beakers appear to have travelled further than the reticella vessels in both senses. It would be very interesting to explore whether this hierarchy of vessel glass types occurs with other glass types and in other regions of Europe – interestingly, it seems almost the other way around in eastern England, with reticella decoration found at twelve sites compared to eight sites with funnels beaker fragments (Figs. 4.56; 4.60). Six of the twelve sites with reticella-decorated sherds had known or postulated monastic connections, a factor that is of course absent from the picture in contemporary Scandinavia.

Vessel glass has been found at the aristocratic ‘magnates’ residential complexes at Toftegård and Tissø (Jørgensen 2003, 181; 189), both in the Danish region (island) of Zealand or Sjælland. Jørgensen remarks upon the striking nature of the intra-site artefact distribution at Toftegård, where ‘all the high-status objects were concentrated in the hall area of the main residence, for instance all the gold-foil figures, Frankish drinking glasses, weapons and riding equipment’ (ibid., 181). Evidence of bronze working was also located in the vicinity. Jørgensen describes the glass as of both Carolingian and Anglo-Saxon origin (ibid.). Thus, the glass vessels and other elite finds differentiate the largest residence from ‘the ordinary farm features of the site’. Similarly, at Tissø the internal distribution of vessel glass is striking: sherds of ‘Frankish and Carolingian’ glass appear only in the hall area with ‘not a single glass sherd from the workshops of the manor or the large market areas’ (ibid., 189). This appears to be evidence for stratification of access at rural sites, but may also be illustrating an unusual refuse disposal pattern. Nothing similar has yet emerged in England (although something similar has been found at Jarrow and Lyminge), but may do in time as more rural sites and vessel glass sherds are found.

Meanwhile, reticella glass has been found in Belgium at Huy, Stavelot, Wellin and Sclayn (Line van Wersch, pers. comm.). Huy was a ceramic production
centre, and the residence of a bishop and the aristocracy. It is now located just south-west of Liège in the east on the banks of the River Meuse, which was and is a key communication and transportation route. Sclayn was very well located at a ford-point of the River Meuse (Van Wersch 2008, 31) only 18km up river from Huy, but the nature of the settlement where the glass was found is still uncertain. Meanwhile, Stavelot is situated just to the southeast of Liège on the River Warche, which flows into the Meuse at Liège, and Wellin is on the River Lesse, which also joins the Meuse, in this case further up in the far southeast of Belgium, just above the French border near Dinant. In summary, all the settlements with reticella glass in Belgium are on the Meuse or tributaries thereof, in the southeast of the country. The Meuse flows from there into the Netherlands, and joins the North Sea in the Rhine delta, just below the Rhine itself and only 15km south of Dorestad. Huy is the nearest of these settlements to the sea at a distance of approximately 200km, so collectively the Belgian reticella finds are an excellent example of inland riverine distribution.

The reticella glass sherds themselves are mainly early examples that have been dated to the seventh century, and were found associated with a well-appointed building that had stone foundations and a broadly residential function. Imported objects were not the exclusive preserve of the elite in Merovingian Belgium – imported pottery is found in the graves of rich and poor, and the same appears to have applied to glass vessels, even though the raw materials came from afar (Van Wersch, 2011). Tableware found in Belgium supports the idea of a uniform civilization in this area, and this seems to have remained the case over time. The presence and abundance in any given place is largely related to the possibilities for supply there, mirroring the importance of geographical and social context in Anglo-Saxon England.Astill commented in 1985 on the striking concentration of portus in the Meuse valley, and suggested that they were ‘a second tier of trading sites for the interior regions’ (1985, 228), a suggestion that may also apply to some or all of the ‘middle tier’ sites in England.
Finally, details of vessel glass from middle-ranking estate centres in France and Germany are beginning to emerge. In particular, Loveluck describes glass vessels as ‘common’ at the estate centres in northern France at Serris ‘les Ruelles’ and Distré ‘Les Murailles’, and at the *castellum* Karlburg on the River Main in Germany (2013, 134). He describes all as centres for consumption and the ‘evidence for the aristocratic pastimes of feasting and hunting’ as ‘striking’ (ibid.). It would be very interesting to study these assemblages in more detail, and compare them in detail with rural assemblages from the rest of northwestern Europe. It also seems highly probable that more existed, and it is likely that more has been excavated and possibly even published, but if so then locating the relevant information lay outside the scope of this project. Further research in this area and comparison with the situation in England and Scandinavia would be very interesting work to undertake in the future.

**Summary**

Assemblages from emporia dominate the existing vessel glass known from northern Europe and Scandinavia, as they do in Anglo-Saxon England, although survival bias is probably a dominant factor in this rather than contemporary consumption. The use contexts seem to be broadly equivalent to the English emporia, although future exploration of the differences would be useful. One example would be the penetration inland along river systems, as shown in Belgium. Another key distinction between the use-contexts of vessel glass on the continent to those in England is that assemblages were found at Palace-Monastery complexes, which had no English equivalents. Therefore, more information about the glass from these sites would be very useful for future study. The early and active economic life of monasteries is also very similar to the situation in England – indeed monastic communities in England were probably emulating Frankish contemporaries in their activities. As in England, the material culture of monastic communities is hard to distinguish from secular estates centres of a similar size. More information is needed on glass
from continental monasteries for comparative purposes, and particularly to address the question of whether monastic vessel glass is distinctive in any way.

As was certainly the case in Anglo-Saxon England, at middle ranking rural centres access to luxury commodities ‘reflects a complex range of social relations influenced by the activities which supported the inhabitants, by their social status, and by geography’ (Loveluck 2005, 253). In other words, as well as the status factor, settlements involved in specialist craft production, like Develier-Courtételle in Switzerland, are more likely to show evidence of imports and luxuries than those engaged exclusively in agricultural production, like Saleux-les-Coutures, Sommes, France. Equally, those who happened to be located on major arteries of communication and trade, like all the small settlements along the Rhine and Meuse, had greater access to the materials passing through than is found at similar rural settlements elsewhere. ‘All the settlements reflect different degrees of integration within regional or longer-distance exchange networks, and none can be viewed as self-sufficient’ (ibid., 237). These points also apply to Anglo-Saxon England, and explain why finding vessel glass at a settlement is always significant for site interpretation, especially when in large quantities: vessel glass demonstrates a strong connection to communication routes, and also helps to build a picture of the nature and status of the settlement concerned and the activities conducted there. Any sherds from rural contexts, especially in France and Germany, are and will be of great interest, as is the case in England. International comparative study of assemblages and contexts from monastic and rural centres would undoubtedly enhance our knowledge of glass trade and consumption, Frankish engagement abroad, regional economic networks, and the nature of the settlements and communities themselves.
Conclusion

This research project has focussed on all known fragments of Anglo-Saxon glass vessels found in settlement contexts dating to the eighth and ninth centuries, with the aim of answering key questions regarding the settlements, society and economy of the middle Anglo-Saxon period. Data was gathered from publications and unpublished theses and reports, from personal communication with excavators and project coordinators, by visiting and recording assemblages in person, and by writing to every Historic Environment Record in England. The result is a comprehensive dataset of existing Anglo-Saxon vessel glass of middle Anglo-Saxon date and from occupation rather than funerary contexts. Analysis of this corpus as a group has enabled the first quantification of individual characteristics of form, colour, decoration, and combinations thereof, and provided the structure for a new typological and geographical framework for fragments.

From a methodological perspective, the subjective nature of classifying vessel form and colour from fragments posed a challenge – one faced to a certain extent by ceramicists as well as glass specialists. However, in this case, broad categories have been used deliberately (e.g. one colour category for the whole unadulterated blue-green spectrum) and consistent methodology applied as much as possible when recording glass in person, for example always studying colour in natural light and considering appearance in both reflected and transmitted light. Some further impediments were imposed by difficulties accessing artefacts and records and the current state of some archives, and reliance in many cases on the quantity and nature of the information that others chose to record or publish. Compositional analysis of the glass was limited to a sample of glass from Lyminge by the difficulties of access and permission, and additional restrictions in terms of resources (time and money). However, while it is important to be aware of these factors and to take feasible measures to maintain consistency, many are common features of archaeological research, and not reason to ignore the information we have. It
is fortunately still possible to identify reliable trends in the data and reach fascinating new conclusions that will themselves be put to the test and evolve as new information emerges.

Both the quantification and comparison of the vessel glass fragments and their attributes, and the mapping of the national distribution of these characteristics (forms, colours and decoration types), represent significant developments. The latter led to the discovery of new spatial patterns (e.g. the concentration of amber and brown glass in the north-east), and inspired new theories regarding the movement of glass vessels (reticella glass probably came to the south and east coasts from two distinct sources; the palm-funnel series distribution seems to have unfurled across England northwards and westwards as the series evolved; glass vessels travelled mainly by water rather than over land). Connections between the emporia and their hinterlands can be seen clearly, although proving the point of origin and direction of travel is more complex. In general, mapping the distribution of characteristics enabled current and future assemblages to be discussed within their regional as well as national context.

Subsequently, all individual assemblages were reviewed and compared to the national corpus and to similar site groups, revealing fascinating differences in the profiles of assemblages consumed at trade hubs (emporium) and ecclesiastical (monastic) sites. This demonstrates how a current national glass database enables information from vessel glass assemblages to inform key research areas such as site classification, local activities and economies, and construction of social identities in a measurable and reliable way. Glass vessels were used on three main site types: emporium, ecclesiastical and middle-ranking rural estate centres, meaning that the vessels were used by a variety of people and in a range of social contexts. Characterisation of vessel glass assemblages can help with interpretation of the nature of the source settlement due to the discovery that palm-funnel series vessels are much more prevalent at emporium, and globular beakers at ecclesiastical sites, which shows that glass was being
supplied and used in different ways. Furthermore, the ecclesiastical assemblage profile is specific and not just a ‘non-emporium’ model.

However, it is important to be aware of how much still remains unknown. It is possible that more emporia will be located, and very likely that additional monasteries and middle-tier estate centres with vessel glass will be discovered in the future. Excavation of Middle Anglo-Saxon rural settlements in England and production of a body of archaeological evidence to refer to is at an early stage. Equally, distributional evidence is probably still affected to a degree by excavation bias – i.e. material appears only where excavations have occurred, and patterns within the excavated areas may be only part of the complete picture (Evison 1988, 244, Stiff 2001, 43). Patterns visible in the current sample may shift or blend and disappear as more vessel glass and more information become available in the future. A greater body of data on the composition of vessel glass in this period will hopefully be developed, which may alter our understanding of production, trade and supply yet again.

Seven case study sites with sufficiently detailed information available were selected for intra-site studies of glass distribution, looking in more detail at how glass vessels were used, who by, and how and where they were disposed of. As expected, disposal was frequently as part of dining waste and as such shows that the vast majority of fragments represent vessels used in this setting and on the sites in question. The other principal type of disposal context is alongside craft working debris, although there are no examples as clear as the ‘fused glass’ identified as probable bead working evidence from Dinas Powys (Campbell 2007, 96-7). The anticipated pattern of peripheral deposition is widespread, but there are some examples of the contrary. Vessel glass is commonly found alongside large deposits of animal bone, evoking largely secular aristocratic feasting practises. However, very importantly, at Lyminge and Jarrow the patterns are different, illustrating monastic consumption as a distinct social context. At Jarrow the glass was found mainly in the guest house and associated with fish bone, which one could argue is still a feasting context
of sorts, albeit a monastic one. Meanwhile, at Lyminge the vessel glass was scattered throughout the residential area in the fills of small refuse pits, indicating a degree of regular use by the monastic inhabitants on a more domestic scale (although a guest house has not yet been found at Lyminge – perhaps if it was it would yield a much larger vessel glass assemblage).

At Lyminge, the opportunity to analyse the composition of a selection of the middle Anglo-Saxon vessel glass revealed results indicating heavy dependence on recycling already frequently-recycled glass (three-quarters of the sampled sherds). However, one quarter appear to be freshly-recycled old glass, suggesting that the monastery or her suppliers benefitted from an organised programme of procurement in the manner proposed for San Vincenzo. Furthermore, five batch pairs emerged, showing that the monastery either purchased or manufactured glass in sets. These results are very important, and highlight the need for more similar work to be done on assemblages from England, north-western Europe and Scandinavia – the richer the international dataset is, the more reliable and informative each batch of results will be, and there is great potential here to learn about the important topics of production and exchange of glass vessel in the early medieval period.

The results of preliminary study of similar material from the rest of the North Sea zone (north-western Europe and Scandinavia) suggest a similar pattern of trade and consumption of glass vessels, influenced by parallel socio-economic trends. However, there are key differences, major gaps in our knowledge, and areas in which research into the detailed similarities and differences hold potential for greater understanding of this period across the region. The foremost of these is production, perhaps combining research into archaeological evidence for glass working (molten glass, droplets, moils, cullet or ‘raw’ glass ingots, crucibles and furnaces) across the North Sea zone with an international programme of compositional analysis. Another example is that more information is needed on vessel glass from monastic sites in continental north-western Europe. Comparison of these assemblages with each other and
the English monastic assemblages would help to establish the extent to which the monastic profile crossed borders, and whether the form profiles of emporia and monasteries differ elsewhere in the same way that they do in England. Parallel comparison of the assemblages from the emporia with each other and the English site groups, and the same for rural assemblages would be equally interesting, especially if more rural sites are excavated. Then we could ask, how do these groups of glass compare with each other and with the English assemblages and why? The next step would be to collect information on the nature and contexts of vessel glass found so far across northern Europe, and integrate the analysis and results with the work of Näsman, Loveluck and others on settlement evolution and hierarchies across the region.

Overall, pan-European comparative research into vessel glass has great potential, with more work on production and a programme of compositional analysis across European sites as the highest priorities.
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