

Durham E-Theses

*A cultural, scientific and technical study of the
Durham lead cloth seal assemblage.*

BANKHEAD, GARY

How to cite:

BANKHEAD, GARY (2016) *A cultural, scientific and technical study of the Durham lead cloth seal assemblage.*, Durham theses, Durham University. Available at Durham E-Theses Online:
<http://etheses.dur.ac.uk/11867/>

Use policy



This work is licensed under a [Creative Commons Attribution Non-commercial 3.0](https://creativecommons.org/licenses/by-nc/3.0/)
(CC BY-NC)

A cultural, scientific and technical study of the Durham lead cloth seal assemblage.

Gary Bankhead

Department of Archaeology

University of Durham

2016

Submitted for the degree of Master of Philosophy



Gary Bankhead 2016

Abstract

Gary Bankhead

A cultural, scientific and technical study of the Durham lead cloth seal assemblage

This thesis is an integrated and interdisciplinary study of 275 lead cloth seals dated from the mid-fourteenth to the early-nineteenth centuries. These recently discovered objects, recovered from a single submerged river-bed site located in the North-East of England, were once linked to the trade, industrial regulation and taxation of commercially produced cloth. They are presented here, catalogued and illustrated. These objects represent the largest assemblage of such material outside London and are of crucial significance for understanding the cloth trade in the late- and post-medieval period. Due to the unusual deposition conditions from which the objects were recovered, rare scraps of textiles have survived in many of the cloth seals. A range of scientific and analytical analyses was undertaken on three cloth seals containing textiles revealing important information. For the first time in the UK, ultra-high performance liquid chromatography (performed at The Centre for Textile Conservation and Technical Art History, Glasgow University) was successfully used to extract colourants related to dyes from textile fragments preserved in lead cloth seals. This significant new information provides new insights into textile availability, trade and the consumption of cloth, mordants and dyestuffs in the late-sixteenth to early-nineteenth century.

Evidence from the cloth seals is combined with other documentary, cartographic and archaeological sources of evidence to produce a synthesis providing new understanding of the cloth trade in Durham in the late- and post-medieval periods. The research generated by this thesis has demonstrated not just the scale and extent of textile production in the City of Durham, but has also revealed evidence of hitherto unknown English and European trade routes.



Fig. 1.1

Wall-mounted frieze depicting cloth, bundles of lead cloth seals and sealing equipment on the facade of the Lakenhal (Wool Hall) at Leiden in the Netherlands. Image taken by author.

...For Geoffrey Egan, archaeologist, born October 1951; died December 2010.



Fig 1.2

Dyers at work, c.1482. *De Proprietatibus Rerum*. Miniature probably by a master of Edward IV (Royal MS 15 Eiii, f 269). Reproduced with kind permission from the British Library

Table of Contents

Title Page	i
Abstract	iii
Table of Contents	vi
List of Figures	ix
Statement of Copyright	xiii
List of Abbreviations	xiv
Acknowledgements	xv
Chapter One	1
Introduction	1
1.1 Introduction to the Durham Cloth Seals	1
1.2 Aims and Objectives	2
1.3 Find Site and Provenance of Cloth Seals	3
1.4 Chronological and Historical Context	4
1.5 Contextual Sources	6
1.6 Organisation of Thesis	7
Chapter Two	8
Methodologies and Sources	8
2.1 Introduction	8
2.2 Method of Photography	9
2.3 Justification Criteria for Illustrating	9
2.4 Method of Illustrating	10
2.5 Lab Equipment and Applications to Prove Method	10
2.6 Access to Archives and Special Collections	11
2.7 Complementary Collections and Archival Material	12
Chapter Three	14
Catalogue and Concordance	14
3.1 Abbreviations used in Catalogue	14
3.1.1 Note on Provenance and Catalogue	14
3.2 English Cloth Seals (Table 3.1)	16
3.2.1 Weavers' Clothiers', Dyers' and Searchers' Personal Seals	16

3.2.2 London Dyers' Company Seals	25
3.2.3 Norfolk Weavers', Clothiers', Dyers' and Searchers' Personal Seals	26
3.3 English Alnage Seals	31
3.3.1 Crowned-Portcullis County Series	31
3.3.2 County Series	34
3.3.3 Four-Part Alnage seals	40
3.4 English Cloth Seals: Second-disc only	44
3.5 English Cloth Seals: Worn	46
3.6 English Cloth Seals: Late-Eighteenth to early-Nineteenth century	49
3.7 Continental Cloth Seals	53
3.7.1 Swabian Fustian District. Southern Germany	53
3.7.2 Low Countries, Flanders and Brabant	58
Chapter Four	90
Review of the Scientific Analysis and Textual Evidence	90
4.1 Introduction and Aim of Chapter	90
4.2 Previous Studies of Archaeological and Historical Textiles	92
4.2.1 Fibre Identification	92
4.2.2 Weave Structures	94
4.2.3 Thread Count and Spin	98
4.2.4 Textile Impressions	101
4.2.5 A Brief Technical History of Dye and Mordant Analysis	102
4.2.6 Justification for Extraction of Textile, Method and Selection	110
Chapter Five	116
Scientific Analysis and Findings from three Case Studies	116
5.1 Analysis and Findings	116
5.1.1 Fibre Identification (Stereo-microscopy)	117
5.1.2 Weave Type, Thread Count and Twist (SEM Analysis)	120
5.1.3 UV-Visible Spectrophotometer Dye Analysis, Analytical Method	129
5.1.4 UHPLC - PDA Dye Analysis	130
5.1.5 X-radiography Analysis	139
5.1.6 Elemental Maps	143
5.1.7 Metallurgical Analysis (EDXRF)	150

5.2 Conclusion	152
Chapter Six	160
Building on the New Textual and Visual Sources	160
6.1 Introduction and Aims of Chapter	160
6.2 Durham, a City in County Durham	162
6.3 Durham's Position (and Influence) in Regional, National Textile Markets	170
6.4 The Presence and Impact on the City of Textile Related Craft Guilds	180
6.5 Durham's Elusive Alnage Officials	204
6.6 The Myles Stapylton Indenture and Other Contemporary Evidence	210
6.7 Durham's Local Borough and County Courts	215
6.8 The Borough of New Elvet	217
6.9 The Probate Evidence	227
6.10 Review of Textual Records Highlighting Textile-Related Artisans	238
6.11 Topographic, Cartographic, Archaeological and other Evidence	252
Chapter Seven	265
Placing the Cloth Seals into a Sequenced Typology and Chronology	265
7.1 The Sequenced Typology of the Durham Cloth Seals	266
Chapter Eight	280
Integrated Discussion of the New Evidence from the Durham Cloth Seals	280
8.1 Durham's Late-Medieval Consumption of Cloth	281
8.2 The Impact of the Dissolution on Cloth Procurement in Durham	286
8.3 Cloth Consumption in Durham Transcending the Dissolution	287
8.4 Durham's Early Post-Medieval Consumption of Cloth	289
8.5 Durham's Post-Medieval Consumption of Cloth	290
8.6 Durham as a Regional Centre for Dyeing Cloth and Linen Weaving	291
Chapter Nine	294
Conclusions	294
9.1 Aims and Objectives	296
9.2 The Heuristic Cloth Seal	297
9.3 Limitations and Further Work	298
Appendices	301
Appendix A: Add. MS 319. Folio 121 & 124. Legal Precedents Book c.1670	300

Appendix B:	Myles Stapylton Counterpart lease - Office of Alnager 1666	301
Appendix C:	MSS. Alan 8/8 Extracts of Orders and Regulations c.1610	302
Appendix D:	Thomas Hall draper of Durham Probate Inventory 1586	303
Appendix E:	Thomas Hall draper of Durham Probate Accounts 1586	304
Appendix F:	George Burdon dyer of Claypath Probate debts owing 1689	305
Appendix G:	George Burdon dyer of Claypath Probate Will 1692	306
Appendix H:	George Burdon dyer of Claypath Probate Inventory 1692	307
Appendix I:	Anthony Emerson dyer of Gilesgate Probate Will 1665	308
Appendix J:	Thomas Morland weaver of Elvet Probate Inventory 1598	309
Appendix K:	Thomas Johnson weaver of Elvet Probate Inventory 1610	310
Appendix L:	Bartholomew Bolton weaver of Durham Probate Inventory 1662	311
Appendix M:	Known Textiles and Dyestuffs in Durham c.1300 x 1800.	312
Appendix N:	Glossary	313
	Bibliography	314

List of Figures

Unless otherwise noted, all images are by the author

Fig 1.1	Frieze on wall of Museum De Lakenhal, Leiden	iii
Fig 1.2	Dyers at work, c.1482. Miniature.	iii
Fig 3.1	Cloth seal types, order of parts and terminology	15
Fig 3.2	Chrutchley archive Assc. No. 2011/5/2 (weavers/dyers privy marks)	17
Fig 3.3	The Augsburg Dyers Guild panel, dated 1634	17
Fig 3.4	St Mary's Church, Barnard Castle font (showing privy mark)	17
Fig 3.5	Cat 1-9 Weavers', clothiers' dyers', searchers' personal seals	63
Fig 3.6	Cat 11-19 Weavers', clothiers' dyers', searchers' personal seals	64
Fig 3.7	Cat 20-32 Weavers', clothiers' dyers', searchers' personal seals	65
Fig 3.8	Cat 33-41 Weavers', clothiers' dyers', searchers' personal seals	66
Fig 3.9	Cat 42-54 Weavers', clothiers' dyers', searchers' personal seals	67
Fig 3.10	Cat 55-61 Weavers', clothiers' dyers', searchers' personal seals	68
Fig 3.11	Cat 62-73 Weavers', clothiers' dyers', searchers' personal seals	69
Fig 3.12	Cat 74-83 Crowned-portcullis county series of alnage seals	70
Fig 3.13	Cat 84-96 Crowned-portcullis county series of alnage seals	71

Fig 3.14	Cat 97-106 Alnage (county series) seals	72
Fig 3.15	Cat 107-116 Alnage (county series) seals	73
Fig 3.16	Cat 117-124 Alnage (county series) seals, Cat 125 customs seal	74
Fig 3.17	Cat 126-136 Four-part alnage/subsidy seals	75
Fig 3.18	Cat 127-152 Four-part alnage/subsidy seals	76
Fig 3.19	Cat 153-166 Weavers', clothiers' dyers', searchers' personal seals	77
Fig 3.20	Cat 167-180 Weavers', clothiers' dyers', searchers' personal seals	78
Fig 3.21	Cat 181-193 Weavers', clothiers' dyers', searchers' personal seals	79
Fig 3.22	Cat 194-205 Weavers', clothiers' dyers', searchers' personal seals	80
Fig 3.23	Cat 206-213 Weavers', clothiers' dyers', searchers' personal seals	81
Fig 3.24	Cat 214-219 Weavers', clothiers' dyers', searchers' personal seals	82
Fig 3.25	Cat 220-225 Weavers', clothiers' dyers', searchers' personal seals	83
Fig 3.26	Cat 226-234 Continental cloth seals - Southern Germany	84
Fig 3.27	Cat 235-242 Continental cloth seals - Southern Germany	85
Fig 3.28	Cat 243-250 Continental cloth seals - Southern Germany	86
Fig 3.29	Cat 251-263 Continental cloth seals - Low Countries	87
Fig 3.30	Cat 264-275 Continental cloth seals - Low Countries	88
Fig 3.31	Map of Northern Europe showing cloth seal provenance	89
Fig 4.1	Cat B.862 four-part alnage seal showing surviving textile	91
Fig 4.2	Basic archaeological specimen weave types	97
Fig 4.3	Cat B.259 showing orientation of textile impressions	102
Fig 4.4	Eighteenth century dyers' recipe (Chrutchley Archive)	108
Fig 4.5	Cat. B.265 Sixteenth century cloth seal and textile (Rouen, France)	112
Fig 4.6	Cat. B.230 Late-eighteenth century cloth seal and extracted textile	113
Fig 4.7	Cat.B.1365 Seventeenth century cloth seal and extracted textile	114
Fig 4.8	Cat.B.2630 Late-sixteenth century cloth seal and extracted textile	115
Fig 5.1	Cat. B.230 Stereo-microscopy image showing single wool fibre	117
Fig 5.2	Cat. B.1365 Stereo-microscopy image showing woollen fibres	118
Fig 5.3	Cat. B.2630 Stereo-microscopy image showing woollen fibres	118
Fig 5.4	Cat. B.2630 Stereo-microscopy image showing single woollen fibre	119
Fig 5.5	Cat. B.230 SEM image (x40 magnification)	121
Fig 5.6	Cat. B.230 SEM image (x 40 magnification)	122
Fig 5.7	Cat. B.230 SEM image (x80 magnification)	122
Fig 5.8	Cat. B.230 SEM image (x300 magnification)	123
Fig 5.9	Cat. B.230 SEM image (x1800 magnification)	123
Fig 5.10	Cat. B.1365 SEM image (x40 magnification)	124

Fig 5.11	Cat. B.1365 SEM image (x40 magnification)	124
Fig 5.12	Cat. B.1365 SEM image (x150 magnification)	125
Fig 5.13	Cat. B.1365 SEM image (x180 magnification)	125
Fig 5.14	Cat. B.1365 SEM image (x1500 magnification)	126
Fig 5.15	Cat. B.2630 SEM image (x50 magnification)	126
Fig 5.16	Cat. B.2630 SEM image (x60 magnification)	127
Fig 5.17	Cat. B.2630 SEM image (x150 magnification)	127
Fig 5.18	Cat. B.2630 SEM image (x400 magnification)	128
Fig 5.19	Cat. B.2630 SEM image (x1000 magnification)	128
Fig 5.20	Cat. B.1365 showing extraction of sample	132
Fig 5.21	Cat. B.230a UHPLC-PDA chromatogram	133
Fig 5.22	Cat. B.230a UV-vis spectra	133
Fig 5.23	Cat. B.230b UHPLC-PDA chromatogram	134
Fig 5.24	Cat. B.230b UV-vis spectra	134
Fig 5.25	Cat. B.1365 UHPLC-PDA chromatogram	135
Fig 5.26	Cat. B.1365 UHPLC-PDA chromatogram (zoomed- in)	135
Fig 5.27	Cat. B.1365 UV-vis spectra	136
Fig 5.28	Cat. B.2630 UHPLC-PDA chromatogram	137
Fig 5.29	Cat. B.2630 UV-vis spectra	137
Fig 5.30	Comparison of chromatograms of standard madder and Cat. B.2630	138
Fig 5.31	Cat. B.2630 composite x-radiography	140
Fig 5.32	Cat. B.1365 composite x-radiography	141
Fig 5.33	Cat. B.230 composite x-radiography	142
Fig 5.34	Cat. B.2630 SEM elemental map	147
Fig 5.35	Cat. B.1365 SEM elemental map	148
Fig 5.36	Cat. B.230 SEM elemental map	149
Fig 5.37	Cat. B.787 EDXRF	151
Fig 5.38	Cat. B.2460 EDXRF	153
Fig 6.1	Map: North East England	165
Fig 6.2	Map: Durham City c. sixteenth century	169
Fig 6.3	Wax seal of <i>Robert Littester of Elvet</i> , dated 1361	189
Fig 6.4	Copy of bye-laws of the Drapers and Taylors Guild, dated 1549	192
Fig 6.5	Calls at Guilds of those to be made Freemen of Durham	197
Fig 6.6	Admissions of Freemen, dated 1761	198
Fig 6.7	List of Freemen of the companies of Durham, dated 1751	199
Fig 6.8	Counter-part lease - the <i>Miles Stapylton</i> indenture, dated 1666	211

Fig 6.9	Camsell's conjectural boundaries of New Elvet tenements c. sixteenth century.	220
Fig 6.10	River Wear in flood at New Elvet, dated 1903	219
Fig 6.11	Probate account of Thomas Hall draper of Durham, dated 1586	227
Fig 6.12	Probate inventory of George Burdon dyer of Durham, dated 1689	232
Fig 6.13	'Housewives' in Durham Market Place, dated c.1790	237
Fig 6.14	Gravestone of William James, Fuller of Durham, died 1702	240
Fig 6.15	Tenement boundaries of New Elvet, dated c. 1442	244
Fig 6.16	Composite map of the Borough of New Elvet c. 1400-1700	247
Fig 6.17	Cat. B.1183 lead cloth seal of James Haigh	249
Fig 6.18	Probate inventory of George Burdon dyer of Durham, dated 1692	250
Fig 6.19	Surviving tenter frames, Otterburn Mill, Northumberland	251
Fig 6.20	<i>Elvet Bridge</i> . Thomas Hearn c. 1783	253
Fig 6.21	<i>Elvet Bridge</i> and tenements. Unknown artist c. seventeenth century	255
Fig 6.22	Historical maps featuring the Borough of New Elvet, 1595-1820	260
Fig 6.23	Cat. B. 1376 medieval brass pins	261
Fig 6.24	Selection of late-medieval decorated lead spindle whorls	261
Fig 6.25	Cat. B.2384 lead bag seal for galls	262
Fig 6.26	Cat. B.86 and B.1388 late-medieval shield shaped lead weights	262
Fig 6.27	Cat. B.350 Hill & Co Woollen Manufacturer trade token c. 1820	263
Fig 6.28	Cat. B.739 late- post-medieval iron ox-shoe	263
Fig 6.29	Multi-part stone mould for lead cloth seals found in Hungate, York	264
Fig 7.1	Cloth seals attached to late-sixteenth/seventeenth century textile	266

Statement of Copyright

The copyright of this thesis rests with the author. No quotation from it should be published without the prior written consent and information derived from it should be acknowledged.

List of Abbreviations

M.O.L.	Museum of London
MOLA	Museum of London Archaeology
N.Mus.	Norwich Museum
S.Mus.	Salisbury and South Wiltshire Museum
B.M.	British Museum (Occasional Paper 93)
Y.Mus.	York Museums Trust
P.A.S.	Portable Antiquities Scheme (https://finds.org.uk/)
FLO	Finds Liaison Officer
DRWA	Durham River Wear Assemblage
A.A.S	Amsterdam Archaeological Services
G.N.Mus.	Germanisches National Museum
L.Mus.	Museum de Lakenhal, Leiden, Netherlands.
BSG	Bag Seal Gallery (http://www.bagseals.org)
UHPLC-PDA	Ultra-High Performance Liquid Chromatography – Photodiode Array
SEM	Scanning Electron Microscope
EDXRF	Energy dispersive X-ray fluorescence
ASUD	Archaeological Services University of Durham
OED	Oxford English Dictionary (http://www.oed.com/)

Acknowledgements

I wish to thank my supervisors at the University of Durham, Christopher Caple, Pam Graves, Mary Brooks and Michael Lewis (British Museum) for their guidance, comments and support. In addition, I wish to acknowledge the following for their helpful advice and comments for which I am most grateful: Jennifer Jones and Vicky Garlic (conservation), Jeff Veitch (photography), Yvonne Beadnell (illustrations), Steven Robertson (technician), Department of Archaeology, University of Durham; Francis Gotto, Pat Mussett (retired) and many other staff members of the Archives and Special Collections, University of Durham; Gill Parkes and her colleagues at the Durham County Record Office; Anita Quye, Jing Han and Julie Wertz at the Centre for Textile Conservation and Technical Art History, University of Glasgow; Penelope Walton Rogers, The Anglo-Saxon Laboratory; Hazel Forsyth, Jackie Keily, Museum of London; Peter Kranendonk, Allard van Helbergen and colleagues at the Bureau Monumentenzorg en Archeologie, Amsterdam; Jori Zijlmans, Museum de Lakenhal, Leiden; Tim Pestell, Curator of Archaeology, Norwich Castle Museum and Cathy Terry, Senior Curator of Social History at Strangers Hall, Norwich. Although I have received help from many other people – far too many to mention – I am especially grateful to the following: Katrin Kania for her hospitality and knowledge of textiles, Martin Roberts, Annemarieke Willemsen, Karl Murr, Martijn Schaftenaar, Charlotte 'Charlie' Wilkinson, Lauren Proctor and Francis Macintosh (both Finds Liaison Officers (FLO), County Durham), Laura Burnett (FLO Somerset), Margaret Staudter, Roger Norris, Greta Meredith, Kate Taylor, Dana Durkee, Michael Nix, Derek Barker, Professor Richard Gameson and Brian Cheesman. I also wish to especially thank my wife Angela for her unwavering support throughout this whole adventure.

Finally, a special mention must go to Geoff Egan to whom this thesis is dedicated. In September 2010, in his role as a National Finds Advisor on Early Medieval to Post-Medieval objects for the Portable Antiquities Scheme, Geoff travelled to Durham to help identify some of the first cloth seals that I had found. It is through my brief exposure to his incredible knowledge of small

finds, along with his willingness to share it with others, that inspired me to complete this research on the Durham lead cloth seal assemblage – research that Geoff had asked to undertake himself.

Chapter One

1. Introduction

1.1. Introduction to the Durham cloth seals

This thesis is a cultural, scientific and technical study of 275 lead cloth seals recovered from the River Wear in County Durham between 2008 and 2014. Although found in the North-East of England the cloth seals, which are of a late-to post-medieval date, come from several regions of England and continental Europe. They represent the largest assemblage of such material available for analysis outside of London and, as such, are of crucial significance for understanding the cloth trade during the period to which they have been ascribed (Lewis 2012, 216). All of the lead cloth seals included in this study were once attached to cloth, as per the relevant English statute (or European equivalent). As discussed below in more detail, regulations required that cloth workers (including dyers and fullers) should fix a seal to cloth as a degree of quality control, while crown-(or bishop)-appointed alnage officials would also fix a seal to cloth when enforcing the current assize of cloth thus confirming that a subsidy for each cloth had been paid (Endrei and Egan 1982, 55-58). Through an interdisciplinary approach, it has proven possible to demonstrate how these small objects were once linked to the trade, industrial regulation and taxation of commercially produced cloth: they also demonstrate just how important this industry was for the economy of the country.

Although not necessarily rare finds, it is unusual to find cloth seals in one place in such high numbers. While most are complete, some are only partially so. It is their very presence in Durham today that is remarkable given the distance many have travelled and the centuries spent lost underwater since they first arrived in the North-East of England. Their enigmatic function, long since obsolete and now mostly forgotten, is not totally lost to us. Many bear script, numerals, privy marks or royal devices which may be difficult to interpret but, when this is done correctly, provide information of the period, of the time of craft-guild regulations, of charters of incorporation and crown statutes and taxation. They

are evidence of the toil of children, mothers, fathers and grandparents, whether poor, affluent, in good health or sick. They signify the work of craftspeople – apprentices, journeymen and masters, whether they were artisan weavers, fullers, drapers, specialised dyers or merchant adventurers. As individual objects they are anything but prosaic; their heuristic nature confirms them as tangible links to the societies that incorporated them in to their daily lives. When considered here as an assemblage they are much more. Not only do they represent direct evidence of a nation's cultural and economic past but, above all, they are the material culture evidence of people's basic need to clothe themselves, whether that be with mundane everyday wear, Sunday best, opulent costume or clothes for the grave.

1.2. Aim and objectives

This thesis aims to weave the scientific, textual, pictorial, cartographic and archaeological evidence together into five sections in order to bring meaning to the recent discovery of such a large number of cloth seals and other textile-related artefacts in a onetime northern powerhouse.

The first objective is to create a catalogue and concordance of the 275 cloth seals; this is detailed in Chapter three. This is a significant section of the thesis, bringing together research findings, illustrations and digital imagery. This presents the many types, functions and provenances of the Durham cloth seals and places them into their wider social, regulative, industrial and geographical context. Wherever possible, parallels of the Durham cloth seals are recorded within their individual catalogue entries. The second objective (set out in Chapter four) details sources of evidence relating to the analysis of archaeological and historical textiles, together with a technical history drawing on the dye and mordant analysis. This section also explains the justification to extract surviving textile from some cloth seals. The third objective was to undertake and present scientific and analytical analysis of archaeological textile extracted from three cloth seals selected as case studies. The results of the analysis undertaken are detailed and discussed in Chapter five. This is followed

by Chapter six which achieves the fourth objective of exploring the historical narratives of the medieval city of Durham, placing it into its rightful historical, cultural and geographical context while also examining its built environment and relationship with a large, almost encircling river for evidence of textile-related activity. This significant body of evidence draws upon various elements of textual, cartographic and archaeological sources to provide evidence of occupation, industry, regulation and trade related to the textile industry. Wherever possible, the focus of evidence centres upon the New Borough of Elvet, the low-lying city suburb positioned adjacent to the artefact find site. This is an important city borough, not least because it lies at the heart of the developing urban fabric of late-medieval Durham. It is to be preceded by the materials and methods used to produce the catalogue and to undertake other scientific research.

The fifth and final objective which is presented here in two parts (Chapters seven and eight) identifies specific trends as evidenced in the preceding objectives with an integrated discussion on all of the new evidence presented following the recent discovery of the Durham cloth seals.

1.3. Find site and provenance of cloth seals

Underwater explorations in the River Wear in Durham City took place between January 2008 and May 2014. The find site is positioned just downstream of the twelfth century Elvet Bridge, mid-way between two areas of late-medieval urban development: the Borough of New Elvet and the Bishop's Borough.

The late-medieval city of Durham had five boroughs. The tenements located in the Bishop's Borough positioned immediately adjacent to the find site were known as Saddlergate (now Saddler Street), while the tenements which abut the river in the Borough of New Elvet are simply referred to as the western edge of New Elvet. Previous archaeological excavations in these New Elvet and Saddler Street locations (Carver 1974 and 1979) suggest that the property boundaries of these tenements survived until the late-twentieth century. Although the find site

may be referred to as Elvet or New Elvet, the study area chosen for this thesis actually encompasses the whole footprint of the late- and post-medieval city. The find site is therefore to be known as Durham, the rationale being that the evidence detailed in this thesis suggests that Elvet is simply a location where some of those engaged in textile production or trade seemingly converged, and that these same artisans were actually engaged in textile-related activity at locations spread across all five boroughs.

The use of the term *provenance* here follows terminology set out by Egan (1987, 11), as meaning 'place of origin of the textile as indicated by information on the seal' which, as is evident with some cloth seals, is clearly different from the findspot.

1.4. Chronological and historical context

The chronological period of study of the Durham cloth seals effectively mirrors the development of the two boroughs discussed above, from the fourteenth through to the early-nineteenth century. While the majority of the seals can be dated to a period of use between the Tudor and Stuart periods, others can be ascribed to an earlier time coinciding with the growth of Durham's boroughs during the centuries that followed the construction of the Framwellgate and Elvet bridges in the twelfth century. In essence, the period of use of cloth seals in England generally spans this same period of the main urban development outside the peninsula's fortified walls. The earliest type of lead cloth seals were those used from 1328 onwards by officers appointed to examine woollen cloth and certify its quality, effectively enforcing the current Assize of Cloth (Statute 2 Ed. III c. 14). By 1353 the marking of cloth had to show the dimensions (Statute 25 Ed. III st. 3 c.1). Later that year Statute 27 (Ed. III st. 1 c.4) required alnage officials to enforce a subsidy of 4d per whole broadcloth or equivalent to be paid to the crown by the weaver or clothier (Bridbury 1982, 47-48). A later 1389-1390 amendment to the regulations (Statute 13 Ric. II st c.11) required that weavers, clothworkers (including dyers) and fullers also had to put their 'signes' on cloth (Egan 1984, 18). Successive English monarchs would continue to

oversee the introduction of similar textile-related statutes until the abolition of the alnage system in 1724. Although the later cloth seals in the Durham assemblage were in use during the period that followed the ending of alnage, they are nevertheless also associated with textile-related activity.

Bonney (1990, 183) notices pre-1450 craft regulation in Durham, based predominantly on the phrasing of the Bishop's charters and regulations for the weavers guild. But it is only after this time that any significant organised gatherings of craft-guild textile workers are observed. The lack of any earlier evidence of craft-guild-related activity is surprising given that from the time of William the Conqueror, for political and administrative reasons, the see of Durham had been given *jura regalia* (rights which normally belong to the crown or government and which included the power of chartering corporations). Therefore, as long as it remained a palatinate county, and as subjects who had such rights, subsequent Bishops of Durham could grant charters of incorporation to any aspiring craft-guilds (Hutchinson 1787, 54; Grant 1850, 11; Carr 1905, 115). Ironically, it is under these same rights that the Bishop of Durham appointed the first *Clerk of the Markets* in 1448, in pursuance of Statute 25 Edw. III st. 3 c.1 a position which held the City's alnage seal and the right to collect duties payable on cloths (Parsons and White 1827, 150) (see section 8.1). Despite having all of the rights associated with *jura regalia*, it is of some interest that crown statutes, like those highlighted above, would continue to be imposed in Durham. A 'rise of the [Durham] craft-guilds' during the sixteenth and seventeenth centuries, resulted in an increase in guild-imposed regulation of textile production; this is reflected in terms of guild numbers, identified in the surviving documentation, and an increase in the number of searchers' personal cloth seals in the assemblage. As with similar activity undertaken elsewhere in England during this time, regulation would have resulted in improved standards in the quality of textile production along with competition between different types of weavers and the subsequent introduction of many new draperies.

The period with which this study is concerned saw many significant historical events that would have affected daily life in Durham. For example, shortly after

the Act for the Dissolution of the Monasteries in 1536, Durham's drapers had ceased supplying expensive livery cloth to Durham priory and, following technical innovations in the textile industry during the late-eighteenth century, the rapid industrialisation of water-powered cotton and worsted spinning mills turned the northern towns of Yorkshire into major centres of textile production. Durham's weavers, based just over the county border, would have faced serious competition.

1.5. Contextual Sources

Data relating to the cloth seals featured in this study have been collected from published and unpublished material. Although few published sources of information relating to cloth seals found in England exist – they are generally limited to research by Geoff Egan – other publications detailing information about significant numbers of cloth seals recently found in London (MOLA excavations) are forthcoming (Bankhead in prep a, and in prep b). Unpublished data relating to cloth seals can be accessed via the Portable Antiquities Scheme (P.A.S.) website which holds records of over 1,105,000 objects, including some 3,450 cloth seals (correct as of May 2016) found by members of the public (typically metal detectorists). Access to different levels of information relating to these finds depends on the user account level. For the purposes of this thesis an application was successfully made for access to 'researcher' level which allowed full access to find data including the precise findspot information. In addition, two other websites which feature cloth seals were viewed: The Bagseal Gallery www.bagseals.org/ and Colchester Treasure Hunting and Metal Detecting www.colchestertreasurehunting.co.uk/clothseals.htm. However, although both of these sites include useful imagery of cloth seals found in the UK, only general information relating to the objects and findspots is recorded. Access to sources of information held in museum collections was limited to viewing and, in some cases, photographing the cloth seals themselves. This is discussed in greater detail in section 2.6 below.

1.6. Organisation of thesis

Although there is now a wider appreciation that these small, often puzzling objects were once linked to the production and trading of cloth, most people are generally unaware of the many variations that exist or indeed the terminology used to describe them. Therefore, this thesis is structured to introduce the Durham cloth seals early (Chapter three), thus allowing the reader the earliest opportunity to begin to comprehend their form and function. The cloth seals are arranged in the catalogue and concordance chronologically, essentially separated into groups based on their type/provenance. The individual catalogue entries contain specific information relating to the objects' original functions, dimensions and periods of use. Wherever possible, detailed information relating to provenance and associated parallels is included, along with information relating to the relevant figure. All 275 cloth seals were photographed for the catalogue and 167 of them are illustrated here. The theme of the following chapter (Chapter four) is to introduce evidence of the types of cloth to which the Durham cloth seals may have once been attached, firstly by featuring a review of existing scientific analysis of archaeological and historical textiles and secondly with a discussion based on textual evidence of its use. The scientific and analytical analyses of surviving archaeological textile extracted from three case study seals follow in Chapter five. This research represents a significant body of work and one that allows important conclusions to be drawn on the consumption of cloth in late- and post-medieval Durham. The later chronological narrative chapters draw together all of the new textual, visual and archaeological evidence into an integrated discussion which helps to clarify Durham's position as an important regional centre for the production of cheaper household textiles, whilst also being an important regional textile finishing centre. Maps detailing all of the locations referred to in the thesis feature in the themed chapters, as do all the illustrations. Research conclusions appear in Chapter nine along with an explanation of some limitations of evidence and recommendations for further work.

Chapter Two

2. *Methodologies and Sources*

2.1. Introduction

As this is a genuinely inter-disciplinary piece of research, it was necessary to master and use several different methodologies appropriate to each aspect of study and type of source material. Consequently, this includes:

- the physical examination of, cataloguing conventions and examination of comparanda respecting cloth seals;
- the conventions for, and skills needed for illustration by hand to a professional standard for this particular type of small find;
- the skills, lighting conditions, and conventions for photographing and processing this type of small find, as well as microscopic photographs of textile samples;
- an understanding of the preparation of samples for, and scientific principles behind, X-radiography, textile and textile-dye analysis, in order to interpret and contextualise the results of these scientific analyses;
- the reading, transliteration, critical appreciation and contextualisation of a wide range of medieval and post-medieval primary documents, cartographic and pictorial sources.

This chapter will present the different sources and processes used, and review the relevant methodologies behind the research carried out into each source type and process, what they can reveal and the limitations of each. The X-radiography, and scientific analytical processes applied to the textile samples preserved in cloth seals, however, are presented in Chapter five along with the results of these applications.

2.2. Method of photography

All of the 275 lead cloth seals recovered from the site were photographed in the Department of Archaeology, University of Durham, under the expert guidance of Departmental photographer Jeff Veitch. Each cloth seal was placed against a black baseboard with a diffused daylight-balanced strip light positioned above and behind the object at approximately 30° above horizontal. This oblique angle allowed raking light to strike the surface of the cloth seals so revealing any fine detail and the relief of the worn surfaces. Harsh shadows on the lower edge of the seals were minimised by the use of a white foam core bounce board as a reflector. Tripod mounted Nikon D200 and D700 digital cameras, incorporating a Nikkor 105mm F2.8 macro lens were used to capture images of both sides of each cloth seal. The images were then saved in a .NEF (raw file) format, before then being converted to .TIFF format for archiving and compatibility with Adobe Photoshop CS6 photo editing software. Although the cloth seals were originally photographed with a black background they were later edited to have a white background to complement the drawn illustrations and make comparisons easier.

2.3. Justification criteria for illustrating specific cloth seals

By their very nature, small lead cloth seals do not always lend themselves to revealing detailed information when presented in a photographic illustration format. Therefore, although labour-intensive, a concerted effort was made to draw as many of the 275 cloth seals as possible; however, due to the time constraints of the thesis it was unlikely that all of them would be illustrated in time. As a compromise a conscious decision was made to exclude drawing those cloth seals that were clearly so worn that no additional meaningful information relating to their original function or provenance could be conveyed by this means. Cloth seal drawings that include a profile or end elevation drawing were selected to highlight their unusual form or the position of surviving textile between the lead discs.

2.4 Method of illustrating

The illustration of the 167 cloth seals included in the catalogue was undertaken following the principles of illustrating archaeological small finds as detailed in BAJR Guide 32: Archaeological Illustrations – Small Finds (2013). Photographic illustrations of all 275 cloth seals were also produced for the catalogue, however, the three-dimensional nature of the cloth seals meant it was deemed necessary to provide drawing in order to communicate more detail and information. Illustration drawings were initially prepared on drafting paper using a Staedtler 788 C Mars technico clutch pencil with 2mm lead and a Staedtler Mars Lumograph pencil with 6H lead. A magnifying glass and raking light from a strip light were used to detect fine detail. Dividers were used to confirm the objects' dimensions. A second version of the drawing was then prepared on drafting paper by tracing over the pencil lines of the first drawing but this time with 0.18 and 0.35mm steel-nibbed Rotring Isograph technical drawing pens. Different line weights were incorporated in the drawings to help emphasise decoration or shadow. Stippling was added to individual drawings to help emphasise the form and depth of the object. These second ink drawings were then scanned using an Epsom Stylus SX415 series scanner and saved as 25-bit colour images, with a resolution of 720 dpi. in a .TIFF format. Adobe Photoshop CS6 photo editing software was utilised to prepare the final illustration. Where cloth seal profiles are drawn, the cross-sections are not shaded as detail relating to how the cloth seal was originally attached to the cloth may have been lost. The final images are represented in the catalogue at a scale of 1:1 in a 720 dpi. resolution that is of publication standard.

2.5. Use of laboratory equipment and applications to prove method

The scientific and analytical analysis was undertaken in the Materials Analysis Laboratory (D243) of the Dawson Building, Department of Archaeology, University of Durham and in the Chromatography Laboratory of The Centre for Textile Conservation and Technical Art History, University of Glasgow.

The analytical facilities used at the University of Durham included:

- EDXRF – Oxford Instruments ED 2000
- SEM – Hitachi TM 3000
- UV-Vis Spectrometer – Camspec 17330
- Spectrophotometer – Minolta 2600d
- Faxitron X-Ray Cabinet
- Research Microscope – Leitz Laborlux 12 POL
- Stereomicroscope – Wild M5

The analytical facilities used at Glasgow University included:

- Dino-Lite Premier digital microscope
- Talboys block heater
- BUCHI R-215 Rotavapor
- Eppendorf Minispin micro-centrifuge, (incorporating a 0.4 µm Millipore centrifugal filter)
- Angilent Premium syringe filter
- Waters Acquity™ H-class system (Waters Corporation, Milford, MA, U.S.A) equipped with a photodiode array (PDA) detector
- Waters Acquity® UHPLC BEH C₁₈ (1.7 µm 2mm x 150mm) shield column

2.6. Access to archives and special collections

Two main repositories of archives were consulted. The first groups of documents were the Mickleton and Spearman and the Hogg manuscript collections and the estate papers of the Bishopric of Durham, held in the Archives and Special Collections of Durham University's Palace Green Library. These collections were accessed at the Barker Research Library and contain original manuscripts and transcripts relating to the governance of Durham City and the history of North-East England. The type of documents examined included a legal precedents book (Mick. Cap 33), folios (f.91v-92), grants (Hogg MS 1/7) and a counter-part lease (CCB/D/1956/504/188381). These are discussed in section 6.5. A second group of documents, relating to the Durham

City Guilds or trade companies, were also accessed in the Barker Research Library these included: ordinaries and founding charters of incorporation, orders, minutes, apprenticeships records, call rolls, admissions records, fines, accounts and miscellaneous correspondence. And finally a third but equally important group of documents, again accessed in the Barker Research Library, was the North East Inheritance Database (pre-1858) Durham Probate Records. This incredible resource containing over 150,000 wills and related archives from across County Durham, Tyne and Wear and Northumberland, provided invaluable information relating to those engaged in Durham's post-medieval textile trade; see section 6.9 for detailed discussion of these probate records.

The second main repository of documents accessed was those held in the archive collections of the Durham County Records Office, based in County Hall, Durham. This material was directly associated with the Durham City Guilds or trade companies and included such documents as bye-laws, admissions to guilds as freemen, lists of Durham City freemen, the calls of tradesmen prior to them being admitted freemen of the guilds and city, lists of company members, minutes of guild meetings and apprenticeship books. Information extracted from these documents features prominently in section 6.4 and helped significantly with the compilation of Chart 6.1 which details total numbers of those engaged in Durham's textile industry. Where primary edited versions of Statutes are referred to, then the relevant (edited) reference is included in the following text. In addition, a note at the beginning of the bibliography refers to the relevant series of Statutes accessed for this thesis.

2.7. Complementary Collections and Archival Material

As highlighted in Chapter three, the period to which the Durham lead cloth seals have been ascribed suggests a sustained period of textile-related activity close to the find site dating from the fourteenth- to the early-nineteenth-centuries. This dating evidence confirms that the Durham cloth seal assemblage has much in common with other significant collections of cloth seals held in UK and European museum repositories. However, in terms of correctly identifying the

exact type or provenance of individual cloth seals, the sheer number of different types, including provincial variations that exist presents a significant problem. What can be said for certain is that from the late-fourteenth to the early-eighteenth centuries lead cloth seals were issued as part of the English governments system of taxation and quality control in the cloth industry, known in England as the *alnage* (Egan 1987, 11). It is therefore reasonable to suggest that thousands of different types of cloth seal were manufactured. This does not take into account the myriad of other cloth seal variations in the form of weavers', dyers', clothiers' or searchers' personal seals, along with those once attached to imported European cloth. Therefore, in order to have any chance of even coming close to confirming the distinct type of cloth seal correctly, comparable collections were researched to try to identify parallel examples.

Between October 2014 and May 2015, cloth seals and other textile-related paraphernalia were examined in the collections of the British Museum, London [the Occasional Paper 93 cloth seals – see Egan 1995], the Museum of London [typically River Thames foreshore finds], Norwich Castle Study Centre, Shirehall and Strangers Hall, Norfolk, Salisbury and South Wiltshire Museum [the Drainage Collection], the Museum De Lakenhal, Leiden, the Bureau Monumentenzorg en Archeologie (Bureau of Monuments and Archaeology) [North/South Line Project], Amsterdam and the Archaeology Museum, Haarlem, Netherlands; the Augsburg Textile and Industry Museum, Bavaria, Germany and the Germanisches National Museum Nuremberg, Germany. Many exact parallels, stylistically similar, and cloth seals with apparent design parallels were identified. Occasionally the legends of several incompletely-registered seals allowed the legends of the Durham cloth seals to be fully restored. Details of all the parallels identified are recorded within the individual catalogue entries in Table 3.1.

Chapter three

3 Catalogue and concordance of lead cloth seals

3.1 Abbreviations used in the Catalogue

M.O.L.	Museum of London
MOLA	Museum of London Archaeology
N.Mus.	Norwich Museum
S.Mus.	Salisbury and South Wiltshire Museum
B.M.	British Museum (Occasional Paper 93)
Y.Mus.	York Museums Trust (https://yorkmuseumstrust.org.uk)
P.A.S.	Portable Antiquities Scheme (https://finds.org.uk/)
DRWA	Durham River Wear Assemblage
A.A.S	Amsterdam Archaeological Services
G.N.Mus.	Germanisches National Museum
L.Mus.	Museum de Lakenhal, Leiden, Netherlands.
BSG.	Bag Seal Gallery (http://www.bagseals.org)
Acc. no.	accession number (DRWA pre-fixed with B.)
<111>	catalogue number
D.	diameter
Ds.	diameters (when more than one part/disc is present)
W.	width
L.	length
MD	metal detecting find (including the P.A.S. method of find)
-	no stamp/mark/device or worn
/	next line
//	next disc
..	single character missing
...	two or more characters missing
()	incomplete or missing letters etc. that can be restored with confidence
(?)	probable
in.	inch

3.1.1 Note on provenance and catalogue

The suggested provenance for the lead cloth seals (in the context of this catalogue), refers to the original location at which the seals would have first been attached to the cloth; typically this is the town or city where the cloth was originally woven and/or dyed, i.e. Norwich, Norfolk (for worsted cloth). This differs from their place of discovery, which for all of them was a submerged riverbed of the River Wear at New Elvet, Durham City, County Durham. Where the provenance of each cloth seal is either identified or alluded to, that location, i.e. city or county, is highlighted on the map of Northern Europe (Fig 3.31). All of the cloth seals were recovered from the New Elvet, River Wear finds site between 2008-2014. Although this is a site that has witnessed a period of continuous occupation from at least the tenth century through the post-medieval period to the present day, the evidence for the use of the cloth seals, presented here and elsewhere in this thesis, suggests a broad period of use of them, dating from the fourteenth- to the early-nineteenth-centuries. Detailed find/context information is recorded in an Excel database, which lists some c.8,500 individual objects (copy may be made available from author on request). Even though the bulk of the assemblage is made up of small iron or non-ferrous metal objects, other categories of finds from the site such as precious metal, stone, bone, ceramics, leather and shell fish are also represented.

Although at first sight the many various forms of cloth seals can seem confusing, the adoption of standardised terminology used in this catalogue, should help the reader to understand both their original function and how to identify the type to which they belong. Fig 3.1 below shows the order of parts and other terminology for four different types of cloth seal. Generally speaking, this can be simplified in that the part which features a rivet device is always disc/part one. The word 'disc' is simply used if that part of the seal being described is a flat circular shape; Fig 3.1 (b) for example, features both rectangular and disc-shaped parts. The number of the individual disc/part

increases incrementally towards the final outer discs/parts which typically features a rivet hole. The catalogue below, presents the Durham cloth seals in a simple list form, in a numerical order, ranging from 1 - 275, these numbers accompany the illustrations on the pages of figures 3.5 - 3.30. Individual catalogue entries highlight in which figure either a digital image or a digital image plus an illustration features, in addition, the actual DRWA accession number is included (given in bold type). This accession number corresponds to the relevant small find entry as recorded on the DRWA database mentioned above. Each individual entry also provides a suggested date, a description of the order of parts and any other terminology, an interpretation of any privy, merchant or scratched marks, together with any comparanda from those identified in other national museum collections or from the P.A.S. In September 2010, Geoff Egan, the then Portable Antiquities Scheme's National Finds Advisor – Early Medieval to Post-Medieval Objects, was invited by Durham County Council's Finds Liaison Officer, Frances McIntosh, to help identify several small finds from the DRWA. During his visit, Geoff viewed some 90 cloth seals that formed part of the assemblage. Therefore, given his expert knowledge of cloth seals, any suggested dates that he ascribed to individual seals have been included in the relevant entry.

Where any thread setts are identified either from impressions or surviving textile, Egan's (2001, 49) approximate 'indicators of quality' (see table 4.1) will be followed, see also 4.2.2 for further discussion on thread counts. All lettering is Roman unless otherwise indicated. The length of the interconnecting strip can be relevant when grouping types of cloth seals together; for the purpose of this catalogue they are described as: short <5mm, medium 5-10mm, long >10mm.

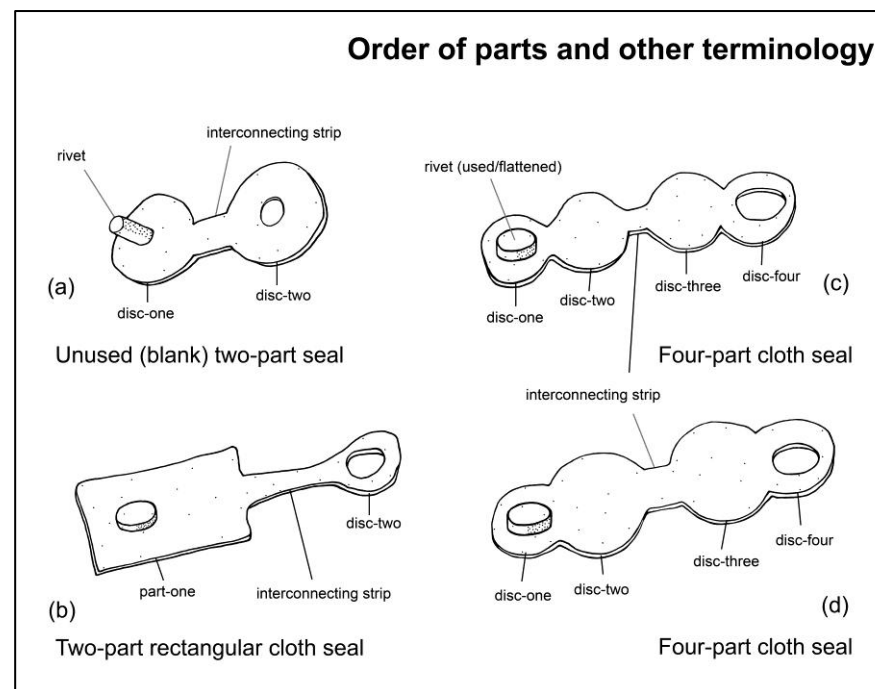


Fig 3.1 Cloth Seal types, order of parts and terminology.

3.2 English Cloth Seals (Table 3.1)

3.2.1 Weavers', Clothiers', Dyers' and Searchers' Personal Cloth Seals.

Though mostly un-provenanced, it can be said with some certainty that the following sixty-two seals are all English weavers', clothiers', dyers' or searchers' personal cloth seals. They are typically characterised by the fact that they feature individual privy or merchant marks, ligatures or stamps, and some of the London Dyers' Company series individually feature a madderbag. Although they are listed in no particular order, any cloth seals with similar marks or initials are grouped together and listed in succession. Where the provenance is known for individual cloth seals this is indicated in both the catalogue and on the accompanying figure. For smaller groups of English cloth seals with the same known provenance, i.e. London or Norwich, Norfolk, then these have been accordingly grouped together – see 3.3 and 3.4.

Intricate privy marks, like those found on several of the Durham cloth seals featured in 3.2 below, have been in use across Europe since the mid-thirteenth century. They were once a measure of the integrity of the merchant and of the quality of his goods, it was important that they were unambiguous and easily recognisable when the goods carrying them reached their final destination. They were not just used by wealthy traders or owners of vessels as every shopkeeper of any standing would have his own mark. There is also evidence that they were hereditary and that various members of the same family retained the same mark but with slight differences in design to avoid any confusion. Like many other privy marks in circulation during the sixteenth and seventeenth centuries, several of them are built around an upright stem, with a 'four' symbol on top, but with variations of the conventional 'XX' or 'WW' -form bases. Although these 'four' symbols can face either left or right, it is usual for initials (presumably those of the individual represented) to be found either side of the upright stem. Fig. 3.2, shows three such privy marks being displayed in an early-eighteenth century

dyers' recipe book from Southwark, London (two feature the initials GV while a third features IW, all three have an XX -form base). However, although the origins of this symbol are unknown (there is a suggestion that it may have a religious significance being linked to the *Agnus Dei* symbol) any clear association with late- or post-medieval dyers is far from certain. For example, the same upright stem and 'four' symbol combination also appears on merchant marks found in the 1554 -1555 Southampton Linen Hall book, though these examples are probably associated with traders and masters of ships (Ewing 1852, 179; Girling 1964, 9-15). In addition, only 7/91 individual privy marks displayed on the early-seventeenth-century Augsburg Dyers' Guild panel (Fig. 3.3), feature the same 'four' symbol device. However, the argument for linking the 'four' symbol privy mark with dyers can be strengthened following the recent recovery of 47 sixteenth-seventeenth-century cloth seals at Tanner Street, Bermondsey, London (a MOLA excavation) (see Bankhead in prep a). Several of these cloth seals which depict the 'four' symbol privy mark also feature a generalised madderbag – a symbol which appears in the London Dyers' Company arms. In addition, a similar combination (madderbag/'four' symbol) is also depicted on B.M. 267 – a seventeenth-century London Dyers' Company seal, many parallels of which have been found near the Swan Stairs/Old Swan area of the River Thames in London.

A similar mark (but without initials) which can be found on the font at St Mary's Church, Barnard Castle, Durham, is perhaps evidence that a merchant gave money to the building or restoration of a church or in this case for the provision of a new font. However, although dyeing and weaving activity took place in seventeenth-century Barnard Castle (see section 6.2), there is no evidence to connect those activities with this mark. Pim (1911, 183) ascribes a 1660 date to the font.

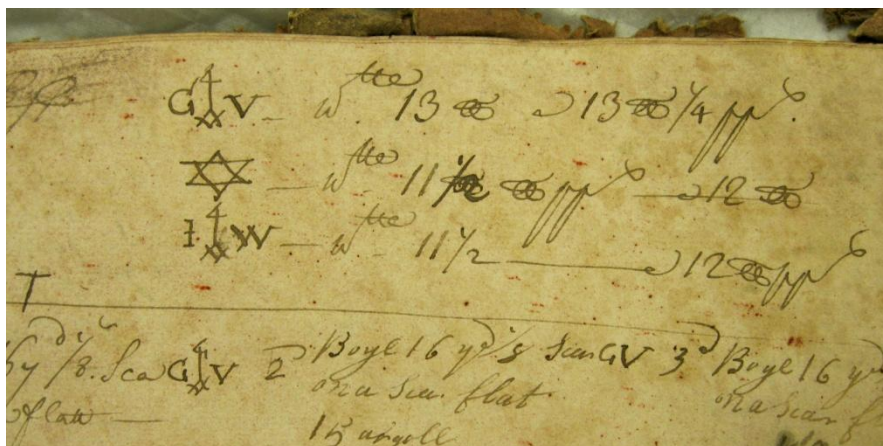


Fig 3.2. Chrutchley Archive Assc. No. 2011/5/2. Image © Author. Reproduced courtesy of Southwark Local History Library and Archive.



Fig 3.4. Seventeenth-century merchant's privy-mark on font, St Marys Church, Barnard Castle, Durham. Image © Author. Reproduced by kind permission St Mary's Church.



Fig 3.3. A section of the Augsburg Dyers' Guild Panel dated 1634. Image © Author. Reproduced by kind permission Augsburg Textile Museum.

No. 1 Fig. 3.5

Ds. 19 mm // 20mm. Sixteenth/seventeenth century. Acc. no. **B. 2672**

(Incuse) I B // privy mark: looped 'four' symbol pointing left, upright stem E (?)B to sides, XX-form base.

A complete two-part cloth seal with interconnecting strip. Compare similar privy marks on: **2, 3, 4, 5, 6, and 7**, also: M.O.L. 95.231/13 a suggested weavers cloth seal found in the River Thames at Dowgate, London, dated to 1566 - 1635. The same combination of EB / IB initials appears on **5** below.

No. 2 Fig. 3.5

Ds. 18mm // 18mm. Sixteenth/seventeenth century. Acc. no. **B. 2177**

Pinecone // privy mark: looped 'four' symbol pointing left, upright stem, E B to sides, XX-form base.

A complete two-part cloth seal with interconnecting strip. Compare similar privy mark on: **1, 3, 4, 5, 6, and 7**; also P.A.S. LON-9C4A43 (MD find River

Thames foreshore, Billingsgate, London) for the same combination of pinecone // 'EB' privy mark (although missing the XX-form base) – identified on the P.A.S. database (perhaps incorrectly) as having an Augsburg provenance and M.O.L. 95.231/13, a suggested weaver's cloth seal found in the River Thames at Dowgate, London, dated to 1566 - 1635. Although there may be an association with a 'fustian' type fabric, this cloth seal may have been once attached to textile woven in any one of a number of fustian weaving centres based in the Swabian region of Southern Germany before then being sent to the black dyeing works in Augsburg. Alternatively, it may have once been attached to a white (un-dyed) fustian, originally woven in Augsburg, but dyed elsewhere, for example, by London- or Durham-based dyers – in this case a dyer with the initials EB. As the textual evidence confirms that the Hostilliar was purchasing '*par lodicum de fustyan*' (coverlets or blankets of fustian) from as early as 1453 and that the Bursar of the monastery of Durham was similarly purchasing grey, black and 'white' [bleached] (a speciality of Ulm) fustian c.1530, from his servants in Newcastle (Raine 1844, 44, 64, 138; Fowler 1898, 147, 153). Consideration should be given, based predominantly on the similarities with the other privy marks which all bear the 'EB' initials in this small group, that this cloth seal was once attached to imported fustian cloth (probably originally white) but which was dyed in Durham. See sections 3.11 and 7.1 for further discussion on Augsburg/Swabian fustians.

No. 3 Fig. 3.5

Ds. 30mm // (missing). Sixteenth/seventeenth century. Acc. no. **B. 893**
 - // privy mark: cross over upright stem, EB to sides, (on rivet of first disc).
 An incomplete two-part cloth seal, the second disc and interconnecting strip are missing. Compare similar privy mark on; **1, 2, 4, 5, 6, and 7**. (Geoff Egan suggested date).

No. 4 Fig. 3.5

D. 18mm // (missing). Sixteenth/seventeenth century. Acc. no. **B. 714**
 Missing // privy mark: looped 'four' symbol, upright stem, E to left (on rivet of first disc).

A two-part cloth seal, the second disc and interconnecting strip are missing. Compare similar privy mark on; **1, 2, 3, 5, 6, 7 and 16**, also: M.O.L. 95.231/13, a suggested weavers' cloth seal found in the River Thames at Dowgate, London and dated to 1566-1635. (Geoff Egan suggested date).

No. 5 Fig. 3.5

Ds. 13.5mm // 13.5mm. Sixteenth/seventeenth century. Acc. no. **B. 2330**

- // privy mark: EB / I B ligature as part of XX-form base.

A complete two-part cloth seal with interconnecting strip. This same combination of double initials appears in **1**; also, compare similar privy marks on; **2, 3, 4, 6, and 7**. Seal currently on loan to the Museum of Archaeology, Durham University.

No. 6 Fig. 3.5

Ds. 18mm // 18mm. Sixteenth/seventeenth century. Acc. no. **B. 1918**

- // privy mark: looped 'four' symbol, tail forms (?)axe, upright stem, E to left side.

A complete two-part seal with interconnecting strip. Compare similar privy marks on; **1, 2, 4, 5, 7 and 16**, see very close parallel: P.A.S. LON-9C4A43 (MD find Thames foreshore, Billingsgate, London), and M.O.L. 95.231/13, a suggested weaver's cloth seal again found in the River Thames at Dowgate, London and dated to 1566 - 1635. Seal currently on loan to the Museum of Archaeology, Durham University.

No. 7 Fig. 3.5

Ds. mm // mm. Sixteenth/seventeenth century. Acc. no. **B.2175**

III // privy mark: (?)I B / horizontal bar, (?)WA-form base.

A complete two-part cloth seal with interconnecting strip. Compare similar privy marks on; **1, 2, 4, 5, and 6**. Seal currently on loan to the Museum of Archaeology, Durham University.

No. 8 Fig. 3.5

D. 17mm // (missing). Sixteenth/seventeenth century. Acc. no. **B.2169**

Cross / F P privy mark // (missing).

An incomplete two-part cloth seal, the second disc and interconnecting strip are missing. Textile imprint on the reverse of disc one c.15 weft threads per 10mm (warp unclear).

No. 9 Fig. 3.5

Ds. 19mm // 19mm. Sixteenth/seventeenth century. Acc. no. **B.2119**

- // ROH ligature, raised circular border.

A complete two-part cloth seal with short interconnecting strip. Seal currently on loan to the Museum of Archaeology, Durham University.

No. 10 Fig. 3.5

Ds. 13mm // 18mm // (missing) // (missing). Seventeenth century.

Acc. no. **B.234**

- // beaded circle around, B O R C ..., beaded circle around, W / I · I / (G) // missing // missing.

An incomplete four-part cloth seal, only two discs are present. The second disc contains the letters (E) B O R C (OM) with four pellets between the R and C. These letters are surrounded by a beaded circle. In the centre of this disc is a smaller beaded circle containing the (?)maker's mark letters I W I S or G, these letters form a cross, in the centre of which is a single pellet. Although only the top half of the letter S/G is present, M.O.L., 78.227/17 shows this as a G. The letters (E) B O R C (OM) indicate the seal originated from the county (COM) of Yorkshire. The reverse of both the discs are blank although the larger disc has a raised rim running around the circumference. The smaller first disc has the remains of a split-pin rivet. Egan (1987, 57 and 255) records a similar Yorkshire cloth seal found in the Thames, London (No.1757) with 'SER/CHE/1611' on an outer disc. See also: M.O.L. 78.227/17 for exact parallel and 78.227/16 for similar.

No. 11 Fig. 3.6

D. 17mm // (missing). Seventeenth century. Acc. no. **B.615**

XXII (in relief) // missing, privy mark: F M either side of upright stem / XX-form base (on rivet of first disc).

An incomplete two-part cloth seal with partial interconnecting strip, the second disc is missing. See M.O.L. 78.43/5 found on River Thames foreshore (Queenhithe) for similar Roman numerals/privy mark combination. The Roman numerals would have been an indication of the length of cloth in yards. (Geoff Egan suggested date).

No. 12 Fig. 3.6

D. 18 mm // (missing). Sixteenth/seventeenth century. Acc. no. **B.514**

- // privy mark: 'four' symbol pointing to right, incorporating a D through horizontal line / N (?)M either side of upright stem / XX-form base (on rivet of first disc).

An incomplete two-part cloth seal with missing interconnecting strip and second disc. This privy mark has similarities with: **1**, **2**, **11** and **14** which all features the conventional XX-form base. A similar privy mark configuration can be seen on the mark of John Lucas of Great Yarmouth, dated to 1664 (Girling, 1964, 14). (Geoff Egan suggested date).

No. 13 Fig. 3.6

Ds. 19mm // 19mm. Sixteenth century. Acc. no. **B.540**

(Incuse) I D / (?)W scratched // intricate privy mark: looped 'four' symbol, upright stem intersected with a horizontal bar (possible letter T) and O, M at bottom of stem, D L either side of stem, beaded circular border.

A complete two-part cloth seal with medium sized interconnecting strip and surviving textile between discs. (Geoff Egan suggested date).

No. 14 Fig. 3.6

Ds. 18mm // 17mm. Sixteenth century. Acc. no. **B.1052**

HN privy mark over conventional XX-form base // -.

A complete two-part cloth seal with interconnecting strip. (Geoff Egan suggested date).

No. 15 Fig. 3.6

Ds. 25mm // 18mm. Sixteenth/seventeenth century. Acc. no. **B.1651**
19½, beaded circular border // privy mark: looped 'four' symbol pointing left made into short cross at tail, upright stem, A M to sides, swirling loops base.
A complete two-part cloth seal with partial interconnecting strip. For close parallels of this privy mark combination, see B.M. 214; M.O.L. NN19011 found in the River Thames, London. The mark of the Norwich merchant Thomas Rix, dated to 1615 features the exact same privy mark combination (Plate V. 16), but with different initials (Ewing, 1852, 189). (Geoff Egan suggested date). Seal currently on loan to the Museum of Archaeology, Durham University.

No. 16 Fig. 3.6

Ds. 17mm // 17mm. Sixteenth/Seventeenth century. Acc. no. **B.1786**
- // privy mark: looped 'four' symbol with (?)cross potent on tail, C (?)I either side of upright stem.
A complete two-part cloth seal with interconnecting strip. Compare similar privy marks on: **1, 2, 3, 5, 6, and 7** also M.O.L. 95.231/13, a suggested weavers' cloth seal found in the River Thames at Dowgate, London, dated to 1566 - 1635.

No. 17 Fig. 3.6

D. 19mm // (missing). Early Seventeenth century. Acc. no. **B.1646**
Privy mark: R C (either side of long cross) // -.
An incomplete two-part cloth seal, the second disc and interconnecting strip are missing.

No. 18 Fig. 3.6

Ds. 19.5mm // 20mm. Late fifteenth/early sixteenth/ century.
Acc. no. **B.217**
Privy mark: RB either side of upright stem with (?)trident on top / horizontal line / two diagonal lines the one on the left forms at its end a cross, E or F between // -.
A complete two-part cloth seal with short interconnecting strip. (Geoff Egan suggested date).

No. 19 Fig. 3.6

D. 21mm // (missing). Sixteenth/seventeenth century. Acc. no. **B.538**
XVI, beaded circle around // missing, partial privy mark: upright stem, B to right hand side (on rivet of first disc), textile imprint on reverse of first disc c.12 warp threads per 10mm, (weft unclear).
An incomplete two-part cloth seal with missing interconnecting strip and second disc. The privy mark displays similarities with **1, 2, 3** and **4** above. Although a fairly fine textile (12 threads per 10mm), the orientation in which the cloth seal was originally attached to the finished textile is unclear due to a lack of interconnecting strip; however, the direction of textile impressions do run parallel with the closing stamp suggesting a warp thread. (Geoff Egan suggested date).

No. 20 Fig. 3.7

D. 10mm // (missing) // (missing) // (missing). Sixteenth/eighteenth century. Acc. no. **B.920**
Scratched 41 // missing // missing // missing (partial beaded circular border on rivet of first disc)
An incomplete (?)four-part cloth seal with only one disc remaining. The front of the disc is scratched with 41. On the reverse is evidence of a split-pin rivet passing through a fragment of a second disc. (Geoff Egan suggested date).

No. 21 Fig. 3.7

Ds. 17mm // 17mm. Sixteenth/seventeenth century. Acc. no. **B.916**
O (?)O / (incuse) E // (?)privy mark incorporating G, lined circular border.
A complete two-part cloth seal with interconnecting strip. (Geoff Egan suggested date).

No. 22 Fig. 3.7

Ds. 18mm // 16mm. Sixteenth/seventeenth century. Acc. no. **B.1074**
- // partial (?)privy mark.
A complete two-part cloth seal but with damaged interconnecting strip.

No. 23 Fig. 3.7

D. 14mm // (missing). Seventeenth century. Acc. no. **B.904**

- // missing, A W / pellet / (?) S (on rivet of first disc).

An incomplete two-part sub-circular cloth seal, the second disc and interconnecting strip are missing. Lettering in relief. (Geoff Egan suggested date).

No. 24 Fig. 3.7

Ds. 16mm // 15mm. Sixteenth/seventeenth century. Acc. no. **B.1267**

Ornately scrolled (?)privy mark // V.

A complete two-part cloth seal with short interconnecting strip.

No. 25 Fig. 3.7

Ds. 24mm // 18mm Sixteenth/seventeenth century. Acc. no. **B.1307**

Privy mark: R.. I(?) // scratched (?)4, small puncture hole created by (?)nail.

A two-part cloth seal with missing interconnecting strip. There is surviving textile trapped between discs and with some faint textile impression.

No. 26 Fig. 3.7

Ds. 17mm // 18mm. Sixteenth/seventeenth century. Acc. no. **B.1274**

- // (scratched) 3 ¼, 1 ¼ to side / 2.

A complete (crude) two-part cloth seal with longer than average interconnecting strip.

No. 27 Fig. 3.7

Ds. 17mm // 20mm. Sixteenth/seventeenth century. Acc. no. **B.1555**

- // privy mark: (?)W within (?)heart shape.

A complete two-part cloth seal with interconnecting strip. Although distorted the privy mark may be that of the 'heart- shaped' series of privy marks which typically contain a set of initials within. See BM.223 and Tanner Street (M.O.L.A) 99 for examples of this type (both dated to the sixteenth/seventeenth century). In addition, the early eighteenth century Chrchley (Southwark) Dyers recipe book (14), features several variations of this type; although these cannot be ascribed as the privy marks of dyers.

No. 28 Fig. 3.7

D. 14mm // (missing). Sixteenth/seventeenth century. Acc. no. **B.902**

XX // missing.

An incomplete two-part cloth seal, the second disc and interconnecting strip are missing. XX numerals are in relief and may have represented the length of cloth in yards. (Geoff Egan suggested date).

No. 29 Fig. 3.7

Ds. 15mm // 15mm. Sixteenth/seventeenth Century. Acc. no. **B.898**

(Scratched) 418 // (?)R E.

A complete two-part cloth seal with short interconnecting strip. Surviving textile trapped between discs. (Geoff Egan suggested date).

No. 30 Fig. 3.7

W. 17mm x L. 24mm // (missing). Late Sixteenth/early seventeenth century.

Acc. no. **B.1266**

XVII / XVII // missing.

One part of a two-part (?)searcher's cloth seal. Egan (1974, 58) suggest that these rectangular or spade shaped seals were pre-cast with a standard specification for different kinds of cloth, typically showing the length (yards) over weight (lbs); the space below/next to the Roman numerals would have then been counter stamped with a searchers or alnagers personal stamp, following later inspection of the cloth. For similar see: PAS NMS-638353 and very close parallel NMS-54DB03 (both found in Norfolk); B.M. 117, 119 and M.O.L. 95.238/8, 81.522/37.

No. 31 Fig. 3.7

Ds. 18mm // 19mm. Seventeenth century. Acc. no. **B.2324**

(Incuse) O V // -.

A complete two-part cloth seal with interconnecting strip. Several varieties of incuse letters on the first disc are known, see also **34** (stamped HY) and **38** (PA), also M.O.L. 95.228/18 (GL) found at Bankside, Southwark, London; S.Mus. 123 (YE), 124 (V/O), 125 (OV); N.Mus. 132.128200 (DS). In addition, several seals from Tanner Street (M.O.L.A excavation) reveal evidence of the

regulation of the London Dyers' Company dyers' work, as pairs of initials are similarly stamped into the first disc (the second discs of which feature a stylized corded madder bag), various combinations featuring the initials: OT, FE (appearing twice), OF and O, suggest that searchers were operating in pairs to inspect the standard of dyed cloth, each in turn, probably stamping a single (?)surname initial on to the disc (Bankhead in prep a).

No. 32 Fig. 3.7

D. 19mm // (missing). Sixteenth/Seventeenth Century. Acc. no. **B.1051**
(Incuse) HW / GO // missing.

An incomplete two-part cloth seal with partial interconnecting strip, the second disc is missing. Probable searchers seal (see 6.4 for reference to the 1450 ordinances of the Durham Weavers' Guild, which detailed a requirement to annually appoint of pairs of wardens and searchers).

No. 33 Fig. 3.8

Ds. 24mm // 17mm. Sixteenth/Seventeenth Century. Acc. no. **B.1268**
- // S (E) A / RCH.

A rectangular two-part cloth seal with interconnecting strip. The first part is an irregular 24mm (width) x 20mm shape, the second, connected by a short interconnecting strip, is a sub-circular disc. The reverse of the first disc features a raised grid of squares (2x3) positioned above two raised (circular) protrusions/pellets. A similar series of typically rectangular cloth seals exist, usually detailing the name of the searcher on one side and a proforma stamp specifying length, weight and width on the other, see example: B.M. 244; although M.O.L. 95.238/8, with a more rectangular first-part, is of a closer design. However, for a very close parallel see BSG.CS.00031, found in Yorkshire.

No. 34 Fig. 3.8

Ds. 18mm // 20mm. Seventeenth century. Acc. no. **B.1306**

H Y (incuse) (the H is rotated 90° to the Y) // (?)Lombardic lettering legend, beaded circular border.

A complete two-part cloth seal with interconnecting strip. See **38** and also **31** for discussion.

No. 35 Fig. 3.8

Ds. 18mm // 18mm. Sixteenth/seventeenth century. Acc. no. **B.1669**

Scratched 46 // privy mark: ornate spangles and swirls ... (?)D to sides.

Two part cloth seal with interconnecting strip. A close parallel to this ornate privy mark is B.M 268, which Egan (1994, 93) suggest is similar to the Dyers' Company seals found at Vintry and Trig Stairs areas on the London waterfront. While two additional seals from Tanner Street (M.O.L.A excavation), Nos. 96 and 114 also feature the same decoration and with initials to the sides. Coincidentally the elaborate decoration is remarkably similar to the embroidered cover of the book of prayer, presented to Queen Elizabeth I by Christopher Barker in 1584.

No. 36 Fig. 3.8

D. 16mm // (missing). Sixteenth/seventeenth century. Acc. no. **B.1366**

XIX // missing, (partial privy mark on rivet of first disc).

An incomplete two-part cloth seal with partial interconnecting strip, the second disc is missing. The Roman numerals, which are in relief, probably represent the length of the cloth in yards.

No. 37 Fig. 3.8

D. 17mm // (missing). Sixteenth/seventeenth century. Acc. no. **B.2179**

12 // missing, partial (?)privy mark (on rivet of first disc).

A two-part cloth seal with partial interconnecting strip, the second disc is missing.

No. 38 Fig. 3.4

D. 18mm // (missing) Sixteenth/seventeenth century. Acc. no. **B.2041**
Missing // P A (incuse).

A two-part cloth seal with partial interconnecting strip, second disc missing,
Faint textile imprint on reverse of first disc; c.10 weft threads x 10mm (warp
unclear), fairly coarse weave. See **31** for further discussion.

No. 39 Fig. 3.8

D. 19mm // (missing). Sixteenth/seventeenth century. Acc. no. **B.2457**
XIII (scratched) // (missing) privy mark: I (or) M B, beaded circular border
(on rivet of first disc).

An incomplete two-part cloth seal, the interconnecting strip and second disc
are missing.

No. 40 Fig. 3.8

D. 16mm // (missing). Sixteenth/Seventeenth Century. Acc. no. **B.2451**
4 ° // missing.

An incomplete two-part cloth seal, the interconnecting strip and second disc
are missing.

No. 41 Fig. 3.8

Ds. 25mm // 21mm. Seventeenth/eighteenth century. Acc. no. **B.2453**
Partial privy mark: central pellet, ornate scrolling loops // scratched 2.
A complete two-part cloth seal with short interconnecting strip.

No. 42 Fig. 3.9

D. 16mm // (missing). Sixteenth/seventeenth century. Acc. no. **B.1785**
Partial privy mark: T / (?)A // missing.

An incomplete two-part cloth seal, the interconnecting strip and second disc
are missing.

No. 43 Fig. 3.9

Ds. 15mm // 15mm. Sixteenth/Seventeenth century. Acc. no. **B.1787**
W I / B I S // -.

A complete two-part cloth seal with short interconnecting strip. No parallels
of this cloth seal have been found to date by the author.

No. 44 Fig. 3.9

D. 17mm // (missing). Seventeenth century. Acc. no. **B.1945**

Effigy of death (upright skeleton holding a sand timer in one hand and a
(?)shovel in the other) // missing, partial (?)privy mark: (?)I C (on rivet of
first disc).

An incomplete two-part cloth seal with partial interconnecting strip, the
second disc is missing. An un-paralleled cloth seal, probably once associated
with burial cloth. The burial '*in wollen*' of the draper James Drisdale, weaver
George Andrews and Jane Fossor at St Oswald's Church, Durham in 1678
(Headlam 1891, 147), are all testament that Acts of Parliament (18 Charles II;
30 Charles II) (Journals of the House of Lords Vol. XII; Ruffhead 1765, 293)
for the 'encouragement of woollen manufactures and prevention of
exportation of monies for the buying and importation of linen' was being
enforced in the parish at that time (see section 6.6 for further discussion).
Evidence supporting the local manufacture of woollens in Durham during the
seventeenth century is recorded in the same parish register: 1628 – Thomas
Bell '*wolline wever*' and 1687 John Dent '*woll-man*' of Shinkley, [Shincliffe]
(Headlam 1891, 75, 163). In addition, minutes of meetings of the Durham
Company of Dyers' and Litsters', dated 1710, record contributions from
Company Freeman towards the procurement of burial cloth – presumably a
guild tradition for when a fellow member dies (DCG 7/1). P.A.S. DENO-
D3E954 (MD find from Hogsthorpe, Lincolnshire) records a silver seal matrix
featuring a very similar skeleton holding an hour glass, but with an arrow
instead of a shovel. The matrix's '*memento mori*' decoration is said to be
paralleled with late-seventeenth-/early-eighteenth-century prints and tomb
sculpture.

No. 45 Fig. 3.9

Ds. 18mm // 17mm. Sixteenth/seventeenth century. Acc. no. **B.2043**
Privy mark: (?)trident / M H // -.

A complete two-part cloth seal with short interconnecting strip.

No. 46 Fig. 3.9

D. 22mm // (missing). Sixteenth/seventeenth century. Acc. no. **B.2042**

- // partial privy mark, (?)single arm of cross.

An incomplete two-part cloth seal with partial interconnecting strip, the second disc is missing.

No. 47 Fig. 3.9

D. mm // (missing). Fifteenth/sixteenth century. Acc. no. **B.2681**

- // missing, privy mark: 'four' symbol, upright stem intersected with a horizontal bar, I .. (on rivet of first disc).

An incomplete two-part cloth seal with partial interconnecting strip, the second disc is missing.

No. 48 Fig. 3.9

D. 13mm // (missing). Fourteenth/early- sixteenth century. Acc. no. **B.2631**

Privy mark: A relief design of a hollow square with a relief dot in the centre. The raised lines forming the sides of the square are extended beyond the corners, and each ends in a short line at right angles forming two T-shapes at each corner. A circular groove surrounds the central design and outside this is a beaded border. // missing, privy mark fleur-de-lys / (?)fleur-de-lys / B M / fleur-de-lys (on rivet of first disc).

An incomplete two-part cloth seal, the interconnecting strip and second disc are missing. These are relatively well struck stamps, however, no parallels of this cloth seal have as yet been found. Although the initials BM may be those of a weaver, clothier or craft guild appointed searcher or warden it is possible that they are in fact those of an alnager. As the unusual privy mark may be a stylized plan of a castle, together with the presence of fleurs-de-lys, they may suggest that this seal is connected with a Bishop of Durham-appointed alnage official. Fleurs-de-lys are associated with Bishop Ruthall (Hutchinson 1785, 400; Akerman 1844, 91) – see Chapter eight for further discussion. The relatively small diameter of this seal suggests an early date (fourteenth/early fifteenth century), although this is far from certain.

No. 49 Fig. 3.9

D. 19mm // (missing). Fourteenth/seventeenth century. Acc. no. **B.236**

(?)petalled flower // clover leaf or quatrefoil.

An incomplete two-part cloth seal with missing interconnecting strip and second disc. Geoff Egan suggested a wide date range for this cloth seal.

No. 50 Fig. 3.9

D. 18mm // (missing). Sixteenth/seventeenth century. Acc. no. **B.529**

Five raised lines running the full diameter of the disc // Privy mark: (?)I.

An incomplete two-part cloth seal with missing interconnecting strip and second disc. For closest parallel, see S.Mus. 37 which has a Wiltshire provenance displaying a shield with arms: Barry of (eight), said to represent stripy fields/pasture-lands and chalk downs. Geoff Egan was unable to allocate an accurate date for this cloth seal.

No. 51 Fig. 3.9

D. 13mm // (missing). Sixteenth/seventeenth/eighteenth century.

Acc. no. **B.746**

Unusual mark, possibly an implement used in the production of textiles // - (partial privy mark on rivet of first disc).

An incomplete (?)two-part cloth seal, only the first disc survives. Textile imprint on reverses of disc one c.15 weft threads x c.15 warp threads per 10mm, fine, probably tabby weave. (Geoff Egan suggested date).

No. 52 Fig. 3.9

D. 18mm // (missing). Sixteenth/seventeenth century. Acc. no. **B.580**

Unusual (crude) privy mark: horizontal line dissected by three shorter vertical lines, all in relief // missing.

An incomplete two-part cloth seal, both the interconnecting strip and second disc are missing. (Geoff Egan suggested date).

No. 53 Fig. 3.9

D. 18mm // (missing). Sixteenth/seventeenth century. Acc. no. **B.1931**
- // missing, B (?)I (on rivet of first disc)

An incomplete two-part cloth seal with partial interconnecting strip, the second disc is missing.

No. 54 Fig. 3.10

Ds. 16mm // 17mm. Sixteenth/seventeenth century. Acc. no. **B.2180**
Standing cockerel facing left // -.

A complete two-part cloth seal with very short interconnecting strip. Several cloth seals featuring a cockerel standing are found on seals associated with Suffolk, see example **134** below for further discussion.

No. 55 Fig. 3.10

D. 17mm // (missing). Sixteenth century. Acc. no. **B.336**
(Incuse) XXXI // (missing) incuse X (on rivet of first disc).

A heavy/crude two-part cloth seal with partial interconnecting strip, the second disc is missing. Probably stamped by a searcher with the weight and measurements of cloth. (Geoff Egan suggested date).

3.2.2 English Cloth Seals: London Dyers' Company Seals.

The following five cloth seals can be attributed to the London Dyers' Company. Surviving textual records of which, suggest that by the mid-seventeenth century many prosperous dyers were operating close to the River Thames in London. While there is a general consensus that many of the dye-houses would have simply been an extension to the private domestic tenements, there is evidence for more significant commercial property, for example: Company members Samuel West (1680) who owned a dye-house and William Trimmer (1675) who rented a dye-house, warehouse (stocked with many dye-stuffs) and grounds, both operated within St Olave's Parish, Southwark (Court of Orphans Inventories of Citizens' and Dyers' CLA/002/02/01). Company freemen too were also operating out of independent shops positioned close to the River Thames; the London Dyers'

Renter Wardens' Register (MS 8154) from 1682 - 1684, places some 37 freemen specializing in stuff, silk, linen, rug, hat and cloth dyeing in multiple riverside sites including locations such as Five Foot Lane, Southwark, Three Cranes and near Cold Harbour, Thames Street (Feldman 2005, 115-116). Ten of the 47 cloth seals recently recovered from a late-sixteenth/early seventeenth-century context at Tanner Street, Southwark (an MOLA excavation), feature a stylized madderbag (Bankhead in prep a). A continuation of Company dyers operating in London, through to the early eighteenth century, is confirmed by the recent discovery of the dyers recipe book discussed in 3.2 above and 4.2.5. There is a general acceptance that London cloth seals featuring a madderbag are related to the Dyers Company, although the use of the madderbag is as a generalised symbol of the Dyers Company arms rather than any reference to the dye madder (Egan 1995, 92).

No. 56 Fig. 3.10

D. 19mm // 20mm Sixteenth/seventeenth century. Acc. no. **B.1275**

Privy mark: upright stem with (?)looped 'four' symbol on top, the upright stem incorporates a P and A at base, H R to sides with a C (or G) between, i.e. P H R C (or G) A, leaves/foliage to left, beaded circular border around // scratched W, 3 or M.

A complete two-part cloth seal with interconnecting strip. A probable London Dyers' Company seal, evident due to the presence of the plant which is almost certainly a 'grain tree' a mythical plant once thought to be the source of red dye: it features on the arms of the London Dyers Company.

No. 57 Fig. 3.10 Ds. 22mm // 23mm. Late sixteenth/early seventeenth century. Acc. no. **B.522**

Madderbag // (missing) A, raised circle around (on rivet of first disc).

A sub-circular two-part cloth seal, the interconnecting strip and second disc are missing. Located in the central part of the first disc is the partial stamp showing the cordage of a madderbag, used here to represent the general symbol of the London Dyers' Company. The actual dye used by this dye house, almost certainly based close to the River Thames, London, would have been woad, for blue cloth; in this case coloured in the capital before being

shipped to Durham. See **58** and **59** for similar, also B.M. 270, 271 and M.O.L. 78.43/48, 95.231/15. (Geoff Egan confirmed this as being dated to the sixteenth/seventeenth century).

No. 58 Fig. 3.10

D. (Missing) // 24mm. Late sixteenth/early seventeenth century.

Acc. no. **B.2332**

Missing // WM / partial madderbag, beaded circular border.

An incomplete two-part London Dyers' Company cloth seal, the interconnecting strip and second disc are missing. As **60** below, the initials W = woad (blue dye), M = madder (red dye) indicate the combination of dyes used. Compare B.M. 270, 271; M.O.L., 78.43/48, 95.231/15 for similar.

No. 59 Fig. 3.10 D. 9mm // (missing). Late sixteenth/early seventeenth century. Acc. no. **B.2630**

(Scratched) 12 (?)2 // WM / madderbag.

A complete two-part cloth seal with interconnecting strip. This is a London Dyers' Company seal (as suggested by the corded madderbag). See **59** for very close parallel, also B.M. 270, 271 and M.O.L., 78.43/48 and 95.231/15 for similar. The initials W = woad (blue dye), M = madder (red dye) indicate the combination of dyes used. Textile extracted from between the discs, is suggestive of a heavily felted woollen broadcloth but with no obvious weave pattern, probably woven in the West of England before being shipped to London for finishing. UHPLC-PDA analysis undertaken at the Centre for Textile Conservation and Technical Art History, University of Glasgow in May 2015, has confirmed that this broadcloth was vat-dyed with the natural dye (probably locally grown) woad, or less likely indigo; then later re-dyed, again in the piece, with the adjective dye madder. This new evidence confirms earlier presumptions that the initials used in this series of cloth seals (WM, WG, WA, WR etc.) are indeed letters which specify the dyes used, see: Finds Research Group Datasheet 3, Fig 19 and Egan (1994, 92) for further discussion. Chapter Five details the full scientific analysis undertaken on the scrap of woollen cloth extracted from this cloth seal.

No. 60 Fig. 3.10

Ds. 19mm // 20mm Late-sixteenth/seventeenth century. Acc. no. **B. 539**

(?)A E or B // (?)I.

A complete two-part cloth seal with short interconnecting strip and surviving textile. Geoff Egan suggested that this cloth seal was linked to the London Dyers Company, as the 'I' stamp on the second disc indicated the number of washes in the dye [woad] the cloth was exposed to, i.e. I = one wash. Woad could be used alone or in multiple washes to deepen the shades of blue. See, 'London Stall' stamps (M.O.L. 78.43/96): for examples of II = two and III = three washes in the dye (Egan 1995, 92, 187). Consideration should be given for UHPLC-PDA analysis of the surviving textile to test for the presence of a blue dye (woad).

3.2.3 English Cloth Seals: Norfolk Weavers', Clothiers', Dyers' and Searchers' Personal Cloth Seals.

The following twelve cloth seals all have a Norfolk provenance. They represent an assemblage of post-medieval cloth seals that attest to a chronological span that effectively profiles Norfolk's worsted weaving history – from the second half of the sixteenth-century through to the early-eighteenth. This assemblage of Norfolk cloth seals is the fourth largest in England after those collections held in London (B.M. and M.O.L.) and at Norwich Castle Museum. Salisbury and South Wiltshire Museum list nine. Collectively they signify a period of time during which, various statutes were passed to regulate the worsted weaving industry of East Anglia. A period also, when additional craft regulations of the industry, drafted in the Mayor's Court in Norwich were being put to the test in the cities sealing halls. They attest to a time when the length, breadth and weave of newly invented 'stuffs' had to be exhibited before an assembly consisting of the Mayor and eight Alderman, and how any problems relating to the industry were settled before juries at the worsted weaving inquest (Millican 1942, 40-41).

Represented within the twelve, are cloth seals with links to events in Norfolk's history such as: in 1616 when the Corporation of Norwich purchased from the Duke of Lennox his right of the [alnage] crown seal, which was to be sealed on to every cloth in the county. Cloth seals produced following the incorporation in 1554 of the Norwich Russel Company, whose cloth seals featured the city arms, a castle with three domed towers over a lion passant; those made in the county, outside the city had a castle without the lion. Also, Norwich Weavers' Company seals that typically bear different variations of the surname initials of the Companies annually elected wardens, together with of the phrase 'worsted reformed' on a second disc (Moen, 1887, 75; Egan, 1994, 46). The presence of one cloth seal in particular – linked to French speaking Walloon immigrants – tells of an association with another very important time in Norfolk's history – the arrival of the 'Strangers'; whom, from 1565 onwards, arrived in Norwich, under licence from Elizabeth I, in ever increasing numbers. The justification to allow these 'aliens' to enter England was made at the time for purely economic reasons; a gamble that effectively turned around the county's fortunes, particularly as the traditional worsted weaving industry was previously in decline due to competition from Netherlands cloth in Norfolk's southern European Market (deprived of fine English wool they turned to Spanish wool) (Allison 1960-61, 79; Richwood, 1970, 81). At the beginning of the seventeenth century, innovations brought in by the skilled strangers, particularly the Walloon caungeantry (lightweight dry (non-greasy) fabrics), resulted in a range of new cloths or 'new stuffs' being produced. A change in techniques, such as an increase in wool-combing to produce better finer yarns, using scoured dyed yarns and by introducing silk thread, produced a much lighter cloth. Together with better regulation and the fact that these 'new draperies' were generally cheaper than the old worsteds, ensured that these 'Norwich stuffs' became England premier worsted for the next two centuries (Allison 1961, 61-65, 69; Rawcliffe *et al.*, 2004, 222-223).

An indication of the diverse range and indeed the scale of textile production in late-sixteenth century Norwich, can be obtained from the city's book of alnage accounts (1580 - 1610). In the year 1584 alone, William Lyttlewood,

the appointed searcher and sealer for the city, inspected and sealed: 262 tuftes, 2080 damaskes, 310 caffaease, 1604 olyotes, 580 valures, 670 large mockadowes, 880 buffynes, 1008 carrolles, 670 [dozen] hose, 1470 sayes, 440 grogaryfes, 1204 [grosse of] lace and 124 syettes. The same year, the aliens Peter Obrie and Christian Verkyn, appointed sealers for the crown seal, sealed 1133¹/₂ double and 672¹/₂ single bays, requiring 7072 lead seals to do so; Lyttlewood was re-imbursed £7. 1s. 8d for the 42,500 [at 4d the hundred] lead seals he used that same year (Hudson and Cottingham Tingey 1910, 77-79).

Evidence of the shipment of Norfolk worsteds to the North East of England during the seventeenth century can be found in the Great Yarmouth port books (TNA E190/493/8). During the first two months of 1661 alone, three vessels: the Employment, Speedwell and Prosperous were despatched to Newcastle by the Fuller Master Giles Wakeman. The cargoes included several bales of worsted stuffs weighing: one hundred and half: twenty four hundred and fifteen hundred wtt (weight), respectively (Nix 2014 pers. comm., 24 July). Allison (1960-61, 78) describes how, from as early as the mid-fifteenth century, Norwich worsteds were being sent along the River Yare for direct export to foreign markets, from Great Yarmouth.

No. 61 Fig. 3.11

Ds. 20mm // 21mm. Seventeenth century. Acc. no. **B.2674**

NOR / WICH / DY // (?)pairs of initials, double lined circular border.

A Norwich Weavers' Company seal.

A complete two-part cloth seal with short interconnecting strip. For similar see: N.Mus. 11390/c2 (MD find from Marsham, ten miles north of Norwich) although this features a lion passant on the second disc, also P.A.S. SOM-361C62 (MD find Carhampton, West Somerset) which is described as a Norwich Weavers' Company seal. Although the use of the NORWICH stamps are recorded on seals dated 1660s - 1705, it is unclear what the initials DY represent. Although it is certain that there is no connection with the letters DY and initials of the Mayor of Norwich (Norwich Mayors' initials are recorded on Russel-Company seals rather than Norwich Weavers' Company

seals, since he was the patron of that organisation), as the DY initials do not appear in the list of Mayors of Norwich from 1452 - 1835 (see, Egan 1987, 181; Hawes 1989, xxi-xxix). If the letters on disc two are indeed pairs of initials then they are presumably those of the annually-elected wardens of the Weavers' Company (see **63** for further comment).

No. 62 Fig. 3.11

Ds. 14mm // 13.5mm. Fifteenth/seventeenth century. Acc. no. **B.2452**

(H)(N) RC / (W) A RB // (?)castle, lion passant below

A Norwich Weavers' Company seal.

A complete two-part cloth seal with interconnecting strip. Eight initials are displayed here compared to many similar seventeenth century Norwich Weavers' Company seals, that generally feature the surname initials of twelve annually elected wardens of the Worsted Weavers' Company, for any particular year; dating from the first half of the seventeenth century and recorded in the Norwich Mayors' Court Books from 1657 – 1705. See examples: B.M. 81-85. However, there is evidence (Egan 1995, 182) to suggest that from an earlier time, perhaps from 1444-5 onwards; only four Wardens from the Worsted Weavers' Company based at Norwich were being elected annually from the weavers of the city, along with a further four from the rest of the county, making a total of eight. This is supported by the 1467 Act (Edw. CAP.I) for the 'Searching and sealing of the wardens of worsted weavers in Norwich and Norfolk', which confirms that four wardens from the worsted weavers living in Norwich and four wardens living in the county were to be chosen to fix their token or seal to the worsted they searched. These same wardens also had the power to search in Norwich, Suffolk and Cambridge (Kebble 1684, 282). Allison adds that after 1444, as many as 100 weavers would assemble to elect their county officials – four from Norwich and four from Norfolk (1960-61, 61-74).

It would be reasonable to conclude therefore, that this seal dates from the second half of the fifteenth century through to the early seventeenth. Egan (1987, 182) lists several seals with combinations of eight initials, all dated to 1620 - 30s, see: example: 3663: Castle //..H../ R(C) / 20 in particular. Also **65**

(below) and PAS SF-0D5996 (MD find Brockley, Suffolk) for exact parallels. These allow the pairs of initials to be fully restored to: HN RC WA RB. Of interest is M.O.L. 95.235/19 which shows another similar configuration of eight initials: (N)P TC / ...R M(P) // arms of Norwich, listed as 'Norwich Worsted?'.

No. 63 Fig. 3.11

D. 17mm // (missing). Seventeenth century. Acc. no. **B.1278**

27 // (?)T (on rivet of first disc).

Norwich Weavers' Company Seal (Worsted Reformed).

An incomplete two-part cloth seal, the interconnecting strip and second disc are missing. This seal, associated with the Norwich Weavers' Company is a common find across England with many recorded examples, however, the only one of its kind from Durham. From the second half of the seventeenth century a cloth seal was attached to both ends of the textile, one stamped with the surname initials of Norwich's annually elected Worsted Weavers Guild wardens (see similar examples: **62**, **66** and **67**) and the other with 'worsted reformed' together with the length of cloth in yards (Egan 1999, 3); earlier examples may have used Roman numerals unlike the small figures discussed below. See B.M. 87, for very close parallel, which apart from displaying an identical '27', has WOR/STED/REFOR/MED on the second disc; the 'T' on the rivet of 60 corresponds exactly with the position of the 'T' in /STED/ of B.M. 87. Although P.A.S. SUR-2E5E12 (MD find Chieveley, West Berkshire) is another very close parallel, again displaying the numerals 27 (it is not certain if the same die was used in any of these examples), this number does not appear to be the standard length of the cloth produced by the Norwich Weavers Company; other metal detecting finds recorded on the P.A.S database all featuring the same 'WOR/STED/REFOR/MED' disc, have indicated on the other disc, different units of lengths, for example: 41 yards on BH-F0D748 (MD find Offley, North Hertfordshire), 56 yards on BH-D75E08 (another MD find from Offley), 29 ½ yards for BH-88AAA6 (MD find Clothall, North Hertfordshire); in addition S.Mus. 28 suggest a length of 40 yards.

No. 64 Fig. 3.11

Ds. 16mm // 16mm. Fifteenth/seventeenth century. Acc. no. **B.2464**

Three towered castle / (?)lion passant // HN RC / WA R(B).

A Norwich Weavers' Company Seal.

A complete two-part cloth seal with short interconnecting strip. As **63** above. See also PAS SF-0D5996 (MD find from Brockley, Suffolk) for exact parallel. The four pairs of (?)surname initials can be fully restored to **HN RC WA RB**, these are the initials of the eight annually elected wardens from the Worsted Weavers (four from the city and four from the county).

No. 65 Fig. 3.11

Ds. 16mm // 16mm. Seventeenth century. Acc. no. **B.1917**

Three towered castle, lion passant below (arms of Norwich) // ... C I / N C (R).

A Norwich Weavers' Company seal.

A complete two-part cloth seal with short interconnecting strip. Although this seal features the arms of Norwich – a castle with lion passant below, the letters on the second disc do not fully make up the word NORWICH (the second 'C' would need to be an 'O'). However, if this is not a misinterpretation by the author, brought about due to damage/distortion of the disc, then it may suggest that the letters are in fact, actually pairs of initials (probably off-struck) and therefore likely to be the surname initials of the twelve annually elected wardens of the Worsted Weavers' Company.

No. 66 Fig. 3.11

Ds. 15mm // 16mm. Seventeenth century. Acc. no. **B.1932**

NOR / WICH // Lion passant.

A Norwich Weavers' Company seal.

A complete two-part cloth seal with short interconnecting strip. This is an unusual variant of the Norwich seals and no exact parallels have been found. The closest match is perhaps N.Mus. 11390/c2 (MD find from Marsham, ten miles north of Norwich), which like **62** above, has NOR/WICH/DY on disc one, but with a similar lion passant on the second disc. Most probably a Worsted Weavers seal.

No. 67 Fig. 3.11

Ds. 15mm // 14mm. Seventeenth century.) Acc. no. **B.1912**

Privy/weaver's mark: W or V / V, beaded circular border // Griffin passant.

A probable Norwich Weavers' Company seal.

A complete two-part cloth seal with interconnecting strip. In the early-seventeenth-century Norwich's principal industry was worsted weaving, the regulation of which occupied much of the attention of Norwich's Court of Mayoralty. While weaves were scrutinised in the sealing halls of Norwich, Statute 7 Edw. IV, c.1 permitted wardens representing Norwich and Norfolk to search in Norfolk, Suffolk and Cambridge. In April 1631 the jury at the worsted weaving inquest, held before the Mayor at the Norwich Court of Mayoralty, fined a weaver with the same W or V / V privy mark as shown on **67** (and **68**), the considerable sum of 25 shillings for being: *'partly two thredds & partly three thredds in the strikeinge, underated and one yard too short'* and 20 shillings for a second cloth as it was: *'two thredds & partly three thredds in the strikeinge being under rated'*. The scrutinised textiles were both white *'paropus'* a kind of double camlet (Millican 1942, 40-41, 143, see also Plate I Fig. 30). See **69** below for an exact parallel.

No. 68 Fig. 3.11

Ds. 13mm // 14mm. Seventeenth century. Acc. no. **B.1913**

Privy/weaver's mark: W or V / V, beaded circular border // Griffin passant.

A probable Norwich Weavers' Company seal.

Two part cloth seal with interconnecting strip. As **67** above.

No. 69 Fig. 3.11

Ds. 18mm // 17mm. Late-sixteenth/early-seventeenth century.

Acc. no. **B.897**

Crown / cross Moline // -, faint textile imprint probably course weave.

A Norwich Alnage seal.

A complete two-part cloth seal with interconnecting strip. A Norwich alnage seal (shown here rather than 5.3 below due to Norfolk provenance). Several parallels exist, see: **113** below; B.M. 77, 120, 121; M.O.L. 95/236/7a, 95/236/7b (both found on the River Thames foreshore, Dockhead,

Bermondsey, London) and N.Mus. 25170(1), for similar seals. However, M.O.L. 95/236/6 (also found on the River Thames foreshore at Dockhead, Bermondsey) is an exact parallel. (Geoff Egan suggested date and Norfolk provenance due to presence of cross Moline below crown).

No. 70 Fig. 3.11

Ds. 12mm // 12mm. Seventeenth century. Acc. no. **B.1427**

Castle with raised portcullis // (?)Trees

A Norwich/Norfolk dyer's seal.

A complete two-part cloth seal with short interconnecting strip. The use of the castle alone here, may be to represent the county as a whole. Individual dyers seals are known from Norwich, see Egan (1987, 193) for references to such, in particular No.542 which shows a plant motif, possibly a grain tree. Also See N.Mus. 25170(3) for similar castle, although an acorn is shown on disc two.

No. 71 Fig. 3.11

D. 18mm // (missing). Late sixteenth/early seventeenth century.

Acc. no. **B.235**

Three-towered castle, (faint) (?)lion passant below (arms of Norwich) // missing, evidence of casting flashing, also textile imprint c.10 warp threads per 10mm x 10 weft threads per 10mm, fairly coarse weave. A Russel Company Seal (the Company was incorporated in 1554-5, Statute 1 and 2 Phil. and M. c. 14, Allison 1960-61, 81).

An incomplete two-part cloth seal, the interconnecting strip and second disc are missing.. See B.M. 80 and PAS BH-95AEC7 (MD find Clothall, Hertfordshire) for parallels. Egan (1987, 192-193) lists several seals of this type, all with FIDELITAS ARTES ALIT ('Reliability fosters skill') on the second disc. (Geoff Egan suggested date).

No. 72 Fig. 3.11

Ds. 17mm // 18mm. Seventeenth century. Acc. no. **B.1650**

WAL / ON within beaded circle, NO(RWICH ALLIENS) around // galley with mast and rigging.

A Walloon Community Seal.

A complete two-part cloth seal with short interconnecting strip. See N.Mus. 442N, TG 10434 03058; M.O.L. 80.121/10; B.M. 93 – 94 and S.Mus. 29, for very close parallels. An important cloth seal that marks a significant period of history for the worsted industry in Norwich. Egan (1987,169-196) generalises that although the Walloons were originally licensed to produce bays, arras, says, tapestry, mockadoes, stamets and kersies, by 1607 it was the Norwich 'stuffs' or 'new worsteds' collectively called caungeantry that were being searched in the Norwich Walloon cloth hall. It is Moens (1887, 74-76) who expands on the Walloons' position in Norwich by highlighting that as early as 1564, the church of St. Mary the Less or St. Mary at the Monastery Gates had been fitted up by the city of Norwich at a cost of £43, as a hall for the Walloons to search and seal their goods (a separate Sale Hall had been set aside for the selling of goods). In 1578, appointed wardens (usually six) were ordered to seal goods on three days a week, between nine and one o'clock, the cloth makers or their servants had to be in the hall before nine o'clock in the morning. In 1580 new orders were agreed for searching and sealing goods; any cloths not so sealed were to be seized. Six seals were appointed, made at the charge of the City (presumably one for each warden), and lead was to be used for the tokens. Allison (1960-61, 66-67) highlights, how, in the 1580s, the city's revenues benefited greatly from the production of cloths by the Strangers, as it frequently received net profits of £200 from the Strangers' search and sale halls: in 1585-6 alone, some 38,723 cloths were sealed. In 1616 cloth made by Strangers had to have a ship on it and if it was found defective, the word ALIEN had to be stamped in the middle of the seal. By 1631 a new Hall was established as the previous one was found to be too small. An unusual four-part cloth seal attributed to the Walloon Community is recorded on the P.A.S. database: BUC-2CC102 (MD from Hanslope, Milton Keynes), shows a ship with three masts, above the date 1631.

3.3 English Alnage Seals:

3.3.1 Crowned-Portcullis County Series

The following 22 crowned-portcullis series cloth seals can all be attributed to the sixteenth to early-seventeenth century, although most are dated from the reign of Elizabeth I. Egan (2001, 60), highlights one coming from London, known to be from the reign of Henry VIII. There is a clear distinction here between these and the earlier county series alnage/subsidy seals dating from 1553 and 1600; see: **108** and **110** below. Typically these seals, which are amongst the largest group of seals recorded, all feature a crown over chained-portcullis, with Lombardic-letter legends, and it is these legends that should identify the specific county to which they can be attributed. The most common abbreviated legends are S'VLN'PAO'VEAL'I CO'... (seal for the county of...). See Egan (1987, 51) for an illustration of a complete example (Fig.13a). However, a common characterisation of this series of seals is poor striking resulting in an illegible legend, and it is perhaps for this reason alone that no county provenances have been identified from the 23 Durham cloth seals. Many parallels exist for these Elizabethan two-part crowned-portcullis series of county seals, including at least 14 from Salisbury, see: S.Mus. 3, 78-90; and eight from Broadgate, London (a MOLA excavation – see Bankhead in prep b), also: B.M. 41, 48, 49, 107; N.Mus. 2008.507.2.2 and metal detecting finds: P.A.S. SUR-418ED7 (Buckingham, Buckinghamshire), SF-6E0501 (Barnham, Suffolk), GLO-F4ED54 (Charfield, Gloucestershire). The Buckingham cloth seal has XV stamped on the second disc, a possible indication of the weight in pounds of the cloth. Two examples are also recorded on the Continent: A.A.S. NZD1.00462MTL134 and G.N.Mus H.M.943.

As may be expected with this type of alnage/subsidy seal, many counterfeit examples have been found, however with the exception of **76** which has a rough stamp engraving, the other 21 from Durham appear genuine. All but two of the 22 Durham cloth seals have the portcullis on the closing stamp i.e. on disc-two; typically (for the Durham examples) disc-one is left blank/un-

struck. For these late-sixteenth-century crowned portcullis series of county alnage seals; the number of portcullis grid apertures is given with a horizontal count first, then the vertical i.e. 3x3 or 4x3. Care should be taken to avoid confusing these early crowned-portcullis cloth seals with a later series of portcullis alnage seals, such as Y.Mus. YORYM:2012.549 16753, which is dated 1652, and simply features a portcullis (no crown) with a 4x4 grid apertures.

No. 73 Fig. 3.12

D. 14mm // (missing). Sixteenth/early-seventeenth century. Acc. no. **B.922**
- // missing, crown / chained-portcullis (on rivet of first disc).

An incomplete two-part cloth seal with partial interconnecting strip, the second disc is missing. (Geoff Egan suggested date).

No. 74 Fig. 3.12

D. 15mm // (missing). Sixteenth/early-seventeenth century. Acc. no. **B.584**
- // portcullis (3x3).

An incomplete two-part cloth seal with interconnecting strip only a small portion of the second disc is present. (Geoff Egan suggested date).

No. 75 Fig. 3.12

Ds. 13mm // 12mm. Sixteenth/early-seventeenth century. Acc. no. **B.563**
Crown / portcullis (3x3) // -.

A complete two-part cloth seal with interconnecting strip. Rough engraving of stamp, possible counterfeit. (Geoff Egan suggested date).

No. 76 Fig. 3.12

Ds. 16mm // 15mm Sixteenth/early-seventeenth century. Acc. no. **B.264**
- // Portcullis, beaded circular border, faint lettering around,

A complete two-part cloth seal with interconnecting strip. (Geoff Egan suggested date).

No. 77 Fig. 3.12

D. 15mm // (missing). Sixteenth/early-seventeenth century. Acc. no. **B.266**

- // missing, (?)crown / chained-portcullis (on rivet of first disc).

An incomplete two-part cloth seal, the interconnecting strip, and second disc are both missing. (Geoff Egan suggested date).

No. 78 Fig. 3.12

Ds. 14mm // 14mm. Sixteenth/early-seventeenth century. Acc. no. **B.1277**

- // chained-portcullis (3x3).

A complete two-part cloth seal with interconnecting strip.

No. 79 Fig. 3.12

Ds. 16mm // 16mm. Sixteenth/early-seventeenth century. Acc. no. **B.1308**

- // ...(?) I U D E ... around chained-portcullis (3x3).

A complete two-part cloth seal with medium sized interconnecting strip. Lombardic lettering. Seal currently on loan to the Museum of Archaeology, Durham University.

No. 80 Fig. 3.12

Ds. 15mm // 13mm. Sixteenth/early-seventeenth century. Acc. no. **B.1279**

- // crown / chained-portcullis (4x3).

A complete two-part cloth seal with interconnecting strip.

No. 81 Fig. 3.12

D. 17mm // (missing). Sixteenth/early-seventeenth century. Acc. no. **B.2331**

- // missing, chained-portcullis, Lombardic lettering around, (on rivet).

An incomplete two-part cloth seal with partial interconnecting strip, the second disc is missing.

No. 82 Fig. 3.12

Ds. 12mm // 12mm. Sixteenth/early-seventeenth century. Acc. no. **B.2462**

Portcullis // (?)I in centre ... (?)I .. O(?)I or U D... around, (?)lined circular border -.

A complete two-part cloth seal with interconnecting strip. Lombardic lettering.

No. 83 Fig. 3.13

D. 14mm // (missing). Sixteenth/early-seventeenth century.

Acc. no. **B.1921**

- // missing, chained-portcullis (3x3) (on rivet of first disc).

An incomplete two-part cloth seal with partial interconnecting strip, the second disc is missing.

No. 84 Fig. 3.13

D. 16mm // (missing). Sixteenth/early-seventeenth century.

Acc. no. **B.1922**

- // missing, crown / portcullis (on rivet of first disc).

An incomplete two-part cloth seal with interconnecting strip, the second disc is missing.

No. 85 Fig. 3.13

D. 15mm // (missing). Sixteenth/early-seventeenth century.

Acc. no. **B.1926**

Missing // portcullis.

An incomplete two-part cloth seal, both the interconnecting strip and first disc are missing.

No. 86 Fig. 3.13

D. 13 mm // (missing). Sixteenth/early-seventeenth century.

Acc. no. **B.1550**

- // missing (portcullis on rivet of first disc).

An incomplete two-part cloth seal, the interconnecting strip and second disc missing.

No. 87 Fig. 3.13

D. 15mm // (missing). Sixteenth/early-seventeenth century.

Acc. no. **B.1648**

Crown / portcullis (3x3), scratched lines // -.

An incomplete two-part cloth seal, the interconnecting strip and second disc are missing.

No. 88 Fig. 3.13

D. 17mm // (missing). Sixteenth/early-seventeenth century.

Acc. no. **B.1783**

- // missing, crown / chained-portcullis (3x3) (on rivet of first disc).

An incomplete two-part cloth seal with partial interconnecting strip, the second disc is missing.

No. 89 Fig. 3.13

Ds. 17mm // 14mm. Sixteenth/early-seventeenth century. Acc. no. **B.1920**

- // portcullis (4x4) // -.

A complete two-part cloth seal with interconnecting strip.

No. 90 Fig. 3.13

D. 11mm // (missing). Sixteenth/early-seventeenth century.

Acc. no. **B.2461**

- // missing, portcullis (on rivet of first disc).

An incomplete two-part cloth seal, the interconnecting strip and first disc are missing.

No. 91 Fig. 3.13

D. 13mm // 15mm. Sixteenth/early-seventeenth century. Acc. no. **B.2645**

- // chained-portcullis (3x3).

A complete two part cloth seal with interconnecting strip.

No. 92 Fig. 3.13

D. 14mm // (missing). Sixteenth/early-seventeenth century.

Acc. no. **B.2173**

- // missing, crown / portcullis (on rivet of first disc).

An incomplete two-part cloth seal with partial interconnecting strip, the second disc is missing.

No. 93 Fig. 3.13

D. 13mm // (missing). Sixteenth/early-seventeenth century.

Acc. no. **B.2174**

- // missing, portcullis (on rivet of first disc).

An incomplete two-part cloth seal with partial interconnecting strip, the second disc is missing.

No. 94 Fig. 3.13

Ds. 15mm // 14mm. Sixteenth/early-seventeenth century. Acc. no. **B.2459**

- // Lombardic lettering around chained-portcullis (3x2), partial beaded circular border.

A complete two-part cloth seal with interconnecting strip.

No. 95 Fig. 3.13

Ds. 15mm // 15mm. Sixteenth/early-seventeenth century.

Acc. no. **B.1914**

- // portcullis (on rivet of first disc).

A complete two-part cloth seal with interconnecting strip.

3.3.2 English Alnage Seals: County Series

No. 96 Fig. 3.14

D. 21mm // 19mm. Sixteenth/seventeenth century. Acc. no. **B.634**

(?)crown / (?)rose // three scratched lines, two horizontal, one vertical.

A complete two-part cloth seal with short interconnecting strip. Possible crown over rose, see **114** for similar and further discussion. (Geoff Egan suggested date).

No. 97 Fig. 3.14

D. 18mm // 18mm Sixteenth century. Acc. no. **B.859**

- // crown / fleur-de-lys, (?)S L to sides, all within lined circular border, Lombardic lettering around.

An incomplete two-part Alnage/Subsidy cloth seal, the interconnecting strip is missing. Textile preserved between discs. Very similar to **98**. Other close parallels are S.Mus. 6 and 7, both associated with Devon; S.Mus. 6 can be dated to reign of Elizabeth I. See also Luccetti and Straub 1999, 20 (Fig. 25) for similar seal which is described as an 'Elizabethan alnage seal'. (Geoff Egan suggested date).

No. 98 Fig. 3.14

Ds. 20mm // 21mm. Sixteenth century. Acc. no. **B.2178**

- // (?)G or L to left of fleur-de-lys, all within a lined circular border, A R or H.

A complete two-part cloth seal with interconnecting strip. As **97**, probable Alnage/Subsidy seal. See Luccetti and Straub 1999, 20 (Fig. 25) for similar seal, which is described as an 'Elizabethan alnage seal'.

No. 99 Fig. 3.14

D. (missing) // 20mm. Sixteenth/seventeenth century. Acc. no. **B.2040**

Missing // partial arms of Stuart Britain, I R to sides

An incomplete two-part cloth seal, only the second disc survives. See **109** for further discussion on this type of alnage seal.

No. 100 Fig. 3.14

D. 23mm // (missing). Early-seventeenth century. Acc. no. **B.1071**

Arms of Stuart Britain, I R to sides, beaded circular border // double struck - P within a beaded circle, (E)BORVM * (COM) around.

An uncommon two-part cloth seal, the second part (missing) being a small loop rather than a second disc, this would have allowed the cloth seal to be sewn on or tied to the textile. It is plausible that the method of manufacture of this type of cloth seal would have been a single rather than a two- or multiple-part mould (determined by a flat upper surface, formed when the lead (?)alloy was poured in to the open mould). Two exact parallels of this seal have been found on the River Thames foreshore, see BSG. CS.00637 and BSG. CS.00301, the discovery of which has allowed for the legend to be fully restored to 'COM EBORVM' (County of Yorkshire). In all three examples the 'county' side has been double-struck. Cloth seals of this type i.e. featuring the Arms of England on one side and a county code on the reverse are similar to the 1553 County Group series, see Egan (1987, 49-50, 208) No.750 in particular, which features a 'B' within a beaded circle and COM (S)OMERSET (County of Somerset) around // Tudor Arms with ER and 1553 to sides. In addition S.Mus. 77 features a similar combination but with a 1600 date. The production of cloth seals of the **100** type, during the reign of James I, may have been due to the simple continuation of Statutes 3 and 4 c.2, 1549 and 5 and 6 Ed.VI. c.6, 1552. An Act that placed a requirement of woollen manufactures in every county in England and Wales to ensure clothiers' seals were attached to cloth, that an overseer was appointed annually to ensure that regulations linked to the length, breadth and weight, drying (no over-stretching) and dyeing of woollen cloth (and wool) was being implemented: the latter Act not actually repealed until 19 and 20 Vict. c.64 (Mortimer 1765, 555; Egan 1987, 207-208).

No. 101 Fig. 3.14

Ds. 14mm // 17mm. Sixteenth century. Acc. no. **B.912**

- // crown over shield with arms of Tudor England, R to right.

A complete two-part cloth seal with partial interconnecting strip. Typically this county series of alnage seals can be dated to 1553 (following the great statute of clothing in 1551 - 1552, 5 and 6 Ed. VI. c.6 (Mortimer 1765, 555; Egan 1987, 207-208), see example: B.M. 40. However, S.Mus. 13 is perhaps the closest parallel to **101**, a cloth seal suggested by Egan (2001, 51) to be from the reign of Edward VI although without confirmation of an E (to left of shield) and lack of any distinguishable Lombardic or Roman lettering legends on **101**, it is possible that this seal actually pre-dates the reign of Edward VI. Egan's theory (1987, 25) of a close correspondence between some alnage seal designs and those for contemporary coinage could date this cloth seal to an earlier Tudor period as similar crown over shield with arms of Tudor England designs feature heavily in Henry VIII's second gold coinage (1526 - 1544) (Spink 2007, 212).

No. 102 Fig. 3.14

D. 14mm // (missing). Sixteenth/seventeenth century. Acc. no. **B.1057**

Crown, (?)G W within // -.

An incomplete two-part cloth seal, the second disc and interconnecting strip are missing.

No. 103 Fig. 3.14

D. 14mm // (missing) // (missing) // (missing). Eighteenth century.

Acc. no. **B.1167**

Missing // Unicorn rampant, 1 ½ to side // missing // missing.

An incomplete (?)four-part cloth seal, with only one disc surviving. For close parallels see B.M. 164; M.O.L. 80.279./187, however, although B.M. 161-163 and S.Mus. 102 are very similar, they all display a unicorn ducally gorged, rampant (typically with the head of George I on a second disc). Although subtly different, it is clear that this post-restoration alnage seal with notable finely engraved die cannot be dated (at face value) as being from the time of

George I; it is more likely that it would have been issued at the very end of the alnage system 1702-24.

No. 104 Fig. 3.14

D. 21 mm // (missing). Sixteenth/seventeenth century. Acc. no. **B.1930**

Crown / shield, incorporating within: Privy mark: looped 'four' symbol pointing left, cross incorporated into tail of four, upright stem, W R to sides, partial beaded circular border // raised 6 4 (on rivet of first disc).

An incomplete two-part cloth seal, the interconnecting strip and second disc are missing. The 64 appears to be part of a date i.e. 1664 or 1764.

No. 105 Fig. 3.14

D. 21mm // (missing) Sixteenth century. Acc. no. **B.1363**

Arms of Tudor England, E (R) to side, beaded circular border // Arms of the City of London (triple stranded cross with sword in first quarter, within ornate shield).

For close parallels see P.A.S. DOR-3AD2F2 (MD find from Shillingstone, North Dorset), SUSS-25B6E6 (MD find Mosterton, West Dorset), and for precise parallels see: M.O.L. 77.220 (found in the River Thames at Blackfriars, London); B.M. 61 (J. B. Caldecott collection); S.Mus. 13, 14, 16, 17 and 18. Although the crown and legends are missing from **105**, it is with some confidence that the much abbreviated inscription on disc one can be restored to: S'VLLI'PAO'VIALl'LON A (*sigillum ulnagei pannorum venalium Londini* - 'seal of alnage of saleable cloths of London'). The second disc would have read: LONDINI PRO PANNIS LANICIS 1573, which translates: 'for woollen cloths at London 1573, Egan (1995, 41) suggests that this series of alnage seals is dated to 1564 and 1573 and that they are the only English cloth seals to denote *woollen* cloths. See also **115** and **116** for similar.

No. 106 Fig. 3.14

Ds. 15mm // 15mm. Sixteenth/seventeenth century. Acc. no. **B.901**

(?)crown, beaded circular border // -.

A complete two-part cloth seal with short interconnecting strip. Although very worn it appears similar to **113**.

No. 107 Fig. 3.15

Ds. 20mm // 19mm. Sixteenth/seventeenth century. Acc. no. **B.2045**

Faint scratched line // seeded rose, (inner) beaded circular border, (C)OVLLCH(E)STER around, (outer) beaded circular border.

A two-part cloth seal with missing interconnecting strip. See P.A.S. LON-5356D0 (MD find from the Thames foreshore at Rotherhithe, London) for similar; although the legend is [correctly] spelt: COLCHESTER.

No. 108 Fig. 3.15

D. 28.5mm // (missing). Late-fifteenth century. Acc. no. **B.2327**

Crown over ornate shield with arms of England, (?)rose to right hand side within circular (?)beaded circle, faint Lombardic lettering around // crown / (?).

An incomplete two part cloth seal, with partial interconnecting strip and missing second disc. Several varieties of these (crowned) county series cloth seals exist, for close parallels see: P.A.S. WILT-7B9BB6 (MD find from Wingfield, Wiltshire); S.Mus. 33 and 34; B.M. 110, 111, 112 and 113. A copper alloy matrix found in Westbury, Wiltshire (B.M. 104) displays an almost identical crown over ornate shield with arms of England, which has been attributed to the reigns of both Henry V and Edward IV (Egan 1995, 53). The illegible Lombardic lettering on **108**, which may be attributable to poor striking could be expected (based on the examples listed above) to be reconstructed to read: S'SVBC'PANNOR'INCOM'...' (where ... is the county name), transcribed as: 'seal of subsidy for saleable cloths in ...'. See also **110** below.

No. 109 Fig. 3.15

D. 16mm // (missing). Seventeenth century. Acc. no. **B.2117**

Missing //.. R to sides, arms of Stuart Britain, beaded circular border.

An incomplete (?)two-part cloth seal with partial interconnecting strip, the second disc is missing. Although used extensively on the milled coinage of both James I and Charles I, these finely engraved arms of Stuart Britain are stylistically similar to those of B.M. 123 (dated 1611) and this is therefore rather more likely to be an alnage seal from the reign of James I (1603 - 1625). See also **100** above.

No. 110 Fig. 3.15

Ds. 24mm // 25mm. Late-fifteenth century. Acc. no. **B.2328**

Crown over ornate shield with arms of England, sun and (?)rose to sides, within raised lined border, faint lettering around // crown over sun and rose halved and joined, within a raised lined border, ... (?)R B D ... (Lombardic lettering) around.

A complete two-part cloth seal with short interconnecting strip. Several parallels exist of this type of county series cloth seal; see BM 110, 111 and 113; S.Mus 33, 34, 43, 44, 63, 72 and MC 8 (not in Salisbury catalogue) for similar crown over ornate shield device, while S.Mus 63 and 64 also feature the crown over rose halved and joined device on the second disc. Egan (1995, 53; 2001, 58), suggest that as similar sun and rose motif are found on English coins dated between 1483-90 (see Spink 2007, 204 for half sun and rose mintmark (39)), it is plausible therefore to ascribe a late-fifteenth-century date to this type of alnage seal. See also **108** above.

No. 111 Fig. 3.15

D. (missing) // 17mm. Sixteenth/seventeenth century. Acc. no. **B.2170**

- // missing, (?)crown, beaded circular border (on rivet of first disc).

An incomplete two-part cloth seal, the second disc and interconnecting strip are missing. Off struck.

No. 112 Fig. 3.15

Ds. 13mm // 10mm. Sixteenth/seventeenth century. Acc. no. **B.2118**

Crown / (?) // partial privy mark.

A complete two-part cloth seal with short interconnecting strip. Although the crown device is comparable in style to those found in Salisbury, see S.Mus. Cat 43-72, the diameter of the first disc of **112** is significantly smaller. The closest from Salisbury in terms of diameter (60 – 14mm, 62 – 16mm) are dated to the late-sixteenth century.

No. 113 Fig. 3.15

Ds. 14mm // 14mm. Sixteenth/seventeenth century. Acc. no. **B.2588**

- // crown, beaded circle around.

A complete two-part cloth seal with short interconnecting strip. Similar to **69** and **106** above. Other similar sized and finely engraved crowns are seen on B.M. 77, 120, 121; M.O.L. 95/236/6, 95/236/7a, 95/236/7b (River Thames, Bermondsey, London) and N.Mus. 25170(1). Various letter/symbols are recorded appearing below the crown, for example: E, W or a small cross, however a lack of one on **113** makes further identification difficult.

No. 114 Fig. 3.15

D. 16mm // 20mm. Sixteenth/seventeenth century. Acc. no. **B.2613**

- // I / (intricate) crown / (?)rose.

A complete two-part cloth seal with missing interconnecting strip. For similar combinations of crown over rose cloth seals, see: B.M. 103 and S.Mus. 8 and 72. Although Egan (2001, 59) suggests that the rose depicted on cloth seals of this type may well be a Tudor, Yorkist or Lancastrian symbol, the type of crown depicted on **114** is much more intricate than that shown on the three cloth seals referenced above. The crown on **114** actually portrays a very close resemblance to Henry VIII's Tudor Crown, with one notable exception, a letter 'I' positioned above the globe on the very top. Although this same crown was used for the coronation of Edward VI, Mary I, Elizabeth I, James I and Charles I, it is not until the House of Stuart that we see this type of crown appearing on English coinage; indeed the same crown over rose combination appears on James I Halfgroats and Charles I Rose farthings (see Spink 2007,

255-255 (2660); 300 (3204-7)). Based on this coinage evidence a suggested date for the cloth seal would be 1604 - 1649.

No. 115 Fig. 3.15

Ds. 20mm // 20mm. Sixteenth century. Acc. no. **B.582**

- // Crown / shield with arms of Tudor England, (?)E (R) to sides, ... VIALL ... around.

A complete two-part cloth seal with short interconnecting strip. Several parallels exist, see: **109** and **116**; B.M. 61, 62; M.O.L. 77.220 (found at Blackfriars, London); P.A.S. SUSS-25B6E6 (MD find from Mosterton, West Dorset), DOR-3AD2F2 (MD find from Shillingstone, North Dorset) and S.Mus. 14, 16, 17 and 18 for similar. The full legend can be restored to: S'VLII'PAO'VIALLE'LON' meaning: 'the seal of alnage of saleable cloths of London'. The orientation of the legend on the seal appears to differ from other similar seals perhaps depending on the series on which they were produced, for example the legend on S.Mus 16, commences at 1 o'clock with S'VLII', while **115** has, at the same position ...VIALL... The initials ER suggest production during the reign of Elizabeth I. Although worn here, other similar seals carry the inscription LONDINI PRO PANNIS LANCIS on the second disc, transcribed this abbreviation reads: 'for woollen cloths at London'; evidence that although London was generally regarded as the countries principal national textile-finishing centre and cloth market, cloths (in this case woollens) were being produced their too (Egan 2001, 50). (Geoff Egan suggested a date ranging from 1551 - 1600).

No. 116 Fig. 3.15

Ds. 21mm // 20mm. Sixteenth century. Acc. no. **B.2326**

Two vertical scratches // crown / shield with arms of Tudor England, E R to sides, (VI)A(LIE) (L)O(N) (S')VL(I) (IPAO) around.

A complete two-part cloth seal with short interconnecting strip. The Lombardic lettering is abbreviated from: *sigillum ulnagii pannorum venalium Londini* and reads: 'seal of alnage of saleable cloths in London', although the I (in SVLI) appears to be an A in **116**. As with **115** above, this cloth seal is also

evidence of woollen cloth production, in London during the reign of Elizabeth I. See also B.M. 61, 62; M.O.L. 77.220 (found in the River Thames at Blackfriars, London); P.A.S. SUSS-25B6E6 (MD find Mosterton, West Dorset), DOR-3AD2F2 (MD find Shillingstone, North Dorset) and S.Mus. 14, 16, 17 and 18 for similar.

No. 117 Fig. 3.16

Ds. 14mm // 17mm // (missing) // (missing). Early-seventeenth century.
Acc. no. **B.896**

- // shield with arms of London (stranded cross) ...VIA... around (Lombardic lettering), beaded circular border // missing // missing.

An incomplete four-part cloth seal, the interconnecting strip, third and fourth disc missing. See S.Mus. 20 for similar London Arms although the legend is different. This is an unusual variation of the London seals which feature the Arms of London. The only discernible part of the legend ...VIA... could be restored to S: VLII'PAO: VIALLE', or an abbreviated version of *sigillum ulnagil pannorum venalium Londini* – 'seal of alnage of saleable cloths In London', examples are known with VIALLE being used instead of VENALIUM. See Egan (1987, 163) for further discussion. (Geoff Egan dated this seal to 1620s). Cloth seal currently on loan to the Museum of Archaeology, Durham University.

No. 118 Fig. 3.16

Ds. (missing) // (missing) // 13mm // missing. Early-seventeenth century.
Acc. no. **B.1054**

Missing // missing // DENSHIR(E) around double rose // missing.

An incomplete (?)four-part cloth seal, with only disc (?)three surviving. Lombardic lettering. See both B.M. 12 (found in the Thames, London at Vintry); M.O.L. NN21189 and 78.43/40 (found on River Thames foreshore) for similar, however, the crown device shown (if originally present) on **118** is worn (although the orientation of the legend/rose is correct); the fourth disc, carries the legend TIVERTON. Egan (1987, 78) suggest that this [similar] alnage seal (numbered 1123), dated to 1610 - 1611, could be a reflection of Exeter's (Devon) role as a textile finishing centre for cloths woven in

Tiverton; as a large number of sixteenth-century alnage seals are recorded for the town. See Also Egan (1987) No's. 833, 1709 and 4831, for crown over rose, DENSHIRE around, cloth seals.

No. 119 Fig. 3.16

D. (Missing) // 15mm. Sixteenth century. Acc. no. **B.2334**

Missing // ...E (?)D or B... (Lombardic lettering).

A two disc seal, the first disc and interconnecting strip are missing.

No. 120 Fig. 3.16

D. 17mm // (missing). Late-fifteenth/early-sixteenth century.

Acc. no. **B.2181**

Missing // crown / (?)half sun, beaded circular border.

An incomplete two-part cloth seal with partial interconnecting strip, the first disc is missing. This crown over rose/sun/fleur-de-lys county series can be dated to the late-fifteenth/early sixteenth century (Saunders 2001, 58). Several similar cloth seals featuring a crown over sun or sun halved and joined with a halved rose, identified as alnage/subsidy seals are recorded, see: S.Mus. 63 for close parallel and 2, 8, 10, 64 for similar; also B.M. 4 for another close parallel.

No. 121 Fig. 3.16

D. 11mm // (missing). Late-seventeenth/early-eighteenth century.

Acc. no. **B.905**

(?)crown // crown / RWR ligature (on rivet of first disc) // missing // missing.

A (?) four-part cloth seal with partial interconnecting strip, the second, third and fourth discs are missing. Geoff Egan suggested that the initials are almost certainly for William III (1689 - 1702).

No. 122 Fig. 3.16

D. 13mm // (missing). Late-sixteenth/early-seventeenth century.

Acc. no. **B.2463**

88 within annulet, N O R · I · I · around // missing, (?)8 (on rivet of first disc).

An incomplete two-part cloth seal with missing second disc, the partial interconnecting strip features a twist at the point of breakage. Similar cloth seals featuring the circled 88 exist, see P.A.S. WAW-AA7110 (MD find Wellington Heath, Herefordshire) and SF-61EA97 (MD find Tuddenham St. Martin, Suffolk); both two-part cloth seals that also feature a crown on the second disc (only partially on the Herefordshire seal). The '8' on disc two of the Durham cloth seal may therefore be construed as being part of a similar crown. Stylistically similar crowns can be found on cloth seals: B.M. 77, 120, 121.

No. 123 Fig. 3.16

Ds. 14mm // 14mm. Sixteenth century. Acc. no. **B.894**

Crown, E (R) to sides / XV // faint privy mark.

A complete two-part cloth seal, with short interconnecting strip.
(Geoff Egan suggested date).

No. 124 Fig. 3.16

Ds. 18mm // 18mm. Late-sixteenth century. Acc. no. **B.2323**

- // F (in Roman lettering).

A complete two-part cloth seal with medium sized interconnecting strip. Probably for 'faulty' or sub-standard cloth. Some twenty cloth seals marked with an 'F' are recorded from Salisbury, the majority of which feature Lombardic lettering suggesting a late-fifteenth or early-sixteenth-century dating. However, S.Mus. 61 and 62 both have Fs in Roman lettering (as with **124**) and are ascribed as late-sixteenth century. Seal currently on loan to the Museum of Archaeology, Durham University.

No. 125 Fig. 3.16

Ds. 15mm // 15mm. Late-fifteenth/early-sixteenth century.

Acc. no. **B.2039**

- // enthroned king holding sceptre and sword and (?)E or H between open legs. Partial legend around in Lombardic lettering.

A complete two-part cloth seal with short interconnecting strip. Surviving textile present between discs. See Endrei and Egan (1982, 59) Fig. 7a for a close parallel, and S.Mus 106-108 which feature a similar enthroned king (all associated with Henry VIII). From these parallels the legend can be restored to: SIGILLV:COSTVMM (?Seal of Customs). Although not strictly an alnage seal, this cloth seal belongs to an important group of seals involved in the regulation of imported cloths, believed to have been attached by customs officials (as per Statutes 12 Ed. IV c3 and 4 Hen. VIII c6) to imported expensive fabrics and cloths of gold (cloth woven with a fine gold weft thread) (Egan 2001, 63).

3.3.3 English Alnage Seals: Four-part Seals

No. 126 Fig. 3.17

Ds. 11mm // 14mm // 11mm // 13mm. Seventeenth century.

Acc. no. **B.1916**

- // Arms of Stuart Britain, R to right // - // Arms of Stuart Britain.

A complete, unprovenanced four-part alnage/subsidy cloth seal with four lozenge-shaped parts and small interconnecting strip. See **128** and B.M. 51 (dated to 1618) and 102 for similar lozenge-shaped parts seals. Hodgkin (1902, 103) shows two similar seals, dated to 1620 (41) and 1619 (39). Seal currently on loan to the Museum of Archaeology, Durham University.

No. 127 Fig. 3.17

Ds. 10mm // 13mm // (missing) // (missing) //. Seventeenth century.

Acc. no. **B.907**

(Incuse) five vertical lines // Arms of Stuart Britain, lined circular border // missing // missing.

An incomplete unprovenanced four-part alnage/subsidy cloth seal, partial interconnecting strip, the third and fourth discs are missing. Evidence of a split-pin rivet on the reverse of disc one. (Geoff Egan suggested date).

No. 128 Fig. 3.17

Ds. 10mm // 14mm // 12mm // 11mm. Seventeenth century.

Acc. no. **B.267**

- // Arms of Stuart Britain // Arms of Stuart Britain // C(?) R

A complete unprovenanced four-part alnage/subsidy cloth seal with four lozenge-shaped parts and small interconnecting strip, the second and third parts are held together by a split-pin rivet'. The initials CR suggest that the seal may date from the reign of Charles I (1625 - 1649). See **126** for further comment.

No. 129 Fig. 3.17

Ds. 10mm // 14mm // 15mm // 11mm. Seventeenth century. Acc. no. **B.237**

- // bust of Charles II/James II/William III in profile facing right, (OF) ENG (L)AND around, beaded circular border // ornate fleur-de-lys, 1 ½ to sides, beaded circular border // -.

A complete, unprovenanced four-part alnage/subsidy cloth seal, with short interconnecting strip. The seal is held together by a split-pin rivet pushing through the fourth seal. Evidence of textile trapped between the third and fourth disc. Although Geoff Egan suggested a date for this seal, he was unsure which monarch was featured; there are good reasons for Egan's caution, particularly as similar seals: B.M. 136, 137, both featuring comparable busts and same 'OF ENGLAND' legend, are identified as James II, while another very close parallel: M.O.L. 95.228/79, also featuring a similar bust and the same legend is described as a 'Charles II type head'.

No. 130 Fig. 3.17

Ds. (missing) // 12mm // (missing) // (missing). Seventeenth century.

Acc. no. **B.1058**

- // partial arms of Stuart Britain // missing // missing.

An incomplete, unprovenanced four-part alnage/subsidy cloth seal, only the second (or third) disc survives.

No. 131 Fig. 3.17

Ds. (missing) // 12mm // (missing) // (missing). Seventeenth century.

Acc. no. **B.1169**

Missing // arms of Stuart Britain within lined lozenge border // missing // missing.

An incomplete four-part alnage/subsidy cloth seal. The only part present could be either the third or fourth disc. Similarities with **126** and **128**, although the arms are crude.

No. 132 Fig. 3.17

Ds. 12mm // 12mm // (missing) // (missing). Seventeenth century.

Acc. no. **B.2325**

- faint lettering (on rivet of first disc) // (?)fox or crowned lion passant guardant// missing // missing.

An incomplete four-part cloth seal, the interconnecting strip, third and fourth discs are missing. There is some illegible lettering on the flattened rivet. See B.M. 126; M.O.L. 95.233/6 (found in the River Thames, London) and BSG.CS.00390 (found on Thames foreshore near Leadenhall Street) for very close parallels. The similar animal which features on all three of these parallels is described as a lion and they all have a crown on their third disc. Seal currently on loan to the Museum of Archaeology, Durham University.

No. 133 Fig. 3.17

Ds. 14mm // 7mm // 7mm // 14mm. Seventeenth century. Acc. no. **B.2339**

Cock standing, lozenge-shaped beaded border around // - split-pin rivet // R S within lined circle, (S[U or V]FF)OLK(E) around // -.

A complete four-part cloth seal with interconnecting strip. Dated to 1630 - 1640s (Egan 1995, 52). The initials RS are those of the Suffolk alnager for that period. See Egan (1987) 808, 1995, 2604, 2723, 3669, 4926; B.M. 100; P.A.S. ESS-5C1112 (found in London) for similar and NARC-B31093 (MD find from Farndon, East Midlands) for an exact parallel. Seal currently on loan to the Museum of Archaeology, Durham University.

No. 134 Fig. 3.17

Ds. 6mm // 7mm // (missing) // (missing). Fourteenth/sixteenth century.

Acc. no. **B.1551**

- // Lombardic lettering legend around // missing // missing.

A very small four-part cloth seal with partial interconnecting strip, the second and third disc are missing. The combination of size and lombardic lettering suggest that this is an early cloth seal. No parallels are known to the author.

No. 135 Fig. 3.17

Ds. (missing) // (missing) 12mm // 12.5mm. Seventeenth century.

Acc. no. **B.1553**

Missing // missing // crown / harp, lined circular border // raised circle around rivet hole.

An incomplete four-part cloth seal with partial interconnecting strip, the first and second discs are missing. See Egan (1994, 52) for reference to crowned harps been associated with Suffolk. See M.O.L. 95.233/4 (described as an alnage seal, found in the River Thames, London) and 78.43/72 (also found in the River Thames) for similar crown over harp device.

No. 136 Fig. 3.17

Ds. 9mm // 8mm // (missing) // (missing). Seventeenth century.

Acc. no. **B.1788**

(Incuse) XII // Fleur-de-lys // missing // missing.

A four lozengform shaped cloth seal with partial interconnecting strip, the second and third parts are missing. (?)Split-pin rivet. Crude (some excessive mis-cast flanges apparent on both discs). See P.A.S. NMS-A35184 (found at Aylsham, Norfolk) and M.O.L. 78.227/4 for similar. The M.O.L. seal is similarly mis-cast.

No. 137 Fig. 3.18

Ds. 13mm // 15mm // 14mm // 15mm. Eighteenth century. Acc. no. **B.2184**

- // bust of (?)George I in profile facing right, beaded circular border // - // crown over thistle, 1 to right, beaded circular border.

A complete unprovenanced four-part alnage/subsidy cloth seal with short interconnecting strip. Although the reign of George I was 1714 - 1727, the bust of the king may have been used after this date. See B.M. 156, 157 and 191 for similar. Seal currently on loan to the Museum of Archaeology, Durham University.

No. 138 Fig. 3.18

Ds. 8mm // 10mm // (missing) // (missing). Late-sixteenth/early-seventeenth century. Acc. no. **B.2456**

- // (cast) N O over privy mark (in relief) // missing // missing

A four-part cloth seal with the interconnecting strip, third and fourth parts are missing. The first disc is sub-circular while the second is lozenge form, on the reverse of which are two short horizontal lines, again in relief. The split-pin rivet appears relatively intact suggesting that the seal was unused or mis-struck when applied to the textile. This seal appears to be a proforma type, pre-cast with specific information while other parts would have been left blank for searchers or alnagers stamps to be applied following inspection (Egan, 1994, 58). See B.M. 119 for an example of the initials (or word) NO appearing on searched seals, together with reference to several other seals featuring the same two letters.

No. 139 Fig. 3.18

Ds. 9mm // 10mm // 10mm // 9mm. Seventeenth century. Acc. no. **B.573**

1635, one fleur-de-lys between 16 and 35 and two above, beaded circular border // - // I F, beaded circular border // -.

This is a four-part alnage/subsidy cloth seal, the interconnecting strip is present but broken, however, the seal is held together by a split-pin rivet. The I F initials are presumably those of the alnage official, they also appear on **140** which is dated 1636.

No. 140 Fig. 3.18

Ds. 10mm // 10mm // 10mm // 10mm. Seventeenth century.

Acc. no. **B.2629**

- // 1636 / harp, partial beaded circular border // split-pin rivet // I or F, with tree or floral motif between initials, partial beaded circular border.

A complete four-part alnage/subsidy cloth seal with interconnecting strip. The seal is held together by a lead split-pin rivet pushing through the third seal. Evidence of textile trapped between discs. See **139** for same initials which are presumably those of the alnager.

No. 141 Fig. 3.18

Ds. 10.5mm // 10.5mm // 10.5mm // 11mm. Seventeenth/eighteenth century. Acc. no. **B.268**

- // - // - // -.

A complete four-part alnage/subsidy cloth seal, with short interconnecting strip. The fourth disc has a split-pin rivet passed through and flattened. Evidence of textile trapped between discs. Similar to **142, 143, 144, 145** and **146**. (Geoff Egan suggested date).

No. 142 Fig. 3.18

Ds. 11mm // 10mm // 10mm // 11mm. Seventeenth/eighteenth century.

Acc. no. **B.925**

- // - // - // -.

A complete four-part alnage/subsidy cloth seal, with short interconnecting strip. The fourth disc has a split-pin rivet passed through and flattened. Evidence of textile trapped between discs. Similar to **141, 143, 144, 145** and **146**. (Geoff Egan suggested date).

No. 143 Fig. 3.18

Ds. 12mm // 12mm // 13mm // 12mm. Seventeenth/eighteenth century.

Acc. no. **B.915**

- // faint outline of lozenge shape // - // -.

A complete four-part alnage/subsidy cloth seal, with short interconnecting strip. The fourth disc has a split-pin rivet passed through and flattened. Evidence of textile trapped between discs. Similar to **141, 142, 144, 145** and **146**. (Geoff Egan suggested date).

No. 144 Fig. 3.18

Ds. 10mm // 11mm. Sixteenth/eighteenth century. Acc. no. **B.715**

- (rivet on reverse) // - // missing // missing.

An incomplete four-part alnage/subsidy cloth seal, the interconnecting strip, third and fourth discs are missing. Similar to **141, 142, 143, 145** and **146**. (Geoff Egan suggested date).

No. 145 Fig. 3.18

Ds. 10 mm // 12mm // 12mm // 9.5mm. Seventeenth/eighteenth century.

Acc. no. **B.862**

- // - // - // -.

A complete unprovenanced four-part alnage/subsidy cloth seal with interconnecting strip, the second and third parts are held together by a split-pin rivet. Surviving textile trapped between discs. Similar to **141, 142, 143, 144** and **146**. (Geoff Egan suggested date)

No. 146 Fig. 3.18

Ds. 13mm // 13mm // 13.5mm // 13mm. Seventeenth century.

Acc. no. **B.2343**.

- // - // - // -.

A complete four-part alnage/subsidy cloth seal, with short interconnecting strip. The fourth disc has a split-pin rivet passed through and flattened. Evidence of textile trapped between discs. Similar to **141, 142, 143, 144** and **145**.

No. 147 Fig. 3.18

Ds. 10mm // 10mm // (missing) // (missing). Sixteenth/seventeenth century. Acc. no. **B.1310**

(Incuse) (?)W, rivet on reverse // - // missing // missing.

An incomplete four-part alnage/subsidy cloth seal, the interconnecting strip, third and fourth discs are missing.

No. 148 Fig. 3.18

Ds. (missing) // (missing) // 11mm // 8mm. Seventeenth/eighteenth century. Acc. no. **B.864**

missing // missing // faint (?)arms of Stuart Britain) // -.

An incomplete four-part alnage/subsidy cloth seal, the interconnecting strip and first two discs are missing. The fourth-disc features an unusual elongated rivet hole. See **149** for similar.

No. 149 Fig. 3.18

Ds. 12.5mm // 8mm // (missing) // (missing).Seventeenth/eighteenth century. Acc. no. **B.1065**

Missing // missing // partial privy mark // -.

An incomplete four-part alnage/subsidy cloth seal, the interconnecting strip, third and fourth discs are missing. See **148** for similar.

No. 150 Fig. 3.18

Ds. 10mm // (missing) // (missing) // (missing). Seventeenth/eighteenth century. Acc. no. **B.1784**

Scratched 4 // missing // missing // missing

A four-part (?)Alnage/Subsidy cloth seal, only the first part is present.

No. 151 Fig. 3.18

Ds. (missing) // 13mm // (missing) // (missing). Seventeenth century.

Acc. no. **B.1888**

Missing // shield with ridged cross (?)city arms of London // missing // missing.

An incomplete four-part cloth seal, only the third or fourth disc and partial interconnecting strip survive. See B.M. 65 for similar shield. Although there is a sword in the first quarter of the shield (as you would expect for the arms of London) there appears to be a lion rampant in the quarter below.

No. 152 Fig. 3.18

Ds. (missing) // 16mm // (missing) // (missing). Seventeenth century.

Acc. no. **B.1915**

Missing // bust of George I in profile facing right, (FIDEI) DEFEN around, radiating beaded border // missing // missing.

An incomplete four-part alnage/subsidy cloth seal with only the third or fourth disc present. Many parallels featuring a similar bust of George I exist, see: S.Mus. 103; P.A.S.: LON-243872 (MD find from the Thames foreshore near London Bridge) and B.M. 158-161. The legend of **152** can be confidentially restored to: FIDEI DEFENS (defender of the faith). Although

George I reigned from AD 1714 - 1727, the use of the bust may have continued further in to the eighteenth century.

3.4 English Weavers', Clothiers', Dyers', Searchers' or Alnage Cloth Seals - Second Disc Only

No. 153 Fig. 3.19

D. (missing) // 24mm. Sixteenth/seventeenth century. Acc. no. **B.2183**

Missing // -.

An incomplete two-part cloth seal, only the second disc is present.

No. 154 Fig. 3.19

D. (Missing) // 14mm. Sixteenth/seventeenth century. Acc. no. **B.2171**

Missing // -.

An incomplete two-part cloth seal with missing first disc; the partial interconnecting strip displays twist damage.

No. 155 Fig. 3.19

D. (missing) // 20mm. Sixteenth/seventeenth century. Acc. no. **B.2682**

Missing // -.

An incomplete two-part cloth seal with partial interconnecting strip, the first disc is missing. Faint textile imprint, course (?)2:1 twill weave, c.8 weft threads x c.8 warp threads per 10mm.

No. 156 Fig. 3.19

D. (Missing) // 23mm. Seventeenth/eighteenth century. Acc. no. **B.2329**

Missing // (?)leaves/berries/floral motif, lined and beaded circular border.

An incomplete two-part cloth seal with partial interconnecting strip, the first disc is missing. Probably associated with the work of the London Dyers' Company as the berries are almost certainly from the mythical grain-tree – the source of red dye and general symbol of the dyeing trade (Egan 1987, 194).

No. 157 Fig. 3.19

D. (missing) // 19mm. Sixteenth/seventeenth century. Acc. no. **B.2038**

Missing // fleur-de-lys, lined circular border.

An incomplete two-part (?)alnage/subsidy cloth seal with partial interconnecting strip. The first disc is missing.

No. 158 Fig. 3.19

D. (missing) // 14mm. Sixteenth/seventeenth/eighteenth century.

Acc. no. **B.1929**

missing // -.

An incomplete (?)two-part cloth seal, only the second disc is present.

No. 159 Fig. 3.19

D. (missing) // 21mm. Sixteenth/seventeenth century. Acc. no. **B.2172**

Missing // partial ornate device possible shield, beaded circular border.

An incomplete two-part cloth seal with partial interconnecting strip, the first disc is missing.

No. 160 Fig. 3.19

D. (missing) // 21mm. Seventeenth/eighteenth century. Acc. no. **B.2168**

Missing // three layers of concentric decoration within raised lined circular border.

An incomplete two-part cloth seal with missing first disc; the partial interconnecting strip displays twist damage.

No. 161 Fig. 3.19

D. (missing) // 19mm. Sixteenth/seventeenth century. Acc. no. **B.2182**

missing // beaded circular border.

An incomplete two-part cloth seal, the interconnecting strip and first disc are missing.

No. 162 Fig. 3.19

D. (missing) // 14mm. Sixteenth/seventeenth/eighteenth century.

Acc. no. **B.2093**

Missing // partial privy mark, partial beaded circular border.

An incomplete two-part cloth seal, only the second disc is present.

No. 163 Fig. 3.19

D. (missing) // 14mm. Sixteenth/seventeenth century. Acc. no. **B.2338**

Missing // -.

An incomplete two-part cloth seal with partial interconnecting strip. The first disc is missing.

No. 164 Fig. 3.19

D. (missing) // 19mm. Sixteenth/seventeenth century. Acc. no. **B.2333**

Missing // partial (?)crown.

An incomplete two-part cloth seal with partial interconnecting strip. The first disc is missing. Possible alnage/subsidy seal.

No. 165 Fig. 3.19

D. (missing) // 27mm. Sixteenth/seventeenth century. Acc. no. **B.2340**

Missing // (?)W or V (Lombardic lettering).

An incomplete two-part cloth seal, only the second disc is present. Similarities with **108** and **110** therefore a possible (crowned) county series alnage/subsidy cloth seals.

No. 166 Fig. 3.19

D. (Missing) // 15mm. Sixteenth century. Acc. no. **B.1061**

Missing // C or G (Lombardic lettering) / floral motif/leaves plant stems.

An incomplete two-part cloth seal, partial interconnecting strip, the first disc is missing. The presence of a floral motif/plant may be associated with the mythical grain-tree – the source of red dye and general symbol of the dyeing trade, therefore this seal is also possibly linked to a London based dyer (Egan 1987, 194).

No. 167 Fig. 3.20

D. (missing) // 21mm. Seventeenth/eighteenth century. Acc. no. **B.1060**

Missing // -.

An incomplete two-part cloth seal with partial interconnecting strip, the first disc is missing.

No. 168 Fig. 3.20

D. (missing) // 18mm. Seventeenth/eighteenth century. Acc. no. **B.1059**

Missing // faint lined circular border -.

An incomplete two-part cloth seal, only the second disc is present.

No. 169 Fig. 3.20

D. (missing) // 21mm. Sixteenth/seventeenth century. Acc. no. **B.1265**

missing // -.

An incomplete two-part cloth seal with some evidence of a partial interconnecting strip, the first disc is missing.

No. 170 Fig. 3.20

D. (missing) // 14.5mm. Sixteenth/seventeenth century. Acc. no. **B.1076**

Missing // -.

An incomplete two-part cloth seal with partial interconnecting strip, the first disc is missing.

No. 171 Fig. 3.20

D. (missing) // 19.5mm. Seventeenth/eighteenth century. Acc. no. **B.1309**

missing // -.

An incomplete two-part cloth seal with partial interconnecting strip, the first disc is missing.

No. 172 Fig. 3.20

D. (missing) // 16mm. Sixteenth/seventeenth century. Acc. no. **B.1927**

Missing // -.

An incomplete two-part cloth seal with partial interconnecting strip, the first disc is missing.

No. 173 Fig. 3.20

D. (missing) // 24mm. Sixteenth/seventeenth century. Acc. no. **B.1364**
Missing // (?)crown.

An incomplete two-part cloth seal with partial interconnecting strip, the first disc is missing. Some similarities with **108** and **110**; possible (crowned) county series.

No. 174 Fig. 3.20

D. (missing) // 16mm. Sixteenth/seventeenth century. Acc. no. **B.1425**
Missing // -.

An incomplete two-part cloth seal with partial interconnecting strip, the first disc is missing.

No. 175 Fig. 3.20

D. (missing) // 17mm. Sixteenth/seventeenth century. Acc. no. **B.1455**
Missing // (?)I, partial (?)beaded border.

An incomplete two-part cloth seal with partial interconnecting strip, the first disc is missing.

No. 176 Fig. 3.20

D. (missing) // 17mm. Sixteenth/seventeenth century. Acc. no. **B.1647**
missing // partial beaded circular border.

An incomplete two-part cloth seal, only the second disc is present.

No. 177 Fig. 3.20

D. (missing) // 19mm. Sixteenth/seventeenth century. Acc. no. **B.1925**
Missing // crown, (?)I W to right side within lined (raised) circular border.

An incomplete two-part cloth seal with partial interconnecting strip. Roman lettering. The first disc is missing. Faint textile imprint, c.15 weft x c.15 warp threads per 10mm, Z-spun yarn, 2:1 twill fairly fine weave.

No. 178 Fig. 3.20

D. (missing) // 18mm. Sixteenth/seventeenth century. Acc. no. **B.1576**
Missing // partial (?)fleur-de-lys within lined circular border.

An incomplete two-part cloth seal, only the second disc is present.

No. 179 Fig. 3.20

D. (missing) // 16mm. Sixteenth century. Acc. no. **B.1789**
Missing // lined circular border.

An incomplete two-part cloth seal with partial interconnecting strip, the first disc is missing.

No. 180 Fig. 3.20

D. (missing) // 20mm. Sixteenth/seventeenth century. Acc. no. **B.1548**.
Missing // two small fleur-de-lys.

An incomplete two-part alnage/subsidy cloth seal, only the second disc is present.

**3.5 English Weavers', Clothiers', Dyers' or Searchers' Cloth
Seals – Worn.**

No. 181 Fig. 3.21

D. 12mm / (missing). Sixteenth/seventeenth/eighteenth century.
Acc. no. **B.1056**

- (partial rivet and casting flashing on reverse of the first disc) // missing.

An incomplete (?)four-part cloth seal. The small size would suggest it was a similar type of alnage seal to those shown in Figures 3.17 and 3.18.

No. 182 Fig. 3.21

D. 17mm // (missing). Seventeenth century. Acc. no. **B.914**

- // partial privy mark: I to left of upright stem (on rivet of first disc).

An incomplete two-part cloth seal, the interconnecting strip and second disc are missing. (Geoff Egan suggested date).

No. 183 Fig. 3.21

D. 11mm // (missing). Sixteenth/seventeenth/eighteenth century.

Acc. no. **B. 610**

- // -.

An incomplete (?)two-part cloth seal with missing interconnecting strip and second disc.

No. 184 Fig. 3.21

D. 10mm // (missing). Fifteenth/sixteenth century. Acc. no. **B.1270**

Partial privy mark (?)ornate shield // (missing).

An incomplete (?)two-part cloth seal, only one disc survives. Badly worn, possible heraldic device or ornate shield. The small diameter and thinness of this disc suggest that it would form part of a multiple (?)four-part cloth seal

No. 185 Fig. 3.21

D. 18mm // (missing). Sixteenth/seventeenth/eighteenth century.

Acc. no. **B.858**

- // (missing) faint privy mark on rivet.

A two-part cloth seal with partial interconnecting strip, the second disc is missing.

No. 186 Fig. 3.21

D. 15mm // (missing). Sixteenth/seventeenth century. Acc. no. **B.1073**

- // -.

An incomplete two-part cloth seal, both the second disc and interconnecting strip are missing.

No. 187 Fig. 3.21

D. 17mm//18mm. Sixteenth/seventeenth century. Acc. no. **B.517**

- // faint (?)privy mark.

A complete two part seal with interconnecting strip. Surviving textile between discs.

No. 188 Fig. 3.21

D. 18mm // (missing). Sixteenth/seventeenth/eighteenth century.

Acc. no. **B.1075**

(?)Lion's head // -.

An incomplete crude two-part cloth seal with missing interconnecting strip and second disc. Consideration can be given for an Augsburg fustian connection as a lion was a mark of quality (see 3.11 below for further discussion) or a link to the Durham Weavers' and Websters' Company which features three lions' heads in their guild arms.

No. 189 Fig. 3.21

Ds. 19mm // 19mm. Sixteenth/seventeenth/eighteenth century.

Acc. no. **B.906**

- // -.

A complete two-part cloth seal with single rivet. (Geoff Egan suggested date).

No. 190 Fig. 3.21

D. 20mm // (missing). Seventeenth/eighteenth century. Acc. no. **B.1276**

- // (missing).

A two-part seal, the second disc and interconnecting strip are missing.

No. 191 Fig. 3.21

D. 18mm // (missing). Sixteenth/seventeenth century. Acc. no. **B.900**

- // (missing) (?)plant/tree(s) on rivet of first disc.

A two-part cloth seal, the second disc and interconnecting strip are missing. The presence of a plant or tree(s) may imply a dyers' seal perhaps associated with London's cloth-colouring industry, the dye houses of which were situated along the Thames. Several seals found on in the Thames, London, feature a mythical 'grain tree', the berries of which were supposed to produce a red dye (Egan 1995, 95-97). See examples: **156** and **166**; B.M. 278 and 286.

No. 192 Fig. 3.21

Ds. 20mm // 20mm. Sixteenth/seventeenth/eighteenth century.

Acc. no. **B.910**

- // -.

A complete two-part cloth seal with short interconnecting strip.

No. 193 Fig. 3.21

D. 13mm // (missing). Seventeenth/eighteenth century. Acc. no. **B.2241**

- // -.

An incomplete (?)four-part cloth seal, only the first part is present. The rivet is a split-pin type.

No. 194 Fig. 3.21

D. 13 mm // (missing). Sixteenth/seventeenth century. Acc. no. **B.2951**

- (partial rivet, textile imprint and evidence of casting flashing on reverse of the first disc) // Missing.

An incomplete two-part cloth seal only the first disc is present.

Textile imprint fine weave c.20 (?)warp threads per 10 mm. Weft unclear.

Probable plain weave.

No. 195 Fig. 3.22

D. 13mm // (missing) Sixteenth/seventeenth/eighteenth century.

Acc. no. **B.1552**

- // -.

An incomplete (?)four-part cloth seal, only the first part is present.

No. 196 Fig. 3.22

D. 12mm // (missing) // (missing) // (missing). Seventeenth/eighteenth century. Acc. no. **B.1546**

- // missing // missing // missing.

An incomplete (?)four-part cloth seal, only the first disc is present; possible split-pin rivet. A textile imprint on the outer surface of first disc may be evidence of calendering, part of the finishing process traditionally used in the manufacture of Norfolk worsteds. The process, which was illegal in 1551 -

1552, but made legal during the reign of James I, had previously been undertaken by calenderers; however, during the late-seventeenth century, wealthier Norwich weavers were also using stuff presses, dressing boards and pressing irons to achieve a smooth, glossy finish on the new stuffs they were weaving. The textile impression would have been formed as the textile was simply folded over the cloth seal prior to being pressed (Allison 1960-61, 70, 72; Egan 1987, 172).

No. 197 Fig. 3.22

D. 13mm // (missing). Sixteenth/seventeenth/eighteenth century.

Acc. no. **B.1923**

- // (missing).

A (?)two part seal, the second disc and interconnecting are missing.

No. 198 Fig. 3.22

D. 10mm // (missing). Sixteenth/seventeenth/eighteenth century.

Acc. no. **B.1549**

- // -.

A worn two-part cloth seal, the interconnecting strip and second disc are missing.

No. 199 Fig. 3.22

D. 12mm // (missing). Sixteenth/seventeenth century. Acc. no. **B.1547**

- // missing, (...I R... on rivet of first disc in Lombardic lettering).

An incomplete two-part cloth seal with partial interconnecting strip.

No. 200 Fig. 3.22

D. 10mm // (missing). Seventeenth/eighteenth century. Acc. no. **B.2046**

Scratched line across diameter of disc // -.

An incomplete (?)four-part cloth seal, only the first disc survives.

No 201 Fig. 3.22

Ds. 10mm // 10mm. Seventeenth/eighteenth century. Acc. no. **B.1924**

- // -.

A complete two-part cloth seal with interconnecting strip.

No. 202 Fig. 3.22

D. 22mm // (missing). Seventeenth/eighteenth century. Acc. no. **B.2450**

- // missing.

A well worn incomplete two-part cloth seal with partial interconnecting strip, the second disc is missing.

No. 203 Fig. 3.22

Ds. 22mm // 11mm. Seventeenth/eighteenth century. Acc. no. **B.1668**

- // -.

A complete two-part cloth seal with long interconnecting strip. A crude/unusual design that may be miss-cast.

No. 204 Fig. 3.22

D. 19mm // (missing). Seventeenth/eighteenth century. Acc. no. **B.1428**

- // - (partial privy mark on rivet of first disc).

An incomplete two-part cloth seal with missing interconnecting strip.

No. 205 Fig. 3.22

D. 13mm // (missing). Seventeenth/eighteenth century. Acc. no. **B.2458**

- // -.

An incomplete (?)two-part cloth seal the second disc and interconnecting strip are missing. Small fragment of textile around rivet of first disc.

No. 206 Fig. 3.22

Ds. 20mm // 19mm. Sixteenth/seventeenth/eighteenth century.

Acc. no. **B.1429**

G or D // -.

A complete two-part cloth seal with short interconnecting strip. Evidence of surviving textile trapped between discs.

3.6 English Weavers', Clothiers', Dyers' or Textile Merchant Cloth Seals: Late-Eighteenth to Early-Nineteenth Century.

As is often the case for this series of cloth seals, the correct identification of the clothier or weaver is often problematic. During the late-eighteenth to early-nineteenth century there was a proliferation of woollen and Worsted spinners and manufacturers operating in the many hamlets, villages and towns in the West Riding subdivision of Yorkshire. For example, Bain's 1822 trade directory lists hundreds of woollen manufacturers based in the Yorkshire towns of Leeds, Bradford, Dewsbury, Saddleworth, Halifax, Huddersfield and Wakefield and equally high numbers of Worsted manufacturers in Leeds, Bradford, Halifax, Bingley, Keighley and Wakefield. In addition, both finished and unfinished woollen textiles would have been passed onto the cloth merchants based in the cloth and piece halls of Bradford, Halifax and Leeds. These merchants would have added their own cloth seals to the bales of cloth, prior to shipment. As a consequence it is often difficult to be certain if the initials depicted on the cloth seals correspond accurately to those listed in contemporary trade directories and gazetteers. With reference to the seals from this group listed below, where a possible identification is alluded to, a reference has been added to the relevant catalogue entry below pre-fixed with the name of the directory, i.e. Baines 1822.

No. 207 Fig. 3.23

Ds. 29mm // 30mm. Late-eighteenth/early nineteenth century.

Acc. no. **B.230**

(S) & S / N° 377 (the 377 is stamped), solid horizontal line between, partial lined circular border // faint lines possibly lettering. A complete two-part cloth seal with medium sized interconnecting strip. Surviving textile trapped between discs – identified as a 2:2 twill weave with Z-spun yarns, the warp threads are significantly narrower in width than the weft suggesting a finer fabric type; the evidence for a finer fabric is strengthened by a thread count c.20 warp x 20 weft threads per 10mm. UHPLC-PDA analysis undertaken at the Centre for Textile Conservation and Technical Art History, University of

Glasgow in May 2015, has confirmed that this fabric was white (undyed) but patterned with darker, blue coloured, weft threads; this blue thread was dyed with the readily available vat dye indigotin. See case study Chapter five. The cloth seal appears to be a pre-cast, which allowed for the (?)consignment/weight/length etc. number to be stamped at a later time following inspection/packing. See **211** below for very close parallel. Baines 1882 – Smith & Sons, Worsted spinners (Little Horton, nr Bradford), p.532; Smith & Sons, Worsted top manufacturer (Kildwick, nr Skipton), p.539; Shores & Selby, Worsted spinners & manufacturer (Bradford), p.155; Samuel Selby, Worsted spinners & manufacturer (Leeds), p.b; Spencer & Son, Worsted manufacture (Denholme, nr Keighley), p.491.

No. 208 Fig. 3.23

Ds. 28.5mm // 26mm. Eighteenth century. Acc. no. **B.512**

.. RICKAB / 292 (incuse) // -.

A complete two-part cloth seal with medium-sized interconnecting strip.

No. 209 Fig. 3.23

Ds. 30mm // 28mm. Eighteenth/nineteenth century. Acc. no. **B.908**

- // ornate privy mark, M (incuse).

A complete two-part cloth seal with short interconnecting strip with surviving textile between discs.

No. 210 Fig. 3.23

Ds. 31.5mm // 26mm. Eighteenth century. Acc. no. **B.511**

Scratched 2 / 2 9 or 0 z or x, two horizontal lines separate numerals // I C / & C, beaded circular border.

A complete two-part cloth seal with medium-sized interconnecting strip. Surviving textile trapped between discs. The scratched numerals on disc one may be linked to the consignment number, length or weight. Baines 1882 – Isaac Clough, Worsted Manufacturer (Little Horton, nr Bradford), p.532.

No. 211 Fig. 3.23

Ds. 30mm // 26mm. Eighteenth century. Acc. no. **B.261**

S & S / N° 4 (the 4 is stamped), solid horizontal line between, beaded circular border // faint lines possible lettering.

A complete two-part cloth seal with medium interconnecting strip. See **207** above for very close parallel and further discussion.

No. 212 Fig. 3.23

Ds. 21mm // 27mm // (missing). Eighteenth century. Acc. no. **B.515**

(Incuse) 39 // T G / (?)D Y.

An unusual incomplete multi-part (?)cloth seal, it is not certain how many discs would have originally been present or how it was actually attached to the textile as there is no rivet device on either the first or second discs. No parallels are known to the author.

No. 213 Fig. 3.23

D. 30mm // (missing). Eighteenth/nineteenth century. Acc. no. **B.2342**

F or B // -.

An incomplete two-part cloth seal, only the first disc is present. Evidence of casting flashing on reverse of the first disc along with a single pierced hole.

No. 214 Fig. 3.23

D. 24mm // 25mm. Eighteenth century. Acc. no. **B.913**

Incuse (stamped) P L or E // partial beaded circular border.

A complete two-part cloth seal with short interconnecting strip. Although similarly stamped with a pair of letters as **31**, **34** and **38** above, the diameter of **214** is significantly greater, therefore listed here with cloth seals of similar diameter.

No. 215 Fig. 3.24

Ds. 33mm // 31mm. Late-eighteenth/early-nineteenth century.

Acc. no. **B.757**

- // CASTE(E).. / WAKEFI(ELD) / 986 (incuse), beaded circular border.

A complete two-part cloth seal with long interconnecting strip. Although no parallels have been found, compare P.A.S.: HAMP-EC2387 (MD Ringwood, Hampshire), LIN-293E87 (MD Osbournby, East Midlands), SWYOR-22C214 (MD Burghwalliss, Yorkshire and the Humber) for similar sized seals featuring 'Wakefield' and with scratched numerals on the reverse.

No. 216 Fig. 3.24

Ds. 31mm // 30mm Eighteenth/nineteenth century. Acc. no. **B.231**

- // -.

An incomplete well worn (?)two-part cloth seal with missing interconnecting strip. Two small holes 5mm apart pierce both discs, suggest possible re-use as a dress weight. Other similar sized dress weights have been found in the River Wear, see B.1416 and B.2064.

No. 217 Fig. 3.24

Ds. 31mm // 28mm. Late-eighteenth/early-nineteenth century.

Acc. no. **B.923**

Scratched 1475 / 372 or z, horizontal line between // PRESTS LEED(S), beaded circular border.

An almost complete two-part cloth seal with medium sized interconnecting strip, the second disc is missing the lower half. Textile imprint on reverse of disc one, probably plain weave, c.8 warp threads per 10mm x c.14 weft threads per 10mm. A cloth seal of William Prest Esq. a successful merchant and Mayor of Leeds 1816-17, he was also a member of the Corporation of Leeds during a time when Leeds was a centre for broadcloth manufacture. He purchased Toulston Lodge, Tadcaster in 1817 (Wilson 1971, 229). See **219** below for exact parallel.

No. 218 Fig. 3.24

Ds. 24mm // (missing). Eighteenth century. Acc. no. **B.542**

- // missing (BP on rivet of second disc).

An incomplete two-part cloth seal with missing interconnecting strip and second disc. The BP (?)initials are intricate.

No. 219 Fig. 3.24

Ds. 28mm // 24mm Late-eighteenth/early-nineteenth century.

Acc. no. **B.2644**

Scratched 74(?)12 / 14 // PRE(STS) / LEED(S), beaded circular border.

A complete two-part cloth seal with medium sized interconnecting strip. See **217** above for exact parallel and further discussion.

No. 220 Fig. 3.24

Ds. 28mm // 20mm. Eighteenth century. Acc. no. **B.2460**

- // -.

A complete two-part cloth seal with interconnecting strip. EDXRF analysis confirms that this cloth seal is made from the alloy pewter. The seal has been crudely made with excessive casting flashing. See case study Chapter five: '5.1.7 Metallurgical analysis' for further discussion.

No. 221 Fig. 3.25

Ds. 34mm // 31mm. Late-eighteenth/early-nineteenth century.

Acc. no. **B.1050**

Scratched 151 over 53=3, three horizontal lines separate numerals. // H I within lozenge border, beaded circular border.

A large complete two-part cloth seal with a long interconnecting strip. Surviving textile between discs. No parallels have been found by the author. Baines 1882 – Isaac Hayley, Worsted manufacturer (Northowram, nr Halifax), p.568; John Holland, Worsted spinners & Manufacturer (Brighouse, nr Halifax), p.470; James Hodgson, woollen manufacturer (Cleckheaton, nr Bradford), p.483.

No. 222 Fig. 3.25

Ds. 28mm // 27mm. Late-eighteenth/early-nineteenth century.

Acc. no. **B.911**

Scratched 3 (?)2 // ...EP..H...N... five pointed star or mullet.

A complete two-part cloth seal with long interconnecting strip. Compare **223** and P.A.S.: DUR-F56017 (MD Carlisle, Cumbria), YORYM-92C746 (MD Beverley, Yorkshire); the stamped legend can be fully restored to: YORK&SHEEPSHANKS* (around) LEEDS. The merchant Joseph Sheepshanks (b.1755) and his four sons all derived large incomes from the family mill in Leeds, in particular due to the supply of cloth to various militia during the war with France in the 1790s (Wilson, 1971, 247). See also 1798 correspondence between the York & Sheepshanks firm and the Earl of Hardwick who commanded a militia of 1000 in the County of Cambridgeshire, concerning an overdue bill of £1438 for the supply of cloth for uniforms for the men under his command (British Library, Add MSS 35670, fol 142et seq.). As County Durham also had a militia, re-organised by the Earl of Darlington in 1759 and which remained mobilised throughout the Napoleonic wars (Vane 2004, 288, 293). It would not be unreasonable to suppose similar uniforms were being supplied to the Durham militia. In 1851, the company exhibited in the South Transept Gallery at Crystal Palace during the Great Exhibition, under 'classes 12 and 15; woollen and worsted'. They are described in the 'official descriptive and illustrated catalogue' as: Leeds. Manufacturers, Dyer and Finishers. Woaded wool black; second woollen cloth. Piece-dyed black and piece-dyed black medium, and fast dye' (Royal Commission, 1851, 488).

No.223 Fig. 3.25

Ds. 27mm // 27mm. Late-eighteenth/early-nineteenth century.

Acc. no. **B.2683**

- // YORK&SHEEPSHANKS* (around) LEEDS

An incomplete two-part cloth seal the interconnecting strip is missing. See **222** above and P.A.S.: DUR-F56017 (MD Carlisle, Cumbria), YORYM-92C746 (MD Beverley, Yorkshire).

No. 224 Fig. 3.25

Ds. 31mm // 27mm. Late-eighteenth/early-nineteenth century.

Acc. no. **B.1264**

Scratched 1197 over 502 or Z, two horizontal lines between // -.

A complete two-part cloth seal with medium-sized interconnecting strip, surviving textile between discs.

No. 225 Fig. 3.25

Ds. 27mm // 27mm. Late-eighteenth/early-nineteenth century.

Acc. no. **B.2337**

- // I R or B / 5, pellet to side.

A complete two-part cloth seal with short interconnecting strip. Lined circular border around.

No. 226 Fig. 3.25

L. 36.5mm x W.10mm // (missing). Late-eighteenth/early-nineteenth century. Acc. no. **B.1183**

IAMES, pellet / HAIGH, horizontal line between // missing.

An unusual incomplete two-part cloth seal in rectangular form, the second part is missing. This is either a cloth seal of James Haigh, a late silk and muslin dyer based in Leeds 1778 - 1800 and author of the 1778 guide to dyeing: *The Dyer's Assistant in the art of dyeing wool and woollen goods*. See Chapter five and six for further discussion on this dyer. Or, a cloth seal of James Haigh, who in c.1738 was the owner of a fulling mill on the Salterhebble Beck (modern day River Hebble) near Ogden, Halifax, Yorkshire. In 1737, 'An Act for the better regulating the manufacture of Narrow Woollen Cloths in the West Riding of the County of York' (Statute 11 Geo. 2. C.28 (Ruffhead 1765, 36)), required that the millman was required to affix a lead seal, provided by the clothier, to one end of each piece and to stamp it with his name and the length and breadth of the cloth; the searcher was to do likewise at the other end of the piece (the searchers were appointed by the West Riding quarter sessions: broadcloth from 1724 and narrow from 1738), (Law, 1988; Barber 2011). It is possible however, given the geographic

location in which these activities were undertaken, that both men are of course the same person or perhaps directly related i.e. father and son.

3.7 Continental Seals

3.7.1 Swabian 'Fustian District', Southern Germany

The Augsburg cloth seals recorded below are examples of probably the most common of all imported cloth seals to be found in England and Wales; the principal textile to which they were attached was fustian. Throughout the medieval period fustian, a mixed fabric usually with a warp of linen and a weft of cotton textile, which produced a smooth silk-like finish, proved to be a popular textile (Pritchard 1990, 15). By the late-fourteenth century, fustian weaving had partially replaced the traditional woollen and linen regions of Augsburg, Ulm, Memmingen, Biberach, Nordlingen and Kaufbeuren in Southern Germany and by 1513, the Augsburg merchant and banker Jakob Fugger also brought fustian weaving to Weissenhorn. Within this Swabian 'fustian district' there was intense rivalry between the different factions of fustian weavers, and underhand tactics were being deployed to prohibit their competitor's trade, particularly with England. In 1536, for example, in the belief that the Fuggers had certain privileges with England, the Ulm weavers considered sending representation direct to Henry VIII with regard to the fustian trade. There is evidence that Henry VIII was using fustian to clothe his soldiers and mariners. The trade in fustians was dominated by the Upper German merchants and trading societies who obtained them at the trading fairs of Ulm, Nürnberg, Nordlingen and Frankfurt. The fustians were then sent to Antwerp where they were then sold to English, Spanish and Portuguese merchants. The Antwerp accounts of 1540, records some 225 bales of fustian (each bale being 45 pieces) arriving. Fustian were either white (bleached), a speciality of Ulm, or coloured grey or black (Kellenbenz 1983, 259-272; Baur 2015, 152). The longevity in the use of fustians was perhaps linked to the range of uses in which it could be put as it was being

suitable, due being finer and softer than the coarser linens, for use as a garment under armour, linings, sheets, furnishings and clothing such as britches (see Chapter four, the 1592 probate inventory of Robert Mitford a successful Newcastle upon Tyne merchant). The prevalence for importing these cheaper, typically 'un-dyed' continental textiles in to England (normally through London), peaked during the late-sixteenth/early seventeenth century, before finally being curtailed with the advent of the Thirty Year War of 1618 - 1648. In the years leading up to the war, typical annual fustian production at Weissenhorn amounted to some 16,732 pieces, compared to 410,000 from Augsburg and 100,000 pieces from Ulm (Kellenbenz 1983, 276).

Although many varieties exist, Augsburg cloth seals typically feature a pinecone, the city's heraldic device and the letter 'A', representing the city's initial. Several cloth seals of this type are listed below, **230** being a good clear example of the 'later' more ornate series. Comparisons can be made between these 'later' Augsburg cloth seals with parallels recovered from an archaeological excavation at Martin's Hundred, Virginia: these cloth seals had a very narrow dating context of 1620 - 1622. Trade between the Virginia Company and the East India Company resulted in fustians arriving in Jamestown and other Virginian colonies during the first quarter of the seventeenth centuries. These textiles would have almost certainly passed through London on their journey; indeed cloth seals with English weaver, merchant and dyers privy marks, have also been found in the same Virginian colonies (Lucchetti and Straube 1999, 21-22; Egan 1995, 106). Hittinger (2007, 23 and table 2, Nos. 1-6) suggests similar cloth seals with a pinecone // 'A' combination, as having a 1600 to early-seventeenth century date. It is relevant to note that variations in the design of the pinecone, ranging from early crude to later ornate versions, may represent historical advancement in die design/application technology.

A distinction between the different devices on the Augsburg cloth seals, for example, pinecone // 'A', pinecone // ox or pinecone // bishop's crozier (however, rather than a crozier, this symbol may actually be a black letter A

or an object linked to the tools associated with textile production, for example, a distaff and a bobbin of spun yarn) are noted and is linked to the quality of the finished textile rather than that of a different period of production. Swabian 'fustian district' weavers had to bring their cloth for inspection by municipal controllers, who then ascribed a classification based on the observed level of quality, a symbol, such as an ox (which represented the first or best quality of fustian) was then depicted on the attached cloth seal(s). Other symbols were used to depict different qualities and these included, lion, grape, wheel, scissors or a letter (Baur 2015, 154). In addition, Kellenbenz, highlights how, in 1552, the Weissenhorn fustian weavers were also using symbols to denote qualities, an ox also being used to denote 'first quality' while a lion was used for 'second quality' pieces. A fourth cheaper quality of fustians known as *brief*, were suitable for dyeing, originally at Ulm, then later at the black dyeing works in Augsburg (1983, 273-6). Endrei and Egan (1982, 52-53), citing Stromer, add to this confusing situation by suggesting that the best fustians were indicated by an ox or a lion, while a bunch of grapes (with leaves) would depict poorer quality textiles. This is compared to symbols depicting a knife, a wheel or scissors, which were used for similarly poor quality fustians at Regensburg, South-East Germany. The grading of fustian textile appears to have been taking place from as early as the first quarter of fifteenth century as Baur (2015, 157), highlighting correspondence between Hanseatic merchants (c.1410), identifies a shipment of sixteen *Fardel* [bales] of Augsburg fustian being sent to Bruges which contained fustians which were half ox quality and half lion quality.

The fact that cloth seals are recorded with an ox and 'AV' or 'AVGSBURG' stamped above and through the middle of the beast, suggests a need to identify from which centre that particular 'best grade' fustian was actually woven. Therefore, variations of the ox design, such as the two depicted in **233** and **251** could, in one case, be representative of fustian woven in Augsburg but in the other case fustian woven in a different centre such as Ulm. However, it is likely that they were both finished (dyed) in Augsburg – hence the presence of a pinecone on both cloth seals.

One final noteworthy observation of cloth seals with a Southern German provenance is that while an ox and lion are pretty unambiguous there is always the possibility that other symbols may have been mis-interpreted. Those associated with a knife/scissors/letter, grapes and wheel (as highlighted above), could in fact represent a distaff/yarn (rather than scissors), a wool carding brush – for raising the nap (rather than a bunch of grapes) or the spokes of a wooden spindle (rather than a [cart] wheel) – in essence – the tools associated with textile production!

The following 25 cloth seals which all have a Swabian 'fustian district' (Southern German) provenance, represent 9% of the Durham cloth seal assemblage.

No. 227 Fig. 3.26

Ds. 20mm // 21mm. Fifteenth/early-seventeenth century. Acc. no. **B.233**
Pinecone, beaded circular border // ornate A (worn), beaded circular border.
A complete two-part cloth seal, with medium-sized interconnecting strip. The pinecone on disc one is the heraldic badge for the city of Augsburg, Germany, the letter 'A' being the city's initial (Egan 1995, 106). In total 10 other cloth seals from the Durham collection feature this same pinecone // A combination. Many close parallels exist, the P.A.S. database in particular, lists 89 'Augsburg' finds, see examples: YORYM-0C7954 (MD find from Cottingham, Yorkshire), NLM-299FC7 (MD find from Binbrook, East Midlands) and A.A.S. NZR2.00554MTL017. In addition, see: S.Mus 150; B.M. 308, 309; N.Mus. (133).7 and 100.951; Tanner Street (M.O.L.A) 108 and M.O.L. NN19014 (found in the River Thames) although this cloth seal also features a letter 'A' and pinecone, it has been incorrectly identified as 'mason's dividers'. (Geoff Egan suggested date).

No. 228 Fig. 3.26

Ds. 18mm // 18mm. Fifteenth/early-seventeenth century. Acc. no. **B.2454**
(Off struck) ornate A, beaded circular border // pinecone on lentoid base with side projections, trefoil to left side, partial beaded circular.

A complete two-part cloth seal with medium sized interconnecting strip. The pinecone is of a similar cruder design to that of **238** and **242**, hence the earlier possible date for this seal. See also A.A.S NZR2.00186MTL063 for a well preserved and finely detailed very close parallel.

No. 229 Fig. 3.26

D. 18mm // (missing). Fifteenth/early-seventeenth century. Acc. no. **B.633**
Ornate A, single annulet above // -.

An incomplete two-part cloth seal, the interconnecting strip and second disc are missing. Evidence of casting flashing and faint textile impression on reverse of first disc; probably coarse weave. The initial letter A is for Augsburg, Germany. Many close parallels exist; see **227** for further discussions/parallels. (Geoff Egan suggested date).

No. 230 Fig. 3.26

Ds. 17mm // 18mm. Sixteenth/early-seventeenth century. Acc. no. **B.401**
Pinecone on tripartite base, within (faint) ornate tressure // Ornate A, annulets to top, bottom and right, pellet in centre, beaded circular border.
A complete well-struck, two-part cloth seal. See **226** above for brief discussion/parallels. For close parallel see: Tanner Street (M.O.L.A) 108; P.A.S. NLM-1F0085 (MD find from Gainsborough, East Midlands) and NMS-35D7D6 (found in Norfolk); S.Mus. 150; and M.O.L. NM19014 (found on the Thames foreshore). Several parallels have been excavated from a 1620 - 1622 context at Martin's Hundreds, Virginia (see PG302, F-320, EU2089, Virginia Department of Historic Resources); Luccetti and Straub 1999, 21 (Fig. 27) for exact parallel; see also Hittinger (2006, 23) and Table 2, Nos. 1-6 for parallels. (Geoff Egan suggested a 1620s date for this seal).

No. 231 Fig. 3.26

Ds. 17mm // 17mm. Sixteenth/early-seventeenth century. Acc. no. **B.513**
Ornate A, annulet to left side, pellet in centre, lined circular border // (?)pinecone, (?)arched tressure within a single line border.
A complete two-part cloth seal with medium-sized interconnecting strip. See **227** and **230** for brief discussion/parallels. (Geoff Egan suggested a 1620s date for this seal).

No. 232 Fig. 3.26

D. 16mm // (missing). Fifteenth/early-seventeenth century. Acc. no. **B.552**
Ornate A, annulet above, beaded circular border // missing.
An incomplete two-part cloth seal with missing interconnecting strip and second disc. See **227** and **230** for brief discussion/parallels. (Geoff Egan suggested date).

No. 233 Fig. 3.26

Ds. 14mm // 14mm. Fifteenth/early-seventeenth century. Acc. no. **B.575**
Ox, A(V) above, (?)beaded circular border // (?)pinecone.
A complete two-part cloth seal with medium-sized interconnecting strip. For close parallel, see **251**; P.A.S. WILT-7E7BF3 (found in a garden in Swindon, Gloucestershire) describes the 'AV' as being the first two letters of Augsburg and the 'ox' representing a 'quality symbol'. However, for two extremely well-preserved examples, see Tanner Street (M.O.L.A) 85 (two identical cloth seals bound together by their interconnecting strips), which is described as: 'Pinecone (on tripartite base), within ornate tressure, beaded circular border // A V / ox (off struck) standing on grass, AVGSBURG through centre of bull, beaded circular border'. (Geoff Egan suggested date for **233**).

No. 234 Fig. 3.26

D. 16mm // (missing). Sixteenth/early-seventeenth century. Acc. no. **B.903**
(Crude) pinecone, several multi-diagonal incuse lines // missing.
A crude incomplete two-part cloth seal with missing interconnecting strip and second disc. See **227** and **230** for brief discussion/parallels. (Geoff Egan suggested date).

No. 235 Fig. 3.26

Ds. 17mm // 17mm. Sixteenth/early-seventeenth century. Acc. no. **B.262**
Ornate A, beaded circular border // stylised pinecone within multi-cusped circular frame of arches with inward pointing trefoil terminals.
A complete two-part cloth seal with medium-sized interconnecting strip. P.A.S NMS-35D7D6 (MD find from West Acre, Norfolk) is a very close parallel for this seal. See also **227** and **230** for brief discussion/parallels. (Geoff Egan suggested date).

No. 236 Fig. 3.27

D. 21mm // 21mm. Sixteenth century. Acc. no. **B.232**
Pinecone // A, annulet to right, within a beaded circular border.
A complete two-part cloth seal with interconnecting strip. Initial observations by Geoff Egan suggested that this type of seal was almost certainly Continental with a sixteenth-century date, however, he also suggested that the device on disc one was a crown above a central circular object. Stereomicroscopy analysis (not available during the original identification) confirms this is actually a pinecone – the heraldic device of the city of Augsburg. The partial initial letter A on disc-two represents the place name. See **227** and **230** for brief discussion/parallels.

No. 237 Fig. 3.27

D. mm // Fifteenth/early-seventeenth century. Acc. no. **B.570**
(Off struck) ornate A, pellet in centre, beaded circular border // missing, base of (crude) pinecone (on rivet of first-disc).
An incomplete two-part cloth seal with missing interconnecting strip and second disc. See **227** and **230** for brief discussion/parallels

No. 238 Fig. 3.27

D. 18mm // (missing). Fifteenth/early-seventeenth century. Acc. no. **B.265**
Pinecone on lentoid base with side projections, trefoil to both sides, beaded circular border // missing, partial ornate A (on rivet of first disc).
An incomplete two-part cloth seal with partial interconnecting strip and missing second disc. For close parallel see P.A.S. IOW-7997E4 (MD find from Brighstone, Isle of Wight) and A.A.S. NZR2.00186MTL063 for a well preserved parallel. The pinecone is of a similar design to that of **228** and **242**, hence the earlier possible date for this seal. (Geoff Egan suggested date).

No. 239 Fig. 3.27

D. 18mm // (missing). Fifteenth/early-seventeenth century. Acc. no. **B.1168**
Ornate A, annulet above and to sides, pellet in centre, beaded circular border // missing, partial pinecone on rivet of first disc).
A well-struck but incomplete two-part cloth seal. The second disc is missing and the interconnecting strip shows evidence of being broken by a twisting action. See also **227** and **230** for brief discussion/parallels. (Geoff Egan suggested date).

No. 240 Fig. 3.27

D. (missing) // 14mm. Fifteenth/early-seventeenth century. Acc. no. **B.918**
Missing // partial ornate A, annulet to left, beaded circular border.
An incomplete two-part cloth seal with missing interconnecting strip and first disc. See also **227** and **230** for brief discussion/parallels. (Geoff Egan suggested date).

No. 241 Fig. 3.27

Ds. 16mm // 16mm. Fifteenth/early-seventeenth century. Acc. no. **B.921**
Pinecone // ornate A, annulet to left, beaded circular border (off struck).
A complete two-part cloth seal, although present the medium sized interconnecting strip is damaged (the two discs of this cloth seal are movable, hence differences between the image and illustration). See also **227** and **230** for brief discussion/parallels. (Geoff Egan suggested date).

No. 242 Fig. 3.27

D. 18mm // (missing). Fifteenth/early-seventeenth century. Acc. no. **B.263**
Ornate A, pellet in centre, beaded circular border // missing pinecone, (?)trefoil to left (on rivet of first disc).

An incomplete two-part cloth seal with missing interconnecting strip and second disc. Evidence of casting flashing on reverse of first disc. No annulets around the ornate A. The pinecone is of a similar design to that of **228** and **238** above, hence the earlier possible date for this seal. See also A.A.S NZR2.00186MTL063 for a well preserved and finely detailed very close parallel. (Geoff Egan suggested date).

No. 243 Fig. 3.27

D. 14mm // (missing). Fifteenth/early-seventeenth century.
Acc. no. **B.1554**
Ornate A, pellet in centre, beaded circular border // missing. Partial pinecone (on rivet of first disc).

No. 244 Fig. 3.28

D. 18mm // (missing). Fifteenth/early-seventeenth century. Acc. no. **B.1919**
(Missing) // partial ornate A, annulets to sides and below.
An incomplete two-part cloth seal with missing interconnecting strip and first disc. See **227** and **230** for brief discussion/parallels.

No. 245 Fig. 3.28

D. (missing) // 21mm. Fifteenth/early-seventeenth century. Acc. no. **B.909**
Missing // partial ornate A, annulet above and below.
A crude two-part cloth seal, the interconnecting strip and first disc are missing. See **227** and **230** for brief discussion/parallels. (Geoff Egan suggested date).

No. 246 Fig. 3.28

Ds. 19mm // 19mm. Fifteenth/early-seventeenth century. Acc. no. **B.2643**
Ornate A, annulets to right and bottom // (?)pinecone.

A complete two-part cloth seal with medium-sized interconnecting strip. See **227** and **230** for brief discussion/parallels. Seal currently on loan to the Museum of Archaeology, Durham University.

No. 247 Fig. 3.28

D. 18mm // (missing). Fifteenth/early-seventeenth century. Acc. no. **B.1072**
Ornate A, lined and beaded circular border // missing.
An incomplete two-part cloth seal with missing interconnecting strip and second disc. See **227** and **230** for brief discussion/parallels.

No. 248 Fig. 3.28

D. (missing) // 18mm. Fifteenth/early-seventeenth century. Acc. no. **B.917**
Missing // ornate A, annulet above and to left side.
An incomplete two part cloth seal with partial medium-sized interconnecting strip. The first disc is missing. See **227** and **230** for brief discussion/parallels. (Geoff Egan suggested date).

No. 249 Fig. 3.28

Ds. 18mm // 18.5mm. Fifteenth/early-seventeenth century.
Acc. no. **B.2322**
Ornate A // pinecone.
A complete two-part cloth seal with medium-sized interconnecting strip. No visible annulets around the ornate A. See **227** and **230** for brief discussion/parallels. Seal currently on loan to the Museum of Archaeology, Durham University.

No. 250 Fig. 3.28

D. 17mm // (missing). Fifteenth/early-seventeenth century. Acc. no. **B.2176**
Either a bishops crozier, a letter [A] or an object associated with weaving – (see3.11 above), (?)six pointed star to right // missing.
An incomplete two-part cloth seal with missing interconnecting strip and second disc. Although the only one of its kind found in Durham, several parallels of this seal exist, see: P.A.S. SF-261786 (MD find from Wixoe, Suffolk), YORYM-43541 (MD find from Stockton-on-the-Forest, Yorkshire)

and NMS-848772 (MD find from Wacton, Norfolk); M.O.L. NN19025 (incorrectly listed as a 'privy mark' rather than crozier) and S.Mus. 143, (described as a blackletter A), In addition G.N.Mus. ZJ3509 is also a very close parallel which features, on disc two, a crude (early version) pinecone and similar six pointed star.

No. 251 Fig. 3.28

D. 20mm // (missing). Seventeenth/early-eighteenth century.

Acc. no. **B.899**

Ox (off-struck) // missing.

An incomplete two-part cloth seal, the interconnecting strip and second disc are missing. Although an ox is also present on **233** (with an Augsburg provenance) this version of the ox is sufficiently different for it to be considered as originating in a separate Swabian fustian weaving centre – see introduction for further discussion. (Geoff Egan suggested date).

3.7.2 Low Countries, Flanders and Brabant.

No. 252 Fig. 3.29

D. 15mm // 18mm. Sixteenth/seventeenth century. Acc. no. **B.1426**

20 // ornate shield with sword erect, two mullets to each side, cross potent in chief (Arms of Haarlem).

An incomplete two-part cloth seal, the interconnecting strip is missing. Textile imprint c. 20 warp threads per 10mm (weft undistinguishable), fine (?)tabby weave. A legend found on parallels reads 'HAERLEMS GOET' meaning 'Goods from Haarlem'. The number 20, being the length of the cloth in Dutch ells (several variations of length are known, i.e. 19¹/₂, 20¹/₂, 40, 56¹/₂). Cloth seals of this type would have been attached to high quality linen woven by weavers from across the Netherlands, including Flanders and Brabant before then being sent to Haarlem, a textile finishing centre located in the North-western Netherlands where the clear waters near the Kennermerland coast proved ideal for the bleaching process (Egan 1995, 110). Holland cloth '*peciis holand panni linei*' were being imported into Durham from as early as 1448-9. See section 6.8 for further discussion. Apart from **253** and **254** below, many other parallels are known with the P.A.S. database in particular listing some 36 similar Haarlem cloth seals, see typical example HAMP-32C363 (MD find from Ropley, Hampshire), also BM 321; S.Mus. 158 and 159 and A.A.S. NZR2.00599MTL7, NZR2.00191MTL081 and NZR2.00404MTL002.

No. 253 Fig. 3.29

D. 14mm // 15mm. Sixteenth/seventeenth century. Acc. no. **B.541**

20 // ornate shield with sword erect, two mullets to each side, cross potent in chief (Arms of Haarlem).

A complete two-part cloth seal. As preceding item. (Geoff Egan suggested date).

No. 254 Fig. 3.29

D. 15mm // 15mm. Sixteenth/seventeenth century. Acc. no. **B.585**

40 // ornate shield with sword erect, two mullets to each side, cross potent in chief (Arms of Haarlem).

A complete two-part cloth seal. As **252** and **253**. (Geoff Egan suggested date). Seal currently on loan to the Museum of Archaeology, Durham University.

No. 255 Fig. 3.29

D. 14mm // (missing). Fourteenth century. Acc. no. **B.523**

(off-struck) ...TOUR... around fleur-de-lys (Lombardic capitals lettering) // missing.

An incomplete two-part cloth seal with partial interconnecting strip, the second disc is missing. There are two rivets on the reverse of the first disc. TOUR is short for Tournai which during the sixteenth century was part of France, later under Dutch control until 1830, when it fell within Belgium borders. Egan (2001, 72; 2010, 58) suggest that the city's Flemish name, *Doornick*, became (in England) a generic term for fine linen. A similar configuration of fleur-de-lys with 'DE TOURNAI' around, dated to the late-fourteenth century can be found on a cloth seal in the Kulturen Museum, Lund, Sweden: KM 19470 (Roddenburg 2011, 7). In addition, eight other cloth seals, almost identical to the Swedish example, reside in the Hungarian National Museum (Cat. 13-20); these are dated from the fourteenth to fifteenth centuries (Mordovin 2014, 209-210). However, there are several subtle differences between **255** and these nine parallels, for example, the rotation of the fleur-de-lys is 180° out of sync, the disc diameters are significantly wider, 17-24mm (at 14mm, the flan of **255** is too small to accommodate the complete stamp satisfactorily), and that the dye used to strike these nine cloth seals was significantly more sophisticated. Given all the evidence, it appears that **255** is an important and rare find, possibly the only one of its kind discovered in the UK. It is plausible that this variation of Tournai cloth seal is one of the earliest so far recorded in Europe.

No. 256 Fig. 3.29

D. 17mm // 17mm. Sixteenth century. Acc. no. **B.288**

7 or V (in relief) // stylised two storey tower depicting an arched doorway on the ground floor level and an arched window in the centre of the first floor. Open crowns to sides, beaded circular border.

A complete two-part cloth seal with interconnecting strip and incorporating two rivets. Like **255**, this cloth seal is also from Tournai, an important textile centre, then part of France. The tower is the city's symbol and is often accompanied by a fleur-de-lys. Tournai was synonymous with the production of fine linens known in England as *Doornicks* (Egan 2010, 58). Only one parallel appears to be recorded in the UK, see P.A.S. IOW-5E9203 (MD find Newport, Isle of Wight in 2011). When Geoff Egan identified this cloth seal in 2010, he described it as a 'new type', previously un-recorded.

No. 257 Fig. 3.29

D. (missing) // 16mm. Fifteenth/sixteenth century. Acc. no. **B.1928**

(Missing) // partial mark possibly fleur-de-lys.

An incomplete two-part cloth seal, the first disc is missing. Two rivet holes. Unknown provenance, probably Continental (Low Countries).

No. 258 Fig. 3.29

D. 13mm // (missing). Fifteenth/sixteenth century. Acc. no. **B.2335**

(?)R or H B / horizontal line / (?)n (Lombardic lettering), fleur-de-lys // -.

An incomplete two-part cloth seal, the second disc is missing. Two rivets feature on the reverse of disc one, also textile imprint c.15 (?)warp threads per 10mm, fine weave. The small diameter of this cloth seal, which is too small to accommodate the complete stamp, has similarities with **260** and may therefore suggest an early date for this seal. Unknown provenance, probably Continental (Low Countries).

No. 259 Fig. 3.29

D. 15mm // (missing). Fifteenth/seventeenth century. Acc. no. **B.1649**
(Off struck) (?)coat of arms, (?)sword, three mullets to side // missing
(partial (?)privy mark on rivet of first disc).

An incomplete two-part cloth seal with missing interconnecting strip and second disc. The coat of arms may be that of the city of Haarlem as three mullets are visible adjacent to a (?)sword, see **252-254** above and B.M. 321. However, this is far from certain, therefore the cloth seal is listed here with an unknown provenance, although probably Continental.

No. 260 Fig. 3.29

D. 16mm // (missing). Fifteenth/sixteenth century. Acc. no. **B.516**
Scratched horizontal line over V // ornate scrolling privy mark on rivets of first disc.

An incomplete two-part cloth seal, the second disc is missing. Two rivets on the reverse of disc one. Evidence of casting flashing, also textile imprint c.15 warp threads per 10mm x c.15 weft threads per 10mm, fine tabby weave. Unknown provenance, probably Continental (Low Countries). Geoff Egan suggested date and indicated that the cloth seal was similar to those from Northern France.

No. 261 Fig. 3.29

D. 13mm // missing. Fifteenth/sixteenth century. Acc. no. **B.1697**
Unusual privy mark (?)chalice // (missing) partial privy mark on rivet of first disc.

An incomplete (?)two-part seal with slight evidence of an interconnecting strip, the second disc is missing. Unknown provenance, probably Continental.

No. 262 Fig. 3.29

D. 15mm // (missing). Early-fourteenth century. Acc. no. **B.863**
Crozier, M (Blackletter), ine (to sides) // crozier (on rivet of first disc).

An incomplete two-part cloth seal with partial interconnecting strip and missing second disc. There is only one rivet.

This important cloth seal is almost certainly from the city of Malines (Mechlen, Belgium); although the croziers depicted may be an acknowledgement to the Bishopric of Liège (Malines recognized the authority of Liège from 1305). Malines was an important centre in Brabant for the production of woollens during the late-medieval period, by the fifteenth century it had superseded Ypres as the leading producer of luxury cloth (van Uytven 1983, 170; Egan 1987, 112; 2010, 58). An exact parallel of this cloth seal is recorded in Egan's Occasional Paper 93, see B.M. 326 (found in East Anglia), dated to the fifteenth to sixteenth century. However, some 15 years later when Geoff Egan identified **262**, perhaps more knowledgeable with this series, he ascribed a fourteenth-century date to it. A second parallel of this rare cloth seal, P.A.S. NLM-758481, is recorded as being found at Gainsborough, Lincolnshire.

No. 263 Fig. 3.29

D. 16mm // (missing). Sixteenth century. Acc. no. **B.895**
...AI, horizontal lines above and below lettering, crude beaded circular border // (missing).

An incomplete two-part cloth seal, the second disc and interconnecting strip are missing. There is a single rivet on the reverse of disc one, also evidence of casting flashing. The disc has been punctured by a single small hole. Geoff Egan identified and dated this cloth seal, suggesting it came from Douai in Northern France. Although larger, cloth seals B.M. 297 and P.A.S. LEIC-56C983 (MD find Scalford, Leicestershire) both have a Douai provenance and feature similar styled lettering. Egan (1987, 101) suggests that the sealing of cloth took place at Douai from as early as the mid-fourteenth century.

No. 264 Fig. 3.29

Ds. 11mm // 11mm. Fifteenth/sixteenth century. Acc. no. **B.1263**
(Off Struck) P, pellet to left, raised beaded border around // (?)Quadruped rampant to left, beaded border around.

A complete two-part cloth seal with interconnecting strip. An unusually small cloth seal, perhaps specifically made so for attachment to delicate textiles. S.Mus. 172, although slightly larger is of the same configuration but a

different letter i.e. G // (?) rat. It has been ascribed as having a possible Arras provenance.

No. 265 Fig. 3.30

D. (missing) // 20mm. Fifteenth/sixteenth century. Acc. no. **B.860**
Missing // -.

An incomplete cloth seal, only half of the second disc is present. The presence of two rivet holes is indicative of cloth seals from Flanders and Brabant. (Geoff Egan suggested date)

No. 266 Fig. 3.30

D. 16mm // (missing). Fourteenth/sixteenth century. Acc. no. **B.1022**
Lion rampant, cross or sword to side // partial privy mark on rivets of first disc.

An incomplete cloth seal, only the first disc is present. The seal features two rivets. Evidence of casting flashing, also textile imprint c.18 warp threads per 10mm x 18 weft threads per 10mm, fine tabby weave. Although the provenance is uncertain, Hittinger (2007, Table 1, Nos. 3), lists a similar sized two-part cloth seal from Ypres, which features a very close parallel of the rampant lion. Also Orduna (1995, p.89 Fig. 38) lists another similar seal, again with a Ypres provenance.

No. 267 Fig. 3.30

Ds. 17mm // 17mm. Sixteenth century. Acc. no. **B.518**
Paschal Lamb, lined circular border // (?)X, lined circular border.

An incomplete two-part cloth seal with missing interconnecting strip. Surviving textile between discs. On the first disc is evidence of a Paschal Lamb, a symbol associated with Rouen in Northern France. During the mid-sixteenth century, Rouen had become an important centre of textile production and many of the city's textile related craftsmen were gainfully employed; a list of these artisans includes: master weavers, silk weavers, madder and woad dyers, linen weavers, linen dyers, bleachers and tapestry weavers (Benedict 1981, 6-7). (Geoff Egan identified this cloth seal and

suggested date). Seal currently on loan to the Museum of Archaeology, Durham University.

No. 268 Fig. 3.30

D. 14mm // (missing). Fifteenth/seventeenth century. Acc. no. **B. 2673**
Lion passant / corded rope // missing.

An incomplete two-part cloth seal, the second disc and interconnecting strip are missing. Unknown provenance, probably Continental.

No. 269 Fig. 3.30

D. 18mm // 18mm. Seventeenth century. Acc. no. **B. 527**
Scratched lines // M / Windmill perched on a triangular base, with an arched doorway and steps leading up to it and two first floor windows below a hipped roof. Two sails protrude from above and behind the roof. Beaded circular border.

A complete two-part cloth seal with surviving textile preserved between discs. Although Egan (1987, 221) records several cloths seals featuring a similar (simple) windmill (all associated with Suffolk), they are all of the four-disc type. The closest parallel is the two-disc cloth seal P.A.S. DOR-BC04CF (MD find Fifehead Neville, Dorset), as it features a 'M' above the windmill. Although P.A.S. SF8425 (MD find from Bedingfield, Suffolk) is also a two-disc cloth seal featuring a windmill, it is unclear if it has a 'M'. Geoff Egan suggested the date and also suggested a Low Countries origin for this cloth seal.

No. 270 Fig. 3.30

D. 13mm // 13mm. Fifteenth/sixteenth century. Acc. no. **B. 2455**
Fleur-de-lys // a double door within wall, one round hinged door knocker on each door.

A complete two-part cloth seal. As **264**, an unusually small cloth seal, perhaps specifically made so for attachment to delicate textiles. Unknown provenance, probably Continental.

No. 271 Fig. 3.30

D. 16 mm // 16 mm. Fifteenth/seventeenth century. Acc. no. **B. 2044**

Cross, pellets to side, bar above, beaded circular border // I.

An incomplete two-part cloth seal, the interconnecting strip is missing.

Unknown provenance, probably Continental.

No. 272 Fig. 3.30

Ds. 22mm // 23mm. Fifteenth/seventeenth century. Acc. no. **B. 1365**

(Scratched) 71 // Privy mark: upright stem, pellet to side, within curving line / AR ligature, all within beaded shield.

A complete two-part cloth seal with short interconnecting strip. The seal features two rivets and has surviving textile between discs. The textile has been extracted for analysis and can be classified as a fine and very fine woven cloth as it exhibits 22 warp x 22 weft threads per 10mm. As the individual threads appear to be ZZ-spun, each with a narrow yarn diameter, it is plausible that the textile is typical of the finer fabrics associated with lighter weighted worsted tabbies. In addition successful UHPLC-PDA analysis undertaken at the Centre for Textile Conservation and Technical Art History, University of Glasgow in May 2015, has confirmed that the original colour of this fabric was red. See Chapter five for full analysis. Unknown provenance, probably Continental.

No. 273 Fig. 3.30

D. 30mm // (missing) Fifteenth/seventeenth century. Acc. no. **B. 2336**

Rampant lion, scratched H W, I or T (incuse) // Partial privy mark on rivet of first disc.

An incomplete two-part cloth seal, the second disc and interconnecting strip are missing. Textile imprint c.18 weft threads per 10mm x 18 warp threads per 10mm, a coarse warp thread runs at 4mm intervals, probable fine tabby weave. The diameter of this cloth seal is similar to several parallels from Leiden, Netherlands, in particular those in the repository of the Museum de Lakenhal. Typically, Leiden cloth seals feature a (stylistically similar) rampant lion holding a sabre and sheath of arrows (the Arms of the Netherlands), see examples, B.M. 324; L.Mus. 8582 and 8583. However, early-

seventeenth-century variations are known showing the lion without these weapons (see Maarleveld and Overmeer 2012, 139 Fig.43). It is possible, due to wear on **273**, that the sabre is now lost.

No. 274 Fig. 3.30

D. 18mm // 18mm. Fourteenth century. Acc. no. **B.562**

Double cross (arms of Ypres) // -.

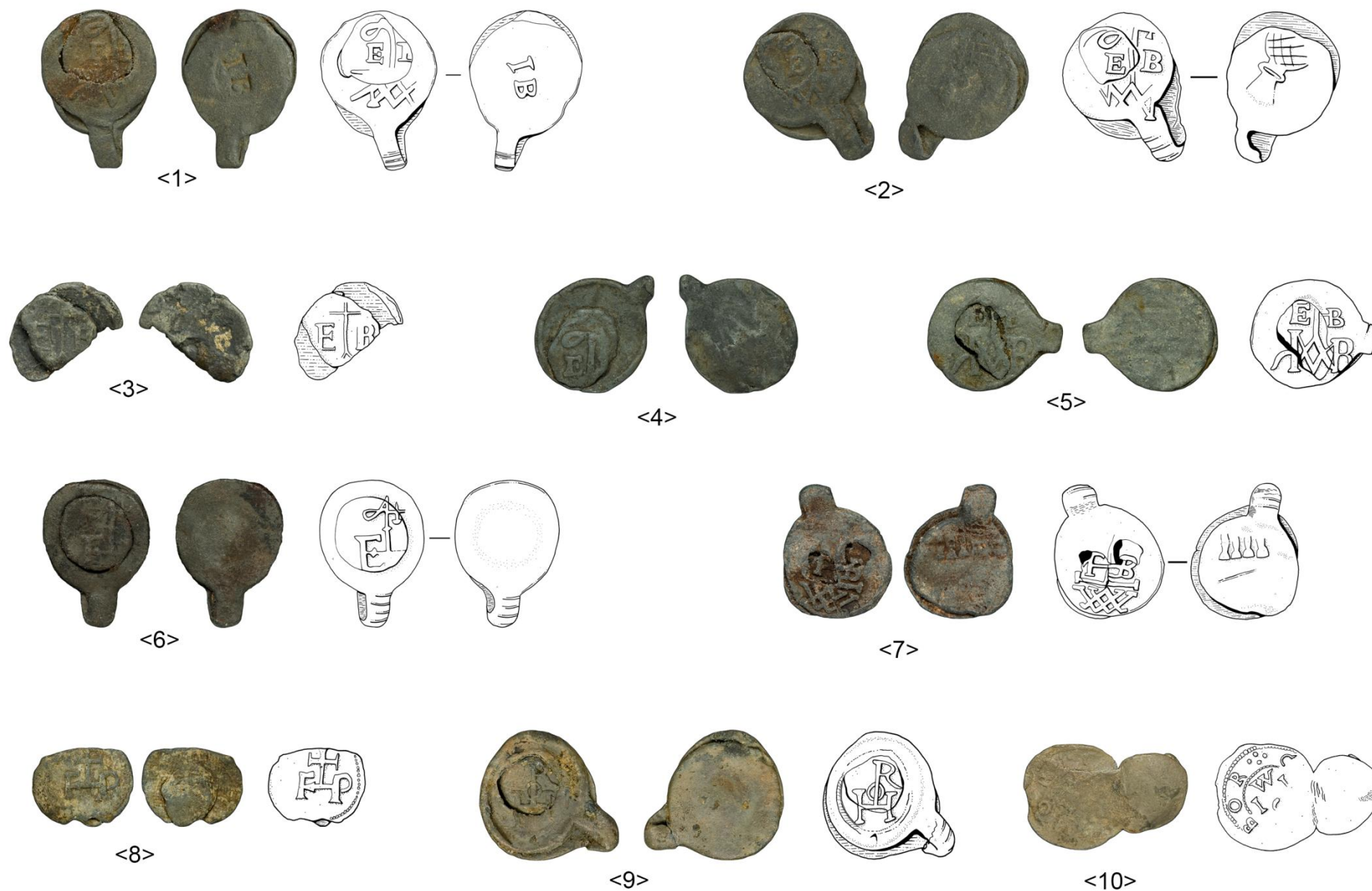
A complete two-part cloth seal. Geoff Egan suggests that this cloth seals has an Ypres provenance and is dated to the fourteenth century.

No. 275 Fig. 3.30

Ds. 11mm // 11mm. Fourteenth/fifteenth century. Acc. no. **B.2341**

Privy mark (?)IC // (?)EP ligature.

An unusually small and complete two-part cloth seal. Unknown provenance, probably Continental.



Scale 1:1

Figure 3.5 Cloth seals: Cat 1-9 unprovenanced, Cat 10 Yorkshire.

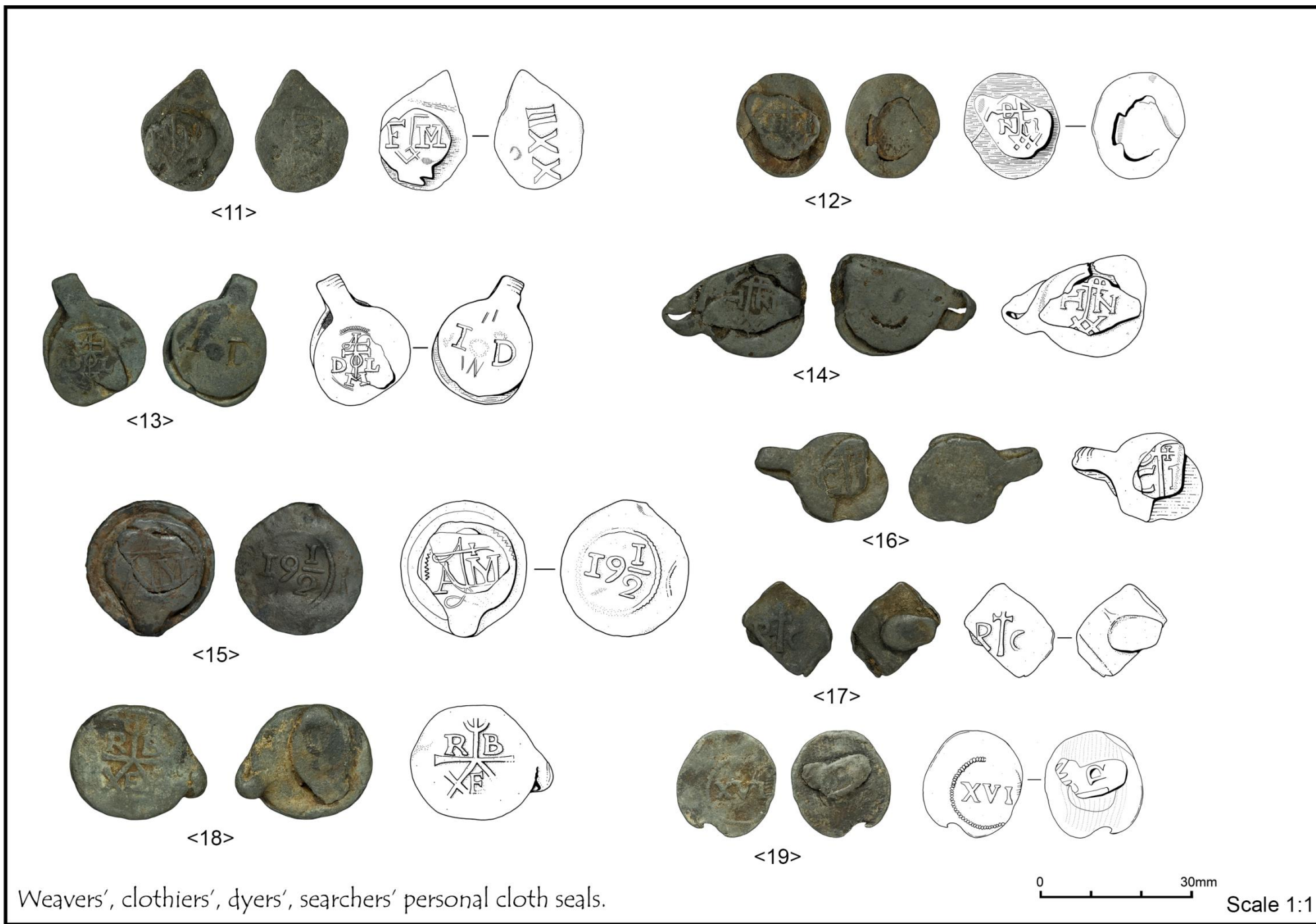


Figure 3.6 Cloth seals: Cat 11-19 unprovenanced.

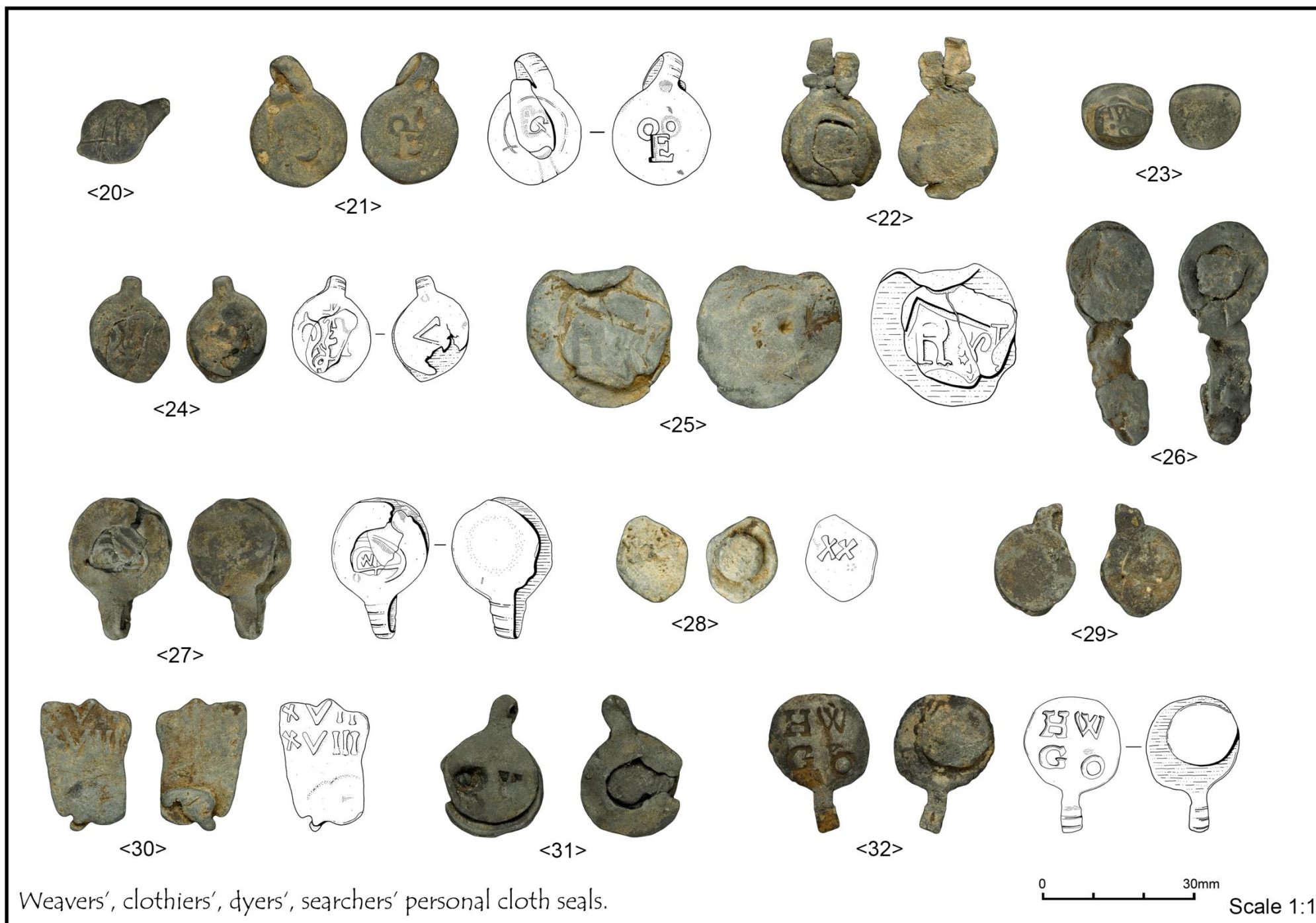


Figure 3.7 Cloth seals: Cat 20-32 unprovenanced.



Weavers', clothiers', dyers', searchers' personal cloth seals.

Figure 3.8 Cloth seals: Cat 33-41 unprovenanced.

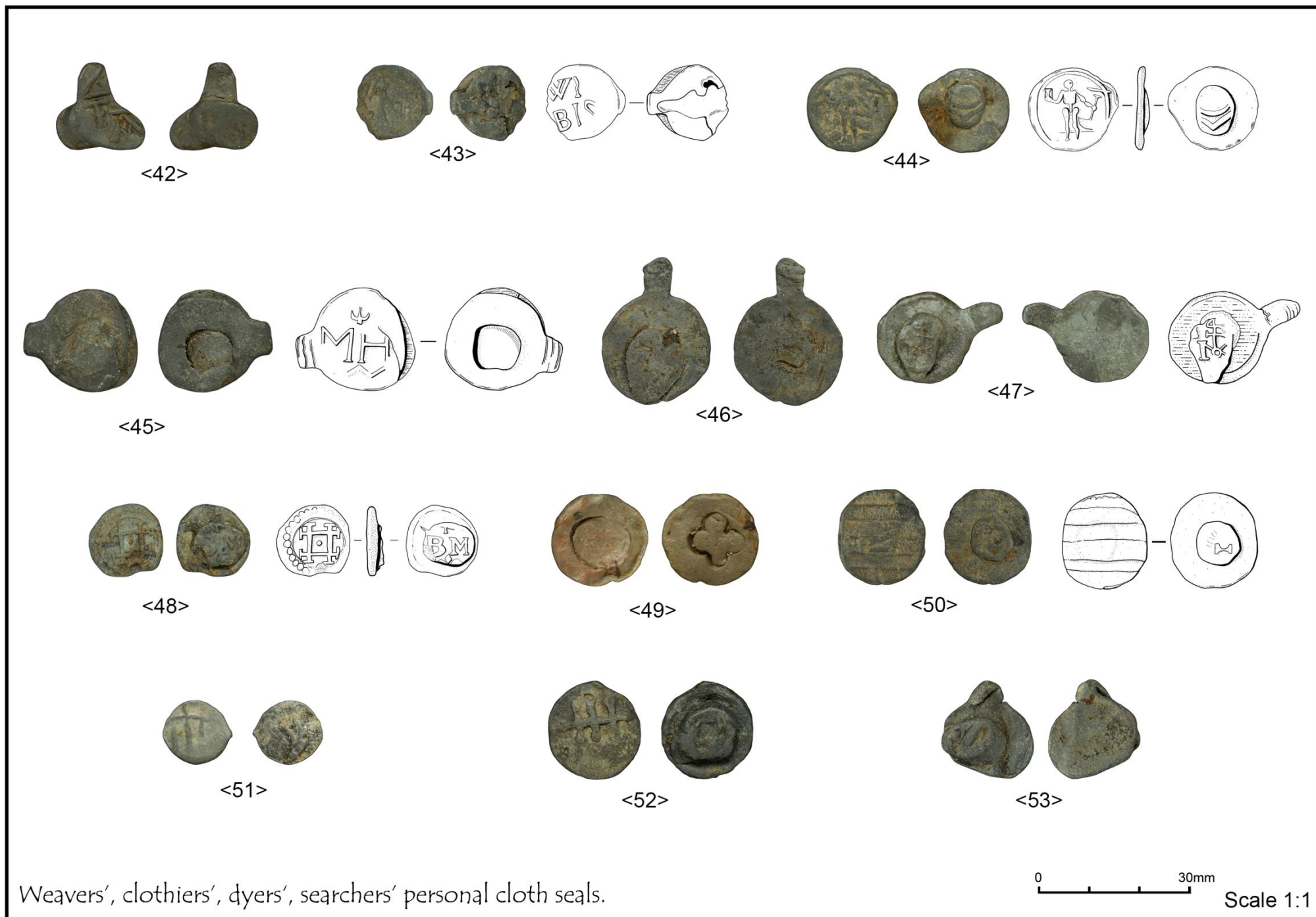
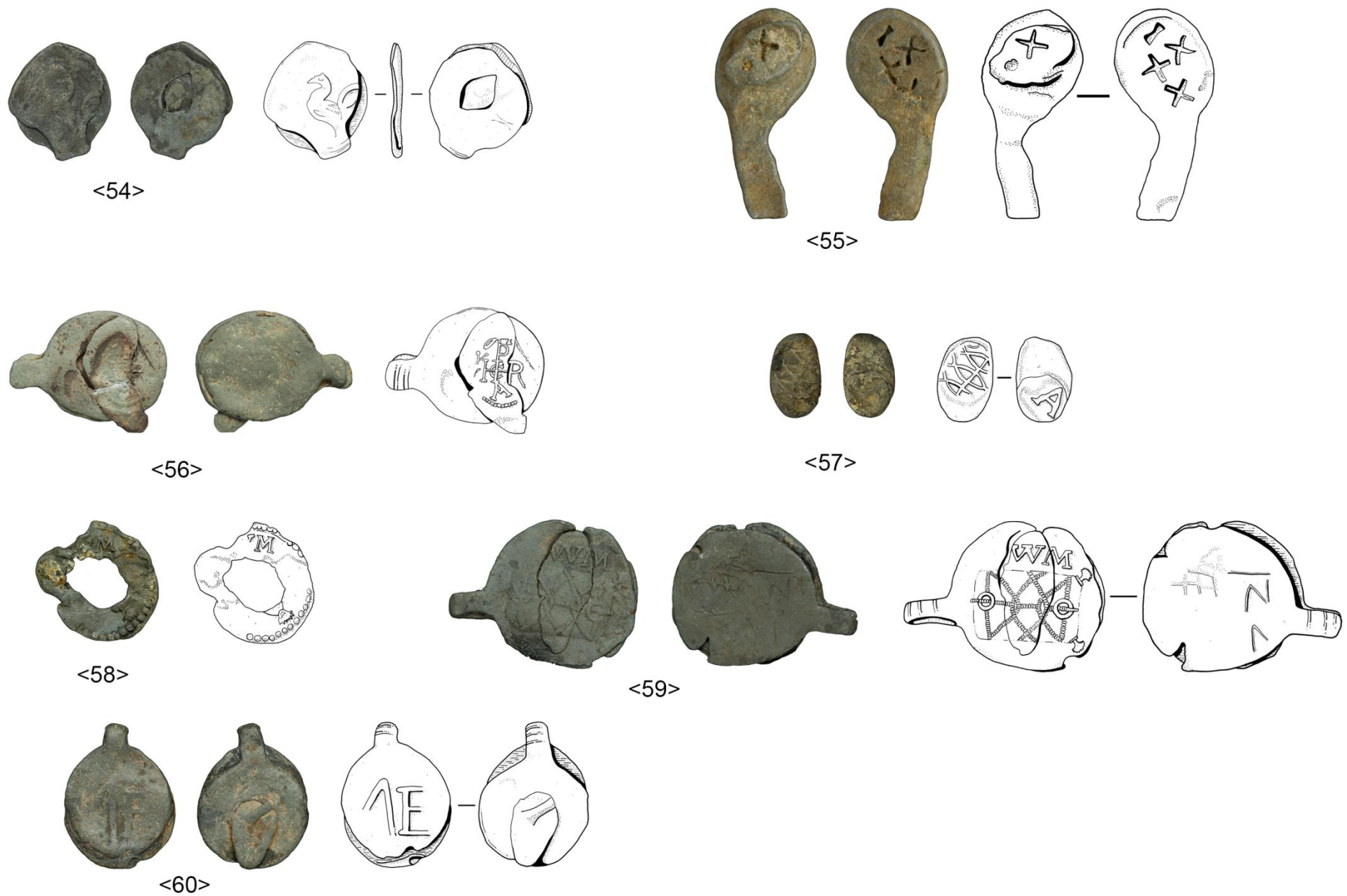


Figure 3.9 Cloth seals: Cat 42-49, 51-53 unprovenanced, Cat 50 Wiltshire.



Weavers', clothiers', dyers', searchers' personal cloth seals.

Figure 3.10 Cloth seals: Cat 54 Suffolk, Cat 55 unprovenanced, Cat 56-60 London Dyers' Company seals.



Figure 3.11 Cloth seals: Cat 61-72 Norfolk.

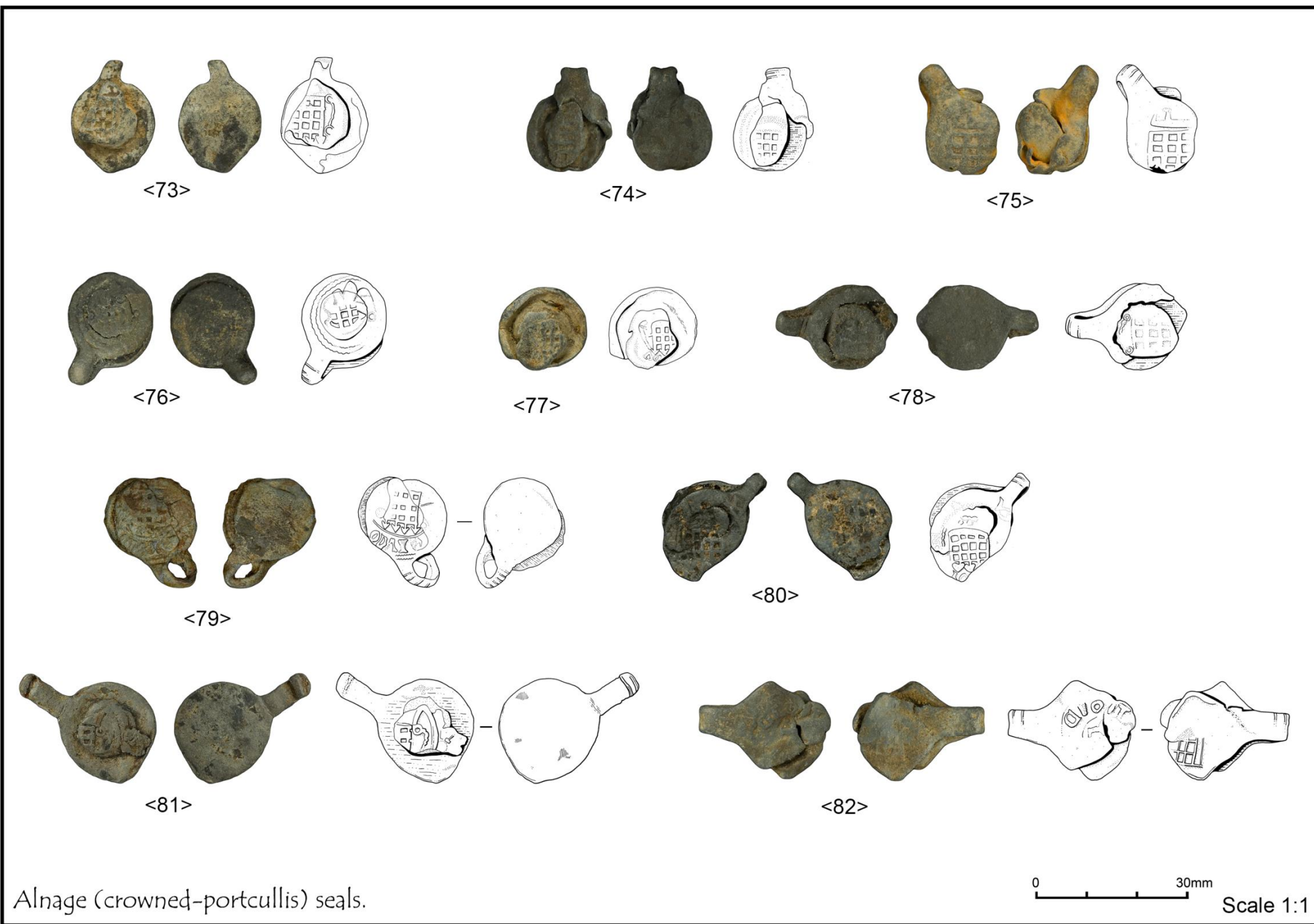
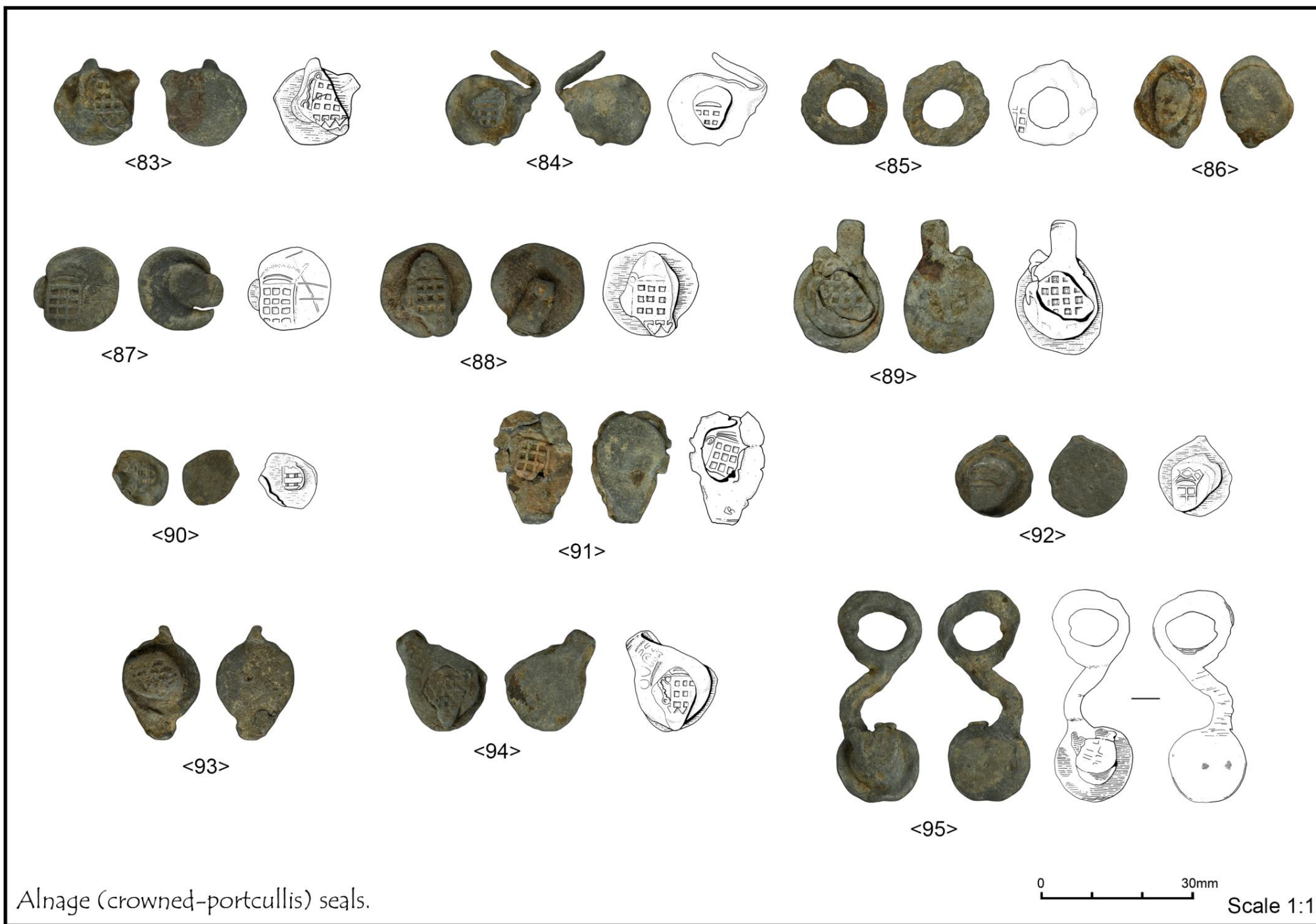
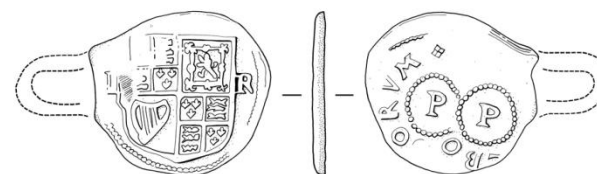


Figure 3.12 Alnage seals: Cat 73-82 Crowned-portcullis series. Unprovenanced





Alnage (county series) seals.

0 30mm

Scale 1:1

Figure 3.14 Alnage seals: Cat 96-99, 101-104, 106 unprovenaced, Cat 100 Yorkshire, Cat 105 London.

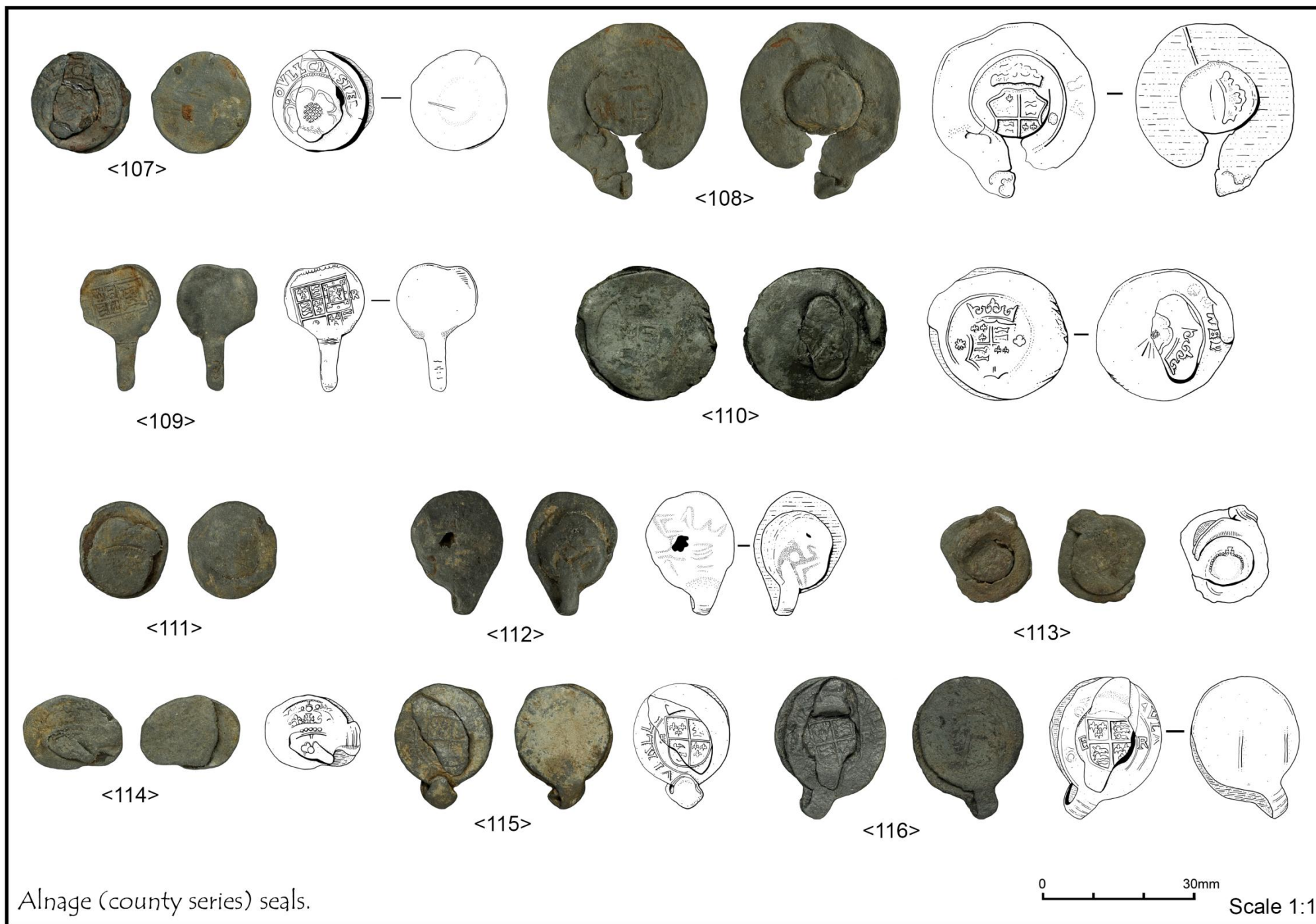


Figure 3.15 Alnage seals: Cat 107 Essex, Cat 108-114 unprovenanced, Cat 115-116 London.

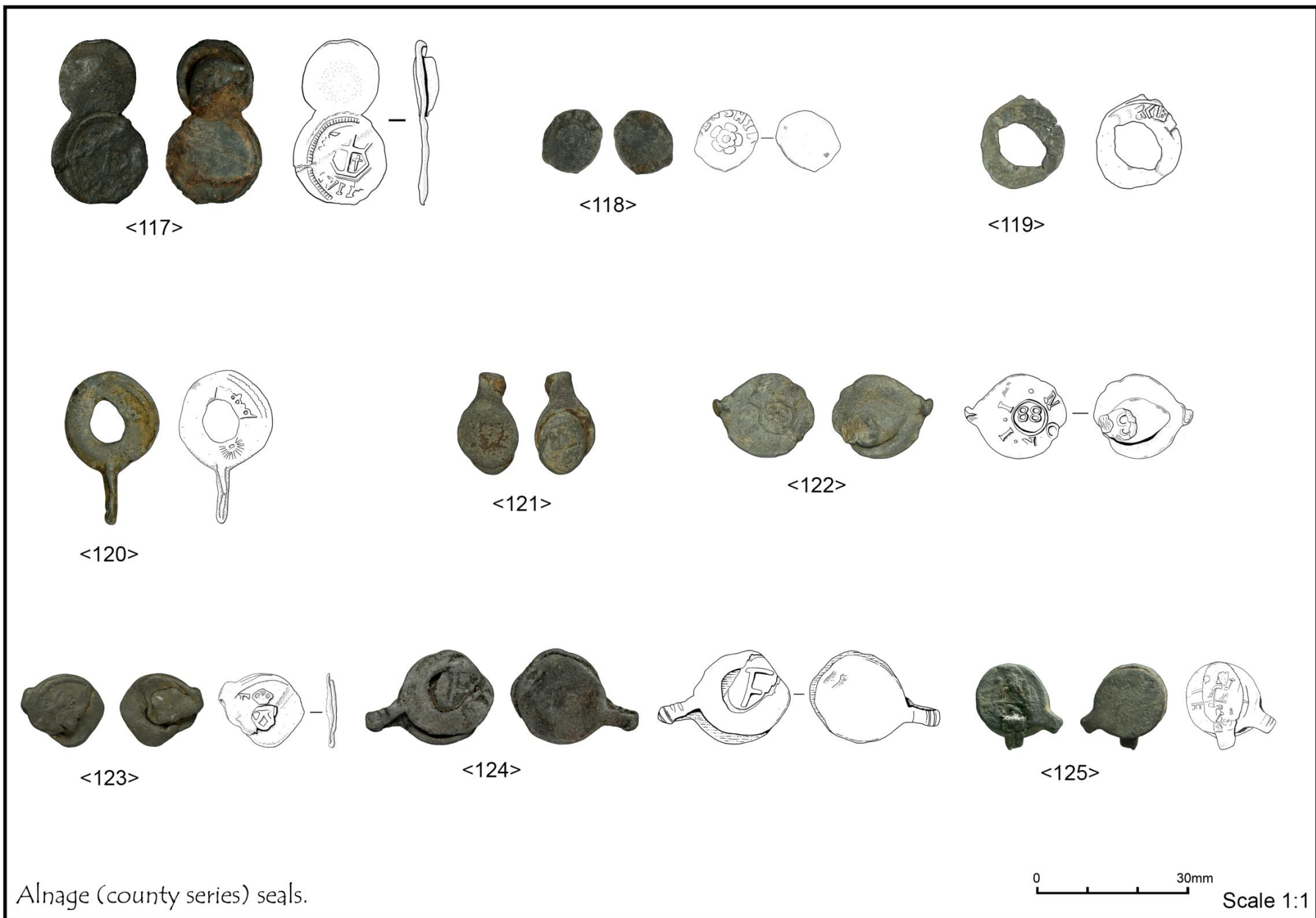


Figure 3.16 Alnage seals: Cat 117 London, Cat 118 Devon, Cat 119-123 unprovenanced, Cat 124 Faulty cloth, Cat 125 Customs seal.

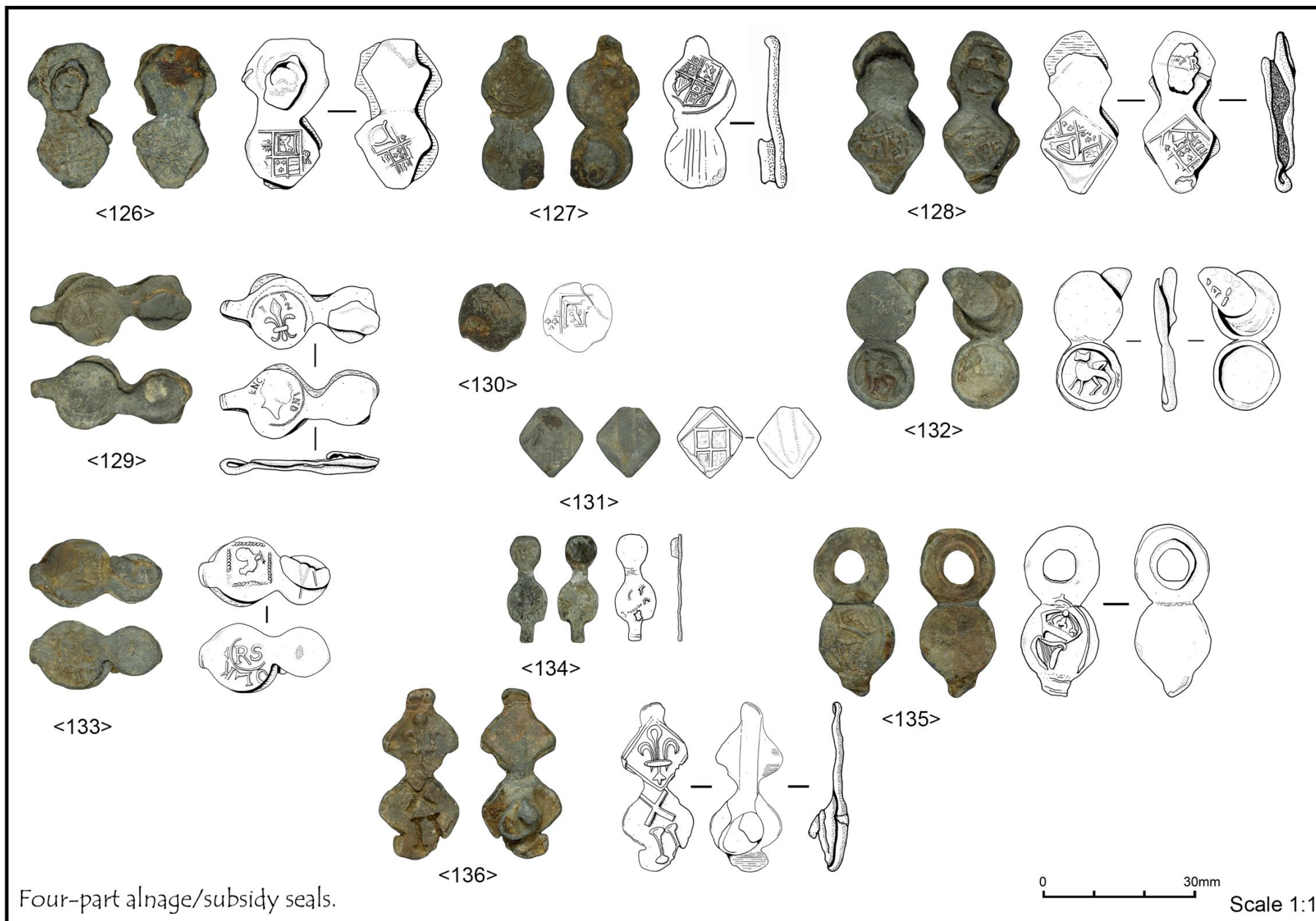


Figure 3.17 Alnage seals: Cat 126-132, 134-136 unprovenanced, Cat 133 Suffolk.

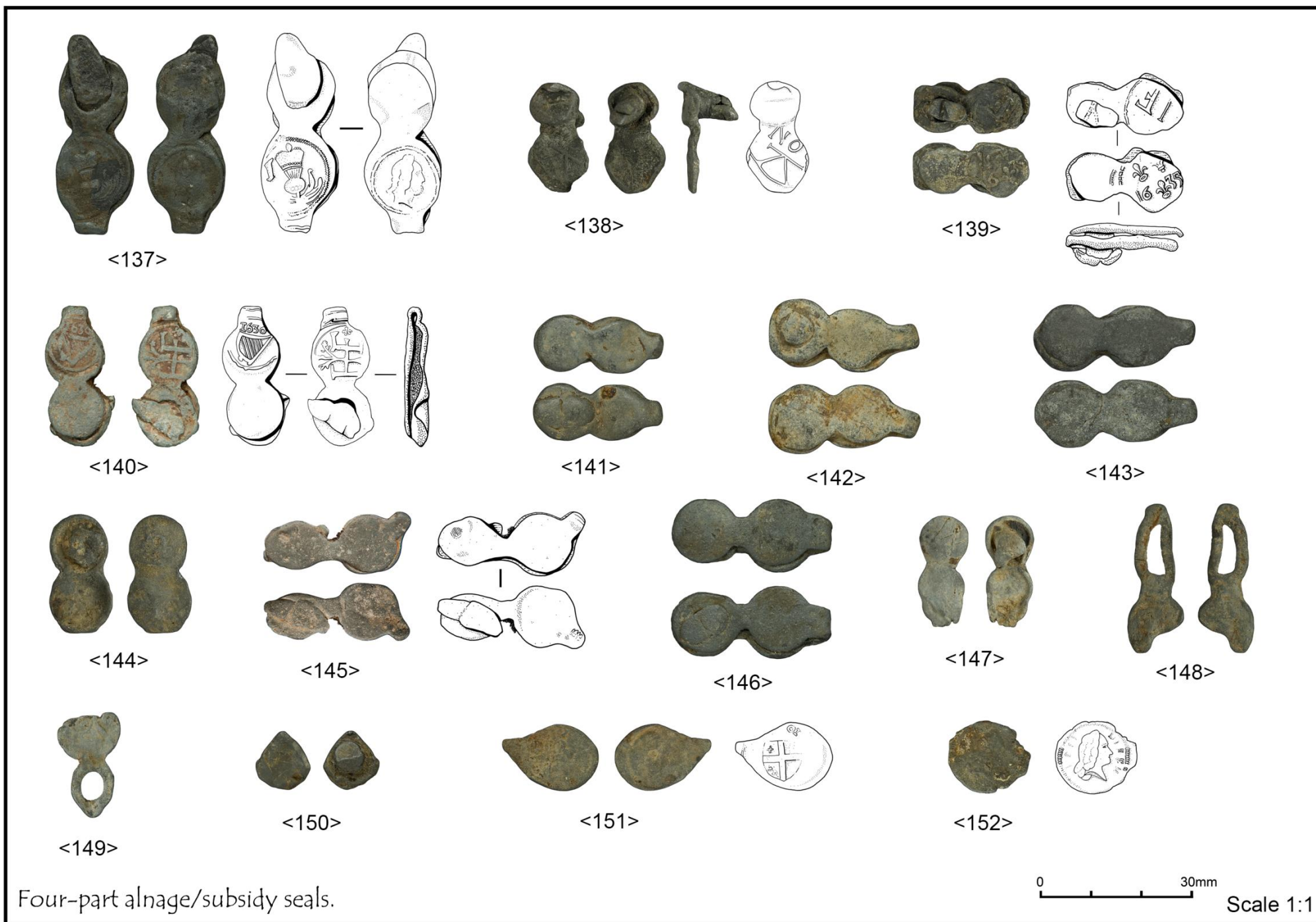


Figure 3.18 Alnage seals: Cat 137-152 unprovenanced.

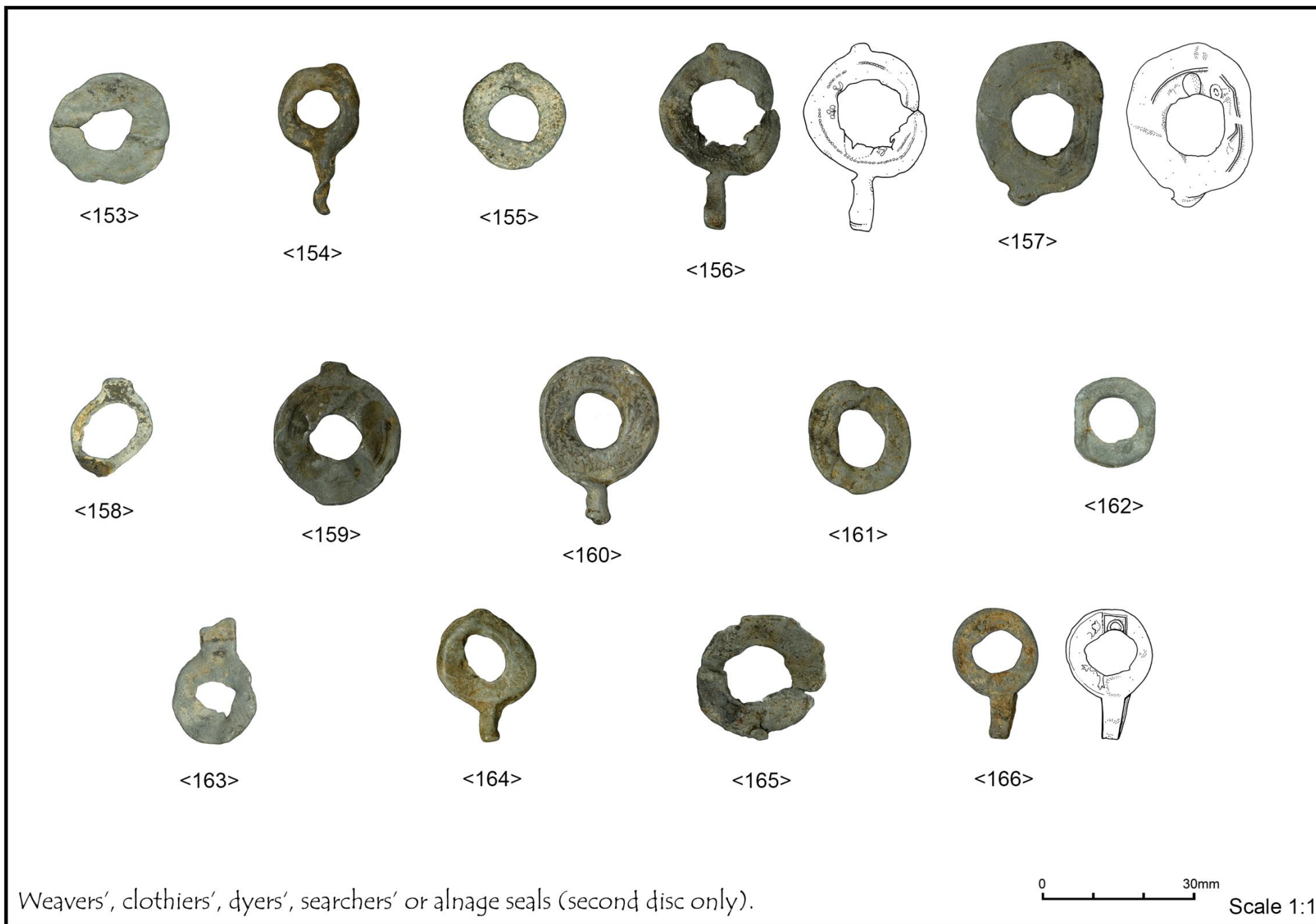
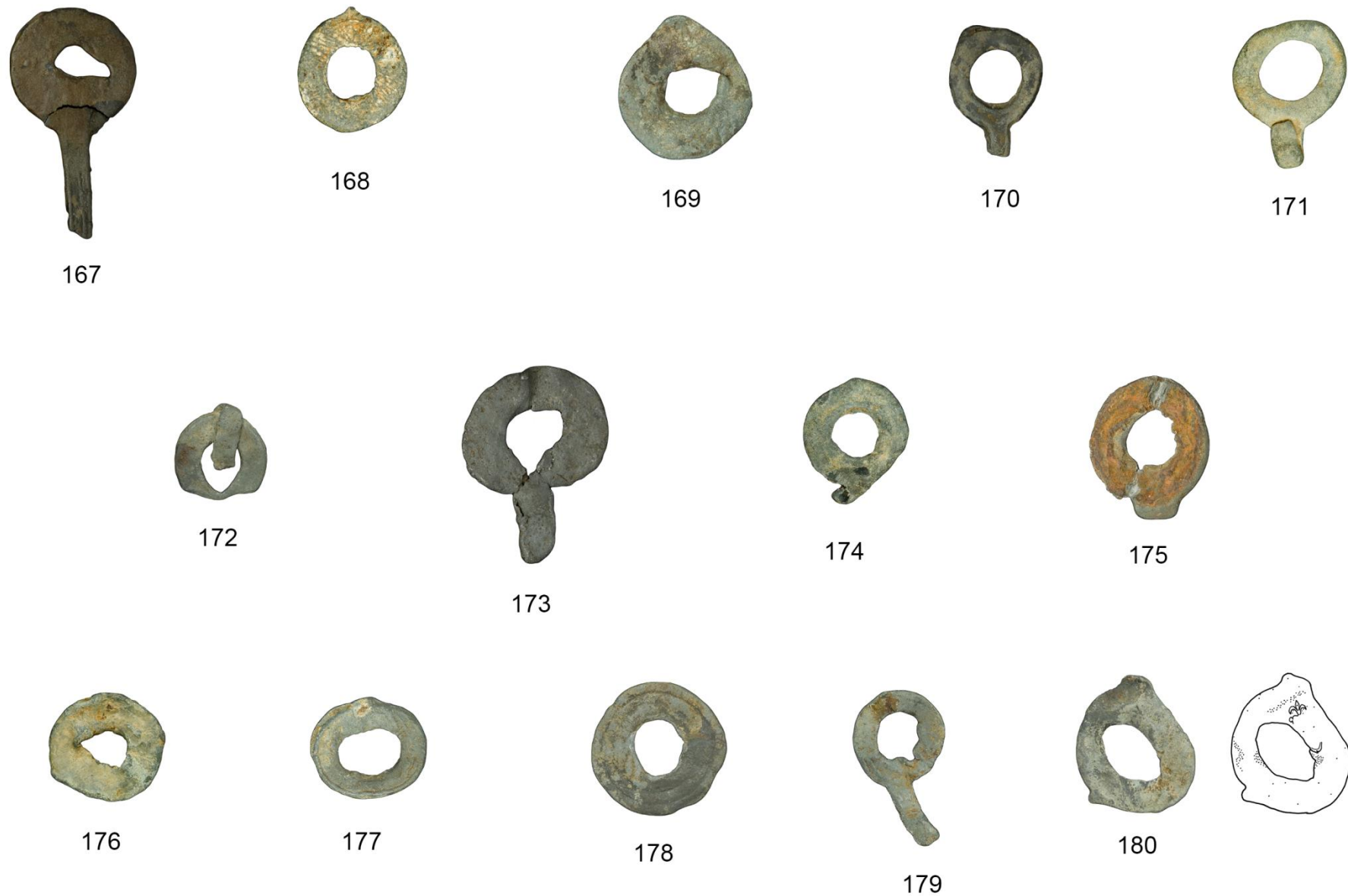


Figure 3.19 Cloth seals: Cat 153-155, 157-165 unprovenanced, Cat 156, 166 London.



Weavers', clothiers', dyers', searchers' or alnage cloth seals (second disc only).

Figure 3.20 Cloth seals: Cat 167-180 unprovenanced.

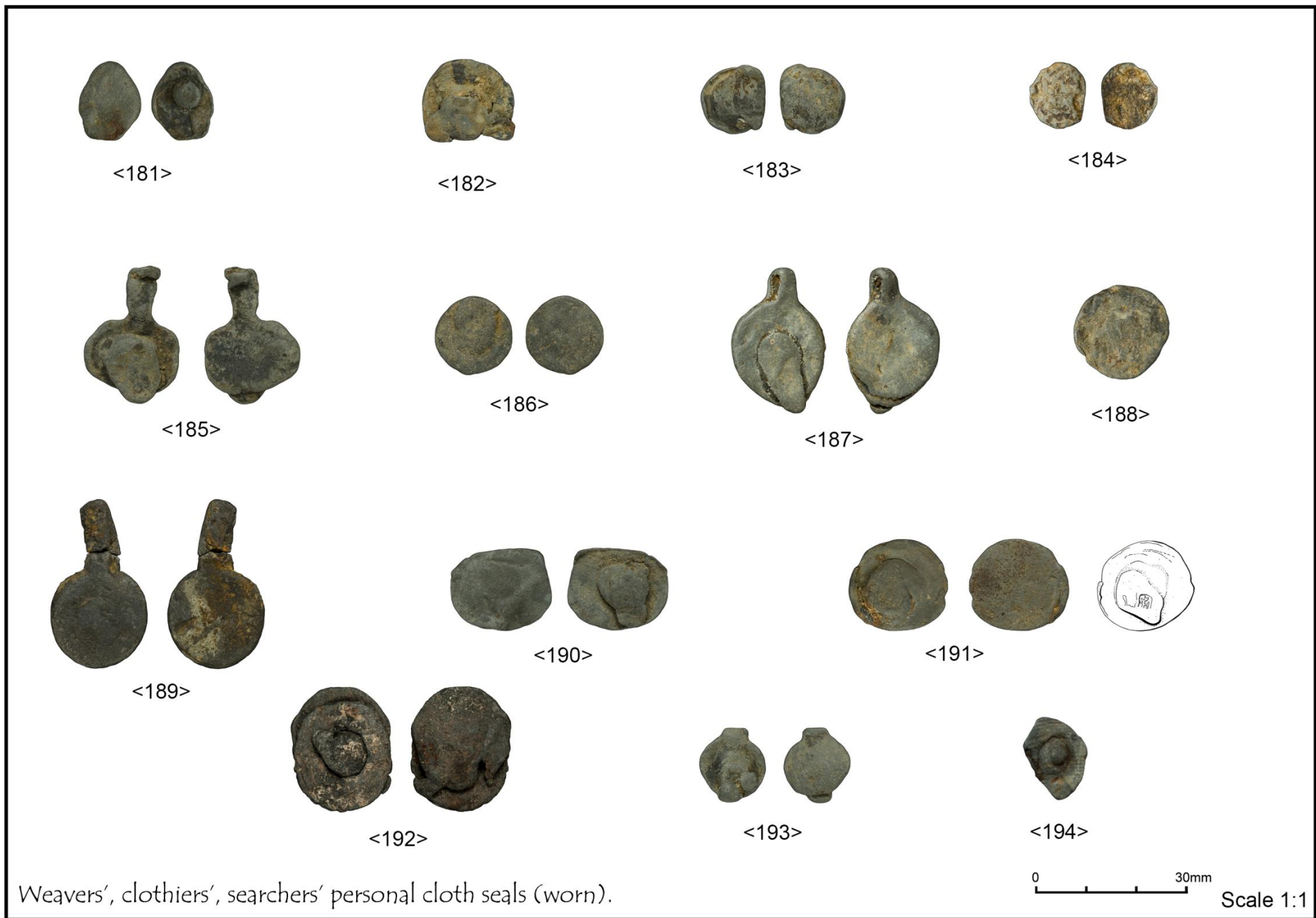
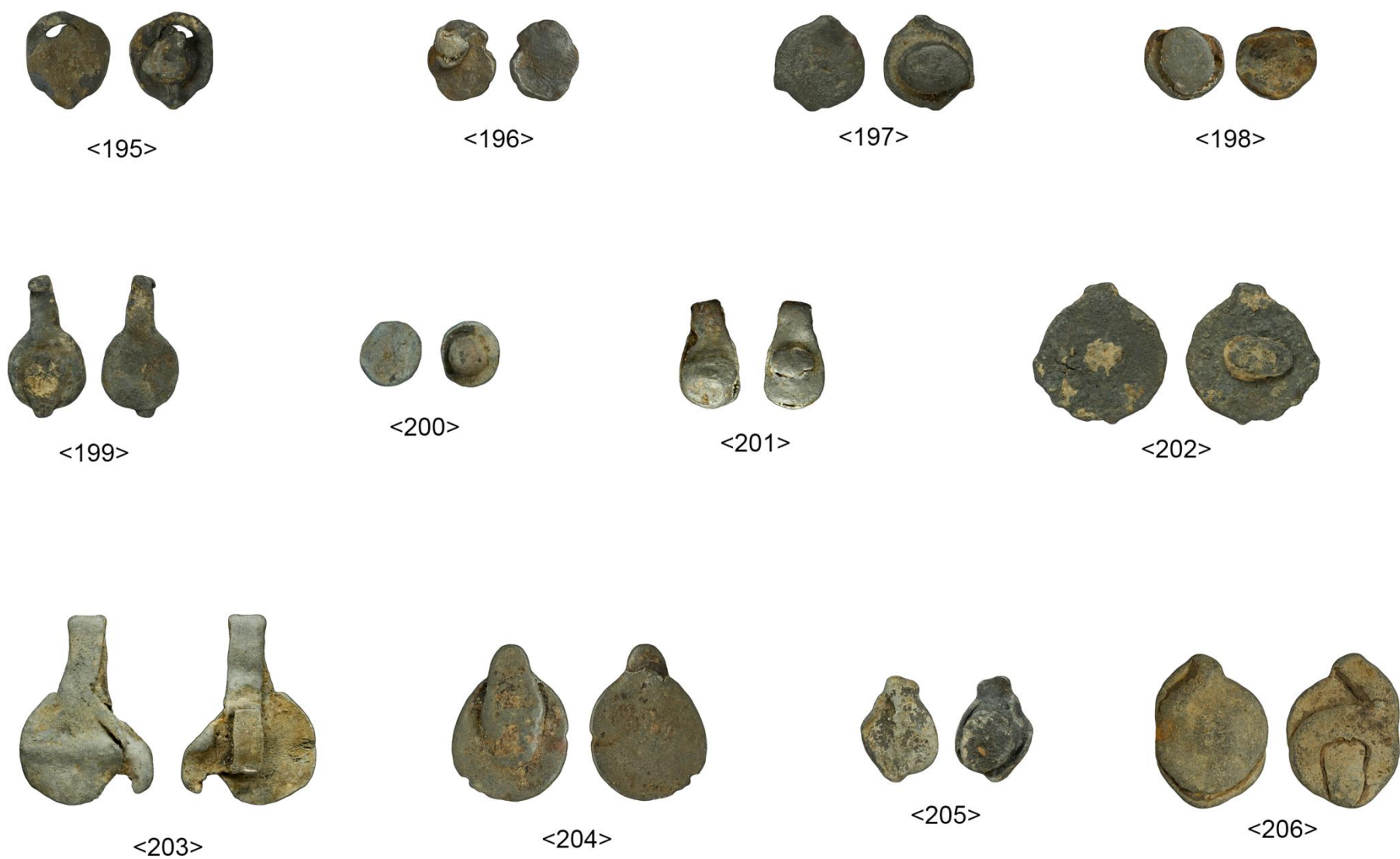


Figure 3.21 Cloth seals: Cat 181-194 unprovenanced.



Weavers', clothiers', searchers' personal cloth seals (worn).

Figure 3.22 Cloth seals: Cat 195-206 unprovenanced.



<207>



<208>



<209>



<210>



<211>



<212>



<213>



<214>

Weavers', clothiers', searchers' personal cloth seals (late-eighteenth to early-nineteenth century). 0 30mm Scale 1:1

Figure 3.23 Cloth seals: Cat 207-214 unprovenanced.



Weavers', clothiers', searchers' personal cloth seals (late-eighteenth to early-nineteenth century).

Figure 3.24 Cloth seals: Cat 215 Wakefield, Cat 216 unprovenanced, Cat 217, 219 Leeds, Cat 218, 220 unprovenanced.



Weavers', clothiers', searchers' personal cloth seals (late-eighteenth to early-nineteenth century).

Figure 3.25 Cloth seals: Cat 221, 222, 224-225 unprovenanced, Cat 222-223, 226 Leeds/Halifax.

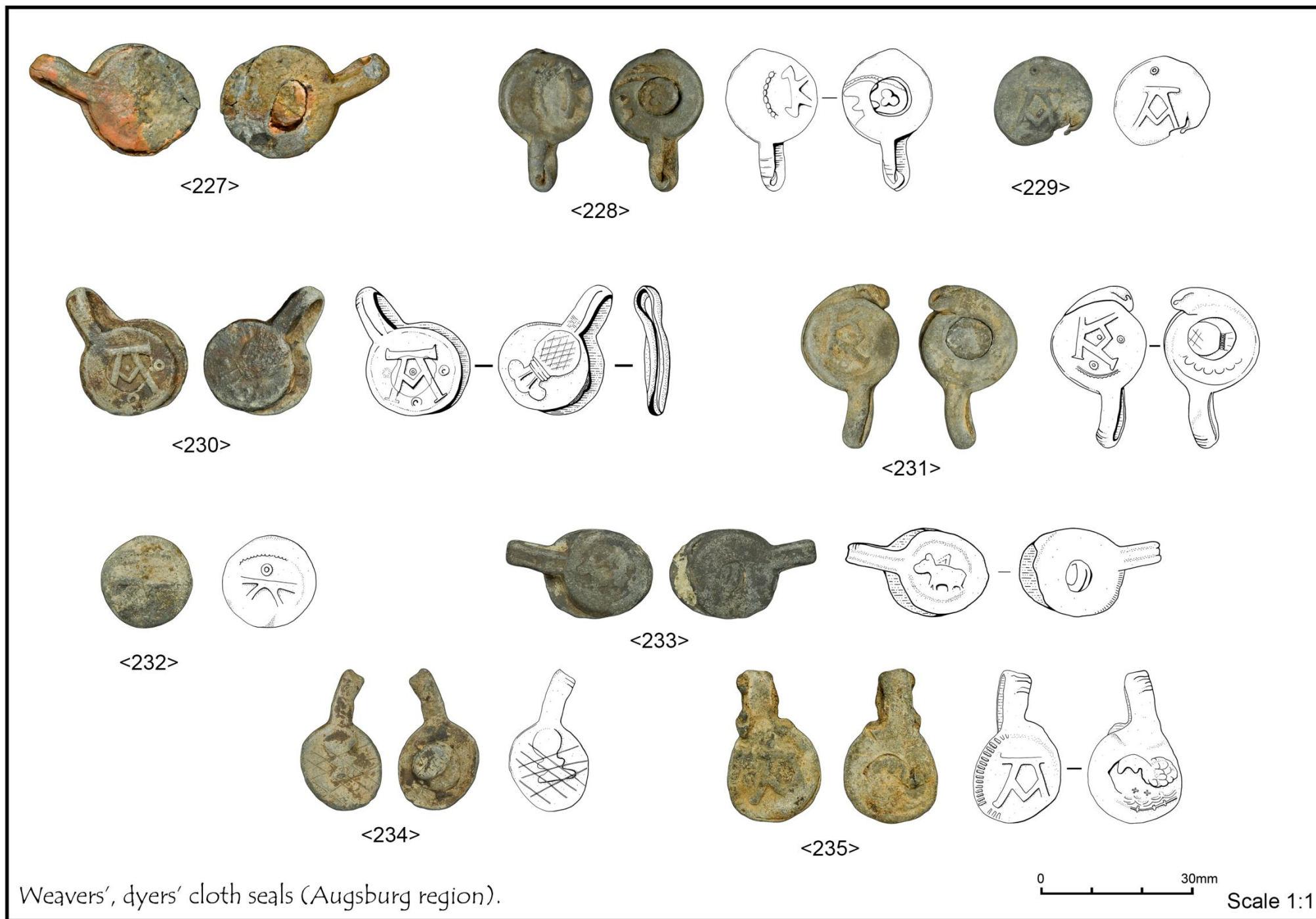


Figure 3.26 Cloth seals: Continental Cat 227-235 Southern Germany.



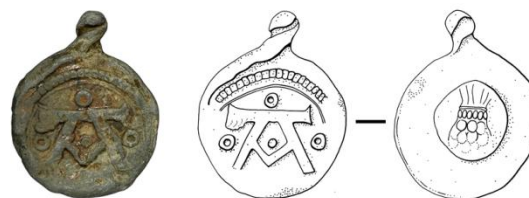
<236>



<237>



<238>



<239>



<240>



<241>



<242>



<243>

Weavers', dyers' cloth seals (Augsburg region).

0 30mm

Scale 1:1

Figure 3.27 Cloth seals: Continental Cat 236-243 Southern Germany.



<244>



<245>



<246>



<247>



<248>



<249>



<250>



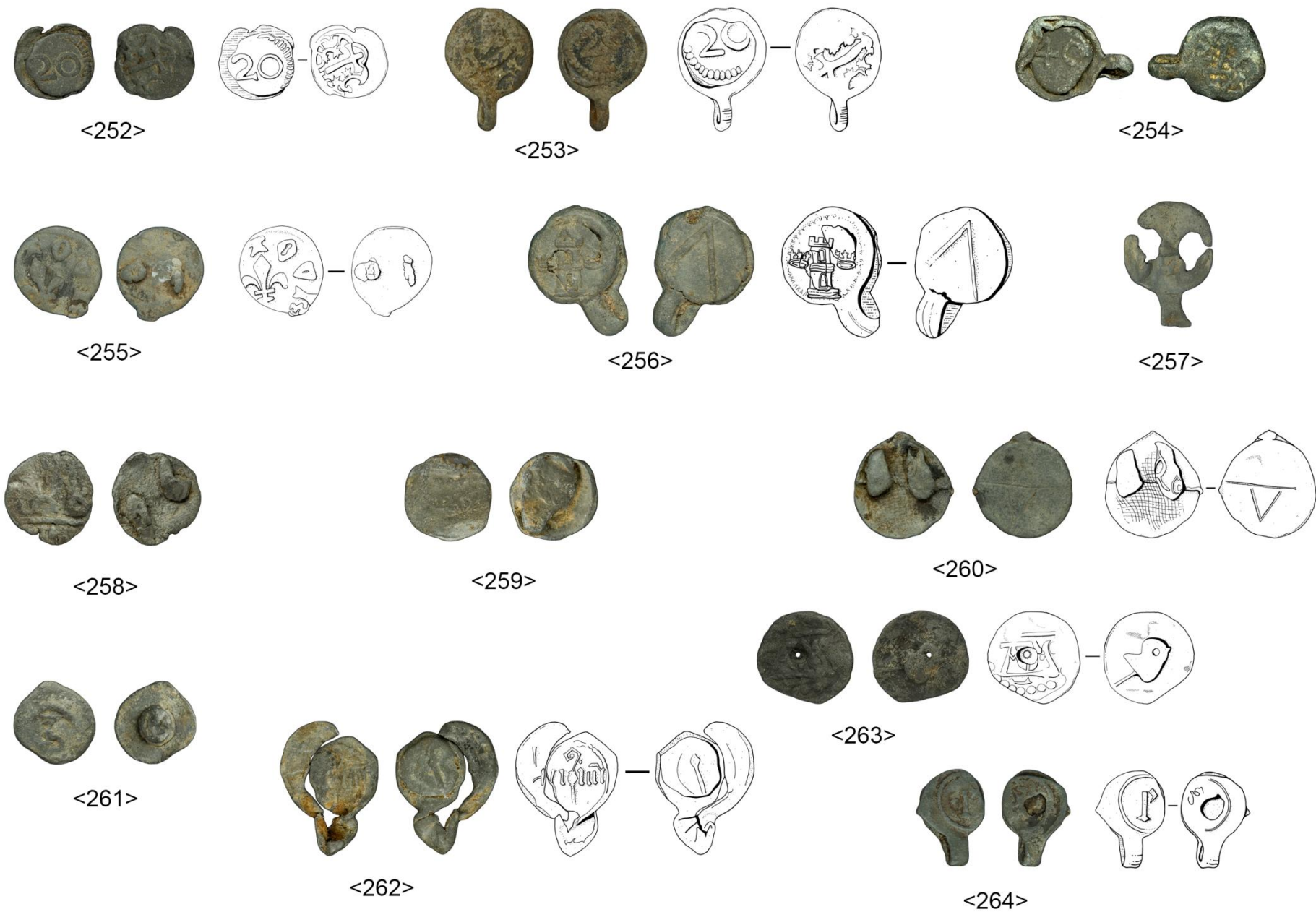
<251>

Weavers', dyers' cloth seals (Augsburg region).

0 30mm

Scale 1:1

Figure 3.28 Cloth seals: Continental Cat 244-251 Southern Germany.



Weavers', clothiers', dyers' personal cloth seals (Low Countries).

0 30mm

Scale 1:1

Figure 3.29. Continental Cat 252-254 Haarlem, Cat 255-256 Tournai, Cat 257-261 unprovenaced, Cat 262 Malines, Cat 263 Douai, Cat 264 Arras

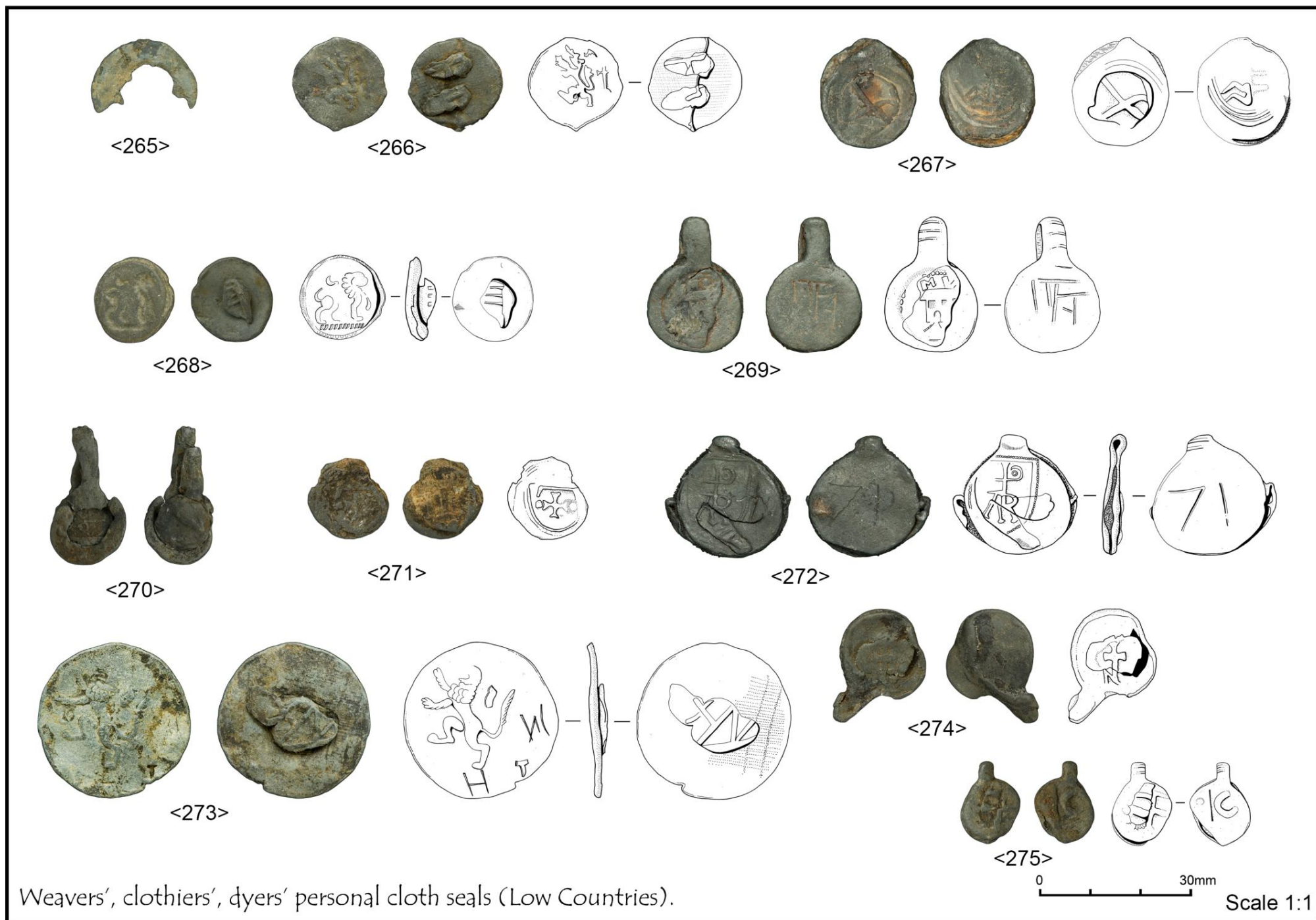
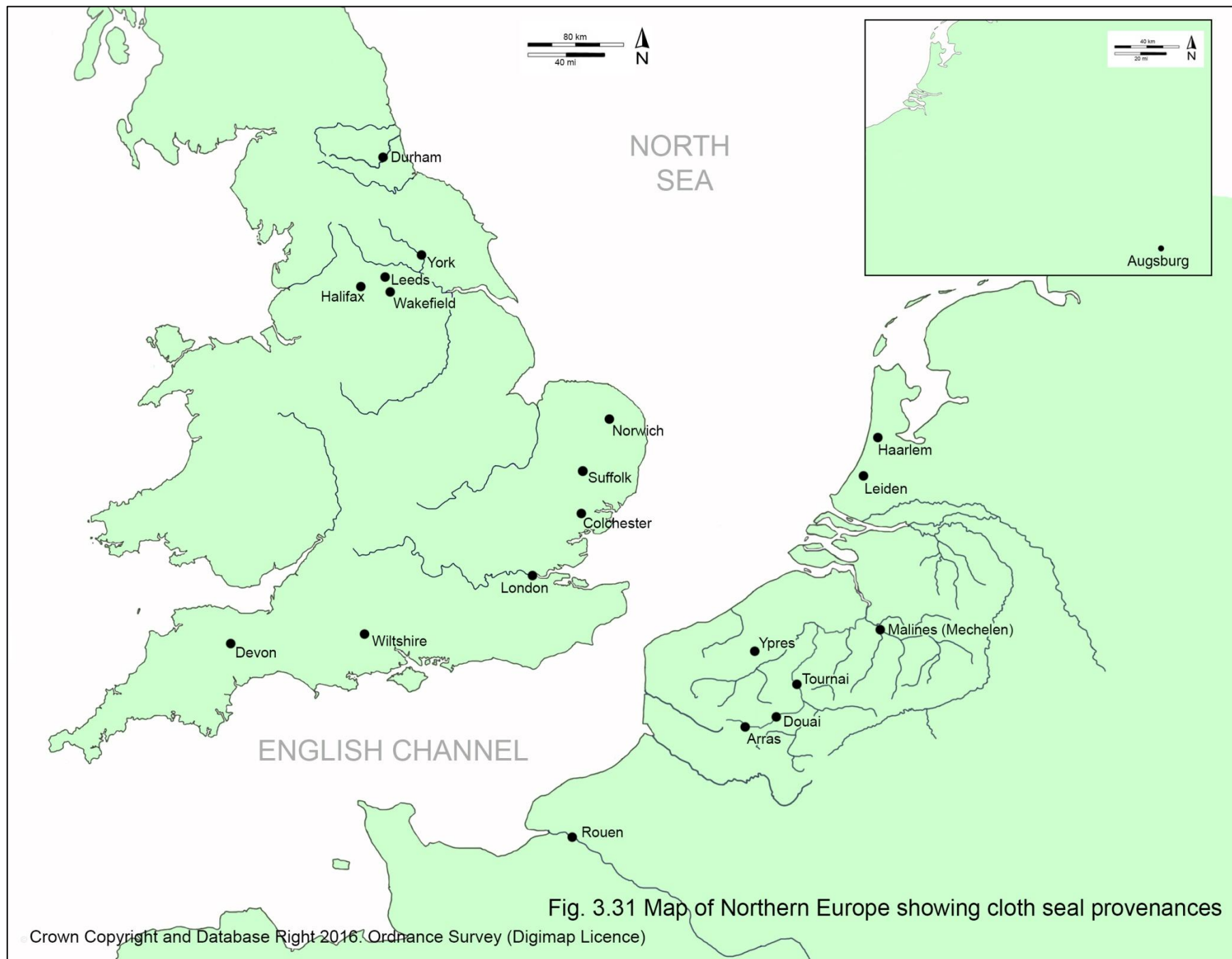


Figure 3.30. Continental. Cat 265, 268-272, 275 unprovenanced, Cat 266, 274 Ypres, Cat 267 Rouen, Cat, 273 Leiden.



Chapter four

4. Review of the scientific analysis, textual evidence and justification for extraction of textile.

4.1. Introduction and aim of chapter.

The unusual deposition conditions have resulted in scraps of textiles being preserved in 9.45% (26/275) of the cloth seals from the Durham River Wear assemblage. Although cloth seals have been found in their thousands across Northern Europe, it is relatively rare for the fabric with which they were once associated with to survive enclosed within them (see example: Fig 4.1). Based on the evidence demonstrated elsewhere in this thesis (Chapter three), these textiles date from the fourteenth- to the early-nineteenth-century. They represent rare survivals of what were once common and everyday fabrics in use during this historical time frame. The survival of this waterlogged organic material constitutes primary evidence of textile availability, trade and consumption: in essence, components of Durham's early social, economic and material culture history. An interdisciplinary study, involving historical and scientific analytical research into these organics, increases our understanding of the regional, national and international textile trade, including the technology of manufacture, but also provides direct links in to the history of those individuals involved with it.

There are widely held views that archaeological textiles can provide us with such information. Walton (1981, 190) highlights how small scraps of textiles from archaeological excavations can provide information on the appearance of fabrics and the technology of cloth manufacture including the tools and techniques used, while identification of dyes present adds to the data. This viewpoint is strengthened by Wild (1970, 3) who describes archaeological textiles as essentially a corpus of data; Crowfoot et al. (2001, 1), who see them as tangible proof of [textile] availability, production methods and dress; by Gilchrist (2012, 70) as evidence for the production of fabrics, styles and colours worn by ordinary people and by Egan (1994, 13), who suggests scraps of

textiles provide ‘unambiguous data on the kind of fabric involved’. However, in relation to dye identification for archaeological textiles, Suroweic et al., (2006, 210) urge caution as, depending on the qualitative and quantitative composition of the main colouring components, dye identification is usually based on comparisons with known references (information relating to the chemistry and identification of natural dyestuffs can be found in publications such as Hofenk de Graaff's *The Colourful Past* 2004, or Schweppe's *Handbuch der Naturfarbstoffe* 1993 (*Handbook of Natural Dyes*)); while, water-logged buried archaeological textiles may suffer from a loss of dye information through hydrolysis and contamination from other organic matter.



Fig 4.1. Cat. B.862. Seventeenth-eighteenth century, four-part alnage seal showing surviving textile protruding from between lead discs. Stereo-microscopy image (Nikon 100 camera, x 20 magnification).

The successful extraction of natural dyes from historical and archaeological textiles is well documented (Walton 1981; Whiting, 1975; Whiting and Harvey, 1981; Suroweic et al., 2006; Karadag et al., 2010; Vanden Berghe 2012; Torgan

et al., 2015). Of particular relevance is the work of van Bommel and Joosten (2012) who successfully extracted dyes from textile enclosed within a cloth seal recovered from the early-seventeenth-century Aanloop Molengat shipwreck (see section 4.2.5). Previous to the scientific and analytical research on the three Durham case studies detailed below (see section 4.3.4); the extraction of dyes from archaeological textiles enclosed between the discs of cloth seals had not been attempted in the United Kingdom (UK).

4.2. Previous relevant studies of archaeological and historical textiles – some textual and physical evidence.

4.2.1. Fibre identification

Ryder's (1983, 455, 473; 1984, 72) analysis of archaeological textiles based typically on fibre diameters has allowed for the categorisation of fleece types. Fleece types generalised as medium wools were found by Ryder to predominate through the late-medieval period, peaking during the fourteenth century while longwools, which began to appear in the fourteenth century and with an increased supply during the sixteenth and seventeenth centuries, would not reach their peak until the eighteenth century. Although regional differences in climate, pasture and husbandry resulted in variations in English wool types (Crowfoot et al., 2001, 15), by the seventeenth century English sheep were rarely of the type that could produce finer shortwool fleeces; indeed it was the Midland Plain longwools that were much sought after for the worsted industry. Although it is possible (through historical documentary evidence) to identify distinct regional breeds of sheep, it is not possible to identify these types from their wool. It is possible, through fibre diameter distributions, to distinguish between long and short wools and hairier mountain sheep (Ryder 1983, 473-474; Walton 1981, 190-191).

The analysis of sixteenth-century wool found in the excavations of the Black Gate, Newcastle upon Tyne, found that, although shortwool (10) was the most common, generalised medium (6), hairy (5), hairy medium (2) and true medium

(3) fibres made up the majority of the 32 samples. On this evidence, if the sheep with coarse fleece types (hairy and hairy medium), which predominated the sixteenth-century uplands of Northern England, made up only 22% of the samples recovered, then it suggests that Newcastle was not relying on local supply (Walton 1981, 190-191). There is evidence to suggest that from earlier times, sheep with coarse fleece types were the main breeds in the North of England. Bowden's (1962, 108) analysis of the wool trade in Tudor and Stuart England indicates that coarse low-valued wools from the 'four northern counties of England' (Northumberland, Westmorland, Cumberland and Durham) were shipped direct by merchants of Newcastle upon Tyne to the Netherlands. The 1337 and 1357 schedules for wool prices per sack place wool from these same four northern counties at the bottom of the rankings, contrasting their typically low price of *c.*£3 6s. per wool pack, against those from Hereford and Shropshire which could command £8 and £7 respectively (James 1968, 68; Munro 1999, 215-216).

The identification of animal fibres by the shape of the individual staple and its morphology to species level can be obtained through transmitted light microscopy (TLM) at magnifications of x400 to x600; although it is essential to have access to a comparative collection of specimens with known origin (Jones, 2013, pers. comm., 30 January). However, as Wildman's 'principles of fibre identification' rule out the identification of the precise origins of a fibre through the measurement of external scale margins or indeed fibre diameter (1954, 84-94; 1961 115-119), it appears that the main guide for comparing late-medieval fleece types is Ryder's summary of medieval wools. This guide includes wool fibre diameter measurements of archaeological textiles recovered from sites across the UK, including those excavations at: Winchester, York, Southampton, Perth, Aberdeen, along with those mentioned below in London (see section 1-84.2.2), as (1983, 473-476; 1984, 25-27).

The fibre analysis of the three scraps of textiles from the Durham cloth seals set out below incorporated the use of both optical and SEM methods. The main advantage of the optical (stereo-microscope) method is that the internal

structure of the fibres can be viewed, including any pigment that may be present. However, due to shallow depth of field, surface characteristics may not always be in focus. Wildman's (1954, 49) multi-parameter fibre classification scheme, which incorporated light microscope analyses, centred on the surface characteristic of scale pattern and medullation characteristics (a hollow or partially-hollow core). By contrast, Robson (1988, 137-162) highlighting research by Phan et al., describes a classification scheme for animal fibres utilising SEM analysis based on: mean diameter and variability, scale interval, scale height and overall scale pattern, with scale height being the important classification parameter which works specifically for wool fibre blends. Robson also concludes that animal fibre classification, using microscopy alone, is virtually impossible (Robson 1997, 747; 2000, 116). Regardless of which classification scheme is incorporated in the analysis of archaeological fibres, it is not, as Ryder highlights above, possible to identify the breed of sheep from which it was originally shorn.

4.2.2. Weave structures.

To appreciate the variety of weave structures that may be encountered in archaeological textiles recovered from controlled excavations of typical, late or post-medieval archaeological (including water-logged) sites in Northern England, it is first relevant to have an understanding of the wide variety of textiles that were once in circulation within the region during this same period. However, for reasons linked to the textual evidence and the proposed provenance of several of the Durham cloth seals (highlighted in Chapter three), it is also pertinent to consider the broader range of textile types available across the whole of England and those from Northern Europe (see Appendix M). In England weaving became a specialist guild craft from as early as the eleventh century, although for Durham it was a slow start as it was not until the mid-fifteenth century that a recognised weaving guild rose to any form of prominence (Bonney 1990, 183).

Although the weaving of undyed broadcloths continued in the West of England until the seventeenth century (Ponting 1971, 42), it was during the early-sixteenth century that new, cheaper cloths such as the Wiltshire kerseys first increased in popularity (Bowden 1962, 44-47). By contrast the worsted branch of the textile industry suffered significantly from foreign competition and by the fourth decade of the sixteenth century was in a state of serious decline. It was not until the reign of Elizabeth I (1533 - 1603) that the production of worsted fabrics such as bayes and sayes became firmly established in England, although these fabrics were previously manufactured on the Continent. Production of English-grown long-staple wool increased to match the demand of the English worsted manufacturers; the creation of these 'new draperies' fed the demand for new, cheaper varieties of textiles. Across England's industrial heartlands specializing in the manufacture of cloths an astonishing range of woollens, linens, fustians, broadcloths, and worsteds of various qualities appeared, and then disappeared, between the twelfth to the seventeenth centuries (*ibid.*, 44-46).

Not to be outdone, the North East of England also played a part in the manufacture of a wide range of textiles. The 1468 Durham inquisition lists several types (see Chapter eight). If not produced locally, then local consumer demand ensured textiles were sought not just from elsewhere in England but also more widely from across mainland Northern Europe. Raine's (1844) analysis of the Bursar of the Monastery of Durham's expenditure on livery cloth between 1530 and 1534 identifies several cloth types, such as hardyn, chamlet, sayes, stamin, boultcloth, Kendal and napre, while Heley's (2009, 178) probate evidence from Newcastle upon Tyne tradesmen (1545 - 1642) adds several more: fustians, kerseys, linens mockadoo's (a fabric imitating silk or velvet) and felts, as well as finer weaves such as damask and velvet. Evidence of the consumer behaviour that was driving demand for these finer textiles can be found in the substantial 1592 probate inventory of Robert Mitford, a member of a leading family of merchants in Newcastle upon Tyne. This provides an important insight into his personal wardrobe. The inventory, revealing a clear relationship between dress and social status, reflects those garments that would

have been worn by the more successful tradesmen, merchants and gentry, rather than the humbler classes in the North East of England. The list includes such luxurious items of men's clothing as: coats of damask garded with velvet, russet (red-brown colour) coloured coats of taffety (taffeta) (plain-woven glossy or light thin silk), gowns of cloth garded with velvet, gowns of grogram (a coarse cloth mix of silk, mohair and wool), damask kirtles, satin kirtles garded with velvet, pairs of satin or taffety sleeves, satin doublets, britches of fustian (cloth) and red satin or taffety purses (Raine *et al.*, 1860, vi, 30, 214-217). This lengthening list of textile types is further supplemented by sixteenth to eighteenth-century probate inventories of Durham's post-medieval dyers, weavers and drapers (see Chapter six for further discussion). However, there is no reason to suppose these textiles were all woven in the North-East. From as early as the late-sixteenth century, Newcastle upon Tyne custom accounts list many (mainly European) cloth imports, including: fustian, Hollande, damask, dornyk (from Tournai), velvet, worsted, and satins from Cyprus; and the raw materials: dressed and undressed flax (*Linum usitatissimum*) (from Reval, France) and hemp (Wade 1995, 59, 240-279). Appendix M provides a detailed list of the cloth types and dyes, found to be in use in the Northern Counties of Durham and Northumberland from 1300 to 1800.

Apart from obscured weaves on heavily fulled and napped late-medieval to Tudor woollen cloth, the identification of weave structure on both historical and archaeological textiles is a relatively straightforward process. Although many weave variations exist, certain weave structures are more common than others in the archaeological record and these are likely to reflect the standard types of wool cloth commercially available (see Fig 4.2). The basic weave types can be summarised as:

- **plain** weave, also known as tabby weave, the simplest form of woven fabric, featuring alternative under and over warp and wefts, i.e. over one, under one.
- **twill** weave, based on a unit of three or more ends (individual warp threads) and three or more picks (individual weft threads). Each end passes

over two or more adjacent picks and under the next one or more. Diagonal lines appear as the binding points are set over by one end on successive picks. The number of pick over which an end passes, and under which it passes can be described as a numerical ratio, for example 2:2 or 3:1. Twill weave variations may have a floating warp or weft on the front of the fabric: the angle created can again vary.

- **satin** weave is based on units of five or more ends and an equal number or multiple of ends. Ends are passed over four or more picks then under the following one, or under four then over the next. As the binding points are set over two or more ends on successive picks a smooth appearance is generated. Damask is a variant of the classic satin weave, achieved by alternating warp- and weft-faced areas of the fabric (Burnham 1981, 52, 99, 113, 154; Brooks 2012, 11-12).

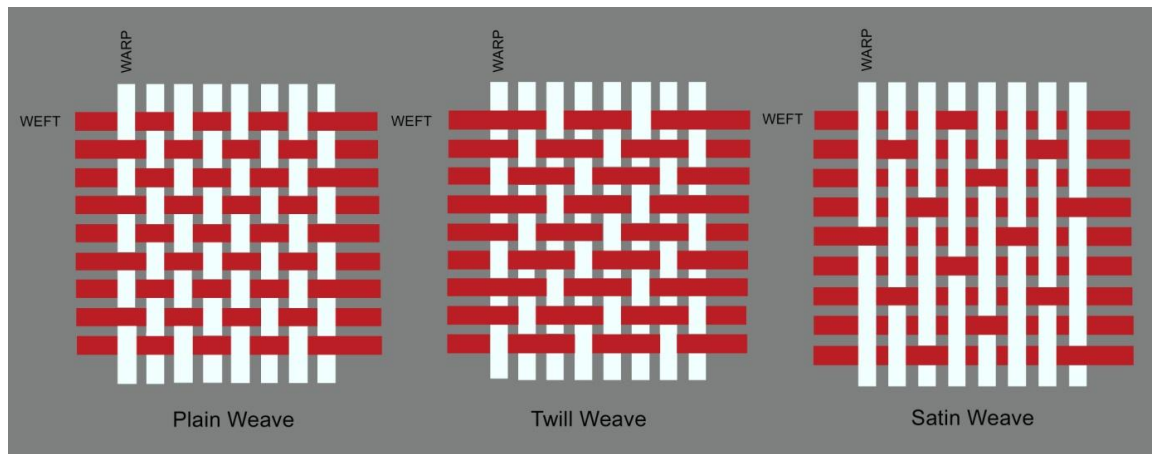


Fig 4.2. Basic archaeological specimens weave types

The early- and mid-sixteenth-century wool textiles recovered from excavations in the Castle ditch, Newcastle upon Tyne; provide much information about what types of textiles and dyes could be expected when examining textiles from the Durham cloth seals of the same date. The most common types of weave found amongst the 496 woven fragments were tabbies (making up 68%), 2:2 twill and 5-end satins. The excavations of a later seventeenth-century bastion, again at Newcastle upon Tyne, recovered 289 woven fragments; weave types included a figured worsted damask in 5-end satin, and both silk tabbies and silk velvets. Due to setbacks in the introduction of silk-worms during the reign of James I,

silk yarn was most probably being imported along with silk velvets from Italy, although the silk tabbies may have been woven locally from imported yarn (Walton 1981, 194; 1983, 222-225). By comparison, the weaves of wool textiles recovered from archaeological excavations in the City of London, including sites at Baynard's Castle, Trig Lane and Swan Lane, dated to c.1150 - 1450, were mainly tabby weaves; however 2:1, 2:2, 3:3, three-shed, four-shed and six-shed twill weaves were also recorded. Variations recorded from observations in the spinning directions of the warp and weft of these textiles and the inclusion of hand-spun worsted thread, support evidence of the development of different patterned and textured cloths (Crowfoot et al., 2001, 26-27). Walton Rogers suggests that these London woollens demonstrate the demise of 2:1 twill and the rise in tabby weaves, while the Newcastle upon Tyne woollens follow on from this being mostly tabby with some 2:2 twill weaves (Walton Rogers, 2016, pers. comm., 8 January).

4.2.3 Thread count and spin

In simple terms, threads are formed by twisting fibres in either an S or Z direction. The letters S and Z are used to designate the two different directions in which the fibre has been twisted or spun, based on the direction of the middle stroke of the two letters: clockwise for S-twist or anti-clockwise for Z-twist. The analysis of these threads and yarns can reveal much about the nature of archaeological textiles. Walton's (1983, 218-219) observations on both the yarn and weave of seventeenth-century archaeological textiles from Newcastle upon Tyne indicate that the diameter of the yarn was relevant as the S-spun yarns were on average coarser than Z-spun yarns in this collection. A shift in the production of woollen tabbies from SS to SZ yarns would suggest a change to finer fabrics while a move from ZZ to ZS amongst worsted twills then may result in a change from finer to coarser fabrics. Crowfoot et al. (2001, 26-27) suggest that the rise of SS spinning, found in late-fourteenth-century archaeological textiles, may have been attributable to increased use of spinning wheels. Examination of three fragments of cloth recovered from fourteenth-fifteenth century deposits at excavations at Barnard Castle, Durham, identified plain

tabby weaves with ZS spinning and with relatively low thread counts of c.12-15/7-8 per cm. While it was apparent that the Z-spun warp threads were finer and more tightly spun than the S-spun weft threads, Elizabeth Crowfoot, commenting on these same fragments of cloth, suggests that the use of differently spun warp and weft threads in fulled tabby weaves was prevalent from the fourteenth century onwards: the main reason being that the fibres were more easily raised when they all lie in the same direction (in Austin 2007, 555). Seven woven fabrics recovered from three Saxo-Norman tenements in Saddler Street, Durham (dated from the second half of the tenth to the early thirteenth centuries), were attributed to some of the earliest recorded settlements in the City. The distinctive feature of these textiles, which were all three-shed twill weave, was the use of soft, very uneven weft yarn with a finer well-spun warp. This was particularly evident in two of the fabrics which contained medium [thread] counts in which the warp was Z-spun worsted and the weft was a noticeably thicker and variable S-spun. While a third coarser fragment contained just S-spinning another was a coarse worsted plaid with two-colour checks (Carver et al., 1979, 36-39). Carver, by linking the presence of the three-shed weave with the use of horizontal looms, suggests that textile production in Durham between the tenth and thirteenth centuries was more for trade than for domestic consumption. Such activity has been connected with developments in political and social order, an outcome marked by the rise of urban centres (*ibid.*, 1979, 71-74).

It is often possible to identify the spin of warp and weft yarns (see section 4.2.4 below for assumptions on warp and weft orientation) and this is the case with two of the three Durham case studies (B.230 and B. 1365) which are both ZZ. In Fig 5.7 (B.230) both Z-spun warp and weft threads are clearly visible; however, the diameter of the weft thread is approximately 50% less than that of the warp, suggesting that the weft is a hard-spun worsted thread. The presence of this narrower thread combined with a similar warp and weft spinning direction has helped to throw up the pattern of the diagonal twill weave. Although referring to late-medieval textiles Crowfoot et al. (2001, 26) suggest that variations in

spinning directions and their association with different periods with different weaves can be an important dating factor for archaeological textiles.

Counting the number of threads or identifying yarn spin direction on surviving scraps of textile can be achieved relatively accurately with stereo-microscopy. However, it is harder to achieve similarly accurate results when analysing textile impressions on the lead discs (see example 4.2.3). Egan's (1994, 14) caution in relation to identifying the weave of fulled woollens, due to obscurities linked to the fulling process, is worth noting: see the Cat. B.2630 case study. Analysis of cloth seals in the British Museum identified, amongst others, textile imprints with thread counts at both ends of the spectrum: the coarser thread counts of 3 per 1cm on a late-sixteenth- to early-seventeenth-century cloth seal from Worcester (No. 105) and finer at 32 warp/32 weft per 1cm on a late-medieval cloth seal from Malines (No. 326). Broadly speaking the higher the number of threads per centimetre the finer the fabric; the comparators 'coarser' and 'finer' can be used to indicate the qualities of textiles with lower or higher thread-counts (Walton, 1983, 218; Egan 1995, 14). Although in the case of textiles from cloth seals, some caution should be observed with threads being bunched around cloth seal rivets, cloth seals which have been positioned on the selvedge or where the edges are unravelling. For the purposes of this thesis, where thread sets are identified either from impressions or surviving textile, Egan's (2001, 49) approximate 'indicators of quality' will be followed, see table 4.1. Where identified, the results of any textile thread count or textile imprint analysis are recorded in each of the catalogue entries, see Chapter three.

Coarse	below 10 x 10 threads per 10mm
Fairly coarse	c.10 x 10 threads per 10mm
Medium	10-11 x 10-11 threads per 10mm
Fairly fine	12-15 x 12-15 threads per 10mm
Fine	Above 15 x 15 threads per 10mm
Very fine	Above 25 x 25 threads per 10mm

Table 4.1. Egan's (2001, 49) 'indicators of textile quality'.

4.2.4. Textile impressions

In addition to the 25 Durham cloth seals that have surviving scraps of textile, a further 23 cloth seals have, to a greater or lesser degree, textile impressions. For example, approximately 50% of the reverse of the first disc of Cat. B.259 features a textile impression (see Fig 4.3). For truly accurate analysis of these thread impressions in terms of calculating warp and weft, it is essential that the original position of the seal in relation to the piece of cloth is known. Egan (1994, 13) has suggested that it is a reasonable presumption that the seals were attached to the edge of the cloth, as this would make them readily visible and available for inspection without unfolding the entire bale. If we adhere to this assumption, then it would be sensible to suggest that if the seal is orientated in such a way that the connecting strip is uppermost i.e. at twelve o'clock, then the thread impressions running horizontally (from nine to three o'clock) would be the warp threads and any vertical impressions would be weft threads. Where relevant, any interpretation of the type of textile or of textile quality is based on this imprint analysis and is recorded in the individual catalogue entries, see Chapter three.

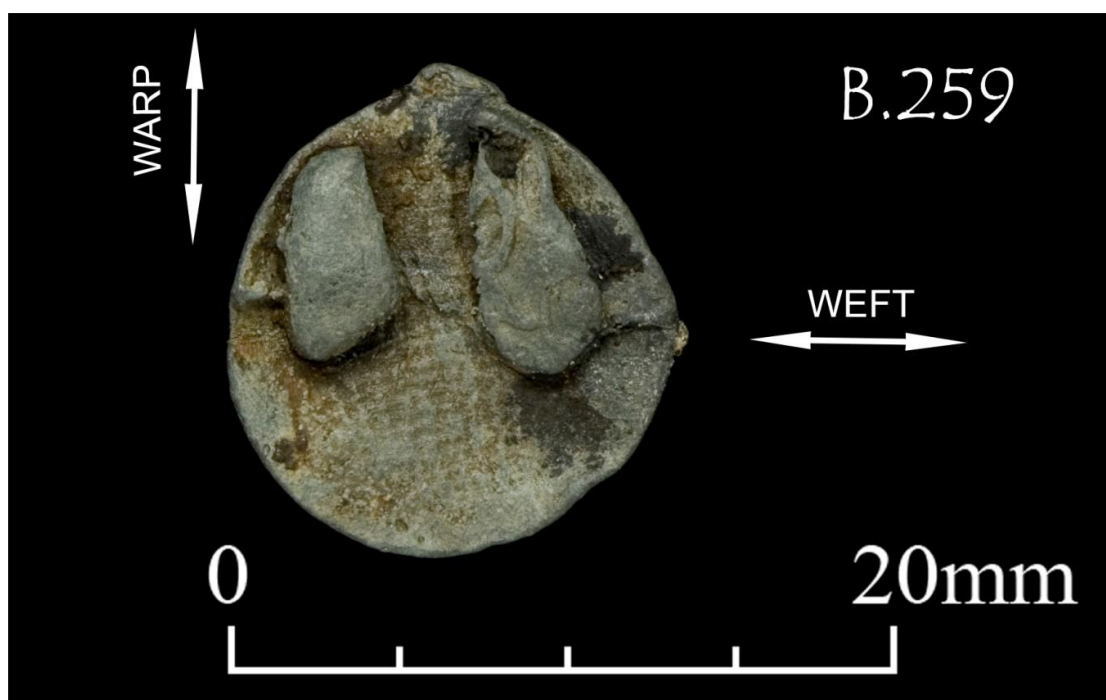


Fig 4.3. Cat. B.259. Sixteenth-seventeenth century continental cloth seal showing orientation (warp and weft) of textile impression (camera: Nikon D200).

4.2.5 A brief technical history of dye and mordant analysis

Natural dyes can be found in a diverse range of natural living sources such as plants or animals, and these can be associated with specific regions of the world. If dyes from archaeological textiles can be identified, then it may be possible to establish correctly the provenance, date and method of production of the original textiles, along with providing information relating to the trade routes of the dyestuffs (Serrano et al., 2013, 1). Dyeing was an integral part of textile production and with the exception of the vat dyes, woad (*Isatis tinctoria* L.) and indigo (*Indigofera tinctoria*), both grown commercially in seventeenth-century England, most other dyes would have been imported by Merchant Adventurers (Ferreira et al., 2004, 330; Walton 1983, 227). Carus Wilson (cited in Walton 1981, 200) suggests that the common European madder (*Rubia tinctorum* L.), an important red dyestuff, was not just being grown in England, but also imported, during the sixteenth century. This claim is supported by late-sixteenth century Newcastle upon Tyne custom accounts, which describe numerous dyestuff imports, including: green copperas and pokes or bales (canvass containers) of alum, madder and woad – the woad arriving from Amiens in Picardy and Caen

in Normandy (Wade 1995, 140-279). The importation of madder to the North-East of England during the seventeenth century is confirmed in the 1663 ordinances of the Newcastle upon Tyne Merchant Adventurers, where, listed, amongst the various rates of *impositions* (imports), is a fee of Vjd payable for every hundred weight of madder, brought inward: this fee was payable by the members, to the wardens of the fellowship (Roberts, Boyle, Frederick 1885, 59). Crowfoot et al., (2001, 19-20) citing Carus-Wilson and Childs, refer to supplies of woad also from Picardy coming in to London from as early as the twelfth and thirteenth centuries, and a century later supplemented by imports from Brabant, the Low Countries, Germany, Lombardy and Languedoc. Haigh, quoting a passage from the seventeenth-century book *Le Marchand*, describes how, in *circa* 1633, one hundred thousand bales of woad, would be transported annually along the River Garonne from Toulouse to Bordeaux (1778, 82). It is easy to envisage how, due to such huge quantities of this important dyestuff being readily available, significant quantities would have made its way, via coastal ports, to English dyers. Woad is recorded along with other textiles/dyestuff related commodities as being traded across several North of England trading centres, including Durham, from as early as the thirteenth century. In 1307, goods moving via the regional coastal ports which were taxed for quayage included important dyestuffs such as potash, woad and copperas, Rochester earth (a hydrous silicate of alumina) for fullers and linen (presumably for weaving), hemp (*Cannabis sativa*) and flax (Fraser 1967, 46). Munro (1999, 1-74) describes the dyeing of wools with woad, in the yarn or in the piece (woven cloth), before then being re-dyed in the piece, with reds or yellows to produce a range of colours: the blue dyestuff present in woad (and later indigo plants) served as the base. Walton suggests that indigo, imported from East India, superseded woad during the second half of the seventeenth century (1983, 227). The turning point in the use of indigo over woad came about in the early-seventeenth century, following the establishment of trading bases in India, Japan, China and the Spice Islands, first by Portuguese, then Dutch, English, French and Spanish traders. The direct importation from these bases of luxury textiles, spices and indigo, into European emporia, such as London and Amsterdam, by sea avoided Middle Eastern and Italian land duties.

The development, during the mid-seventeenth century, of indigo plantations in the European colonies in the West Indies and Americas, contributed to the woad industries' demise (Balfour-Paul 1998, 41-42).

Natural dyes can be applied to textiles in three ways, and as such, can be classified as: vat dyes, mordant dyes or direct dyes (Ferreira et al., 2004, 330; Hofenk de Graaff 2004, 15-16). These natural dyes can also be classed as (or known as) adjective or subjective dyes. Substantive dyes are those that dye the fibre directly (direct dyes) and do not depend on any mordant such as woad, indigo or Tyrian purple (mordant dyes). Adjective dyes are only capable of being fixed upon a suitable base – i.e. material mordanted with a metal salt. These types of dyes include: madder, kermes, cochineal, logwood (obtained from the heartwood of the tree *Haematoxylon campechianum* L.) and weld (*Reseda luteola* L.) (Bancroft 1814, vi; Hofenk de Graaff 2004, 16-17). Ferreira et al., (2004, 330) clarify this adjective process by describing how a solution of mordant (normally a metal salt) is first absorbed within the structure of the fibres that are to be dyed and when later exposed to the dye solution, an interaction with the mordant-fibre structure produces an insoluble brightly coloured hue. While woad was popular because it did not require a solution of mordant for it to adhere to wool fibres, other natural dyestuffs did require exposure to a dissolved mordant. Perhaps the most important member of this group of mordant dyes is madder. Being a member of the dye plant group *Rubiaceae*, madder contains the colouring matters alizarin, munjistin, pseudopurpurin and purpurin (with purpurin being more soluble in alum than alizarin). The process of dyeing with madder using the mordant alum is recorded throughout Northern Europe during the seventeenth-eighteenth centuries – see extract from Haarlem manuscript and London Dyers' Company recipes below (Hofenk de Graaff 2004, 92-95). The process of dyeing with the vat dyes woad and indigo was slightly complicated, in that, as they were both water-insoluble, they had to be first converted into a 'leuco' form – obtained through reduction, before they could then impregnate the fibre. The dye would then revert to its original form in the fibre following oxidation (Ferreira et al., 2004, 330; Hofenk de Graaff 2004, 16). Interactions during the dyeing process

with mordants such as aluminium, iron, tin, chromium or copper ions, and so-called 'dye-assistants' for example, cream of tartar (potassium hydrogen tartrate), could improve the washfastness (resistance to washing, rubbing and water), lightfastness (resistance to daylight), lustre and brightness of colour of the dyed textile (Ferreira et al., 2004, 330; Hofenk de Graaff 2004, 17). The technology of both non-mordant (substantive) and mordant-dyeing (adjective) using natural dyes, changed little until the development of synthetic dyes in the mid-nineteenth century (Munro 1994, 23-24).

There is evidence that alum was widely used by post-medieval textile dyers. Boas Hall suggests that, by the mid-sixteenth century, there was vast empirical knowledge on the use of the chemical compound alum with dyeing (1958, 127). The historian Singer (1948, 245) suggesting that the historical use of alum is in essence evidence of the 'earliest chemical industry', also recognised the early chemical knowledge of dyers:

'If alum be present the dark colour is brightened'.

The importance of the use of alum during the dyeing process is also evident in James Haigh's late-eighteenth century *'Hint to his fellow dyers'* when vat dyeing with indigo:

'I would recommend to the Dyers, after washing the dark blues well at the river, to turn the cloth very quick through a warm vessel of water, in which has been dissolved a little alum, and they will see a surprising change in the lustre from that simple process.'

Morrison (1981, 3-23) describes how an alum industry flourished on the North Yorkshire coast from c.1595 until c.1850, principally due to the availability of the raw materials: seaweed, shale, coal and human urine. The demand for alum grew because, in a soluble form, it had an affinity to the natural fibres: wool, cotton, silk and linen. As a mordant it could fix natural dyes to the fibres making them brighter and more permanent. The alum produced in the many works

based around the Boulby, Whitby, Guisborough and Sandsend areas was a mixture of two types: ammonium alum – $\text{Al}_2 (\text{SO}_4)_3 (\text{NH}_4)_2 \text{SO}_4 \cdot 24\text{H}_2\text{O}$ and potassium alum – $\text{Al}_2 (\text{SO}_4)_3 \text{K}_2 \text{SO}_4 \cdot 24\text{H}_2\text{O}$. However, it was the presence of a colourless form of alum crystals at these sites that meant the much sought-after purer form of the aluminium compound could be produced. Demand for this product was, as could be imagined, huge and exports to important textile centres such as London, Norwich, Leeds and the West Country continued throughout the seventeenth century. By the mid-eighteenth century it was being exported across Europe and to Northern America. During the mid-seventeenth century the demand from London dyers and salters was such that they themselves opened their own works in the Guisborough area. Evidence of the use of the alum in the City of Durham appears in the 1689 probate inventory for the Claypath-based dyer, George Burdon (DPRI/1/1689/B17/1-8 – see appendix F), where, in addition to several other important stuffs listed in his dye house inventory, we find: *5 stone and 10 pound of Allome* [alum]. The inventory of George Burdon and that of his father, also a dyer called George Burdon, is discussed in greater detail in Chapter six. In 1577, the Newcastle Merchant Thomas Leddell (mentioned above) had two hundred and seventy four weight of alum valued at iiij^{l} (Raine 1835, 414).

Contemporaneous historical dyeing recipes highlight how textile dyeing workshops operating on both sides of the English Channel used the mordant alum throughout the late-medieval period; although there appears to have been no standardised unit of measurement for its use (as demonstrated in the following two examples). The first is an extract from a late-seventeenth century Haarlem manuscript (278/r/2), describing how yarn is dyed red with madder:

'For 8 pounds of yarn 1½ pound of white alum, with ½ a pound of French wine-stone with one pint of bran for 1½ hour... add 2 pounds of madder and the yarn boiled in it for 1/8 hour...'

A.S.N. v.der G. from Hofenk de Graaff (2004, 97).

A second dyeing recipe, transcribed by the author from a recently discovered private collection of fourteen early-eighteenth century dyers recipe and pattern books, dating from 1720s - 1740s, demonstrates one method of how information on dyeing circulated around Europe. The book, which features many recipes for dyeing cloth various shades of red, contains instructions written in Dutch on one page with an English translation on the opposite page; small samples of dyed textiles (presumably that as described in the recipe) are pinned alongside each corresponding recipe (Fig 4.4). For whatever reason – perhaps political or financial - it seems that a specialised Dutch dyer was brought to London in the early-eighteenth century to transfer his invaluable knowledge to men who could be described as being his compatriots' competitors. It is certainly possible that the completed pattern and recipe books may have once belonged to either a London Dyers Company Master Dyer, operating out of a significant dyehouse close to the River Thames, or to a 'Housekeeper', that is a Company freeman who had the right to bind apprentices and set up an independent shop (Feldman 2005, 115-116). One typical recipe featuring the dyestuff madder, the mordant alum and the 'dye-assistant' cream of tartar reads:

'1. long Cloth pinke Culler. boiled with River watter Charge the boiling kettle with 6 pd & a $\frac{1}{2}$ of allum. & 4 pd & a $\frac{1}{2}$ of argel [cream of tartar]: this Cloth is grained with Spring watter & $\frac{3}{4}$ of a pd of mader. $\frac{3}{4}$ of a pd of argel. & $\frac{3}{4}$ of a pd & 3 ounces of Cochineal grained in Spring watter.'

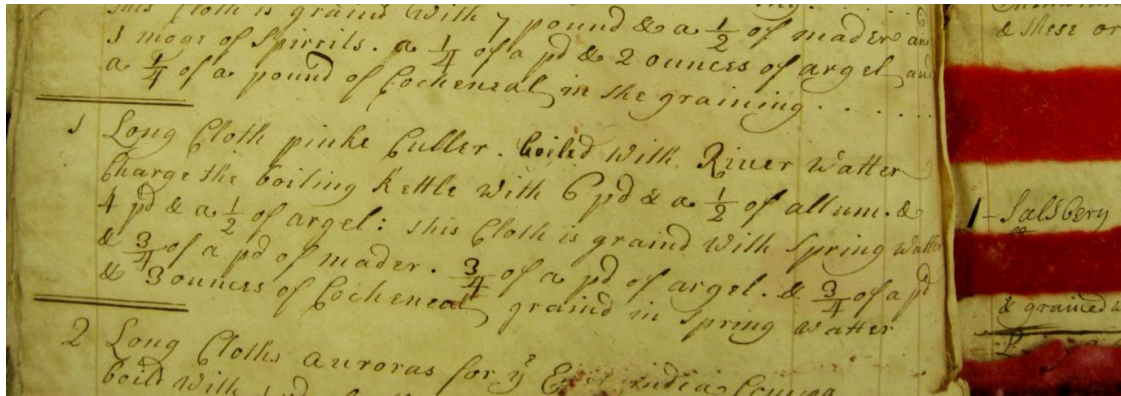


Fig 4.4. Chrutchley Archive Assoc. No. 2011/5/13. Image reproduced courtesy of Southwark Local History Library and Archive.

Fordyce (1857, 34) recites an interesting occurrence following the great flood of the River Tees at Barnard Castle, County Durham in 1771. A dyer operating out of a dyehouse positioned adjacent to the river on the south end of the bridge had his cellars flooded, the river water contaminating tammies being dyed in a kettle (tammies can be categorised as light-weight, plain-weave fabrics with hard-spun warp and weft (Kerridge 1885, 53)). After being cleaned of the sand and mud the cloth '*attained a colour beyond his most sanguine expectations*', it was then sent to London where it gained such satisfaction that orders were placed for more; however, the luckless dyer was unable to repeat the process. In this example, the flood water could have contained any number of permutations of different chemical compositions. However, it is possible that it contained enriched levels of peat tannins washed down from the peat bogs found on the Pennine hills. The commercial form of tannin is tannic acid, a substance that can be extracted from Tara pods, Sicilian sumac or gallnuts. Although from the middle of the seventeenth century tannic acid and iron salts (probably also found in the river water) had been adopted for dyeing cloth black, it is not to be expected that the Barnard Castle dyer would have known this and therefore have any chance of repeating the process (Hofenk de Graff 2004, 331)

Due to contamination with organic matter, very little sign of the original colour of archaeological textiles being present is evident to the naked eye, as often the textile is found to be stained various shades of brown or black (Surowiec et al., 2006, 210; Walton, 1981, 198). Spectroscopic and chromatographic techniques

used by Whiting and Harvey have successfully identified the dyes indigotin, madder and the insect dye kermes (obtained from the dried bodies of the female scaled insect *Kermes vermilio* Planchon, a species native to Southern Europe) in 12 out of 30 archaeological woollen textiles recovered from the early and mid-sixteenth century castle ditch, Newcastle upon Tyne (Walton 1981, 198). Similarly, dyestuffs were extracted with solvents from textiles recovered from the seventeenth-century castle bastion excavations in Newcastle upon Tyne, the measured absorption spectra being cross-checked against paper chromatography. Although these seventeenth century textile deposits were dominated by indigo and madder, a range of other dyestuffs were also present, including either the imported Coccid dyestuff kermes, or cochineal (obtained from the female scaled insect *Dactylopius coccus* Costa, native to tropical and subtropical South America and Mexico), brazilwood, oak galls (probably from Turkey or Aleppo), and fustic (Walton 1983, 226-227). It is of some relevance that the historical terminology for the main red Coccid dyestuffs originating in Southern Europe and the Middle East was 'carmine', 'crimson' or 'grain', while the new coccid dyestuff found in Mexico and South America was referred to as 'cochineal' (Hofenk de Graaff 2004, 53-54, 76-77).

Thin layer chromatography and UV-visible spectrophotometry have been used to identify dyes in textiles successfully, most notably on late Saxon wools from London, Viking Age wool and silk samples from Dublin and the National Museum of Denmark (Walton 1988, 14). Further scientific advances in dye analysis have since been developed which can identify and characterise a wide range of natural dyes obtained from single fibres just a few millimetres in length. One such advancement, known as high performance liquid chromatography (HPLC), has already been used to characterise a diverse range of plant and animal organic dyes from cultural heritage objects (Serrano et al., 2013, 1). Hofenk de Graaff suggests that variations of HPLC testing (by incorporating different extraction methods) can be used to identify the main colouring matters of the vat dyes: woad/indigo and Tyrian purple, and the red and yellow colours associated with mordant dyes (2004, 22-23). The successful extraction of dye components from 36 out of 81 samples of seventeenth-century

textiles, recovered from Scottish Highlands and Islands peat bogs, using HPLC with photodiode array detection (PDA) proved it was possible to extract dye from textiles that were once thought not to be coloured (Suroweic et al., 2005, 209). For the purposes of this paper, perhaps the most relevant HPLC identification of dyes from archaeological textiles performed to date was by Professor Maarten van Bommel and Ineke Joosten, of the Cultural Heritage Agency, Netherlands, in 2012. The team's discovery of woad or indigo, madder and a third unidentified colouring agent from a scrap of textile recovered from a lead cloth seal was a particularly significant achievement, given that out of the 101 cloth seals recovered from the Aanloop Molengat shipwreck (sunk 2.5 miles west of Texel Island, Netherlands, in c.1635), only one had surviving textile enclosed within it. This cloth seal, which was recovered from the seabed at a depth of 16m, has been identified as once being attached to a Delft saai, a twill woven from worsted and probably dyed in Leyden, as per the regulations of that time (van Bommel and Joosten 2012; Maarleveld and Overmeer 2012, 96, 127-129). The extraction of dye from this early seventeenth-century textile recovered from the sea bed raises hope that the loss of dye information through hydrolysis is not always the case, particularly with reference to lead cloth seals recovered from water-logged archaeological deposits.

4.2.6 Justification for extraction of textile, extraction method and rational for selection

The removal of the surviving textile from within the cloth seals, such as that shown in Fig 4.5, could provide samples of fabric from which further information could then be extracted, such as weave structure, thread count, twist, fibre identification (warp and weft), dye and mordant analysis. This information can then be correlated with the chronology and provenance of the cloth seal. While there is an argument that we should endeavour to preserve the artefacts recovered through archaeology for future generations, the subject does not progress if the artefacts recovered cannot be studied and researched as much as possible. A sound argument exists to extract textiles from the cloth seals in a controlled manner, ensuring as much of the textile and cloth seal as possible will be protected and preserved. Although the fibre and dye analysis

would require the removal for destructive analysis of a small numbers of threads from the cloth sample, any samples removed will reveal valuable information which justifies any loss of material. In deciding which cloth seals were most appropriate from which to extract the surviving textile, it will be important to consider first a number of different factors:

- quantity and level of preservation of the surviving textile
- potential for successful textile extraction – based on the positioning/complexity of the folded/flattened rivet(s)
- provenance (origin of textile)
- chronological span (based the suggested date ascribed to the cloth seal and the relevance of that period to other relevant textual evidence)

Although the sample size was relatively small in terms of numbers chosen for analysis, they would still essentially form a sufficiently diverse group to profile similar patterns of textile consumption to that already observed in the three larger assemblages previously studied: London, Norwich and Salisbury. The three cloth seals chosen were:

- Cat. B.230 (see **207**, Figure 3.23) – a late-eighteenth/early nineteenth-century clothiers/merchant's cloth seal, probably once attached to a narrow woollen cloth, woven in the West Riding of the County of Yorkshire (Fig 4.6);
- Cat. B.1365 (see **272**, Figure 3.30) – a seventeenth-century Low Countries import (Fig 4.7)
- Cat. B. 2630 (see **59**, Figure 3.10) – a late-sixteenth century London Dyers' Company seal (Fig 4.8).

With regards to Cat. B.230, two separate samples were taken due to the presence of a possible 'fleck' of darker thread in the textile, as this might have indicated that a different coloured yarn had been woven in to the fabric. These samples were subsequently referenced as Cat. B.230a (brown) and Cat. B.230b

(dark); the descriptions in brackets merely indicate the colour of the textile as observed by the naked eye under normal lighting conditions at the time of extraction.



Fig 4.5. Cat. B.265. Sixteenth-century cloth seal from Rouen, France, showing surviving textile between lead discs. Stereo microscopy image. (Nikon 100 camera).

In laboratory conditions, a pointed wooden probe was used first to prise loose and then raise the rivet(s) device of each cloth seal into a near vertical position (approximately at a right angle in relation to the two discs). The two lead discs were then gently eased apart using a flat wooden probe, the upper part being manoeuvred up, over and clear of the rivet(s) device (see Chapter three, Fig 3.1 for order of parts and other terminology). This process effectively reversed the original sealing technique. Gentle pressure applied using a scalpel blade, positioned behind any textiles that appeared to be adhered to a lead disc, was sufficient to free it. Alcohol was then applied to the scraps of textile to prevent any subsequent microbiological degradation. Once the alcohol had evaporated, the scraps of textiles were then placed into individual 75 micron polyester packets and labelled. The lead discs were then returned as closely as possible to their original form, minus the textile. A Nikon D200 digital camera was used to obtain high resolution .TIFF formatted files of both sides of the textile (referred to as Side A and Side B) and lead cloth seals (F-stop f/14, exposure time 1/13

sec. ISO speed ISO-100, focal length 105mm). The composite images, Figures 4.6 – 4.8 were subsequently created with Adobe Photoshop software. The position of the rivet device(s) on each cloth seal is clearly visible (Cat. B.1365 featured two rivets).



Fig 4.6. Cat. B.230 (207). Late-eighteenth/early nineteenth-century merchants' seal. Intact (above), extracted textile (below).
Camera: Nikon D200.



Fig 4.7. Cat. B.1365 (272). Seventeenth century continental cloth seal (featuring two rivets). Intact (above), extracted textile (below). Camera: Nikon D200.

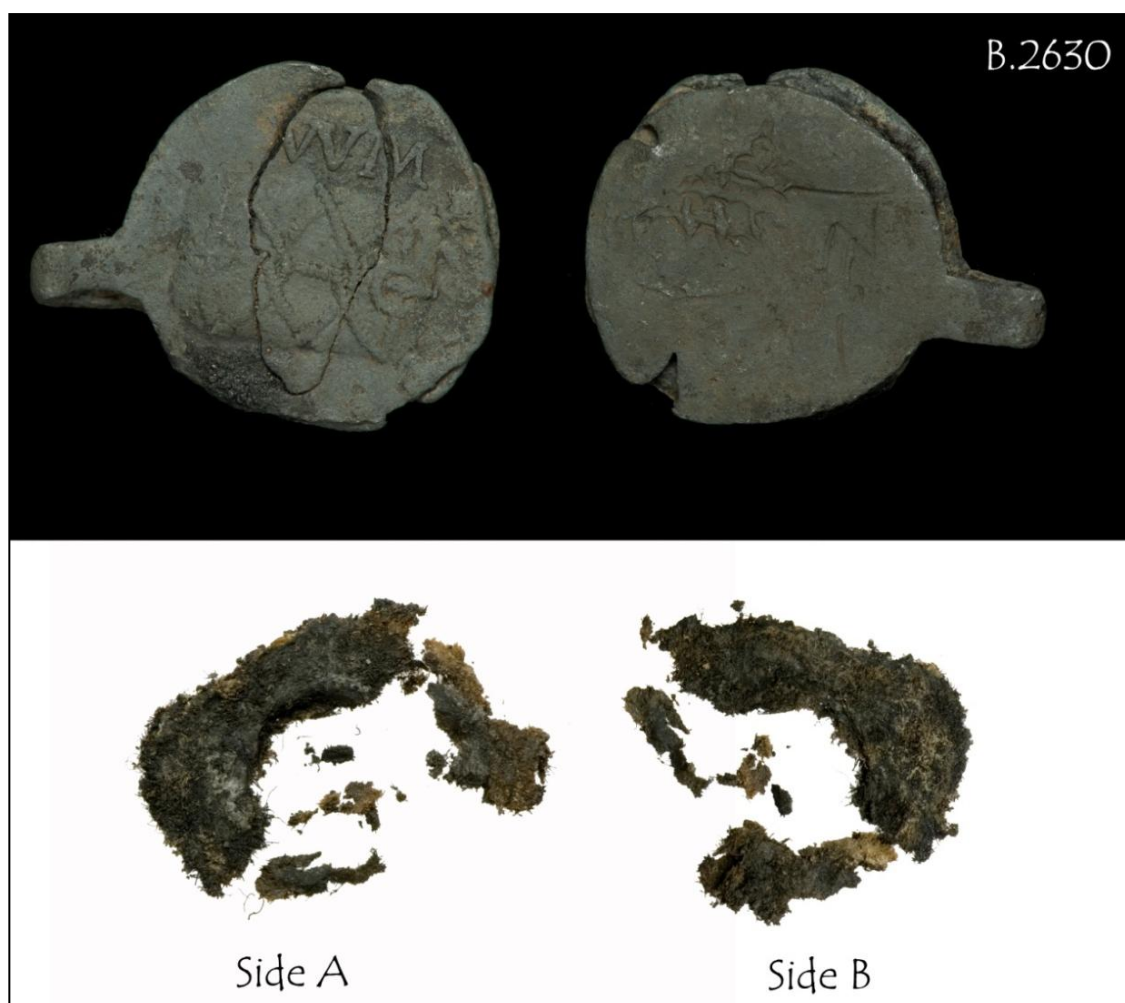


Fig 4.8. Cat. B.2630 (59). Late sixteenth/early seventeenth-century, London Dyers' Company seal. Intact (above), extracted textile (below)
Camera: Nikon D200.

Chapter five

5. Scientific Analysis and findings for three case studies

5.1. Analysis and findings

The main aim of this chapter is to describe the range of scientific and analytical analyses undertaken to examine scraps of textile extracted from lead cloth seals, then present the associated findings/conclusions. In essence, it will describe the methods used to deconstruct the individual component parts of three cloth seals from the Durham River Wear Assemblage.

The surviving scraps of textiles preserved between the discs (and through the interpretation of thread impressions visible on the lead discs) can potentially reveal information, such as the identification of the type of weave, fibre, spin (both warp and weft), thread count, mordant and dyestuffs used, including evidence of fulling, such as felting (thickening the cloth) or calendering (smoothing the surface to give a glossy sheen). Due to the time constraints of this thesis, only three cloth seals were selected as case studies for full analysis. Analysis of each of them was undertaken to answer specific questions related to obtaining precise information. A range of analytical techniques was utilised, including equipment based at the Department of Archaeology, University of Durham, as follows – imaging techniques: scanning electron microscopy (SEM); digital imagery (photography): digital cameras, digital microscope; observation techniques: stereo-microscopy; analytical techniques: X-radiography, energy dispersive X-ray fluorescence (EDXRF), UV-visible spectrophotometry and ultra-performance liquid chromatography with photodiode array detection (UHPLC-PDA), the UHPLC-PDA analysis was undertaken at the Centre for Textile Conservation and Technical Art History, University of Glasgow. EDXRF analysis was used on a fourth cloth seal, for qualitative analysis, due to the unusual composition of the seal (see 5.1.7 below for results/discussion). Analysis of marks stamped onto the cloth seal during the original sealing of the textile is covered separately in Chapter three.

5.1.1 Fibre identification (stereomicroscopy).

A Nikon Coolpix P5100 digital camera (F-stop f/5.1, Exposure time 1/21 sec., ISO speed ISO-400, Focal Length 19-24mm), attached to a port of a transmitted light stereomicroscope was used to capture still microscopy images of both isolated and small groups of individual fibres from all three case studies (Figures 5.1 - 5.3). Samples were prepared for individual microscopy as whole mounts, with the aim of identifying the fibre type through observations of visible features, such as: scale pattern, medullation, the general shape of the staple, and pigmentation. It was anticipated that subsequent categorisation would allow for comparison with known samples to aid in species identification.

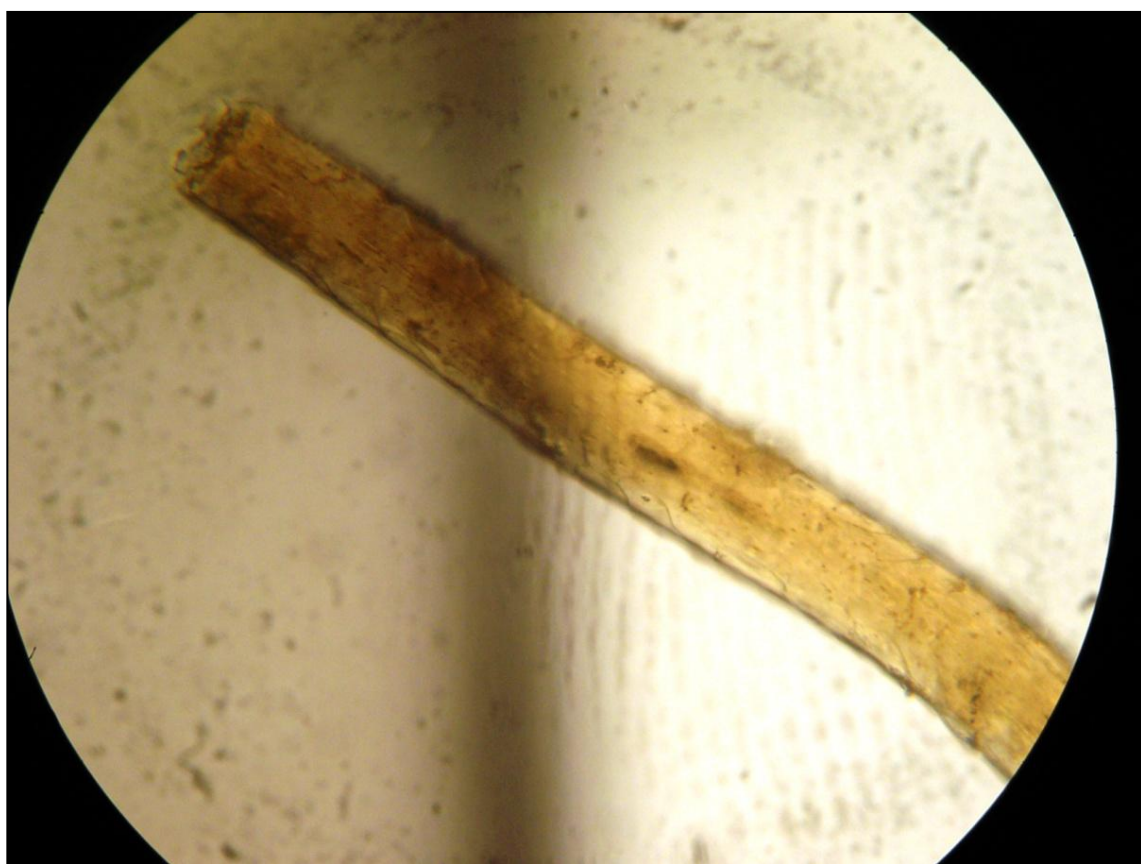


Fig 5.1. Cat. B.230. Stereo microscopy image, single wool fibre (Nikon P5100 camera; x 50 magnification)

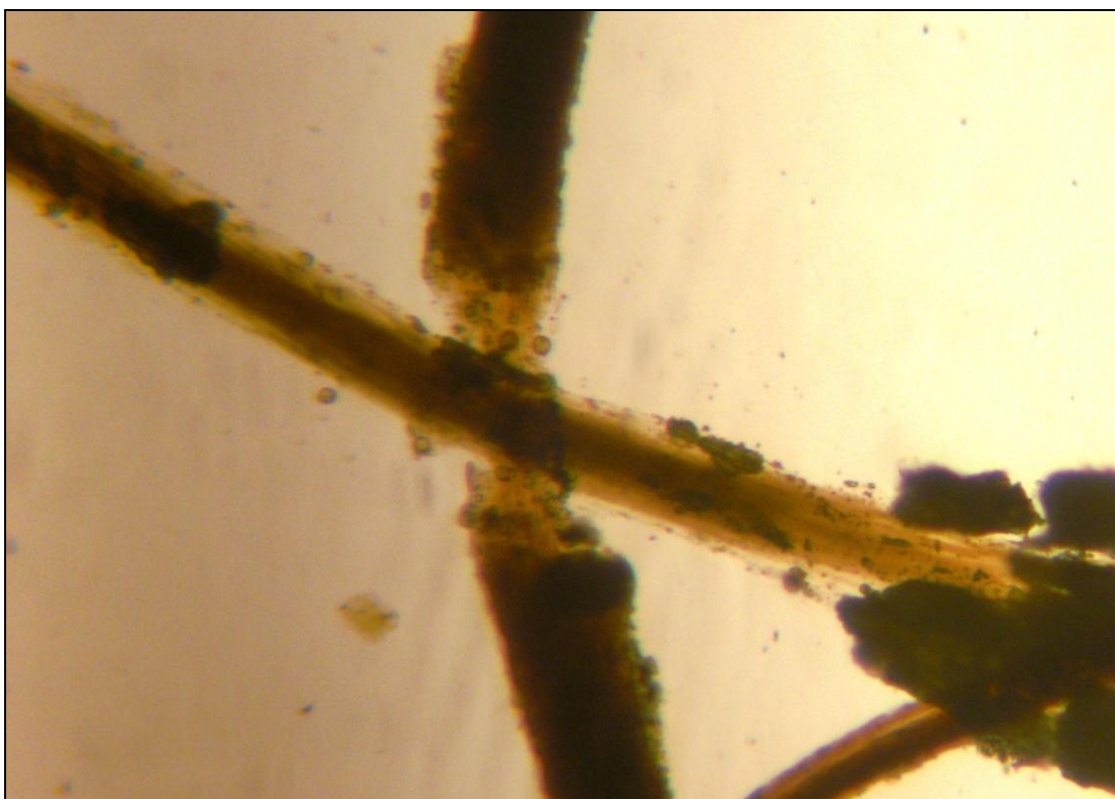


Fig 5.2. Cat. B.1365. Stereo microscopy image showing individual woollen fibres (Nikon P5100 camera; x 50 magnification).

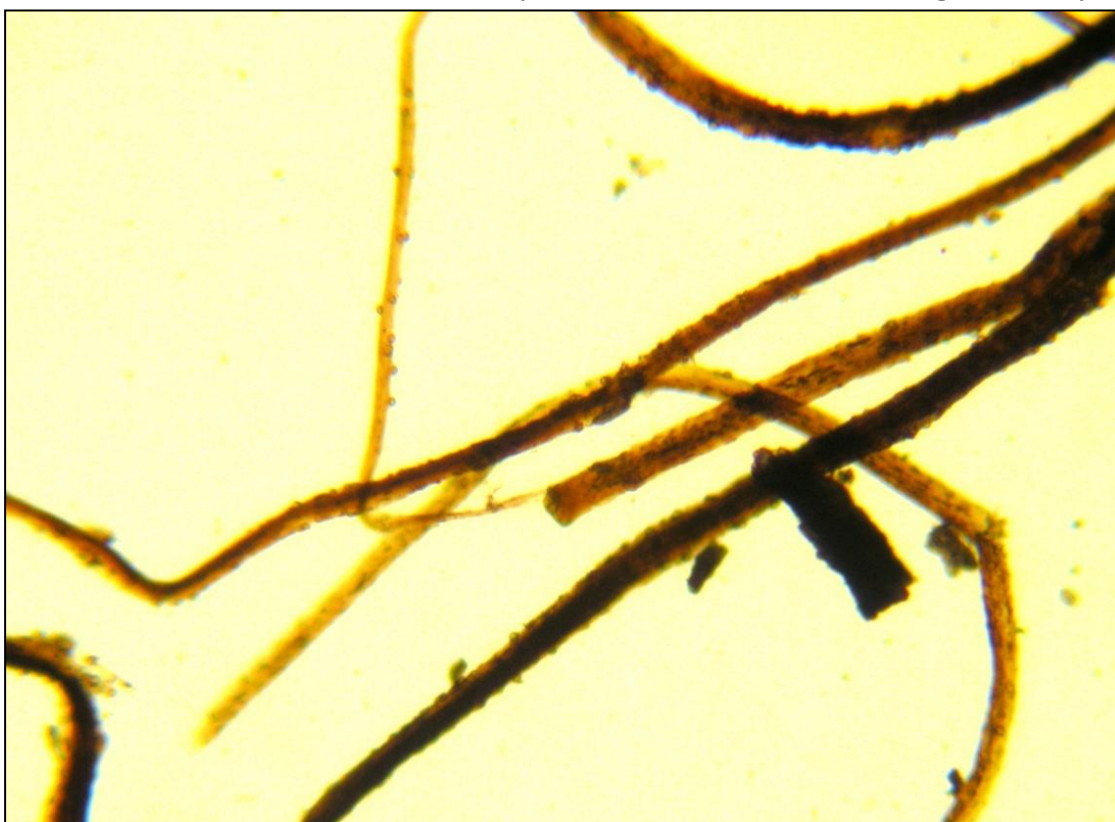


Fig 5.3. Cat. B.2630. Stereo microscopy image showing individual woollen fibres (Nikon P5100 camera; x 50 magnification).

The level of textile preservation of Cat. B.230 allowed for the isolation of a single fibre; although faint, the shape of a visible scale pattern could be observed along the length of the fibre, although due to the image resolution and magnification (Fig 5.1), it was difficult to calculate scale height, scale interval or any changes in scale pattern. There was no discernible medullation. Although white wool breeds dominated much of England throughout the late- to post-medieval period, due to staining in all three case studies, probably through contamination with other organic material, any fibre pigmentation identification using stereomicroscopy techniques alone was difficult.

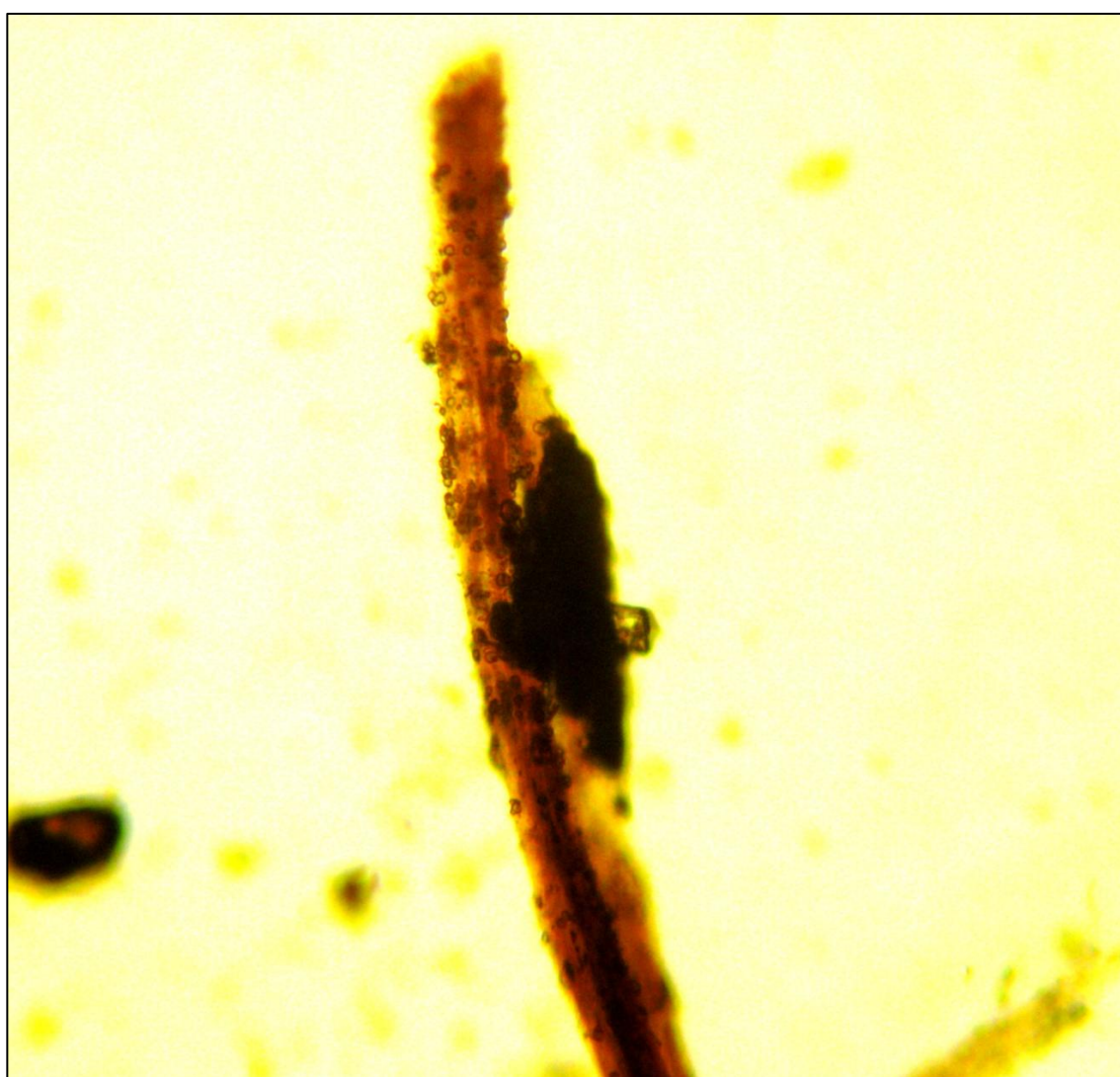


Fig 5.4. Cat. B.2630. Stereo microscopy image showing single woollen fibre (Nikon P5100 camera; x 50 magnification).

By comparison the fibres of Cat B.1365 and B.2630 were both quite degraded and only slight evidence of a scale pattern could be observed; however, both samples did feature varying degrees of medullation (most notably in Figures 5.2 and 5.4). The significance of Cat. B.2630, which features fibres with several different diameters (see Fig 5.3 above and SEM images Figures 5.15 - 5.19 below), is discussed further in 4.3.2. The morphology of the fibres extracted from all three case studies confirms they are of animal origin; with sufficient diagnostic features present to classify them as sheep. As no scale measurement was incorporated in the process of generating the images, it would be difficult to calculate the diameter of any single fibre for comparison with Ryder's classification of sheep breeds (Ryder 1984, 24-27).

5.1.2 Weave type, thread count and twist (SEM analysis).

In order to confirm and ideally improve on the results of the stereomicroscopy analysis (5.1.1 above), a scanning electron microscope (SEM) (Hitachi TM-3000 table top microscope, with a dedicated SwiftED 3000 Energy Dispersive X-ray Spectrometer to facilitate elemental detection), based in the Department of Archaeology, Durham University, was used to obtain high-resolution images of all three case studies. Samples of each of the three case studies were adhered to aluminium stubs using electrically conductive adhesive before being placed into a chamber beneath a column, before the system was put under vacuum. An accelerated high-speed, fine stream of electrons was scanned across the surface of each of the three samples, this process effectively knocking off more electrons from the atoms at the surface, than from the atoms in the valleys of the specimen. The detection of these displaced electrons by a low-energy electron detector allowed for images to be created with a very good depth of field, the morphology of which mimics the surface topography of each sample. The high resolution series of greyscale images (see Figures 5.5 - 5.19), produced at magnifications ranging from x40 – x1800, capture the topographical structure of the surface of each sample. Interpretation of these images has allowed for comments to be made ranging from the type of individual fibres used through to weave structure.

Cloth seal B.230 can be confirmed as a woollen woven cloth of 2:2 twill weave. While both yarns appear to be Z-spun, the warp threads are significantly narrower than the weft (Fig 5.7). Classification as a fine fabric can be confirmed by the thread count c.20 warp x c.20 weft threads per 10mm (the classification is based on Egan's 'Indicators of quality', see Table 3.1).

Cloth seal B.1365 is similarly classified as a fine woollen fabric, as it features c.22 warp x c.22 weft threads per 10mm. However, it is a plain weave. Again both warp and weft threads are Z-spun, although on this occasion they are of similar diameter.

The third case study, B.2630 is notably different to the first two as no discernible weave pattern is visible. Instead we observe a confused mass of interwoven fibres (see also 5.1.5. x-radiograph analysis). Woollen fibres of different diameters are present in the textile, which is indicative of heavily felted woollens typical of Tudor broadcloth.

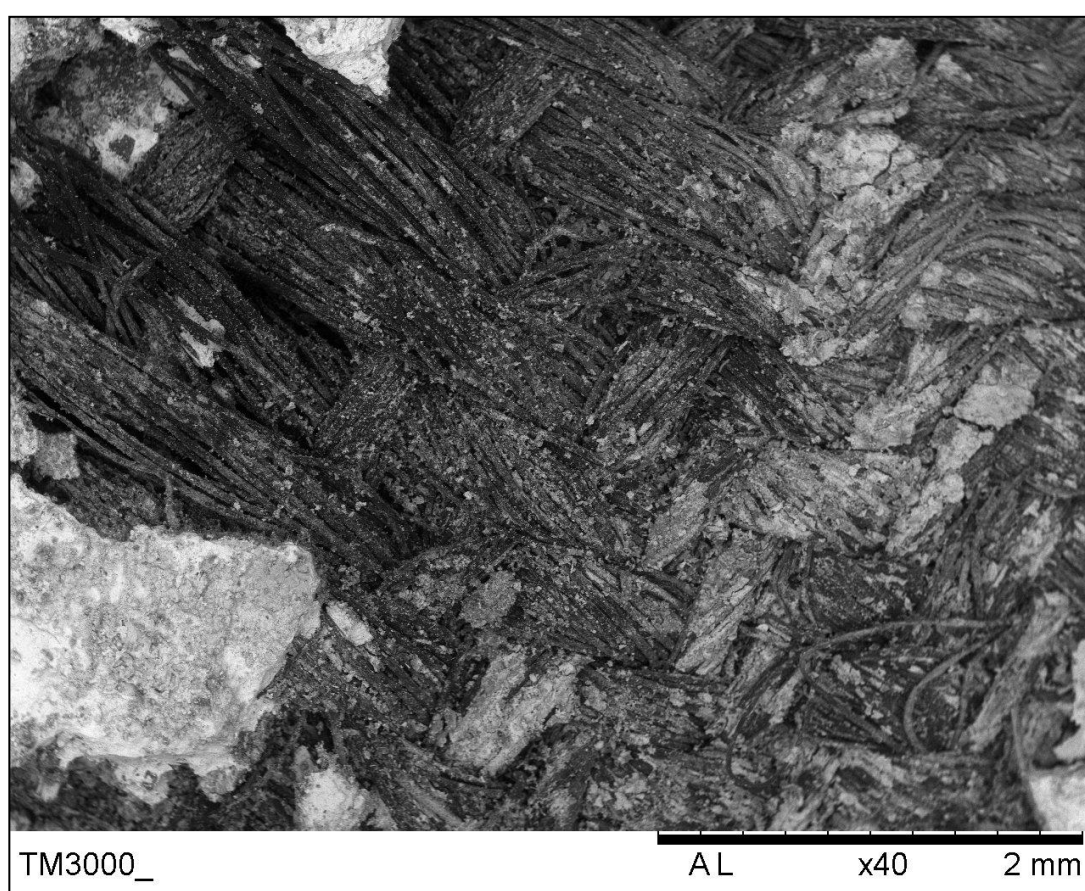


Fig 5.5. Cat. B.230. SEM x40 magnification

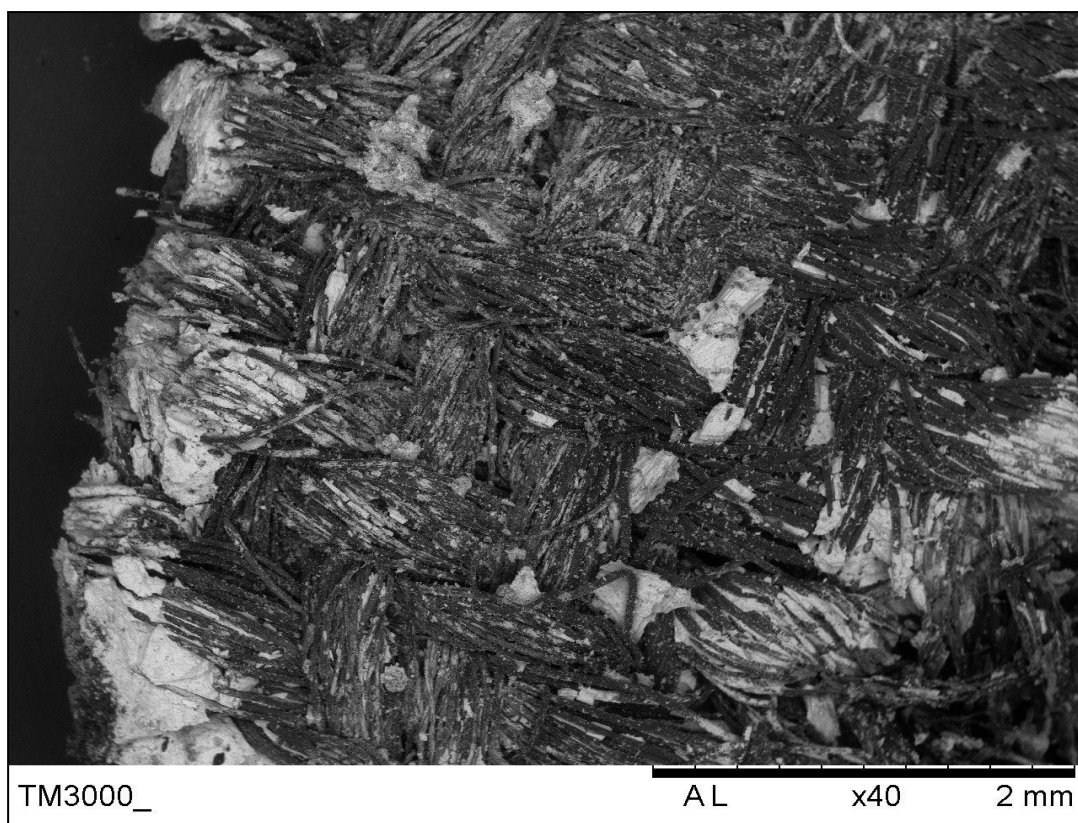


Fig 5.6. Cat. B. 230. SEM x40 magnification

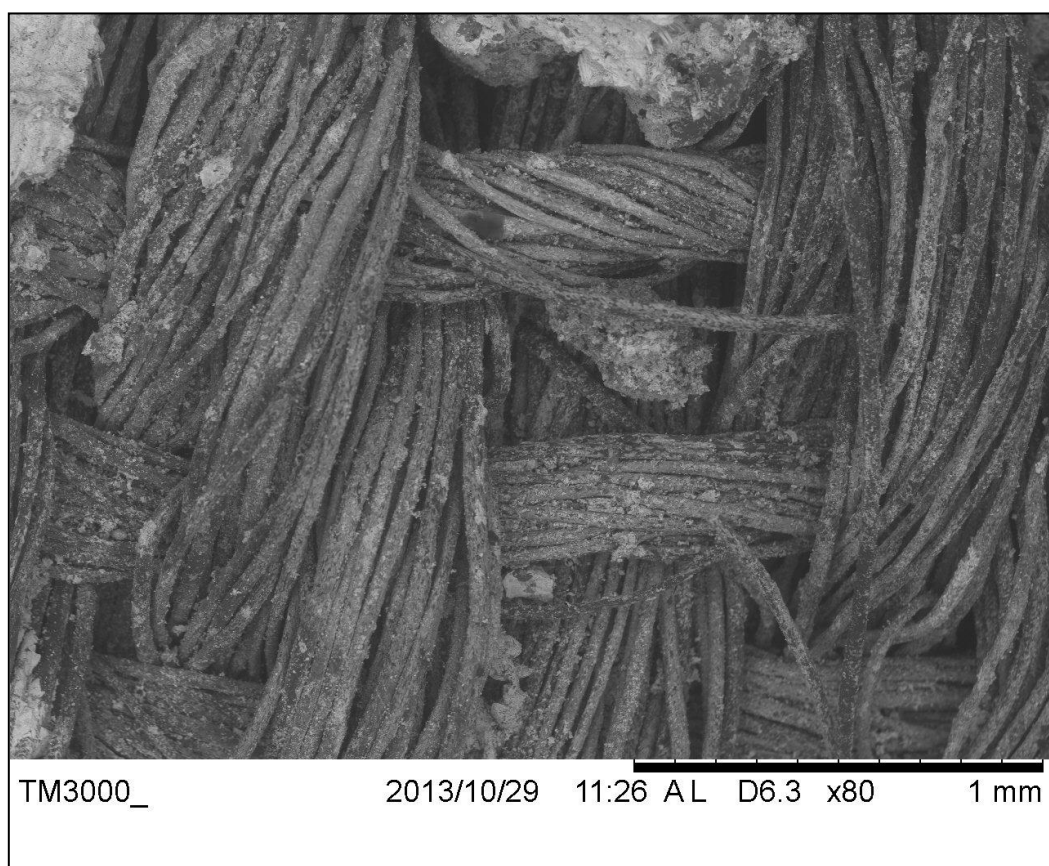


Fig 5.7. Cat.B.230. SEM x80 magnification

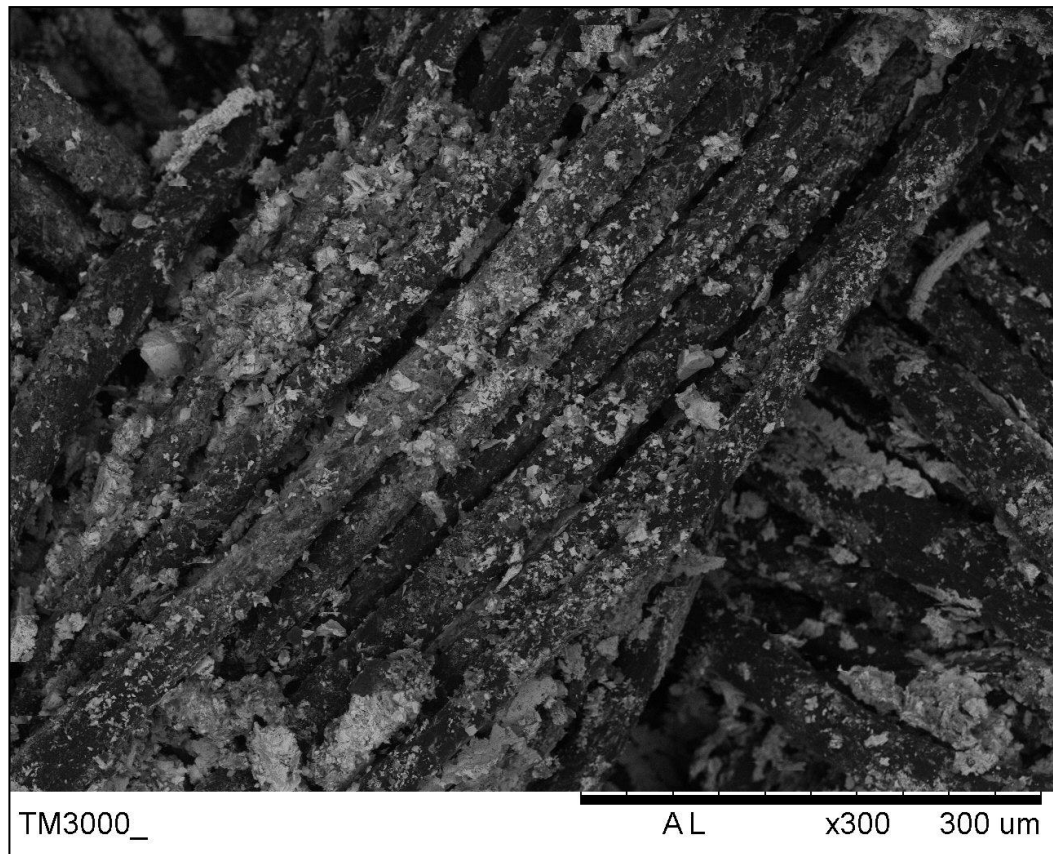


Fig 5.8. Cat. B.230. SEM x300 magnification

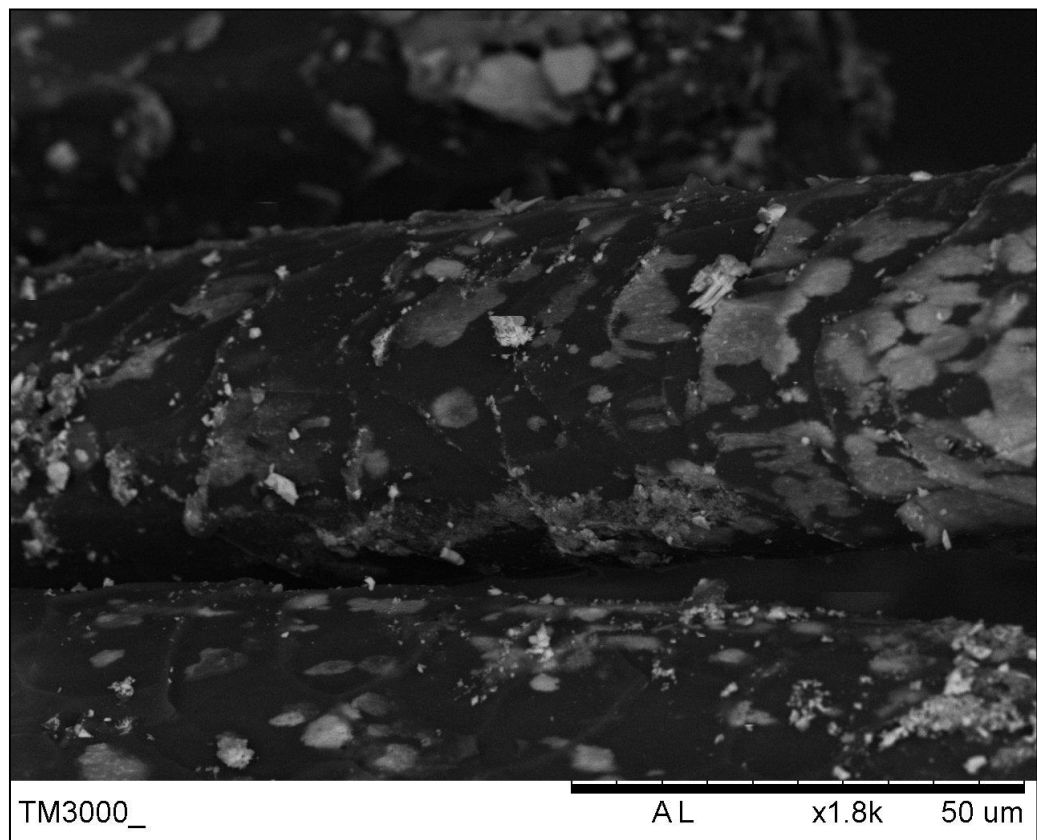


Fig 5.9. Cat. B.230. Scales on wool fibre. SEM x1800 magnification.



Fig 5.10. Cat. B.1365. SEM x40 magnification

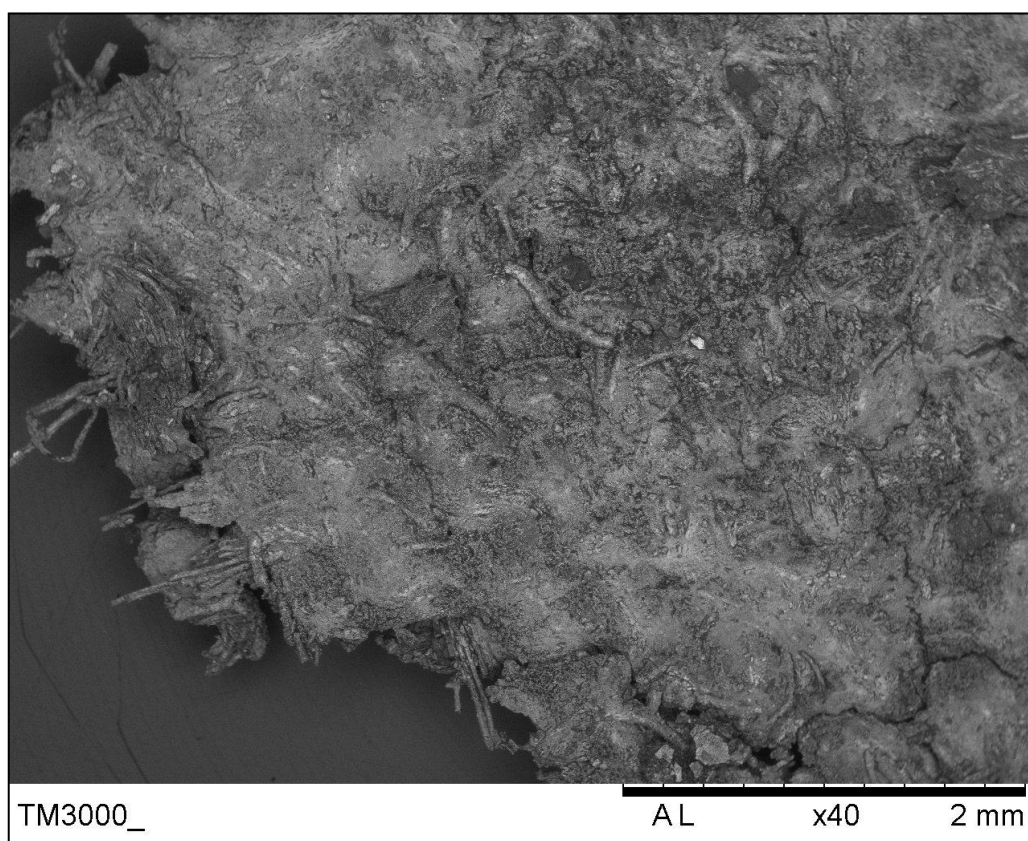


Fig 5.11. Cat. B.1365. SEM x40 magnification

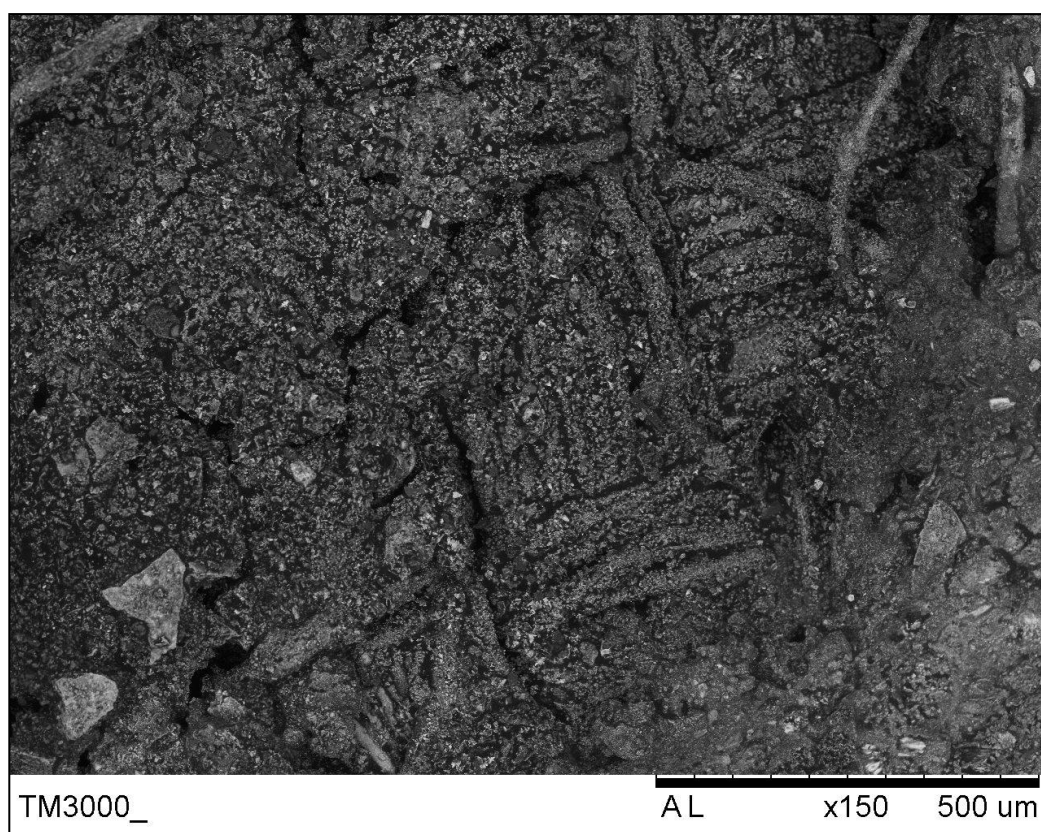


Fig 5.12. Cat. B.1365. SEM x150 magnification

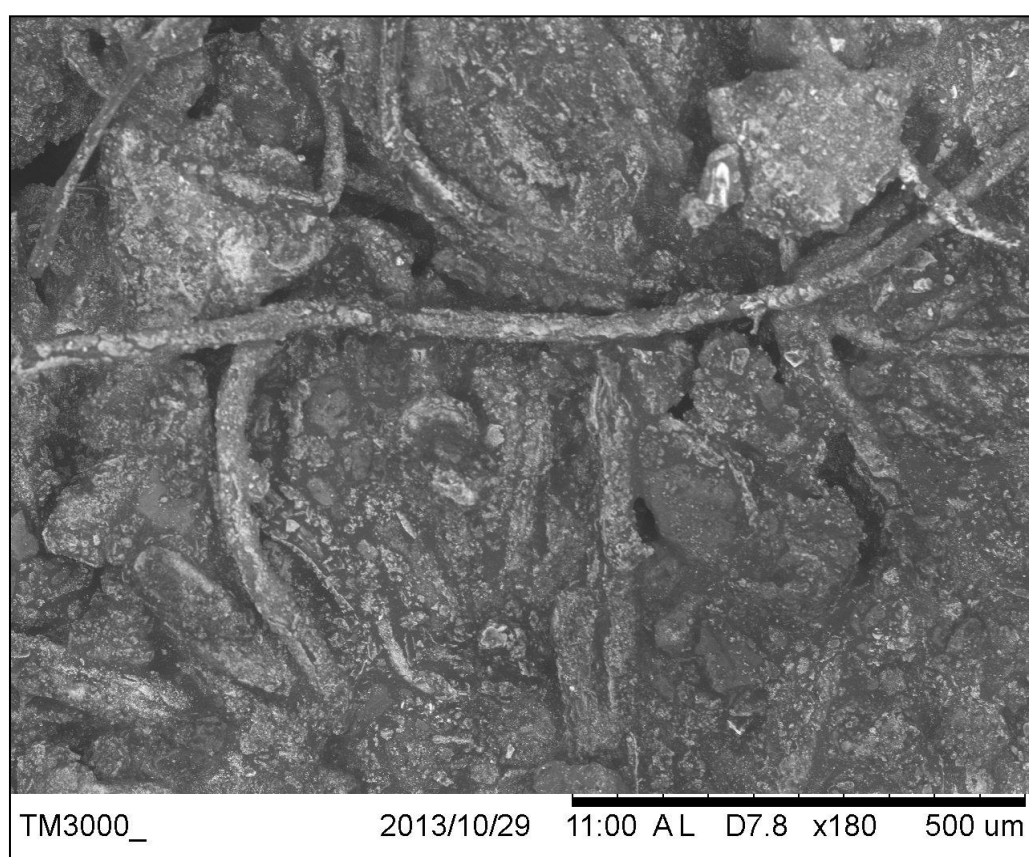


Fig 5.13. Cat. B.1365. SEM x 180 magnification

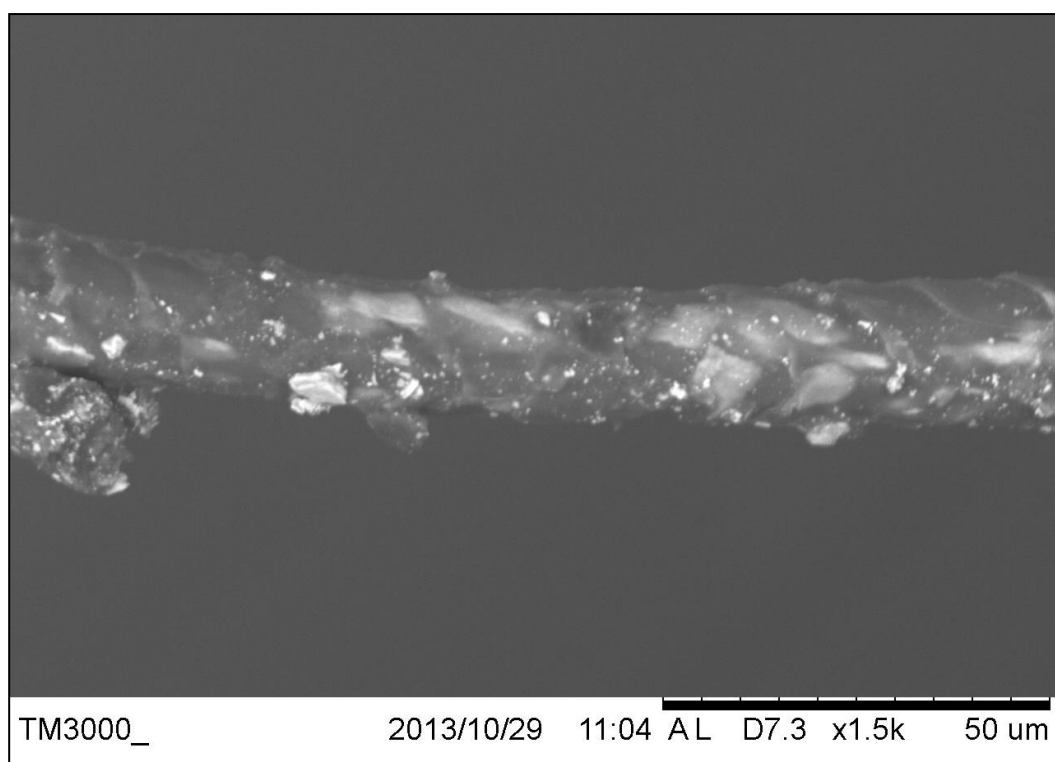


Fig 5.14. Cat. B.1365. SEM x1500 magnification. Scales on single wool fibre

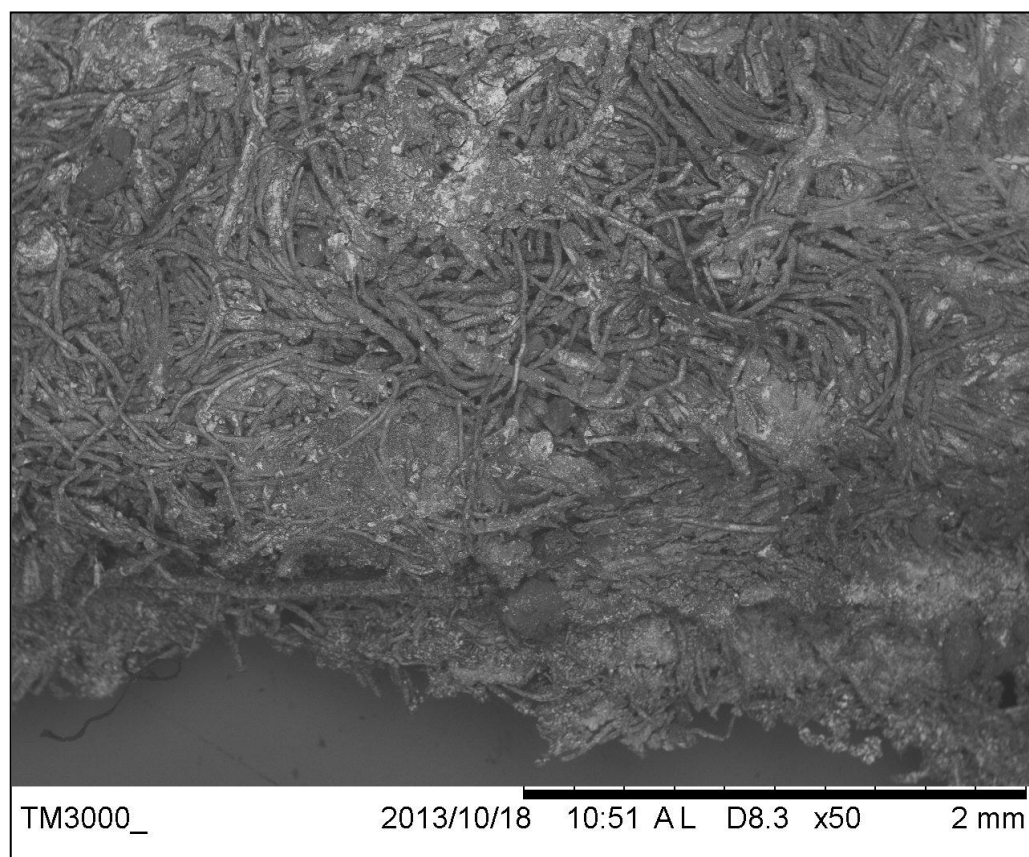


Fig 5.15. Cat. B.2630. SEM x50 magnification

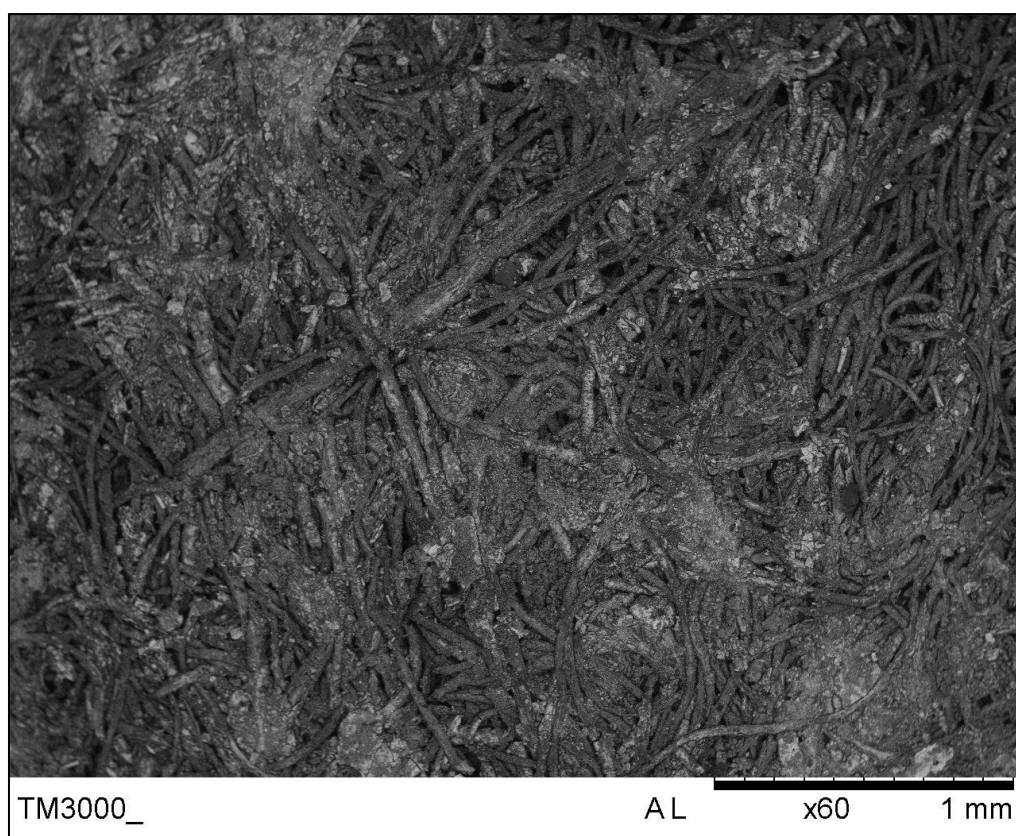


Fig 5.16. Cat. B.2630. SEM x60 magnification

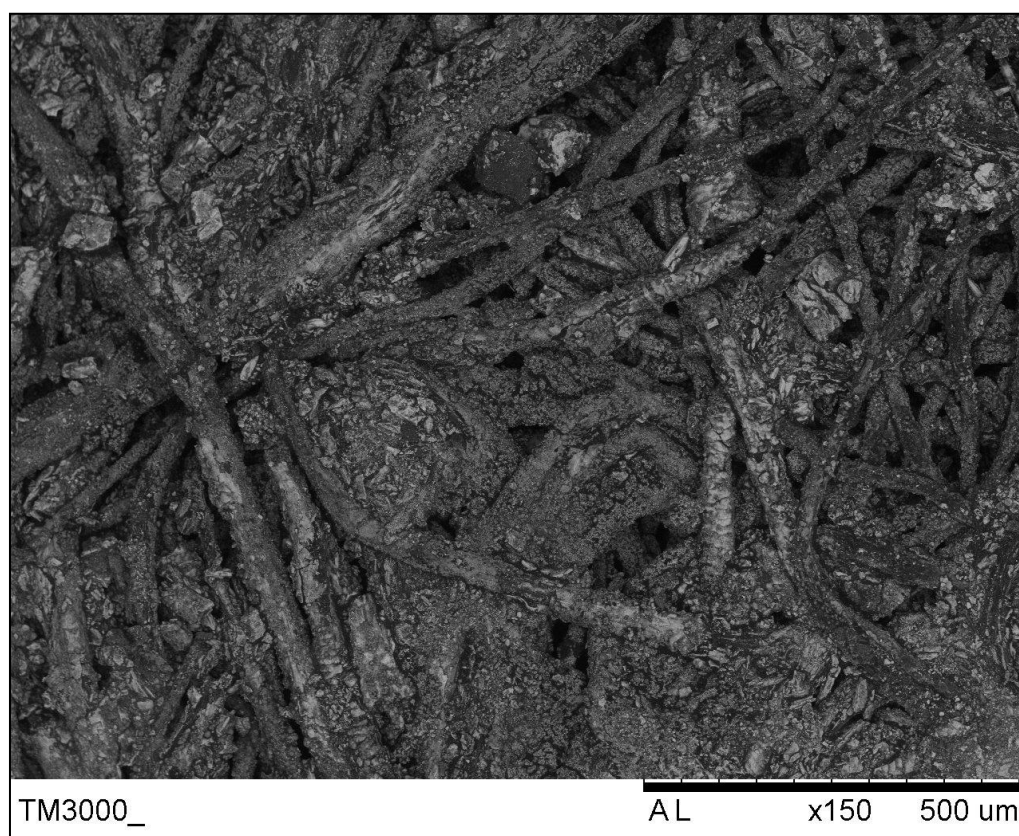


Fig 5.17. Cat. B.2630. SEM x150 magnification

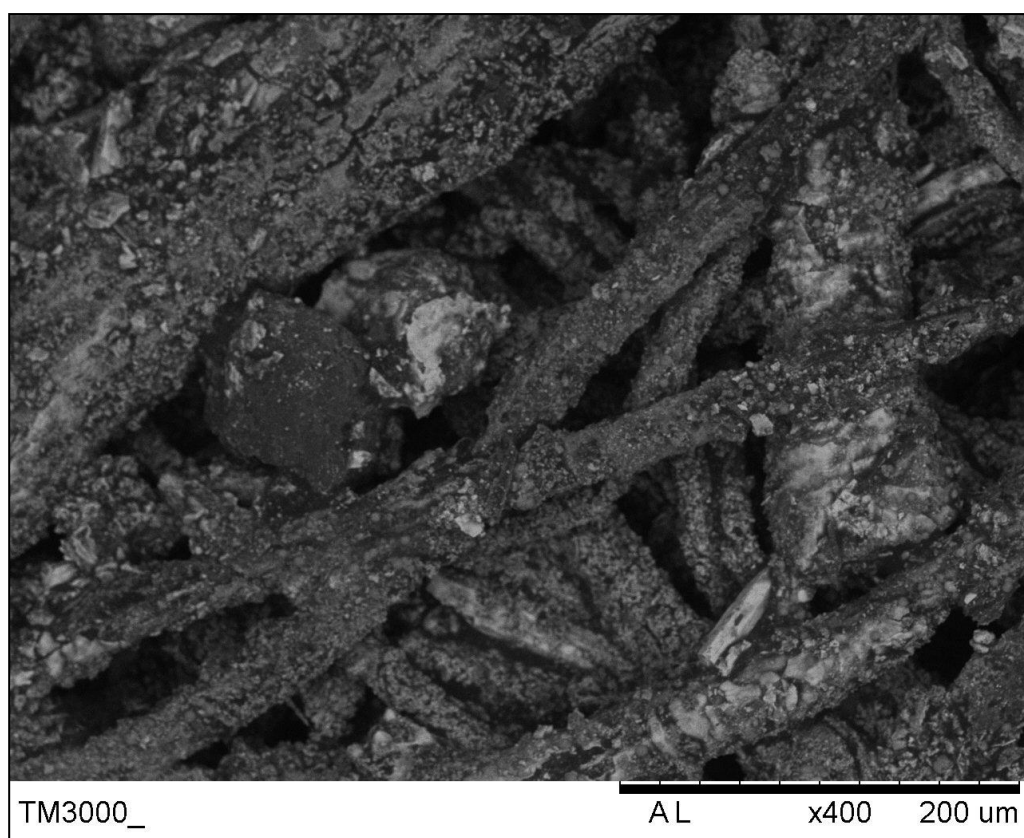


Fig 5.18. Cat. B.2630. SEM x400 magnification

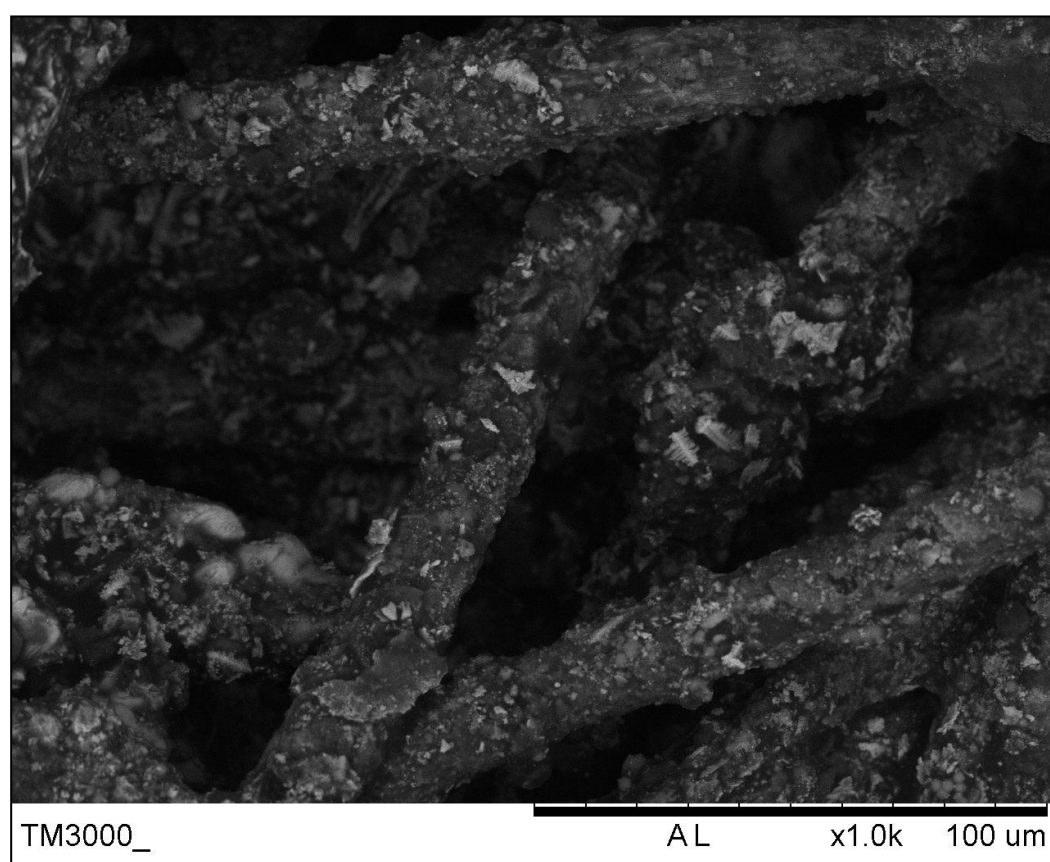


Fig 5.19. Cat. B.2630. SEM x1000 magnification

5.1.3 UV-Visible spectrophotometer dye analysis, analytical method (University of Durham).

Stained by the burial environment various shades of brown or black, the three case study textile samples displayed no visible evidence of their original colour. However, this did not mean that traces of the original dyes were not present. As discussed in section 4.2.5, procedures involving spectroscopic, solvent and chromatography analysis have already been used successfully to identify dyes that had not been originally visible to the naked eye in archaeological woollen textiles. The initial technique chosen to attempt to extract dyes from the Durham case studies was based on a four-stage procedure originally developed by Whiting and Taylor and outlined [in a report published in *Dyes in History and Archaeology* 7,] by (Penelope) Walton (1988, 14-15). In summary, samples of all three case studies were heated to 90 degrees in a Pyridine/distilled water mix for 20 minutes before then being cooled and further diluted, as per stage one of the four-part procedure. The filtered samples were then placed into a Cary 50 UV-visible spectrophotometer, set to scan at a wavelength of 300-900 nm. In addition to the three case studies, known samples of indigotin, madder and a blank were also put through the same stage-one sampling procedure. The results of the UV-visible analysis were not as promising as first hoped, as only the known sample pre-dyed with indigotin (with a maximum absorption of 620 nm) was successfully extracted in Pyridine (see chart 5.1). Stage-two of the procedure, would have required that the three case study samples were then mixed with diethyl ether; however, before this second stage was commenced an invitation was received from Dr Anita Quye, based at The Centre for Textile Conservation and Technical Art History at the University of Glasgow, to use the Chromatography Laboratory to undertake Ultra-High Performance Liquid Chromatography Photodiode Array (UHPLC-PDA) analysis of the Durham textile samples (see section 5.1.4 for full analytical method).

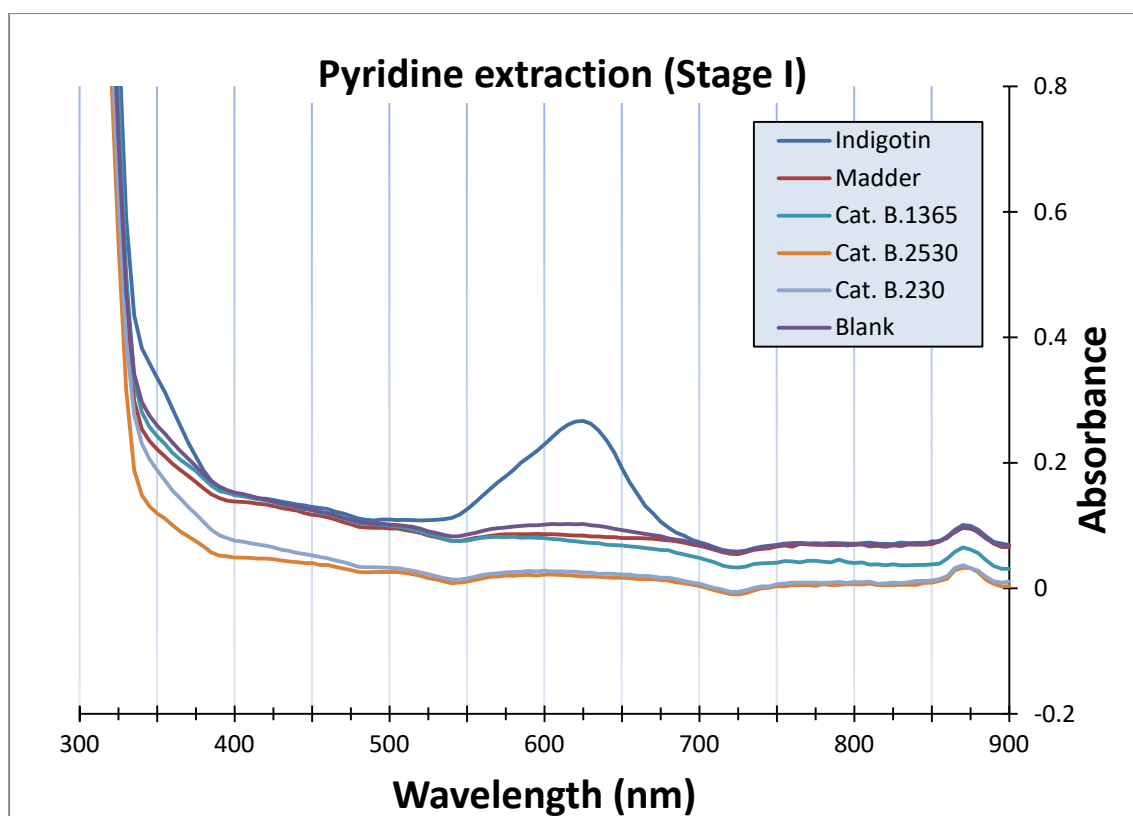


Chart 5.1. Stage I, Pyridine extraction.
Cary 50 Bio UV-visible spectrophotometer.

5.1.4 Ultra-High Performance Liquid Chromatography - Photodiode Array, dye analysis, analytical method (University of Glasgow)

As highlighted above, Whiting, Harvey and Walton, utilising spectroscopic, chromatographic and solvent techniques, successfully extracted dyestuffs from archaeological textiles. However, due to the unusual deposition conditions in which the cloth seals were found, a more sensitive system of detection, such as those at the facilities at The Centre for Textile Conservation and Technical Art History, University of Glasgow, would be more likely to detect the small amounts of surviving dyestuffs. The analysis, which was performed in May 2015, took place in the Centre's Chromatography Laboratory under the guidance of Dr Anita Quye and PhD student Jing Han; sample summary reports: 2015.001.1 (B.1264), 2015.001.2a and 2015.001.2b (B.230) and 2015.001.3 (B.2630) were recorded by PhD student Julie Wertz.

Four samples were prepared from the three case studies; this included one sample each from B. 1264 and B.2630, and two from B.230 – one taken from an area of the textile stained brown, labelled B.230a, and one from an area of the textile which appeared to display a thin line of darker thread, labelled B.230b. This was done to determine if textile B.230 had been woven with different coloured warp and weft threads. The removal of the samples was performed with the aid of a digital microscope (Fig 5.20), before they were placed into a 1 ml flat-bottom glass vial. The extraction of any vat or direct dyes required that 100 µl of dimethyl sulfoxide (DMSO) was added with a micropipette to each individual vial; they were then heated in a Talboys block heater to 80 °C for ten minutes. Each DMSO extract was then transferred, using a disposable tipped micropipette, into a vial insert for retention. The second step of the extraction process required an aliquot of 100 µl hydrochloric acid solution, comprising 37% hydrochloric acid/methanol/water (2:1:1 v/v/v), was then added to the remaining fibre samples in each vial. These samples were then heated for a further 10 minutes at 100 °C before then being evaporated under vacuum to dryness using a BUCHI R-215 Rotavapor. The DMSO fraction (which had been retained earlier) was then added to these dried extracts, effectively recombining the extracts from the first two steps. This reconstituted extract was then filtered, first by an Eppendorf Minispin micro-centrifuge, incorporating a 0.4 µm Millipore centrifugal filter, and then through a 0.2 µm Angilent Premium syringe filter. Typically 20 µL reconstituted hydrolysate was obtained from each extract, however only 4 µL would be required to be injected into the UHPLC column.

The UHPLC analysis was performed as previously published by Serrano, et al., in *Journal of Chromatography A*. (2013); Han 2016, using a Waters Acquity™ H-class system (Waters Corporation, Milford, MA, U.S.A.) equipped with a photodiode array detector. A volume of 4 µl, taken by autosampler from each of the four extracts was injected. Separation tests were carried out using a Waters Acquity® UHPLC BEH C₁₈ (1.7 µm 2mm x 150mm) shield column. The solvents methanol and formic acid were combined with water to form a solution suitable for the gradient elution programme. For qualitative evaluation of the results

chromatograms with a range of 190 to 800 nm were produced and these were examined at 254 nm (see Figures 5.21, 5.23, 5.25, 5.26, 5.28 and 5.30 below).



Fig 5.20. Careful extraction of sample. x200 magnification (Cat. B.1365), (Image: Dino-Lite Premier Digital Microscope).

The results of the UHPLC-PDA analysis confirm that colourants relating to dyes were successfully extracted from all three cloth seal case studies. The results, presented in the UV-visible spectra and UHPLC-PDA chromatograms below (see Figures 5.21-5.30) demonstrate how the natural dye indigotin was identified in cloth seal B.230 (a+b) at 21.82 mins and extracted at 350 nm.

Cloth seal B.1365 contained a Nowik type A component (a characteristic component of redwoods); detected at 14.62 mins and extracted at 254 nm; and the dyes alizarin (detected at 20.59 mins with maximum absorption at 429.5 nm), indigotin (detected at 21.83 mins with maximum absorption at 615.8nm) and purpurin (detected at 24.36 mins with maximum absorption at 481.6nm), were detected in cloth seal B.2630.

Cat. B.230a (brown) Eighteenth-century cloth seal

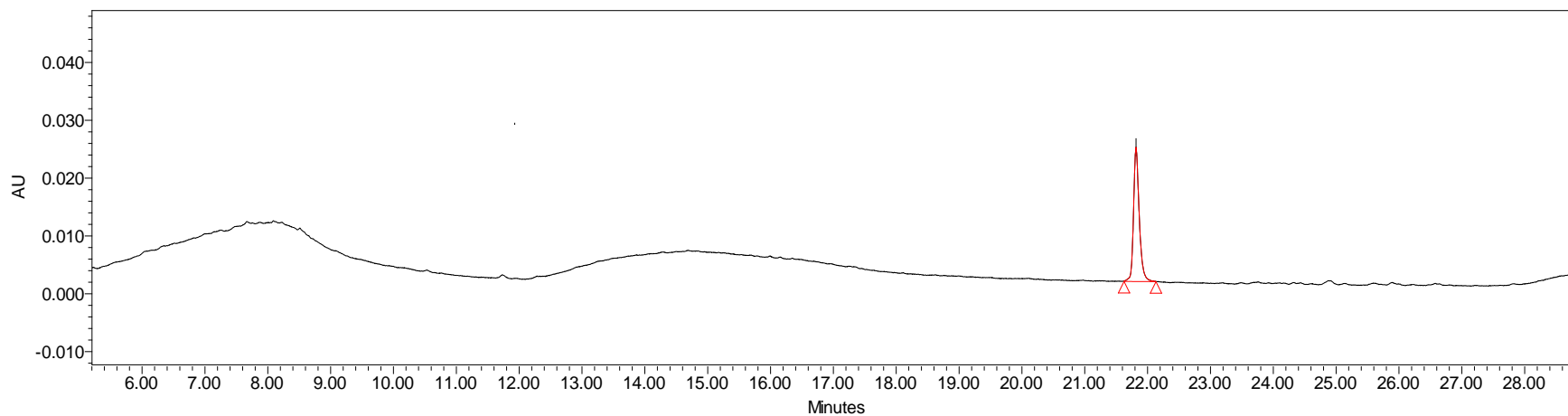


Fig 5.21. Cat. B.230a. UHPLC-PDA chromatogram (extracted at 350 nm)

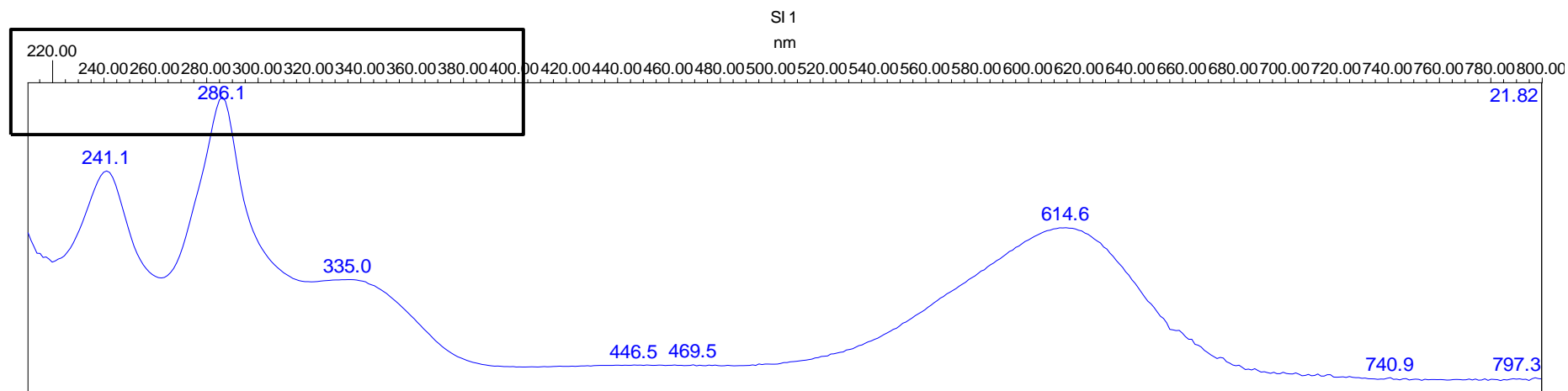


Fig 5.22. Cat. B.230a UV-vis spectra Indigotin is identified at 21.82 min.

Cat. B.230b (dark) Eighteenth-century cloth seal

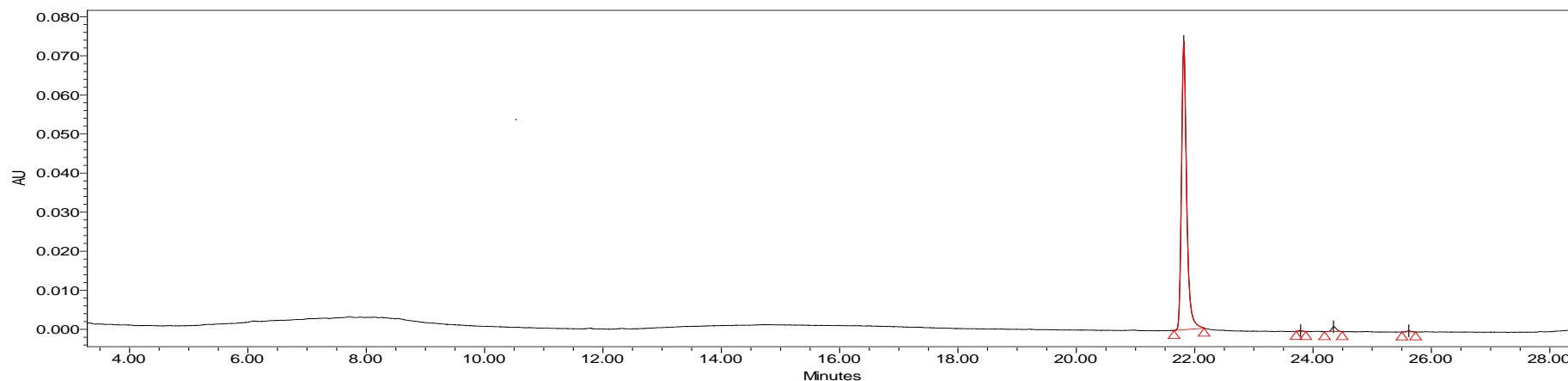


Fig 5.23. Cat. B. 230b. UHPLC-PDA chromatogram (extracted at 350nm)

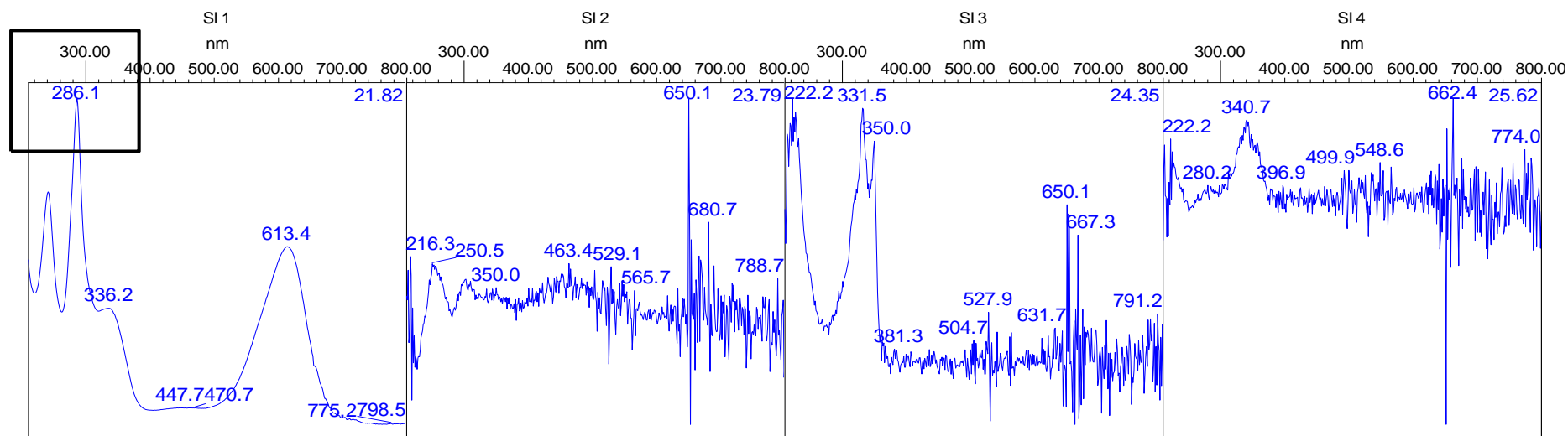


Fig 5.24. Cat. B.230b. UV-vis spectra. Indigotin is identified at 21.82 min.

Cat. B.1365 Seventeenth-century continental cloth seal

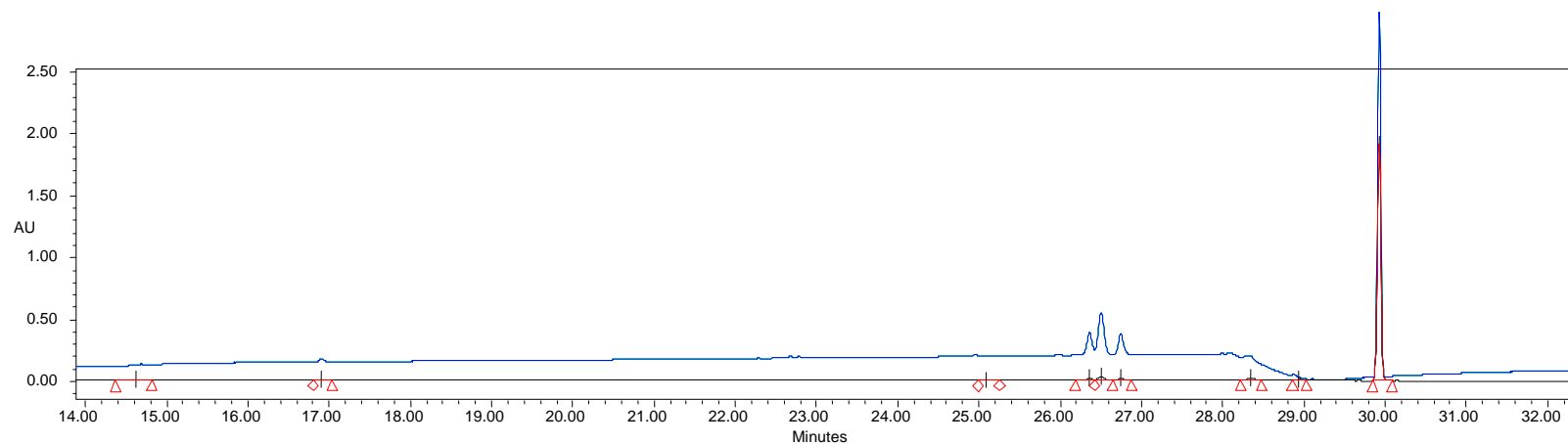


Fig 5.25. Cat. B.1365. UHPLC-PDA chromatogram (black-extracted at 254 nm; blue-maxplot)

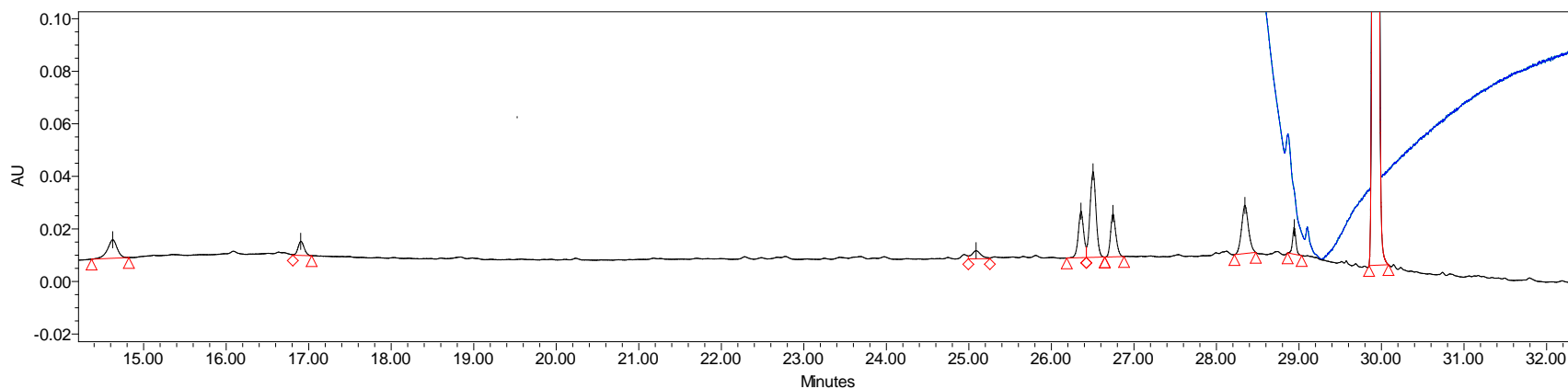


Fig 5.26. Cat. B.1365. UHPLC-PDA chromatogram (black-extracted at 254 nm; blue-maxplot) (zoomed- in).

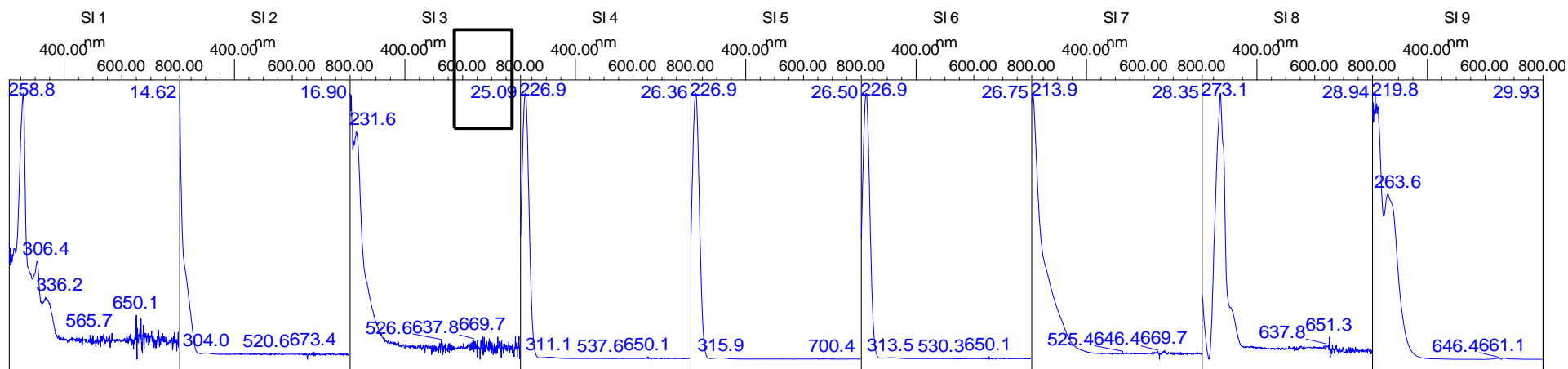


Fig 5.27. Cat. B.1365. UV-vis spectra. Nowik type A component, a characteristic component for redwoods, is detected at 14.62 min.

Cat. B.2630 Sixteenth-century London Dyers' Company cloth seal

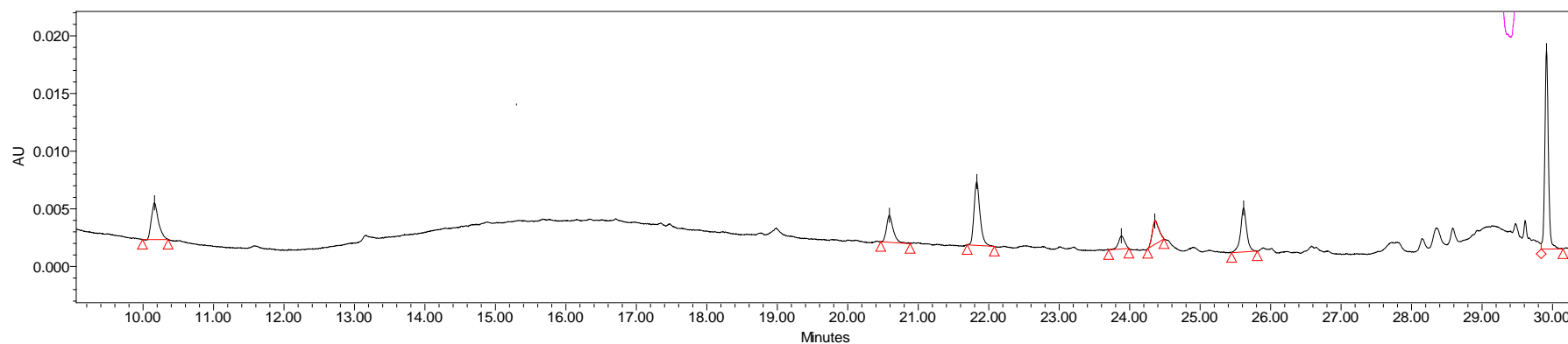


Fig 5.28. Cat. B.2630. UHPLC-PDA chromatogram (extracted at 350 nm)

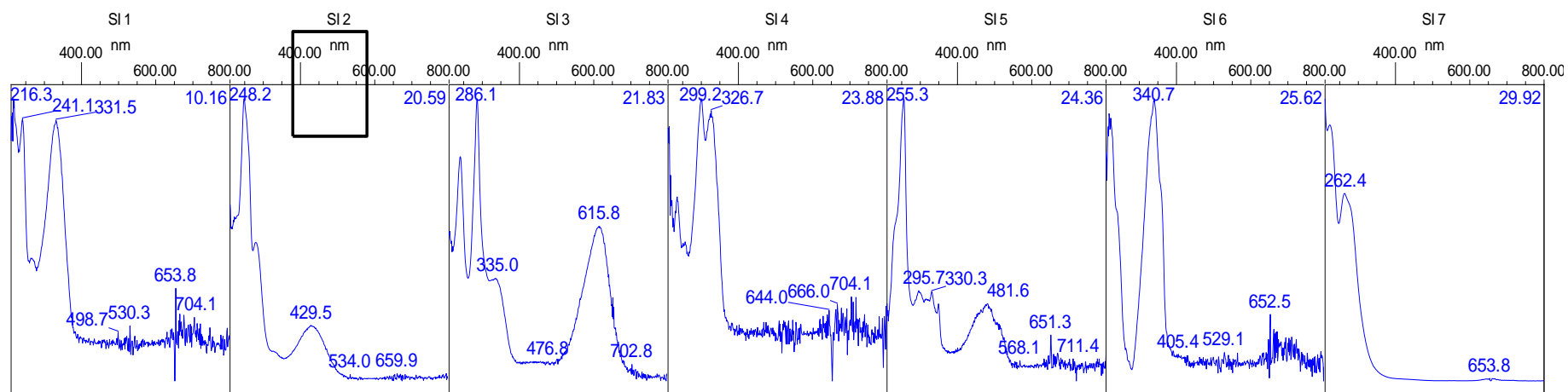


Fig 5.29. Cat. B.2630. UV-vis spectra. Alizarin (20.59 min), indigotin (21.83 min) and purpurin (24.36 min) are detected.

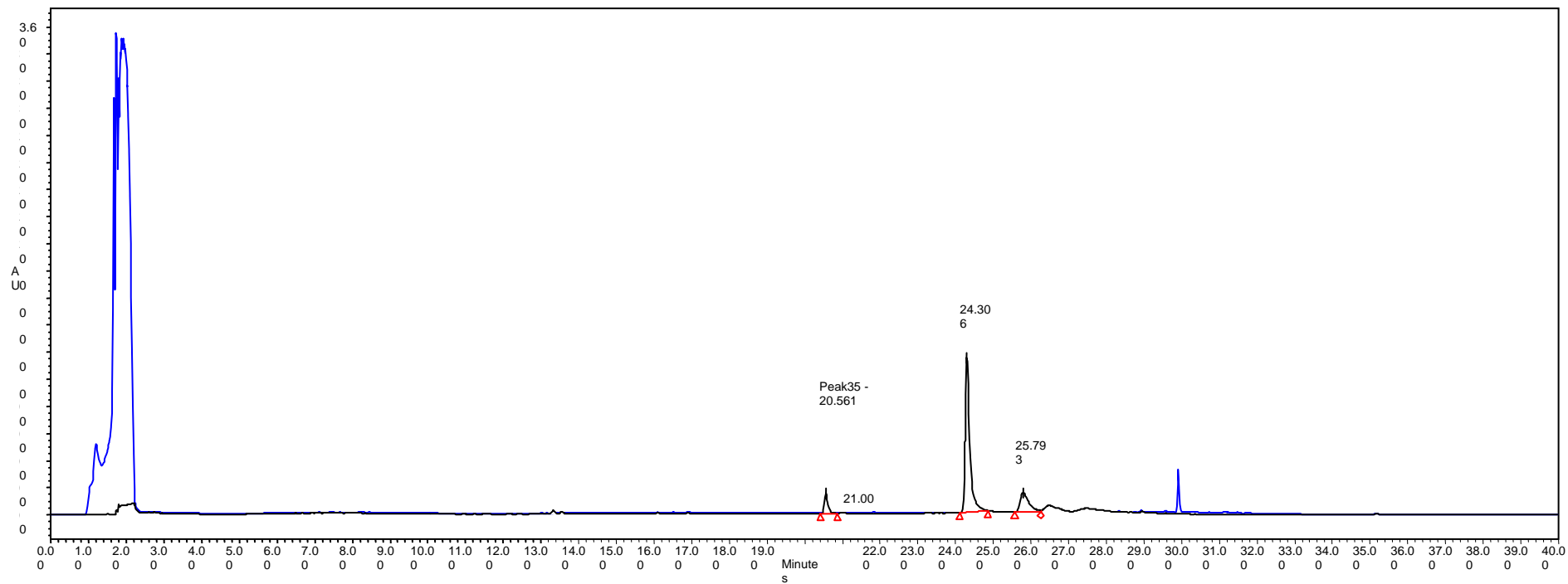


Fig 5.30. Comparison of chromatograms of standard madder (*Rubia cordifolia*) dyed wool (black) and sample B.2630 (blue) (extracted at 254 nm).

5.1.5 X-radiography analysis

Radiographic investigation of the three textile case studies was undertaken to explore the validity of comments made by Dr Katrin Kania (freelance textile archaeologist and academic publisher) and Frances Lennard (Senior Lecturer in Textile Conservation at Glasgow University) that the scrap of textile from cloth seal B.2630 was perhaps a heavily felted woollen: discussions had centred on the fact that no obvious weave pattern was visible (Kania, 2015, pers. comm., 28 April; Lennard, 2015, pers. comm., 26 May). In the Department of Archaeology, Durham University, a radiograph was taken of the textile using a Hewlett-Packard 43806 X-Ray System, Faxitron Series (50 KVP, 6 mA, 120s), with AGFA Structurix D4 Pb film; comparison radiographs were also taken of the other two case studies. High-resolution digital images of the radiographs were then taken with a Nikon D700 camera, these in turn were then modified with Adobe Photoshop software to produce a composite image showing both negative and positive radiographs, see Figures 5.31-5.33 below. Careful analysis of these modified radiographs established that the weave pattern and thread count can be determined from archaeological scraps of textiles, but that it is not possible to identify fibre types, or indeed the structure of yarn. Although some irregular and non-uniform thickening of the yarn could be observed, these features may be the result of different spinning and weaving methods (O'Connor and Brooks 2007, 326). While areas of thickening or bunching of threads, particularly around the rivet areas, can be observed, there is no evidence that any of these three cloth seals were originally fixed over areas of selvedge.

The radiograph evidence reinforces both the stereomicroscopy and SEM findings as distinctive weave patterns are again observed in both Cat. B.1365 and Cat. B.230 (discussed in 4.3.2 above); however, the structure of Cat. B.2630 appears to be markedly different. With this example, as it is not possible to distinguish separate threads of warp or weft amongst the jumble of interwoven fibres, it would therefore be reasonable, based on all of the available analysis, to come to the conclusion that B.2630 is in fact a heavily felted woollen. Heaton (1920, 260-261) describes how such a finish is achieved. The process, which is

known as felting, is due to the felting property of wool whereby under heat, moisture and pressure, individual fibres or scales hook on to each other, the individual fibres becoming interlocked and entangled to such an extent that the fibres comprising warp and weft are indistinguishable. The resulting fabric, which is known as a woollen, features a comparatively rougher texture, is thicker (following wetting/shrinkage) and is firmer and stronger than woven cloth.

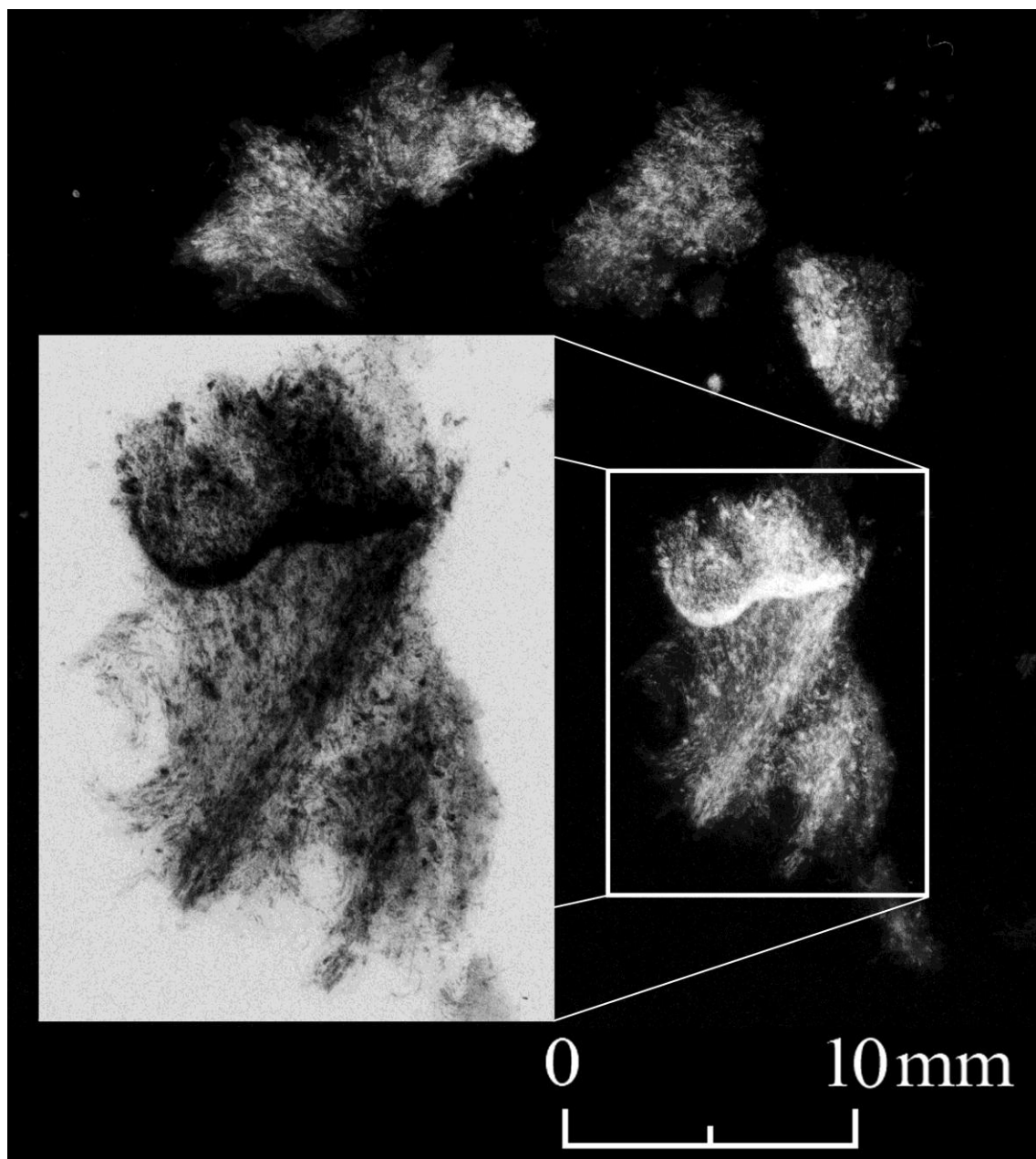


Fig 5.31. Composite x-radiography image of Cat. B.2630
(positive image insert).

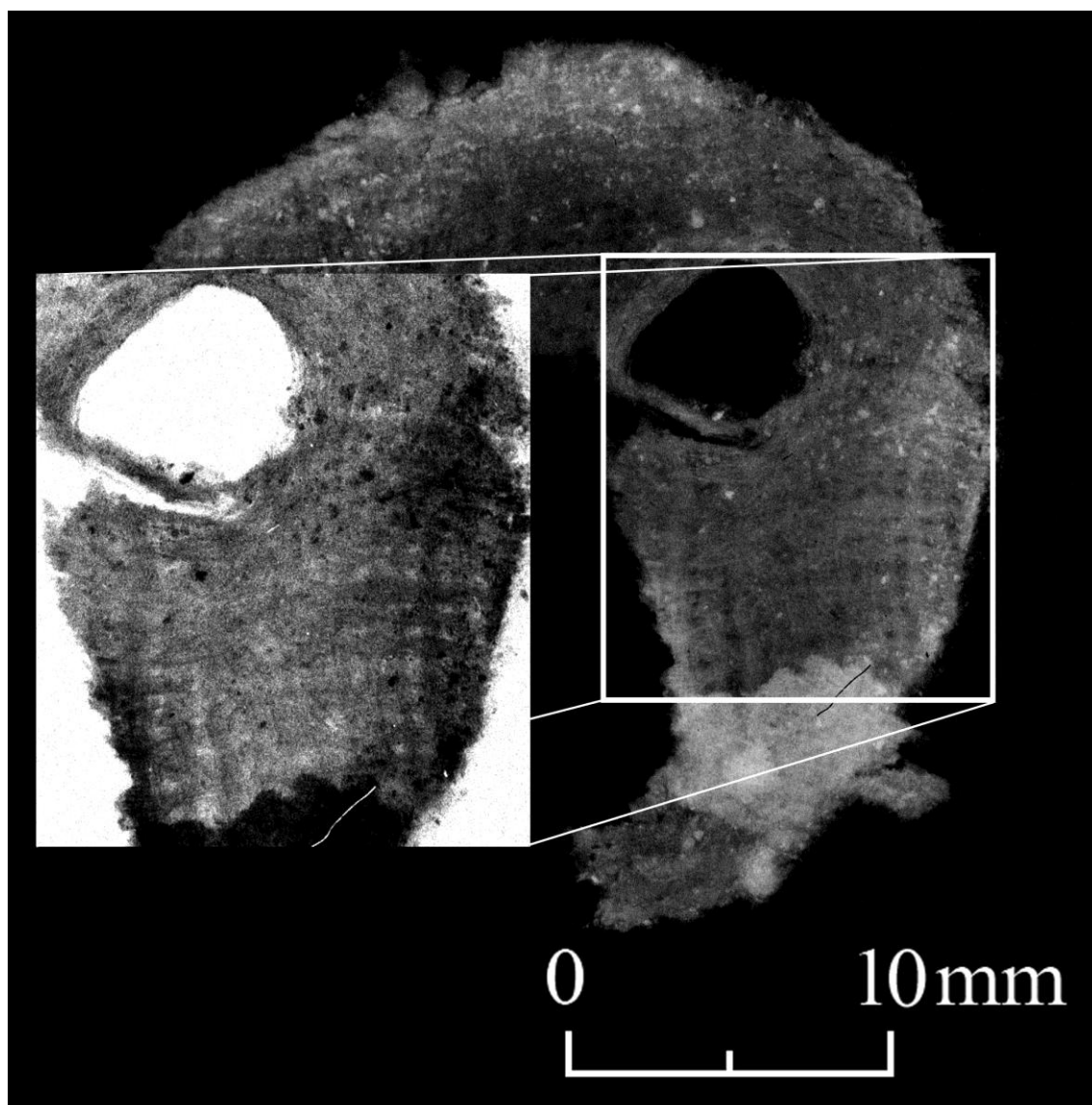


Fig 5.32. Composite x-radiography image of Cat. B.1365
(positive image insert).

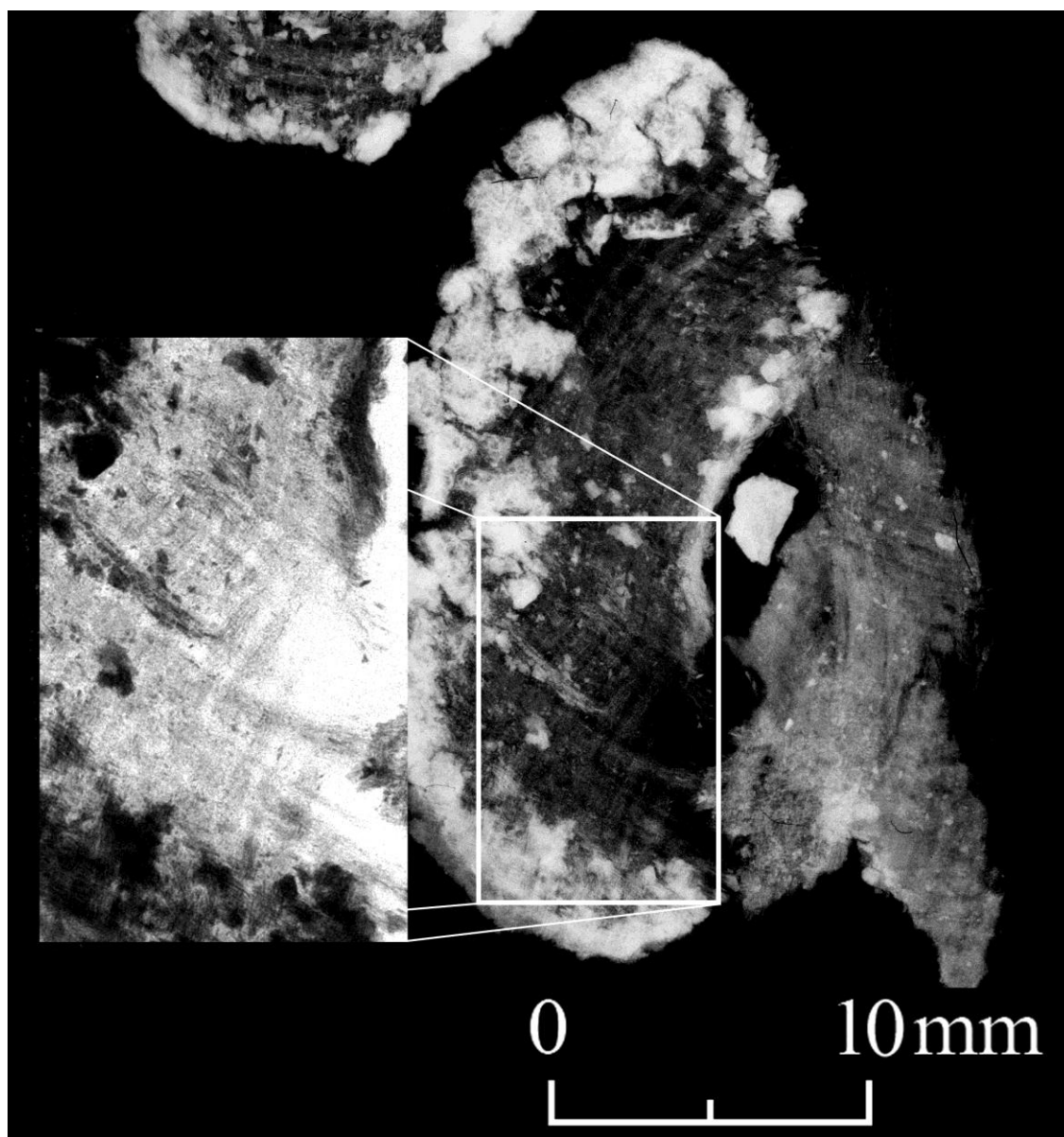


Fig 5.33. Composite x-radiography image of Cat. B.230
(positive image insert).

5.1.6 Elemental maps

Elemental maps were produced for all three case studies to identify if a mordant (or combinations of mordants), such as aluminium, chromium, iron, tin or copper ions had been used to fix natural dyes to the woollen fibres of the textile during the dyeing process. It also sought to show the location of minerals, such as iron sulphides derived from the burial environment. The elemental maps were produced using the same SEM analytical Hitachi TM-1000 table top microscope as detailed above, utilising a SwiftED-TM EDX system (Hitachi High-Technologies). Elemental mapping at a microstructural level by SEM incorporating a silicon drift detector can be used to achieve full compositional mapping (Newbury and Richie 2013, 973). Given the likely dates that the cloth in all three case studies was woven, along with the presence of the mordant dyestuffs madder and redwood and the vat dyestuffs woad and indigo, identified in the UHPLC-PDA analysis detailed above, it would not be unreasonable to expect the presence of chemicals that were once used to bond dye molecules to fibres or to improve both colour and lightfastness (see reference to the dyer James Haigh above: alum was added to improve the 'lustre' of textiles dyed with the vat dyes woad and indigo). Of particular interest would be any traces of aluminium, iron or tin salts as metal ions from these salts are able to form complex compounds with the hydroxyl, the amino and the carboxyl groups of mordant dyestuffs (Hofenk de Graaff 2004, 14).

The results of this non-destructive analysis demonstrate how the production of elemental maps is a useful analytical technique to identify the chemical composition of the surviving scraps of archaeological textiles, recovered from a watery context. A meaningful picture of the element distribution of each surface was constructed and this provided information about the elemental composition of each textile sample (see Figures 5.34 - 5.36). Where any chemical elements were detected and the elemental distribution corresponded with the actual position of the fibres within the structure of the textile, then an assumption was made that these chemical concentrations were at one time integral with the fibre. Where chemicals were determined but there was no correlation with the visible structure of the textile, then no inference could be made that these 'background' readings

were ever linked to the original dyeing process. However, their very presence does leave open a possible interpretation that they once were.

All three case studies revealed concentrations of lead and sulphur on or in the threads of the textile. The occurrence of sulphur in all three samples is likely to be through contamination by sulphide ions present in the anaerobic conditions of the find site, formed as a result of freshwater strains of sulphur-reducing bacteria, such as *Desulfovibrio vulgaris* (Postgate 1979, 34) which reduce sulphates to sulphides (SO_4^{4-} to S^{2-}) (Caple, 2015, pers. comm., 20 September). The correlation of lead and sulphur in Figures 5.34 - 5.36, shows that lead sulphide mineral is present in the structure of the textile. The results for those metal ions associated with mordant use are mixed, as both background (or random) and concentrated levels were detected; for example, levels of aluminium (probable evidence of the use of the mordant alum) were detected in concentrations related to the structure of the fibre in B.230, partially related in B.2630, but only at background levels on B.1365. As discussed above, the North Yorkshire coastal alum industry was producing alum from c.1595 to the mid-nineteenth century; during the mid-eighteenth century some 600 ton were being exported worldwide annually. As this time frame encompasses all three case studies, then it would be reasonable to expect that any aluminium detected in concentrations correlating to the positioning of the fibres in the three case studies could be linked to Yorkshire's alum. Based on this assumption there is strong evidence that this is the case for both B.230 and B.2630; although the random appearance of aluminium in B.1365 (Fig 5.35) suggests that the aluminium is no longer concentrated in the dyed fibre, therefore, as it is not related to the fibre structure it cannot have any association with alum. An alternative explanation for the presence of aluminium could be associated with burial contamination. Aluminium is also present as a component of clay and clay particles would be expected to be present as particles which covered the samples as they lay submerged in the River Wear for some 500 years. However, given that both random and concentrated traces (which correlated to the position of the fibres) were detected, this seems unlikely.

The presence of iron and copper in samples B.2630 and B.230 shows some slight correlation with the positioning of the fibre (B.1365 had background levels of iron but no copper), and could be present for a number of different reasons. Explanations for the presence of these metals include: the use of mordants such as the protosulphates of iron (green copperas) and copper (blue copperas), during the dyeing process, by exposure to the alloys of copper from which dyeing vats were often made and in which the dye solutions were heated, or simply by contamination from soil or river water. As discussed above, textual evidence to support the use of these mordants exists in abundance: for example, in 1692 the Durham dyer George Burdon possessed 7 stone of copperas and 4 stone of swarf fillings. Although it is unclear if this copperas was that of iron or copper, imports of green copperas do appear in the late-fifteenth century Newcastle upon Tyne customs accounts (Wade 1995, 140-279). In addition, the 1577 probate inventory of the Newcastle upon Tyne general merchant and Alderman Thomas Leddell, lists a hundred and a half weight of green copperas, valued at xxiiij^s, stored in the cellar next to his shop (Raine 1835, 413-414). Potentially the presence of copper in two of the case studies may be as an incidental result of the dyeing process – through simple contamination from the vessels in which the dye was prepared. The technology of woad dyeing required that grated madder, bran and water were boiled in copper boilers (Munro 1999, 23); Hofenk de Graaff (2004, 246), suggests that the dyeing method for woad required that crushed woad balls, water, potash, old urine and sometimes bran and even madder, were boiled to around 50°C in brass kettles. Low levels of copper are present in soils, especially urban soils which may contain corroding copper objects. Analysis by material of all the objects in this collection recovered from the River Wear at Elvet suggests that 40% are copper alloy and 20% are brass. If the presence of copper in B.2630 and B.230 is interpreted as being 'even background' levels - unrelated to the fibre structure – then it would not suggest a role associated with dyeing textile. However, as copper is not present in all three case studies then contamination from soil or river water would seem unlikely.

In addition to possible exposure to iron dyestuffs such as those listed in the dyer George Burdon's 1692 probate inventory, the presence of iron in all three samples,

may derive from iron oxides in the soil and water. Low concentrations of iron salts are seen in all natural ground waters. High concentrations might be expected in the River Wear which has historically been contaminated with both naturally occurring and mine-related iron rich sediments, and these are the dominant diffuse sources of iron in the river (Mayes, Jarvis and Younger 2005, 502). The low levels of iron detected in the three case studies are not correlated with the sulphur indicating there are no iron sulphide minerals present.

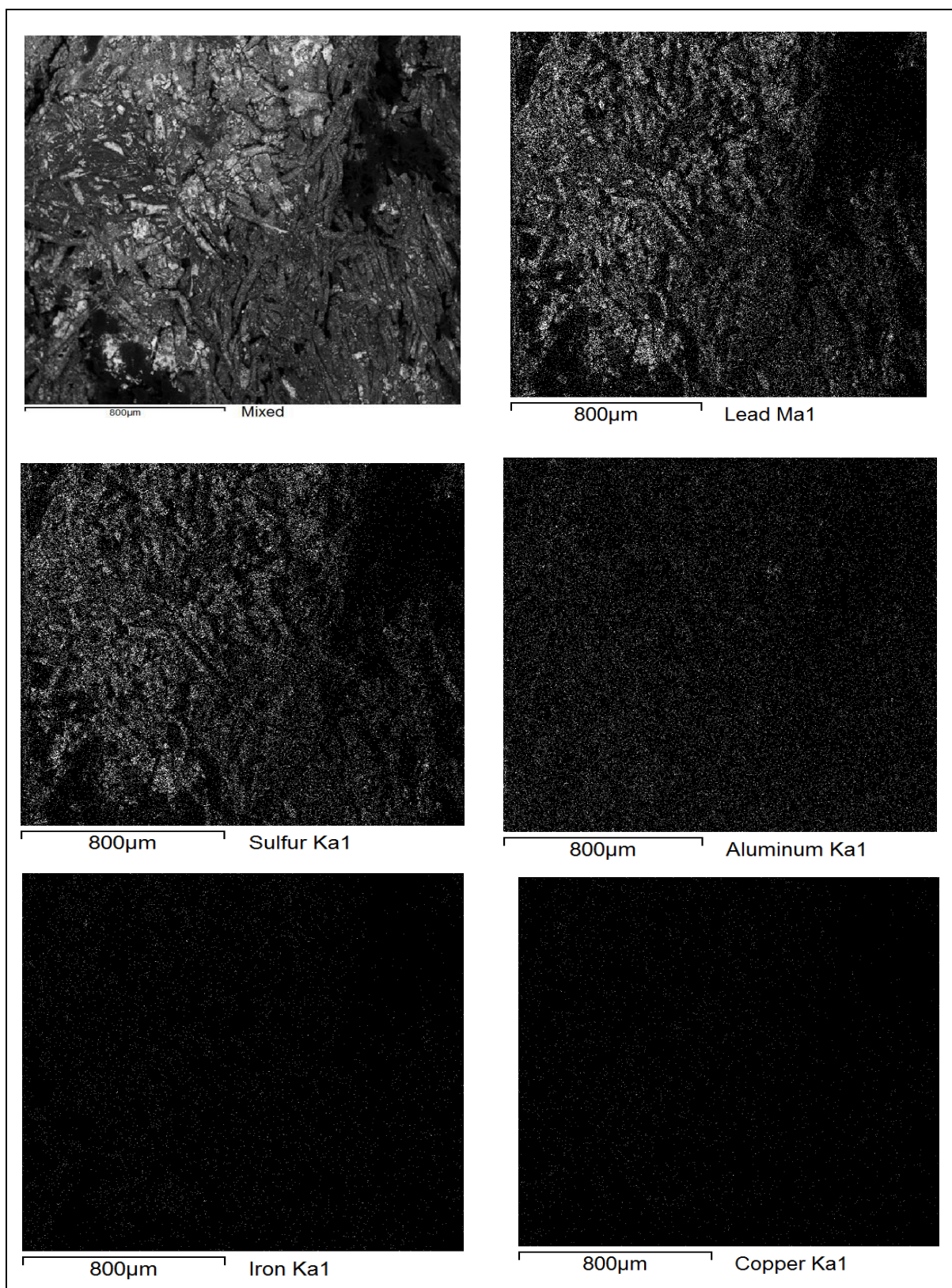


Fig 5.34. Cat. B.2630. SEM elemental maps showing distribution of Lead, Sulphur, Aluminium, Iron and Copper.

Acc. Voltage: 15.0 kV, Resolution: 512 x512 pixels, Process Time: 4 mins, Image Width: 1.730 mm.

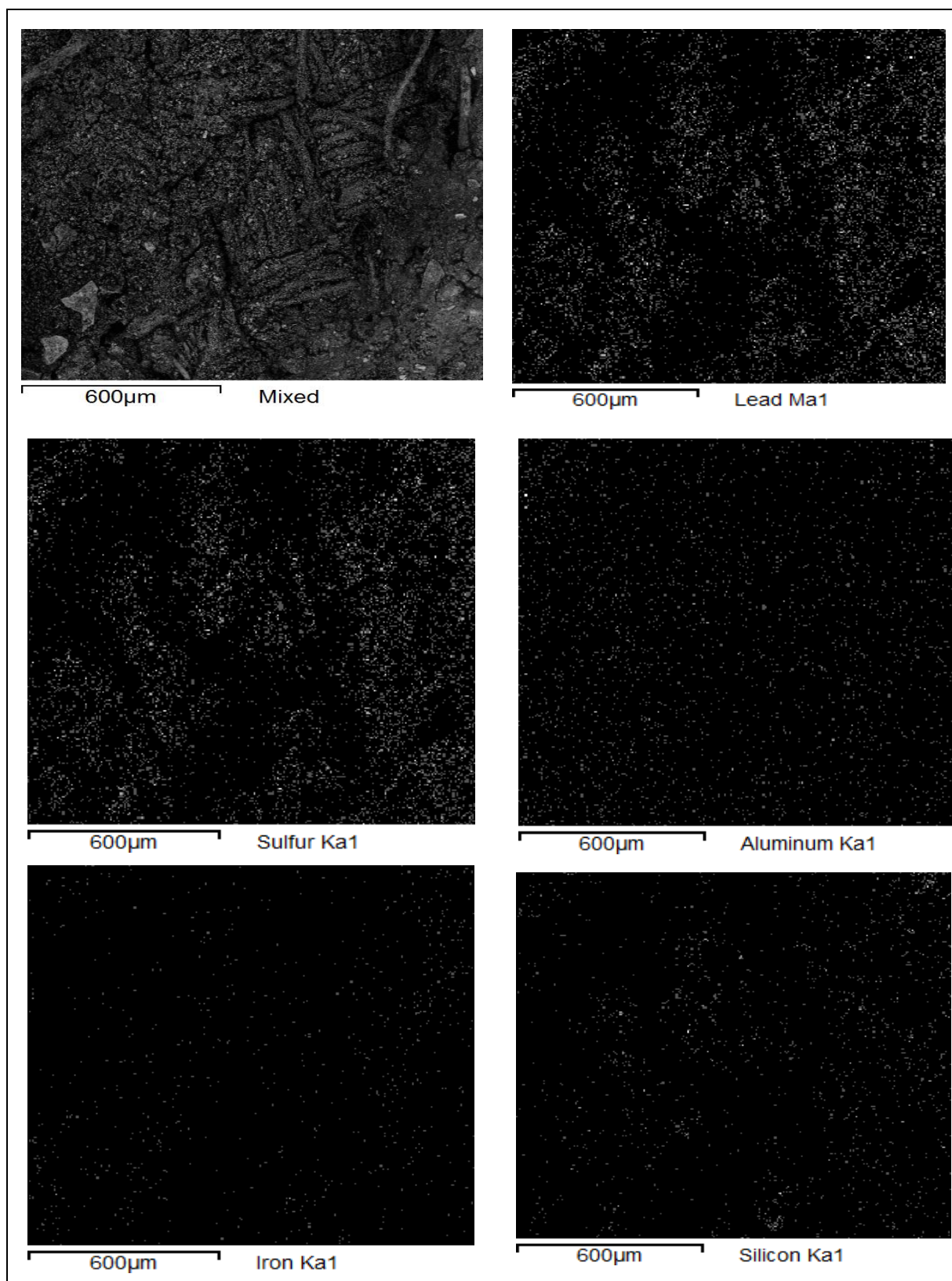


Fig 5.35. Cat B.1365. SEM elemental maps showing distribution of Lead, Sulphur, Aluminium, Iron and Silicon.

Acc. Voltage: 15.0 kV, Resolution: 256 x 256 pixels, Process Time: 5 mins, Image Width: 1.384 mm

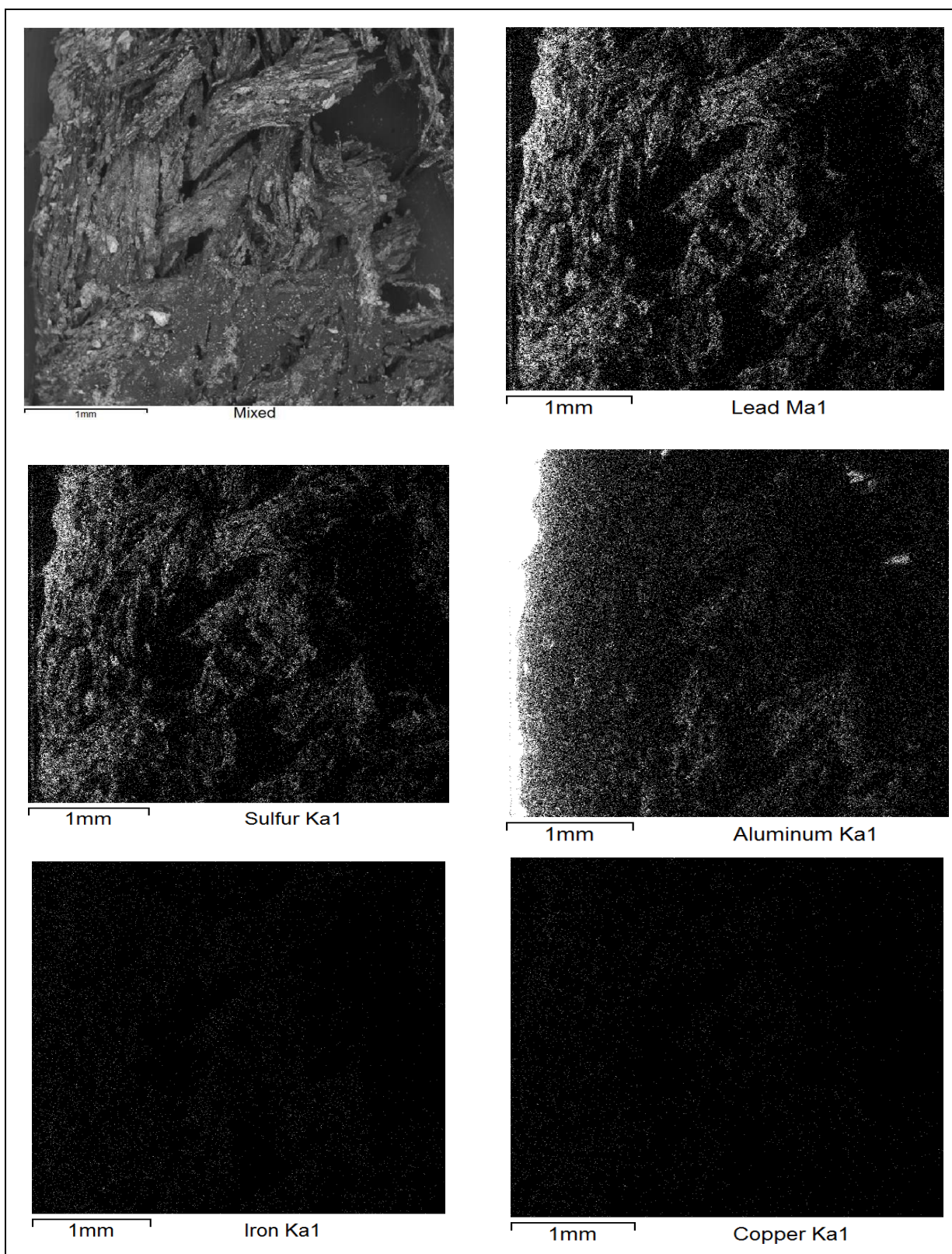


Fig 5.36. Cat. B.230. SEM elemental maps showing distribution of Lead, Sulphur, Aluminium, Iron and Copper.

Acc. Voltage: 15.0 kV, Resolution: 512 x512 pixels, Process Time: 4mins, Image Width: 3.460 mm.

5.1.7 Metallurgical analysis – energy dispersive x-ray fluorescence (EDXRF)

Elemental analysis was undertaken to investigate the composition of the metal of cloth seal B.2460 (Cat. 220 Figure 3.24), in particular to identify if it was the alloy pewter rather than pure lead. The appearance of this particular cloth seal had puzzled the author because, although it retained all the features of a two-part cloth seal complete with rivet device and interconnecting strip, its composition appeared different to that of all the other lead cloth seals in the assemblage. The presence of mis-cast flanges around the outer edges of each disc, an unusually domed rather than flattened rivet device, lack of any privy marks and a hard feel (rather than the malleable touch associated with lead), all contributed to questions linked to its manufacturing technique and provenance. The use of non-destructive energy dispersive x-ray fluorescence (EXDRF), which has been used for many decades to analyse archaeological material, was chosen to investigate if detectable levels of tin were present. Emitted x-rays can cause fluorescence when passed through matter, the irradiated surface ejecting electrons from the inner shells of atoms located near the surface of the object; a subsequent re-distribution of electrons from the outer shells of atoms to the inner shells releases a distinctive fluorescence which can be measured and is characteristic to the particular elements in the sample (Caple 2006, 155; Mantler and Schreiner 1999, 3-17; Lachance and Claisse 1995, 39-45). An Oxford Instruments ED 2000 EDXRF machine incorporating an air-cooled silver target x-ray tube, thin beryllium window and vortex silicon conductor detector was used to sample cloth seals B.2460 and B.787; the latter was selected at random, as a comparator. The analysis was performed on each sample with an accelerated voltage of 40kV and 1mA current for 100 seconds. In order that both samples were not damaged in any way, neither artefact was polished or drilled before analysis although contaminated or corroded surfaces of artefacts may have a chemical composition different to that of uncorroded surfaces, with the exception of lead or tin any other metals that may be present i.e. iron or copper, were to be discarded in the analysis.

The semi-qualitative analytical EDXRF examination of cloth seal B.2460 identified the presence of lead and tin, confirming that it was in fact the alloy pewter (Fig 5.38). This contrasts with B.787 which is pure lead (Fig 5.37). As lead was more readily available and in fact cheaper than tin, it seems surprising that any tin was present at all and it probably came from recycled metal. From as early as 1532, following confirmation of the charter by Bishop Tunstall, the manufacture and regulation of the composition of alloys would have been tightly controlled by the ordinances [in Durham] of the Goldsmiths, Plumbers, Pewterers, Potters, Glaziers and Painters (known as the Plumbers' company) (Whiting 1941, 397-401); similar ordinances, such as those for the Guild of Pewterers of London, dating from 1358, would have been in place elsewhere across England. It is therefore probable that the production of B.2460 was either as a result of an unsuccessful experiment or of poor workmanship; in any event it appears to have been unusable as a cloth seal.

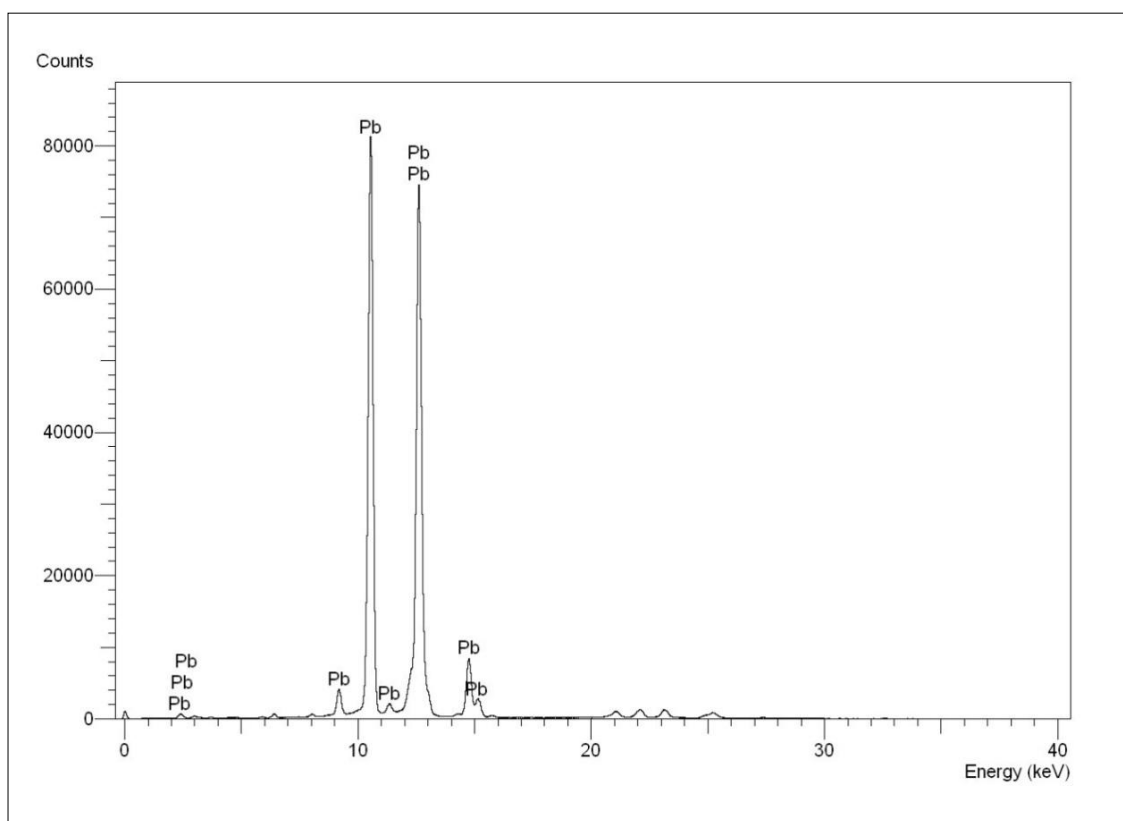


Fig 5.37. Cat.B.787. EDXRF analysis showing only lead (Pb).

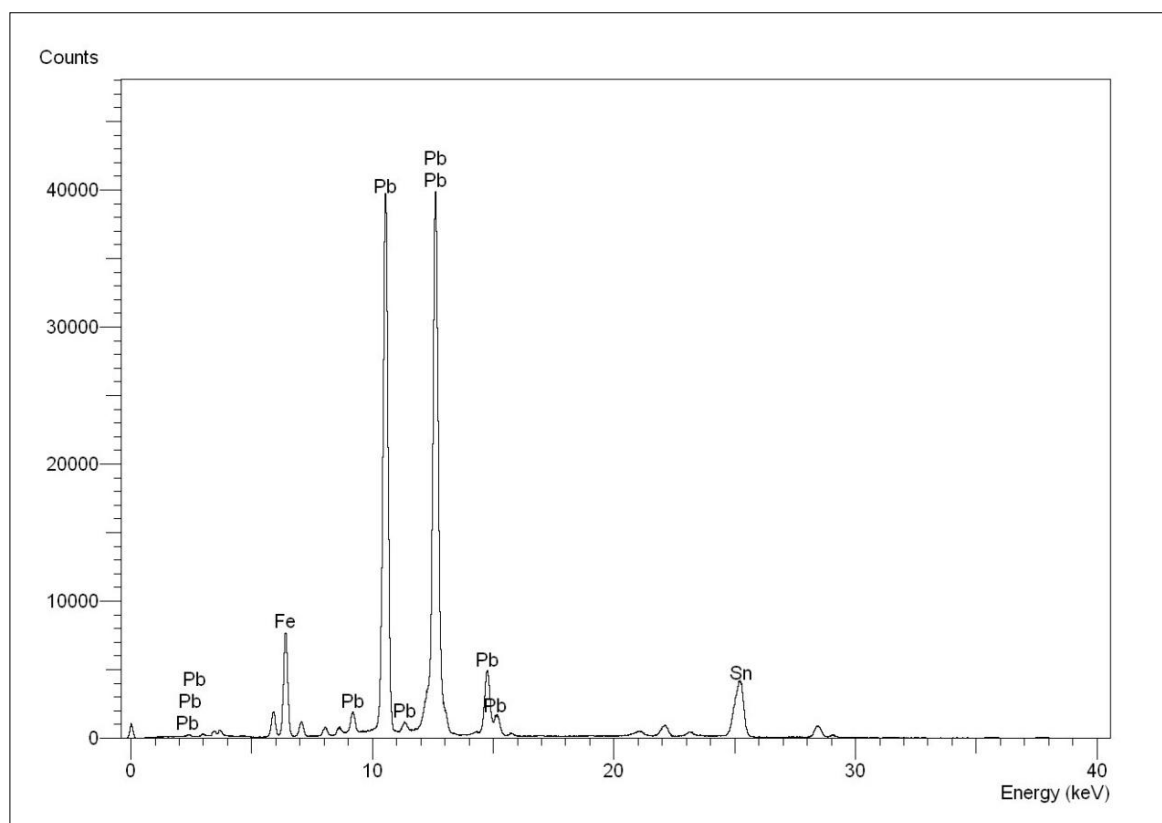


Fig 5.38. Cat. B.2460. EDXRF analysis showing lead (Pb) and tin (Sn).

5.2 Conclusions

Taking into account the full range of detailed scientific evidence we now have, alongside the other historical evidence presented elsewhere in this thesis, conclusions concerning precise details of all three case study cloth seals can now be made.

It is now perfectly plausible to suggest that the cloth seal B.2360 (59) was once attached to fine broadcloth, probably produced in the West of England towards the end of the reign of Elizabeth I, or very early into the reign of James I. After being woven, this heavily felted woollen would have been sent to London (the national textile finishing centre) where it was vat-dyed with the natural dye (probably locally grown) woad, or less likely indigo. The broadcloth was then later re-dyed, again in the piece, with the adjective dye (see section 4.2.5 for explanation of adjective dyes) madder this second dyeing is validated by the presence of the components; alizarin, purpurin and indigotin; although also locally grown, the

madder may have been imported from the Low Countries (Walton 1981, 200; Wade 1995, 140-279). It is far from certain where this second dyeing would have taken place, as dyers in London and Durham were both using the red dyestuff madder during this time (Britnell 2008, 119). However, the fact that the seal is stamped 'WM' (which presumably stands for woad and madder) above a corded madder bag (used here as a generalised symbol of the London Dyers' Company) suggests that both dyeing activities took place in London – as indicated by the stamp. Previous publications have suggested that seals with similar iconography letters to those of B.2630 refer to the natural dyes woad and madder by the letters WM. We can now, based primarily on this new UHPLC-PDA evidence, confirm that this claim is in fact correct (see: *Finds Research Group Datasheet 3*, Fig 19). Although the fact that cloth seal B.2630 was recovered from the River Wear in a location just a few metres away from where several riverside tenement dye-houses were operating between the mid-fifteenth to late eighteenth centuries may suggest that further dyeing activity took place in Durham and that the cloth seal was lost when the newly dyed cloth was being rinsed in the running river water. While the blue dyestuffs present in woad would have served as a base colour, the later exposure to the red colouring matters present in madder would have produced a range of colours which included purple. The presence of iron and copper in the textile may be linked to the use of/or contamination from, other mordants, such as the protosulphates of iron (green copperas) and copper (blue copperas) or derived from soil. The presence of lead sulphide concentrations in the fibre is a result of the action of sulphur-reducing bacteria from the anoxic river bed find site reacting with the lead from the cloth seal. The specialised craftsmen who initially dyed the woollen were almost certainly either London Dyers' Company master dyers, operating out of a significant commercial dye-house, or Company freemen housekeepers, who had the right to set up an independent dye-house (usually an extension of a domestic tenement). As the income of London Dyers' Company members was dependant on their right to seal all cloths that were dyed blue within a ten mile radius of the City of London, most dye-houses would have been established close to the River Thames, within an important trading centre close to London markets, tidal freshwater and with easy access to coastal trade.

It can also be concluded that if Walton's (1981, 230) assertions that, during the sixteenth century, the majority of English-produced woollens were being sent undyed and undressed to be finished in the Low Countries and that by the end of the century there was a move in England away from the heavily-finished broadcloths to lighter and finer worsteds, are correct, then it is certainly plausible that cloth seal B.2360 was once attached to a broadcloth, woven during an age of transition, in a time when similar woollens were now being sent to London rather than the Low Countries for finishing but before the stronger demand for the 'new draperies' saw a demise in the production of traditional Tudor broadcloths.

By contrast the amount of precise historical evidence pertaining to unparalleled cloth seal B.1365 (272) is rather more limited, although this is simply due to problems associated with the identification of its privy mark featuring an *AR* ligature; this might have helped confirm its provenance and associated trade networks. What we can conclude through the scientific evidence is that this fine, plain woven textile, which probably originated in Northern Europe, was exported to Durham sometime during the late-seventeenth century. The fact that the cloth seal features a double rivet device supports the European provenance theory; Egan alludes to a Low Countries and French 'fashion' for cloth seals featuring two rivets. He also identifies several fifteenth/sixteenth-century two rivet cloth seals originating from draperies in Flanders and Brabant, including important textile centres such as Bruges and Malines (1994, 5; 2010 56-58); similarly, Mordovin (2014, 197) attributes cloth seals with two rivets to Tournai (Flanders). The presence of other cloth seals with two rivets in the Durham River Wear assemblage with Tours and Tournai provenances is also relevant. The extracted textile can be classed as somewhere between a fine and very fine woven cloth as it exhibits 22 warp x 22 weft threads per 10mm. As the individual threads appear to be ZZ spun, each with a narrow yarn diameter, it is plausible that the textile is typical of the finer fabrics associated with lighter weighted worsted tabbies. The upper surface of the textile appears to be quite smooth with a somewhat glossy sheen (see Fig 4.7), which may be evidence of calendering using a hot press. Crowfoot et al., describe good quality textiles featuring a hard combed yarn and shiny surfaces as being worsteds, although a higher warp thread count would also

be a similar indicator (2001, 28). Obviously this is not the case with B.1365, which has an equal warp/weft thread count. The successful UHPLC-PDA extraction of a Nowik type A component is a significant discovery, for it allows for comments to be made on the original/proposed colour of the textile, the dyeing techniques used and probable trade routes of this dye.

The Nowik type A component is a characteristic component of redwoods (Nowik 2001, 129-144), the term redwoods being used to describe the reddish wood of any number of trees. The principal varieties containing soluble redwood (mordant) dyes from the genus *Caesalpinia* include: Peachwood, Sappanwood, Limawood and Pernambuco, collectively known as Brazilwood. Redwoods were imported into Europe from the sixteenth century onwards, following Portuguese navigators' discovery of the trees in Brazil c.1500, and later Central American discoveries in Mexico and Nicaragua: although Sappanwood (*Caesalpinia sappan* L.) was an earlier Asian import. The use of logwood in England as a dye was banned by an Act of Parliament in 1581, being deemed 'false and deceitful'; only for the Act to be being repealed by Charles II, in 1662 (Hurry 1930, 259-263). The red coloured logwood dye was considered to be a lesser dye due to its poor fastness properties, cochineal and madder being preferred instead; however, when used with different mordants such as copper, iron, chrome, alum or tin it was not only possible to improve the fastness properties but also to produce many different colours ranging from black to grey and blue through to purple (Ferreira et al., 2004, 333). In addition to the seven stone of copperas found in George Burdon's Durham-based dye-house in 1692, it included: one stone of Logwood, woodwash and rotten wood (see Chapter six for further details of dyestuffs found in George Burdon's inventory).

In summary, it is perfectly plausible that cloth seal B.1365 was once attached to a textile woven in an important textile production area, situated close to the northern coast of Europe, at some time during the second half of the seventeenth century (certainly after 1662). This fine, lightweight worsted, plain woven woollen may have formed part of a consignment of white ('un-dyed') textiles, bound for the port of Newcastle upon Tyne, then onwards overland to Durham. A Durham Dyers'

Company freeman, master or journeyman based in the New Borough of Elvet, situated close to the River Wear, could have used a combination of the mordants alum and iron, with the soluble dye-stuff logwood, imported from Central America, to create a red- or grey-coloured cloth. Again, the cloth seal could have been lost in the river during the rinsing of the newly dyed cloth. The *AR* ligature would have been the initials of the clothier or weaver rather than those of a dyer while the scratched 71 on disc two may have been the fabric's length in (?)ells.

Cloth seal B.230 (207) is one of two almost identical cloth seals in the assemblage both of which feature an abbreviated form of the manufacturer or merchant manufacturers' trade name, S & S. An intentional blank space after 'Nº', would have allowed a (?)consignment number (i.e. 377 or 4), to be stamped at a later phase of the finishing process or immediately prior to shipment. Faint marking on the reverse of both cloth seals may be that of the length and breadth of the cloth. The diameter of the cloth seal is 29mm and this places it amongst a group of fifteen other similar [larger] sized, typically late-eighteenth to early-nineteenth century cloth seals in the assemblage. The provenance of some of them is known: Halifax, Leeds and Wakefield, Yorkshire. However, during the late-eighteenth to early-nineteenth century there was a proliferation of woollen and worsted spinners and manufacturers operating in the many hamlets, villages and towns in the West Riding of Yorkshire and this makes accurate identification of any abbreviated names which appear on this series of cloth seals difficult. In addition, both finished and unfinished woollen textiles would have been passed on to the cloth merchants based in the cloth and piece halls of Bradford, Halifax and Leeds and these merchants too would have added their own cloth seals to the bales of cloth, prior to shipment. As a consequence it is often difficult to be certain if the letters/initials which feature on this group of cloth seals correspond accurately with those listed in contemporary trade directories and gazetteers (see 3.10 and 7.1 for further discussion on the manufacture of woollens and worsteds in the West Riding of Yorkshire) (Baines 1822, 29-30; Calderdale History 2016).

The trade of cloth from Yorkshire to Durham had been long established; for example, in 1531, the Convent of Durham listed under the heading of expense for

the wardrobe [for Finchale Abbey], procurements of cloth bought at Ripon and Wakefield fairs (Raine 1837, Glossary p.cccxxxxxi); *Bill obligatorie* entries dated to 1586, in the accounts of the Durham draper Thomas Hall, indicate that several merchants from Leeds and Wakefield had entered into contracts to supply cloth to Durham. Kerseys, a type of coarse narrow cloth, woven from long wool, were listed in his inventory (DPRI/1/1581/H1/6). There is sufficient evidence to suggest that cloth seal B.230 appears to date from the late-eighteenth to the early-nineteenth century, certainly long after the time when the alnage system had ceased; this group of larger diameter cloth seals would have been an indication of manufacture or shipment, rather than any form of guild-controlled regulation or official taxation. The catalogue entry for cloth seal B.911 (see Chapter three) is of particular relevance; similarities in terms of size and style suggest it has close parallels to B.230 and it may help shed light on the regional textile trade. This cloth seal is directly associated with a company established by the merchant Joseph Sheepshanks of Leeds, a man who rose to prominence in the 1790s producing cloth for the militia during the war with France. In 1851, the family business exhibited at Crystal Palace during the Great Exhibition, under ‘classes 12 and 15; woollen and worsted’. The business is described in the ‘official descriptive and illustrated catalogue’ as: Leeds. Manufacturers, Dyer and Finishers. Woaded wool black; second woollen cloth. Piece-dyed black and piece-dyed black medium and fast dye’ (Royal Commission, 1851, 488).

The high level of preservation of the scrap of textile has enabled accurate comments to be made about the nature of this woollen cloth; for example, it can be clearly identified as a 2:2 twill weave. Although both yarns are Z-spun, the warp threads are significantly narrower in width than the weft suggesting a finer fabric type. The evidence for a finer fabric is strengthened by a thread count c.20 warp x 20 weft threads per 10mm. Even though stereomicroscopy imagery hints at a fine darker thread running through the textile, the UHPLC-PDA analysis did not detect two different traces of dye, and it is therefore probable that the main part of the fabric was simply white (undyed) and that the cloth was patterned with darker, blue-coloured, weft threads. This blue thread was dyed with the readily available vat dye indigotin. From the mid-seventeenth century onwards, indigo plantations

had been established in the West Indies and Americas (Balfour-Paul 1998, 41-42) and it is plausible that this important trading commodity crossed the North Atlantic to ports at Liverpool or Manchester, then onwards via canal to Yorkshire. If this was the case then the wool for the blue thread would have had to have been dyed in the yarn, rather than being dyed in the piece. There is no evidence that this textile was dyed in Durham.

The presence of aluminium in the fabric is interesting because the vat dye indigo is water-insoluble and requires to be converted into a leuco form before it can penetrate the fibres as such it normally does not require a mordant (Ferreira et al., 2004, 330; Hofenk de Graaff 2004, 241). However, in this example, the presence of the mordant(s) alum (and possibly iron and copper), could have been used to broaden the range of colour and to improve the fabric's colourfastness. The presence of iron and copper may also be due to contamination similar to that described for cloth seal B.236 above. Almost certainly the alum was locally sourced from the county's coastal alum industry.

The (third) White Cloth Hall based in Leeds c.1775 to 1858 was an important commercial enterprise allowing local merchants and clothiers to purchase a stall and offer up for sale, their white cloth; by 1810 mixed cloths, including jersey and kersies, were also being sold. The minutes of a committee meeting in August 1808, highlight how every piece of cloth found in the hall must have the manufacturers' name and place of abode woven in or a fine of 5/- would be incurred. It is certainly possible that the cloth to which cloth seal B.230 was attached passed through this Hall (Schedule of papers from the Leeds White Cloth Hall Collection, Special Collections MS 283, Leeds University Library).

Table 5.1 displays a summary of the scientific analysis for all three case studies.

Summary of findings for all three case studies.						
Cloth Seal	Weave	Yarn	Fibre	Dye	Mordant	Date
B.2630	Heavily felted	N/A	Wool	Woad and Madder	alum	1595-1610
B.1365	Plain weave. 'fine/very fine' thread count c.22 warp x c.22 weft threads per 10mm.	ZZ	Wool	Redwood (Nowik type A component)	alum	1600-1700
B.230	2:2 twill weave. 'fine' thread count c.20 warp x c.20 weft threads per 10mm. Evidence of calendering	ZZ	Wool	Indigotin	alum*	1780-1850
* Although not required as a mordant, the inclusion of alum during the dyeing process may have improved various qualities of the finished dyed fabric.						

Table 5.1. Summary of scientific analysis for all three case studies.

Chapter six

6. Building on new textual and visual sources to understand the textile industry in Durham and the North-East.

6.1. Introduction and aims of chapter.

Although no single published synthesis of the cloth trade in Durham exists, the research occasioned by the examination of the Durham lead cloth seals goes some way towards providing one. This chapter establishes the scale of cloth production as it appears from published sources, proposes that the area adjacent to the cloth seal find spot was particularly associated with the cloth industry and re-assesses the scale and extent of the textile trade in Durham. Despite what might be concluded from literature to date, this chapter will seek to demonstrate that the extent and longevity of the textile trades were greater than the previous literature would imply. Perusal of the surviving historical documents and contemporary literature, Hutchinson (1787), Surtees (1840), Fordyce (1857) etc., would leave the reader with little doubt that from the mid-thirteenth to the early nineteenth century, cloth production in the city of Durham was only a minor preoccupation of its inhabitants. This is, however, a false impression; it is possible to locate the names of a large number of individual craftsmen trading in or working with textile commodities. These artisans, the weavers, fullers, dyers and drapers, represent the component parts of the cloth-production industry in Durham. It is also possible, with increasing documentation, to trace places of abode, identify whom they married, how many children they had, their craft, trade or guild membership and position within the guilds, as well as post-mortem probate, wills and bequests. It is even possible to identify their specific role within an evolving market economy and an increasingly enfranchised society.

As the main aim of this chapter is to identify the scale and extent of textile production in Durham, it is first necessary to identify Durham as a place, to be able to understand not just its built environs but also the very structure and functioning of its society. While it is already well documented that Durham was once a major medieval city, re-analysis of the city's historical records, focusing on those

elements that may have impacted on the production, trade or consumption of textiles helps to achieve this aim. Obviously it is important to understand the physical aspects of Durham's built environment, both on and beyond the peninsula. This does not just include those buildings and open spaces located safely within the fortified castle and cathedral precincts, but also those which lay beyond and of course its largest natural physical feature – the River Wear. This chapter contains information relating to the extent of the city's immediate hinterland to which it was so closely bound, consisting of five sprawling boroughs, located on either side of the u-shaped curve of the large constantly flowing river. The Old Borough, the Bishop's Borough, the Borough of St Giles, the Borough of Elvet and the Barony of Elvet together formed Durham City. Each of the boroughs was criss-crossed with fords, bridges, vennels (narrow passages), pathways and roads – the current street layouts are practically unaltered since the late-medieval period. With the exception of the centrally-located Bishops Borough, the other four boroughs essentially form the city's suburbs, an area which Dobson (2005, 42) describes as a heterogeneous collection of small villages rather than being anything like an integrated community. In addition, this chapter recognizes the significance of the city's semi-rural geographical positioning in the heart of the North-East of England and propinquity to an often aggressive Scottish neighbour and with it, seemingly unending border warfare (Roberts 2003, 22). Of some importance is the fact that County Durham was the seat of a bishopric and a county palatine, home to not only a powerful Prince Bishop but also to a second great ecclesiastical household, the Benedictine Priory. With these overlords came the associated monastic buildings, castle, cathedral church and during the late-medieval period, a major pilgrimage centre which all played an important part in the early development of the city. The chapter includes aspects of the city's social and commercial activities, for example, questions as to who were its inhabitants, where were their tenements, messuages or burgages (the terms messuages and burgage may have been interchangeable, burgage being linked to plots of land held in 'burgage tenure' (Camsell 1985, 64)) and workshops located. Where were the markets, churches and land boundaries? Who were their landlords? What of the numerous craft guilds, companies and associated fraternities, with their standards for quality control, professional behaviour and regulations of apprenticeships and

freemen? And finally, how was the maintenance of law and order upheld against those individuals who engaged in abusive or deceitful practices especially in textile production or trade in a city dominated by the temporal power of two religious communities and yet still falling under the control of a secular state?

It is noteworthy that, throughout this chapter and whenever relevant, the focus will shift to a particular suburb of Durham City, known today as 'New Elvet' (formerly the ancient Borough of New Elvet). Any new evidence relating to this area is particularly important, as within it lay the find site of all of the lead cloth seals. It will be referred to in the following text as 'New Elvet' or the 'New Borough'. In addition, when the terms 'city' or 'Durham' are used, this denotes activities taking place within the area that fell under the jurisdiction of the five boroughs. Any reference to activities outside this area will use the relevant town/place names or the term 'County Durham'.

6.2. Durham, a city in County Durham.

Durham City is the county town of County Durham. Located in the North-East of England, it sits on a large horseshoe bend in the River Wear, surrounded by a rich and varied countryside positioned ten miles inland (west) from the North Sea. The same river meanders north-east, eventually spilling into the sea at Sunderland – a coal exporting port from the early-eighteenth century onwards. Thirteen miles north of Durham is the major river port of Newcastle. Here the River Tyne has facilitated a port since Roman times. By the late-medieval period, the port had become a significant exporter of raw materials, including coal and wool (Threlfall-Holmes 2005, 9; Graves and Heslop 2013, 119-122) and was an importer of raw materials and commodities, including important dyestuffs, into the region, controlled by the Newcastle upon Tyne merchant adventurers. Gateshead, also a port positioned opposite Newcastle on the south bank of the River Tyne, marked the northern-most boundary of County Durham. The River Tees, some 20 miles to the south of the city, formed the southern-most (natural) border.

A second port, located on the coast at Hartlepool, some 16 miles south-east of Durham, was claimed by the Bishop of Durham in c.1189. However, in 1200, King John granted a charter which gave the town 'borough' status, the men of which were free burgesses with the same laws and privileges as the burgesses of Newcastle upon Tyne, although the rights of Durham's Bishops were subsequently restored. Hartlepool, with its strategic positioning on the North Sea coast, carried some importance, particularly during the Scottish Wars (Fordyce 1857, 248). The small medieval market town of Barnard Castle, positioned at the mid-point of the Tees Valley some 25 miles by road, south-west of Durham, marks the boundary with the Tees lowlands to the east and the Pennine uplands to the west. Not only do these high fells of the Pennines mark the county border with Cumbria but were, from the medieval period an extensive area of upland pastures, suitable for sheep grazing (Camsell, 1985, 36; Austin 2007, 3). The stone bridge over the River Tees connects Barnard Castle with the village of Startforth – historically part of the North Riding of Yorkshire but transferred to County Durham in 1974 – and is adjacent to an area where fulling, cloth bleaching, weaving and dyeing activity took place during the seventeenth- and eighteenth-centuries. Carpet manufacture continued in the town's workhouses through to the mid-nineteenth century. The Great Exhibition in 1851 featured carpets from the town's Thorngate Mill and included such fanciful carpets as Kidderminster fabric and Dutch fabric carpets, with a warp made from silk noils (OED = short pieces of wool combed out of a long staple) (Fordyce 1857, 17, 33-34). A major land owner in this region of the county was the Bowes family, who had an association with mineral extraction (particularly lead and coal) in Upper Teesdale, from as early as the sixteenth century. Mining of lead ore by lessees of land owned by the Bishop of Durham also took place in the Northern Pennines at Weardale; this was well established by the late fourteenth century (Camsell 1985, 36; Drury 1992, 22-25; Brown 2010, 16). The availability of locally sourced lead ore would have been important to members of Durham's Plumbers' Company, particularly those engaged in the production of lead cloth seal blanks. Fig. 6.1 shows the position of Durham in relation to the main ports, towns, cities and rivers of the North-East of England mentioned in this chapter.

The river at Durham is non-tidal and despite plans to make it so, remained un-navigable by boat to the sea (Ruffhead 1765, 3; Dufferwiel 1996, 109). The bend in the river is significant enough to form a peninsula and here the river, along with steeply-sloping river banks once formed part of the early natural defences of a monastic settlement, established in Durham in 995 (Rollason 2015, 27-38). The Anglo-Saxon Chronicles provide the first hint of a settlement in Durham, possibly of some importance, as early as the eighth century, probably situated near the present day St Oswald's Church in the borough of Old Elvet; Anglo-Saxon sculptured stone cross remains were discovered built into the west wall of the fifteenth-century tower of St Oswald's Church (Barmby 1890, 32; Cramp 1984, 66-68).

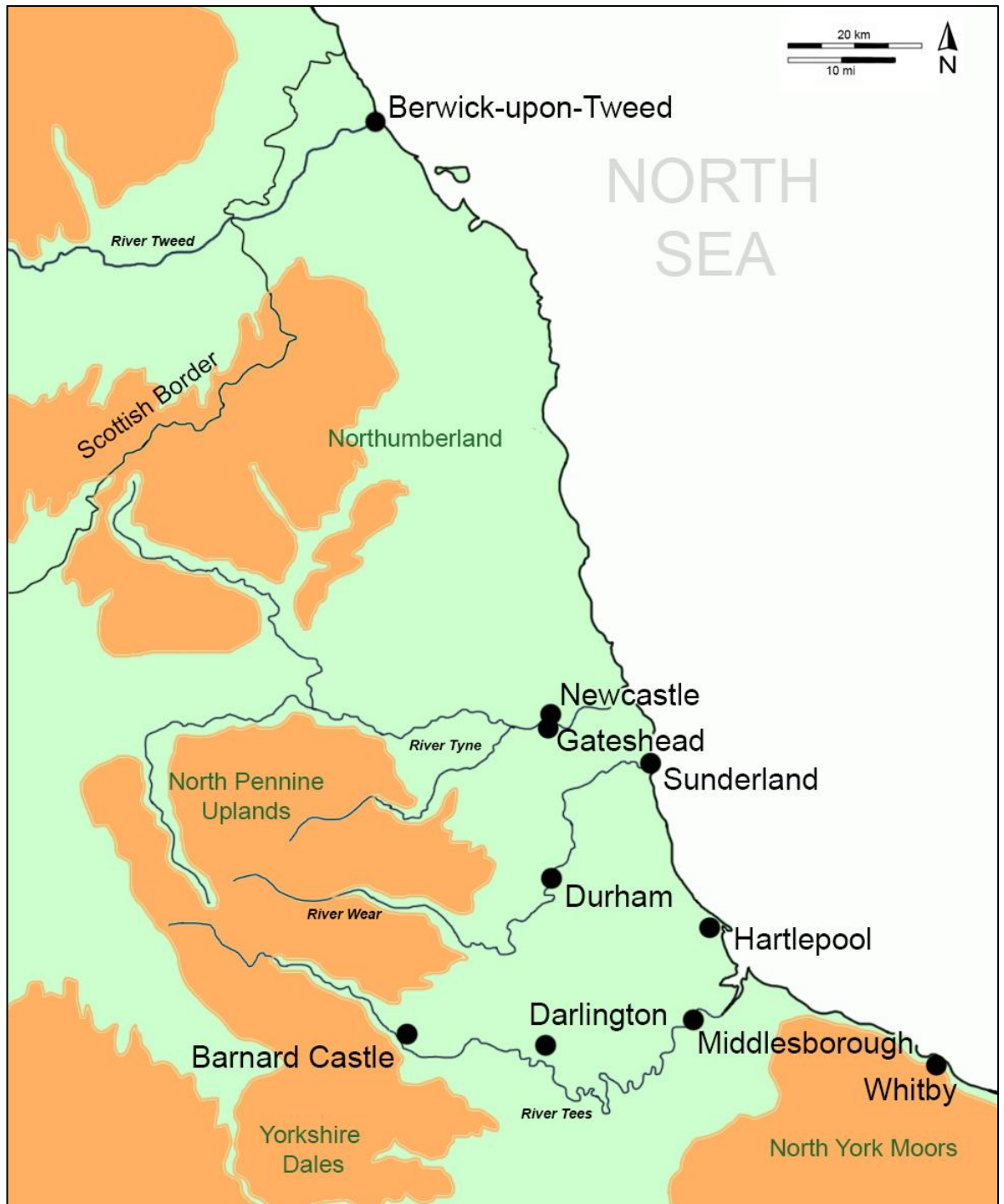


Fig. 6.1. North East England.
Reproduced under © Crown Copyright and Database Right 2016.
Ordnance Survey (Digimap Licence).

Apart from some chance Romano-British finds, there is very little archaeological evidence of any actual settlements apart from presumed prehistoric earthworks at nearby Maiden Castle, either on the peninsula or within the immediate vicinity, pre A.D. 995; although mid-late Anglo-Saxon skeletons have been found in the Dean's Garden located close to the Cathedral (see also: DRWA: Cat. B.2167 for a (?)fourth century Roman *dupondius* coin) (Hutchinson 1787, 308-310; Carver 1979, 92-93; Roberts 2003, 13-16; Emery 2015, 160). During the twelfth- to sixteenth-centuries it became a major medieval city and shrine site (Camsell 1985, 35-38, 66). The medieval market town which lay outside the defensive walls was relatively undistinguished, with few buildings of any significant character. Most of the buildings occupied land on the opposite river banks positioned to the west, north and east of the peninsula, but the peninsula was always accessible from the north without having the need to cross the River Wear via a narrow neck of land, known today as Claypath. Hutchinson (1787, 5) alludes to the construction of early fortifications and a possible moat to defend this access point. Two twelfth-century, defensive bridges, Framwellgate built in the 1120s (from the west), known as the 'old bridge' and Elvet built in the 1160s (from the east), known as the 'new bridge', allowed access on to the peninsula via the respective boroughs of Crossgate and New Elvet.

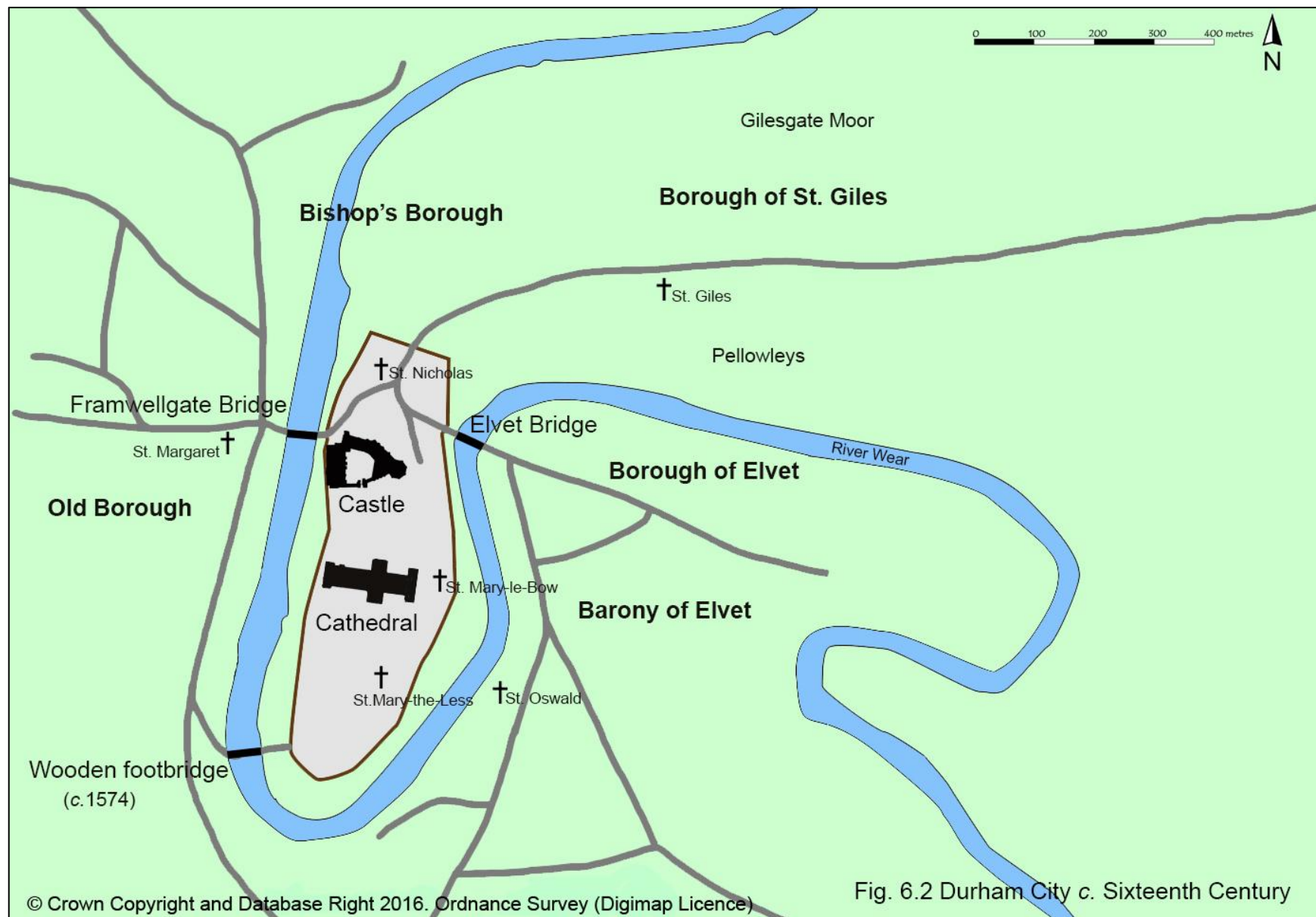
While the well-documented translation of St Cuthbert's corpse and subsequent monastic settlement during the tenth century provides the earliest acknowledged evidence of activity on the peninsula, it was not until 1071 that the Norman Bishop Walcher oversaw the first substantial construction there. A later twelfth-century charter (probably a forgery) granted by Prior Bertram to the burgess of the borough, provides early evidence of a suburb located outside the peninsula (a settlement for the benefit of the monks, consisting of some 40 merchants houses and tradesmen's shops), which was known as the Barony of Elvet (modern day Old Elvet). Although there is some evidence that Bishop William de Carilepho had previously granted, or even re-granted, this same borough to the convent, as early as 1091. In the twelfth century, Bishop Hugh le Puiset, controversially established a new borough, located to the north of the Barony of Elvet, called New Elvet or the New Borough. In addition he ordered the construction of a new bridge to be built

in this new borough. This was an important construction as it enabled his merchants (residing in his new borough) to have better access into the late-medieval, fortified town (Hutchinson 1787, 8; Carver 1979, 94). Dobson (1973, 41) describes this building of *Novus Pons du Elvet* by Bishop Puiset as a transformation of the low-lying Elvet into an important route-centre, perhaps reason enough for the Bishop to usurp all this part of Elvet as an episcopal borough. Analysis of Cathedral priory rentals suggests that this area located to the east of the Durham peninsula, known throughout time as Elveth, Elvetehalge, Elvethaugh and the New Borough or Borough of New Elvet, was commercially active throughout the late-medieval period, certainly during the period from the thirteenth to the sixteenth century. Not only do the records show evidence of significant numbers of tenement buildings, but also expensive stone housing being built here (Carver 1974, 124-126).

Situated in the North-East of England and close to the Scottish border, Durham was always destined to be an area of instability due to continued conflict between the independent Scottish kingdom and the English Crown. Even after the end of the Scottish Wars of Independence (1328), the area was routinely affected by conflict until the Union of the Crowns – marked by the accession of James VI of Scotland to the English throne in 1603 (Watts 1975; Groundwater 2013; Standley 2013, 3). Camsell (1985, 28-32) citing Symeon, describes how, during the reign of King Stephen, William Cumin infamously attempted to usurp the Bishopric of Durham. In the 1140s Cumin's troops burnt parts of Durham's suburbs including the boroughs of Elvet and St Giles. The boroughs were again attacked by the Scot Robert Bruce in 1312-13 (*ibid.*, 1985, 98; Hutchinson 1787, 311; Barmby 1896, xviii; Dobson 1973, 40). The largest battle to occur in the vicinity of Durham took place in 1346, one mile to the west of the city, around the site of Neville's Cross. The result, a significant victory for the English over the Scottish army, also saw the capture of the Scottish King David II (Ornsby 1846, 177-180).

Fig. 6.2 depicts a reconstructed Durham City as it appeared during the sixteenth century. The network of lanes, roadways and the defensive fortifications are as those depicted on Mathew Patterson's 1595 map of the city (Fig 6.22)

supplemented by place-name information taken from Roberts (2003, 91), and Camsell (1985, 26-27).



6.3. Durham's position (and influence) in regional and national textile markets

To be of any kind of influence in regional, national or international markets, Durham had to be either commercially active in the production of textile commodities, or a renowned cloth finishing centre. The problem however, is that in terms of the written histories of Durham, there is virtually no recognition that this was ever the case; this is in spite of the fact that so much textual evidence survives to suggest the contrary. It seems therefore that Durham's textile industry history appears to be missing, when in actual fact this really should not be the case at all.

As Spufford (2002, 223-228) describes a transformation of trade across thirteenth-century Europe, including a radical alteration in commerce, it is relevant to consider the implications of his analysis on the activities which were occurring at this time in the North East of England. If Durham was indeed a major medieval city, just what was its position with regard to influencing regional, national and international textile markets? Certainly due to an increasing city population and also because of a growth in the local money supply, an expansion in the scale of trade at a local, regional and national level would have been possible. Dobie (2011, 134) reinforces the argument for changes in business and administration practices in Durham, certainly at a local and regional level, for while referring to the receipts and expenses of the Cathedral Priory during the late-thirteenth century, he speaks of a variety and complexity of cash transactions. Although covering a later period (1460-1520), Threlfall-Holmes's (2005, 102-132) study of the purchasing strategies of the Cathedral Priory identifies purchasing decisions and relationships linked with cloth suppliers in both the city and mainland Europe.

In terms of size, the urban sprawl of Durham during the thirteenth-fourteenth centuries was comparable to that of the town of Leicester, Leicestershire. Coincidentally both centres have extant surviving borough records from this late-medieval period. Based on this size comparison alone, it is easily

conceivable that, for a period, the extent of urban cloth-making in the boroughs of both Durham and Leicester may have been similar in scale. This assertion is relevant because Bridbury (1982, 7-8), highlighting the achievement of Carus-Wilson, who researched the early borough records and acclaimed Leicester as one of the greatest cloth-making towns in thirteenth century England, suggests that perhaps Leicester was only an average cloth-making town, for if similar records had survived for Bristol, Exeter or Norwich, would they too have revealed comparable lists of craftsmen, guilds and organised cloth-making? Although there are no extant league tables based on the size of late- to post-medieval English cloth-making centres, sufficient textile-related documents do survive for Durham from which the scale of textile production in the city could be modelled against that of Leicester or any other English textile production centre.

Although there is little doubt that a late- to post-medieval textile/cloth industry of sorts once existed in and around Durham (Bonney 1990, 149-159), we have to reflect on why the city, together with its immediate hinterland, never aspired to any form of recognition as a principal or even average-sized cloth industry location. This question bears even more relevance when considering Munro's (1999, 41) observations relating to the traditional view of why England overcame the Low Countries' supremacy in cloth production, due to the advantages of rural location, cheap labour, water-powered fulling and demand for cloth, as these were all constants for Durham throughout this same period. Readily available raw materials such as hemp, flax and wool (albeit the wool was of relatively poor quality) should also be acknowledged as an additional local advantage. Perhaps the reason for a 'missing' textile industry may be due to the fact that, unlike other geographical regions of the United Kingdom, very little detailed research was undertaken by contemporary historians as to its true historical scale. Had they done so, then it is conceivable (based on the evidence presented here), that Durham would now be recognised as once being, not just an important area of textile (linen) production, but also a significant regional textile finishing centre.

However, it seems that in terms of cloth production, Durham was not even classified as being of an average sized cloth producing town. In 1640, when the Royal Commission on the cloth industry, put forward several remedies for the '*redressing of the great deceits and abuses used in English manufacturers [of cloth],*' was to identify the chief towns in England that '*use the trade of clothing and making of stuffs*'. It is of some relevance to learn that on a list which featured the names of some 62 clothing towns considered for such work, neither Durham nor Leicester appeared (Ramsay 1942, 491-493; Thirsk and Cooper 1972, 246). An additional relevant remedy put forward by the Commission included the production of a new two round [part] cloth seal; on one round was to be stamped the crown seal and on the other, the seal of the corporation (appointed within the said town). There is some contemporary recognition (albeit fleeting) in that a series of similar recommendations and remedies aimed at improving various seventeenth-century English industries highlighted that the only production of linen in England during the last quarter of the seventeenth century was done on the weaving looms in the counties of Durham, Yorkshire and Lancashire. This was in part due to the availability of hemp and flax in these remote counties and partly due to the cheap wages paid to children of both sexes - some as young as five years old who were employed to produce it. The bulk of linen used in England at this time was being imported from France and other 'foreign countries' (Thirsk and Cooper 1972, 576). The remedies suggested to rectify this situation called for a continuation of import duties on such textiles. This position would have been strengthened by the passing, in 1666, of '*An Act for the Encouragement of Sowing and Planting Hemp and Flax*' (18 Car II) (Journals of the House of Lords Vol. XII). Harte and Ponting (1973, 102) suggest that during the first half of the eighteenth century certain regional economies were dependant on linen production and for County Durham and parts of Yorkshire it was the staple industry. While there is evidence of the importation of flax into the North East region from as early as the first quarter of the fourteenth century (as discussed in section 4.2.5), it is unclear when cultivation levels in the region were adequate to sustain demand from the local linen weavers. Therefore, although we have no way of knowing where the *8 pounds of flax* (valued at 6s 8d) and stored in the hall house of

Thomas Johnson of Elvet, in 1616 came from (DPRI/1/1610/J2/3), it is likely that from the mid-seventeenth-century onwards, Durham's linen weavers could have been sourcing locally grown flax and hemp.

Spufford (2002, 252) suggests that linen weaving and flax growing were activities often found in the same places and for that reason linen weaving was an industry that developed in the countryside. Although the process of cultivating and propagating flax was intensive, yields from a single hectare of the plant could produce sufficient fibre for 1200 ells of linen. After linen was woven, bleaching with wood ashes and possibly lime would take place before the washed linen was then stretched out to further bleach and dry in the sun. As this drying process could take a number of weeks to complete in dry sunny conditions, it was clearly a seasonal event (Spufford 2002, 252). Grassmen's accounts for the Parish of St Giles, Durham (Grassmen were appointed to take charge of the common lands of the Parish) for the years 1660 - 1725 record multiple annual receipts for tenter-rents (usually for 8d. (Barmby 1896, 75-105)). The use of the word 'tenter', in this context, differs from that discussed below – where the same word refers to the wooden frameworks on which cloth was held taut to prevent shrinkage while drying. Instead, it appears that the Gilesgate Grassmen (who would have possessed knowledge of tentering, particularly as Durham's late-seventeenth century dyers and others were using tenter frames), used the same word to describe the stretching-out of linen, on open ground, to dry in the sun after being bleached and washed: much in the same way as detailed by Spufford above. This assumption is strengthened by a reference within the same accounts describing tenter-rents as payments for bleaching ground on the common (Gilesgate Moor) or elsewhere (Barmby 1896, 70-109). The identification of these records is an important development in confirming the period in which linen weaving (and bleaching) was taking place in the city's immediate hinterland.

Some supporting evidence of earlier linen production in Durham can be drawn from Threlfall-Holmes' (2005, 209-210) analysis of the Durham obedientiary accounts. Her case study, based on the records relating to suppliers of cloth to

the Priory of Durham, reveals a range of both large and small transactions undertaken locally, regionally, and in four examples purchases of cloth from London. This research identifies significant cloth procurement by the monks of Durham Cathedral Priory, with 329 individual suppliers of cloth during the period 1464 - 1520. By establishing that while the cloth needs of the monastery fell into four main categories – livery cloth, other clothing, cheaper coarser cloths and linens – it was actually the consumer behaviour of the monks which ensured that relatively cheap linens were purchased from domestically-produced cloth suppliers. The more expensive linens purchased originated typically from the Low Countries (*ibid.*, 2005, 102-106). So what of the reference to ‘domestic procurement’: was this textile actually being woven in Durham? Threlfall-Holmes does allude to ‘familiar local suppliers’ names’ and the absence of any transport costs while also citing Huntley and Stallibrass (1995, 70-71) for evidence of archaeological plant remains found in archaeological sites in Northern England as proof that flax was grown in the Durham and Newcastle areas during this period and suggesting that cloth production was taking place in the region (Threlfall-Holmes 2005, 109-110). The evidence for local suppliers of cloth is also supported by Fowler (1900, 650-652) who lists several local Durham weavers in his analysis of the 1468 - 1467 Account Rolls of the Priory of Durham.

By way of a contrast, Fraser’s (1981, 166-168) work on the Northern Petitions throws light upon the sorts of goods, including a range of different cloth types, being traded by the merchants between Flanders and the Durham monks. In 1336 the burgomaster and échevins of Bruges seized goods from the servants of two Durham merchants, Robert Cockside of Durham and Robert de Gretewych of Durham, on the allegation by Simon Fauvale that the king owed him a sum of money. The subsequent enquiry, which was held in Durham in 1337, found that the two servants had bought 39 coloured cloths worth £104, 14 striped cloths worth £32 13s 4d and 1000 pieces of canvas worth £9, all presumably different types, quality or even quantities of cloth to that available domestically in Durham. Typically, sacks [or sarples] of wool and hides would be shipped out of the ports of Newcastle or Hartlepool by the pair to Flanders and items, including

various types of cloth, canvas, spices and mercery, purchased or exchanged. Bursar's records dated to the middle of the fourteenth century confirm that Robert de Gretewych of Durham sold cloth extensively to the Priory of Durham (Bonney 1990, 158).

The textual evidence suggests that during the late-medieval period, the main consumer of cloth in Durham was the Benedictine monastery, procurement for which was overseen by a number of officers and obedientaries who were entrusted with the running of the house and cells of Durham Cathedral Priory. A distinction between an officer and an obedientary suggests that the latter's office had been separately endowed with resources which would allow the functions of that office to be performed, for example, the provision of land and manors from which they could generate income. Some of the important obedientaries of Durham Priory included the almoner, chamberlain, communar, feretrar, hostiller, infirmarer and sacrist. The provision of cloth – in fulfilment of any of the individual duties of these obedientaries – would have been made possible by drawing from these separate sources of revenue. While the hostiller (who controlled the income from Elvethall and the tithes of St Oswald's church) was responsible for providing linen for the guest hall, it was the chamberlain who was responsible for purchasing cloth and the employment of a tailor to clothe the monks and novices. In the last quarter of the fifteenth century the priory chamberlain was procuring on average 500 ells of linen per year. In addition, the office of bursar was responsible for a large income being generated from rental returns from lands not otherwise allocated (the total accounted for almost three quarters of the priory's income). From this significant income, the bursar would pay all the expenses of the monastery as well as the servants' wages. The position of bursar was not always a popular one due to the burdensome administrative work involved; between 1250 - 1539 the names of 72 Durham bursars are recorded (Threlfall-Holmes 2005, 19-21, 113; Dobie 2015, 28-40). During the period 1424 - 1450, the Priory purchased a range of different textiles. Although relatively small quantities were bought for liveries from Durham-based merchants/drapers, such as linens from Thomas Warwick de Dunelm and the wife of Richard Preston de Elvet and blue cloth from Robert

Preston (Morimoto 1983, 38-45). Much greater quantities of linen and other various coloured cloths such as, rays, russets, broad and striped cloths were bought from merchants from Billingham, Newcastle, Darlington, York, Thirsk and Richmond; while black cloths for *vestura* (clothing, hangings, livery or vestments (Latham 1989, 510)) were purchased from fairs in London and York (Morimoto 1983, 38-55).

The domestic consumption of imported 'finer quality' textile commodities in late-medieval Durham is well documented. There is much evidence to suggest that, like the above mentioned early-fourteenth century livery cloths imported from Flanders, other fine textiles were being shipped into Durham. These fine textiles were sought from numerous other sources, not just from England, the near Continent and as far away as Augsburg in Southern Germany. An extract from the 1313 - 1314 account rolls of the Abbey of Durham, under the heading *Garderoba* (wardrobe), demonstrates the extraordinary length the monks went to in order to acquire the exact type of cloth they required. In this example, sayes purchased in Lincoln were taken by cart some eight miles north-west to Torksey where the River Trent allowed the cloths to be shipped some considerable distance north via the Rivers Humber and Ouse, first to York, then beyond to Boroughbridge before finally being taken overland by cart to Durham: a distance close to some 150 miles (Fowler 1898, 512). The additional transport costs for each leg of the journey added considerably to the total costs incurred for the cloth. Other evidence of the procurement of higher grades of cloth, in this example described as gentlemen's, valets' and grooms' cloth, for the Bursar of Durham's household are recorded as occurring slightly closer to home than Lincolnshire; although they did incur similar handling, transport and toll fees. In 1530 - 1531, a local man (probably from Durham) named George Heddon was despatched (on numerous occasions) to regional fairs such as those held at Ripon and Wakefield, both in North Yorkshire. He was often sent with a *famulus*, a member of the Bursar's household. Procurement of these various cloth types at these fairs would have enabled the Bursar to pay his staff in various ways, including being given their livery – *liberaturae* (uniforms) as was his custom (Raine 1844, 48). That the Bursar was still despatching men to

procure cloth from Yorkshire some fifty years later is highlighted by Tillott (1961, 84-91) who, while referring to an expansion of the rural textile industry in Yorkshire, describes how, during the late-fifteenth century, Durham Cathedral Priory switched procurement of cloth from York drapers, to drapers from Leeds and Halifax.

Based on early accounts it may be hypothesised that the absence of any significant textile production in Durham may have been linked to the inferior quality of Durham wool. This assumption may be supported by James (1968, 8), who notes that in 1338, when Edward III fixed the price payable for two years, at which the best wool of several shires should be settled, Hereford wool commanded £8 per sack, Shropshire £7 and Lincoln £6 13s. 4d, Durham's inferior wool could only command £3 6s. 8d. per pack. The argument for inferior quality wool in Durham is further strengthened by Bowden's (1962, 108) analysis of the wool trade in Tudor and Stuart England, which highlights how coarse low-valued wools could be shipped direct by merchants of Newcastle upon Tyne to the Netherlands. His reference does not actually mention Durham directly, choosing instead to use the phrase 'the four northern counties of England', which were Northumberland, Westmorland, Cumberland and Durham.

In addition, Bridbury (1982, 114) citing Gray's alnage statistics of the mid-fourteenth century lists only 69 Cloths of Assize exported from Newcastle in 1353 - 1354 (both Newcastle and Hartlepool were the main trading ports for Durham). This is compared with 2,118 cloths from Bristol, 2,131 from Hampshire and 1,253 from Kent. There is no direct evidence that this was actually Durham cloth, although a tenuous link is made by Bowden's analysis above. These statistics change dramatically across the whole of England during the following 40 years, as total output grew from 10,993 cloths in 1353 - 1354 to 49,308 cloths of Assize in 1398. However, total exports from Newcastle only increased from 69 to 121 cloths by 1398. Compare this low production to the output which occurred in York (city not county), where during the same period there was an increase from 225 in 1354 to 3,462 Cloths of Assize by 1398 (*ibid.*,

114). It is argued here that the lack of settled opinion on the extent of the trade is partly due to these alnage account statistics being flawed. It would be a reasonable assumption that a similar increase in the export of cloth from Newcastle was occurring as was the case in nearby York; some other factors had to be impacting on the region. As mentioned earlier County Durham had cheap labour, rural location and fast flowing rivers, all of which were necessary for an emerging/thriving cloth/textile industry, so why then do the accounts indicate such a poor increase in cloth production? The answer may lie partially hidden within a Calendar of Close Rolls dated 20 November 1354 (Hinds and Bird 1908, 48). Here we see Edward III writing to the Bishop of Durham Thomas de Hatfield, ordering him to permit the King's collectors in the liberty of Durham, to levy and collect the subsidy on each cloth for sale, as granted by Council held on the 27th year of his reign, for the right of the Crown to seal the cloth and collect alnage. Edward questions why the Bishop hinders his appointed collectors from sealing the cloth under the appointed seal when the subsidy had been paid. According to Barker (2006, 132), Hatfield openly resisted Edward III, causing the King to 'wonder that he presumed to do such things'. The important point here is that, as Bishop of Durham, Hatfield had a duty to resist the King, despite their personal relationship, even if that relationship had played an integral role in ascent to Durham's episcopal throne (*ibid.*, 2006, 2). Put plainly the King's writ did not extend into the liberty of Durham as it was the Bishop's land; the King was simply not entitled to collect any subsidy. Jolliffe (1967, 398), highlights a similar situation when Abbot Sampson of Bury claimed that King Richard II had no demesne right to regulate the tolls of the town, as instead the rights belonged wholly to the Saint.

Although ultimately surrendered, Edward III's original 1354 writ was not the end of the dispute for in October the following year the King again wrote to the Bishop of Durham (Hinds and Bird 1908, 159) with an order to permit his appointed collectors of the subsidy of cloth to levy the subsidy in the liberty of Durham. This time the King went to great lengths to set out clearly the legal rationale, based on the rights of the Crown for the alnage of cloth, citing the ruling of the great Council assembled at Westminster in the 27th year of his

reign. Edward names Robert de Penreth and Robert de Thorneye as his appointed men to collect the subsidy in the port of Newcastle upon Tyne and all places by the sea coast between Berwick and Whitby but again complained that his collectors were being hindered from exercising their office in the liberty of Durham. The tension between the two men is obvious as highlighted in his final comments on the matter when Edward sets out that both great and petty customs should be levied in Durham as elsewhere in his realm and that he will not be deprived of that subsidy. It appears therefore, that Hatfield (and perhaps his successors) stood their ground, continuing to defend the palatine's rights to collect its own alnage subsidy and seal cloth produced in the liberty of Durham. That this was the case is supported by Gray's mid-fourteenth century alnage statistics mentioned above, as they actually demonstrate that this continued from 1353 to at least 1398 with a meagre total of only 69 rising to 121 Cloths of Assize being produced across the North-East region. The potential implications of this would be to suggest that Gray's alnage statistics do not actually reflect the subsidies collected across the whole of England: County Durham's are missing! Consideration therefore, should be made for further work to review the national alnage accounts taking into account those subsidies collected by the Bishop of Durham, if indeed any records are extant.

Some elements of textile-related activity occurring in Durham were acknowledged by the late eighteenth-century antiquarian William Hutchinson, whose early work described the histories and antiquities of the County Palatine of Durham, later similarly documented by first Parson and White in 1827 and then William Fordyce in 1857. Collectively, these works are important however, for not only do they contain transcribed pre-Reformation grants issued by Durham's bishops to the many craft guilds, but, occasionally, we get a sight of the names of individual Durham citizens, each tasked with specific roles; for example, Robert Kelsey a man who was not only the first Marshall or Clerk of the Market [of Durham] but also the first recognised alnage official (see 6.5 below). Bonney's seminal work on medieval Durham highlights townsmen engaged in the craft roles of weavers and fullers; she also suggests that the evidence to support the argument that the textile industry was the dominant

industry of Durham is, at best, sparse. In any event, at no point did it approach the scale of the textile industry documented at York, Stamford or Norwich during the late medieval period (Bonney 1990, 154).

6.4 The presence and impact on the city of textile-related craft guilds

Although the presence of craft guilds in late and post-medieval Durham has never been in doubt, questions relating to their scale and organisation persist. This section of the thesis presents a thematic review of related extant historical documents, such as those found in the substantial archive repositories of the Durham County Records Office and the Durham University Library, Archives and Special Collections. However, due to the remit of this thesis only documents linked to the craft guilds associated with the textile trade, the dyers, fullers, weavers and drapers, were examined. The examination of important factual sources, such as ordinaries (regulations), recognizances, charters of incorporation, records of meetings and lists of freemen and members and combining these research findings with additional textual evidence linked to local parish and manor court activity, has allowed a picture to emerge which, for the first time, defines not only the scale of textile activity but also highlights the roles certain craftsmen played in town society in late- and post-medieval Durham.

Although at best scant, some of the earliest references to the presence of guilds and guild-related property in the city of Durham seem to suggest that religious (St Cuthbert, Corpus Christi, St Margaret etc.) rather than craft guilds dominated during the late-thirteenth century; although it is unclear if the properties they owned were used for business or social activities, it is probable that the rents from them were used to support guild activities or religious activities. Only the guild of St Nicholas owned a guild hall (others are described as guild house(s)), this stone-built property, which was once owned by the merchant Reginald c.1271, was situated in Durham's market place (Camsell 1985, 89-91). References to any early craftsmen linked to the textile trade during this time are similarly scarce, although in 1260, two men, perhaps associated with wool

production, Richard, son of David Wolpuller of Crossgate and Thomas Wullepuller, witnessed the signing of a charter (Misc. Ch.2372; 4.18. Spec. 17). It is not until 1450 that we see the first evidence of albeit relatively small numbers of weavers (23) gathering to witness their craft regulations (compared to the 100 Norwich worsted weavers who occasionally assembled after 1444, to elect their county wardens (Allison 1960-1, 73)). The appointment at this 1450 meeting of two members, William Nesse of Framwellgate and John Frank of Clayport, as wardens for that year, marks an important early milestone in the regulation and quality control of commercially produced cloth in Durham (PRO Durham Chancery Enrolments 3/44 m.10-11; Camsell 1985, 169). Hutchinson (1787, 16) captures the essence of the weavers' 1450 ordinary:

'that they meet yearly, and choose two wardens and searchers; that they make procession on Corpus Christi day; To obey the ordonances stipulated by the wardens, under the penalty of iiij d. That no one shall set up and exercise his trade, till his looms and his proficiency in the trade be certified by the wardens. No Scotchman to be taken apprentice. No one to weave till he has taken oath before the bishop's officers in the city court; also that: no man shall go into the said city [Durham], to desire no other mans customers, or work from him.'

Whiting (1941, 148) suggests that these ordinances would have provided a model for other craft guilds. Although the signing of a charter represents significant progress for Durham's relatively insignificant mid-fifteenth century weaving industry, it is unclear if this formation of textile workers into an organised and recognisable craft guild was already established before 1450. There is always the possibility that Bishop Neville's charter simply represented the incorporation of an existing society.

The only evidence of any earlier regulation of cloth production exists in two forms: firstly, the letters between Edward III and the Bishop of Durham in 1354 (discussed above), and secondly, Durham's manorial court records. However, the latter appear to relate to inspection and quality control by alnage officials

rather than guild-appointed wardens or searchers. What is certain is that, various manorial courts held by the authority of the Prior of Durham witnessed the settlement of many disputes and the levying of fines linked to the weaving of cloth, such as when in 1370 Ranulphus Webster forfeited his cloth at Elvet's Marshallsea Court as it was an ell too short. Three relatively basic entries in the same court records provide a rare glimpse of an alnage official at work in Durham in 1392. The wives of Ascon de Cletlem and William, son of Thomas Smithson, along with the weaver Ranulphi del Hall all placed themselves at the mercy of the same court for not showing their cloth, on various occasions, as summoned to do so by the appointed alnager (Fowler 1898, 327-353). Although the exact occupation of the two husbands is unclear, the fact that two women were summoned to appear in this way provides a valuable snapshot of what the situation in Durham must have been like before the creation of a weaver's or spinners guild and their associated craft regulations. It would seem highly unlikely that these women were being summoned before a jury for weaving cloth for purely domestic use, indeed (though slightly later) Statute 7. Henry IV, dated 1405, stated that no subsidy would be collected on cloths made by anyone clothing themselves or their household (Stamp 1933, 8). It is more likely that they were either part of a supply chain – making cloth to order, or they were producing cloth to be sold locally for their own profit: most probably at Durham's market. The fact that they were summoned not for weaving cloth in the first instance, but because they failed to have it inspected once woven, suggests that they were actually being allowed to weave at this time. The single authority who would have allowed this to happen was of course the Bishop of Durham, and his appointed alnager, who was clearly aware of their activities, was simply undertaking his duties as per crown Statute (27 Ed. III st. 1 c.4; 13 Ric II st. c.11, etc.). He had requested that they showed him their finished cloth so that he could inspect it and then claim the relevant fees. Ironically this quite insignificant borough court activity may actually be compelling evidence suggesting that anyone residing in the city's boroughs was allowed to weave cloth during the second half of the fourteenth century, or perhaps evidence for an absence of a recognised weaving guild. Coincidentally, the activity of the two women mentioned above (and others) could help account for the 38 decorated

lead spindle whorls recovered from the River Wear at Elvet (Fig 6.22). Handloom weavers were always short of yarn and there is strong evidence here that the spinning of yarn (and not using a wheel) was being undertaken in a suburb of the city rather than in Durham's rural hinterland, activity perhaps contradicting Ponting's view of the fourteenth century West of England cloth industry that much of the spinning was done outside towns (1971, 25).

Apart from the few weavers discussed in 6.7 below, who were summoned to appear before Elvet's Marshallsea Court, very few others are recorded as living or operating in the Borough of New Elvet during the late-medieval period. There is evidence that in the same year (1392), Ascon del Cletlem also placed himself at the mercy of the court while, John Garnet and John de Dalton appeared for seemingly similar offences (Fowler 1898, 346-353). The only known weaver to occupy property in the Borough of New Elvet is one Richard Webster who, in 1382, rented part of a tenement in Northrawe from the Bursar (plot 10, Fig 6.16), although by 1413, he had vacated the property – or was perhaps deceased? (1.17. Spec 40).

As with the weaving activity described above, fullers too had an early presence in late-medieval Durham. The earliest record for a fuller in the city is for one Walter de Scelton who, in c.1317 was granted a burgage on land abutting Ratonrawe in New Elvet (3.17. Spec. 12). The fact that two other men Robert Walker (c.1365) and John Walker (c.1538) also occupied New Elvet tenements, coupled with the presence of dyers, weavers and drapers (discussed below), strengthens the argument that the borough was an important centre for textile finishing during the late-medieval period (see Fig. Map 6.16 and Table 6.2). On 12th February 1447, the names of fifteen fullers, Robert Walker, Adam Frithbank, John Joyce, John Martyndale, John Robynson, Thomas Walker, Adam Hoban, William Fayrechayce, John Forman, Robert Bowet, John Winter, John Wryght, John Padyngton, Andrew Walter and John Gray, appear in an early recognizance of their guild (Durham Chancery Rolls DUR 3/46 m.23d). It seems likely that this event, when combined with the slightly later 1450 weavers' gathering, suggests an invigorated period of economic development in Durham,

overseen by Bishop Neville. However, this assertion somewhat contradicts Camsell's suggestion that the fulling mill situated below the cathedral lay in waste for much of the fifteenth century; by 1551 Bursars' accounts describe it as a corn mill (although the date of conversion is unclear) and from 1462, the South Street fulling mill had been converted to a corn mill. The fact that out of Durham's eight riverside mills, it is only these two which are described as being fulling mills (1985, 52-53) suggests that the fifteen fullers listed above were probably practising their craft in tenement workshops. An apparent absence of surviving historical documents relating to fulling activity in Durham for nearly 36 years from 1462 - 1498, may support the argument for an absence of working fulling mills in Durham. Although further evidence of fulling in the city is alluded to in the Bursars' account rolls dated to 1486 - 1487, which lists, under the heading *Garderoba*, procurement of livery cloths and furs bought for the Prior of Durham and for the fulling of cloth in London and Durham, as well as payment for the carriage of the said cloth from the capital to Durham: '*pro fullacione dictorum pannorum apud London, ...et apud Dunelm*'. This same entry also lists the names of fourteen presumed 'local' weavers who were also supplying various quantities of cloth to the Prior (Fowler 1900, 650-652). It was not until August 1498 that evidence of any fulling related activity in Durham re-surfaces, this time in archidiaconal court records in the form of a breach of faith case which was brought against Richard Smallwood and John Hugheson for fulling contrary to the 'ordinances of the art of the fullers' (DCG 8. DCD/Off.; Britnell 2008, 70). However, by its very nature, this activity alone suggests, that in the years leading up to 1498, a well-established and structured craft guild had to have been in place, certainly one so structured that it was capable of enforcing guild byelaws and appointing wardens to regulate their craft members' activities. Later, in 1526, the activities of two '*procurators de walker*' (wardens of the Fullers' Guild), William Robynson and Johannem Dyxson, suggest a continuation of a well-organised fulling guild, as they enforce their company's ordinances by placing a complaint made against the fuller Oliver Thornbrugh before the panel of jurors of the Crossgate Borough Court (Britnell 2008, 304).

In addition to the fourteen weavers mentioned above operating in Durham in 1486-7, other extant textual evidence supports a continuation of guild-controlled weaving activity during a time when it was possible that no fulling mills were operating in Durham. Records detailing an inquest which was held in 1468 by the Steward of the Borough of Durham, Richard Racket (DURH 3/50.85 microfilm copy only, original in the TNA), detail how a controversy had developed between two groups of weavers: the wolne-weavers and the chalon or shalloon-weavers, over who had the rights to manufacture what types of cloth. The decision by the jurors is of interest as not only do we learn that they sided with the wolne-weavers as from 'time imorial' they had the sole right of weaving woollen and linen cloths, but also because the types of cloth being woven by them at that time are referred to: planlyn, caresay (originally made in Kersey in Suffolk), seckcloth (sack-cloth) and celicia (hair) cloth. The shalloon-weavers were deemed to have the sole right to weave tapestre-works (tapestry) such as say, worset (worsted), motleys, tweled (twilled) and dyaper (diaper) cloth. A 100 shilling fine imposed for any transgression emphasises the level to which both groups of weavers wanted to defend their craft rights (Hutchinson 1787, 21; Surtees 1840, 21-24; Whiting, 1941, 148).

The relevant conclusion here is that Durham may have had at least one working fulling mill operating throughout the late-medieval period. If this is correct then Durham, like Salisbury, would have had a continuity of textile production throughout the late-medieval period unlike many other towns in England which had witnessed decline; this may have been in part because of the development of mechanical fulling (Ponting 1971, 22). Although Ponting argues that this continuation of the textile trade would have been more prominent as a rural industry rather than the old urban trade, Durham's semi-rural location and proximity to a powerful and reliable river ensured that mills, driven by something other than manual power, was introduced into textile production. St Cuthbert's popular shrine would have helped matters somewhat, as local traders would have benefited immensely from the visits of countless numbers of pilgrims, until its desecration in 1538 by the commissioners of Henry VIII (Roberts 2003, 24) although Ornsby (1846, 66) describes the shrine being

defaced and dismantled and the coffin broken open in 1540. Regardless of its relatively small size in terms of members, the fullers craft guild appears to have gone from strength to strength as by 1565 Letters Patent from Bishop Pilkington incorporate them under the name of cloth-workers and walkers (Surtees 1840, 23-24). Later still in 1635, Bishop Morton granted a new charter (DURH 3/108 m. 3d.) to the cloth-workers, walkers, cloth-fullers, cloth-dressers, hat-makers, and felt-makers. Although there is little textual evidence of fullers residing or operating within the late-medieval Borough of New Elvet, this is not the case for the post-medieval documentary evidence. Consequently, numbers of fullers are shown to increase some tenfold during this later period. Analysis of the parish records of St Oswald's Church, show that between c.1617 - 1746, 26 fullers resided within its parish boundaries; this total is set against a combined total of 138 fullers identified as operating in the rest of the city's boroughs, during the period 1540 - 1800 (156 fullers are recorded as operating in Durham between 1240-1800). As in the rest of the city (incorporating all the other boroughs) the numbers of fullers at Elvet peak c.1680 (Chart 6.1).

Craft guild numbers were not always only dependant on any economic prosperity on which to survive. There is plentiful evidence of a seemingly endless uphill struggle with early mortality. The premature deaths of hundreds of Durham's inhabitants are well-documented in both parish and guild records. Although many of these deaths were linked to ill-health brought about by the squalid living and working conditions within the city's boroughs (see discussion below), other causes of death, beyond the control of the authorities, are also documented. The unusual death of one Durham fuller, Robert Fisher in 1694, who drowned in the River Wear above Elvet Bridge is of interest, as not only does it place an elderly fuller (in his seventies), within the Borough of New Elvet, but it also highlights how Robert, born c.1620, may have been related to other men with the same family name who, it appears, were all practising the craft of fulling in Durham for at least a century. The death of the fuller Richard Fisher on 24th March 1746 came at a time of general decline of the company (the 1751 admissions of Freemen recorded only 23 living members – see below) and he may well have been the last of his family name serving as a fuller in the

city (Headlam 1891, 177, 286). A particularly sad tale relating to fullers operating in Durham occurs in the year 1604 when the plague again took hold in the city (the first occasion being 1589); the parish of St Giles was particularly badly affected, with over 100 related deaths. The parish register of St Giles records how, during one harrowing month, the fuller's wife Anne Frissell died from the plague and was buried on 5th September, her husband's apprentice Cuthbert Heugeson was buried on 16th and Richard Frissell himself died on 23rd of the same month (Barmby 1896, 133). Given that during the 1598 visitation 344 died '*within Elvitt streates*' alone (Headlam 1891, 37), it is easy to see how such uncontrollable events would have had a devastating effect on all levels of society, not just in Durham but also across the whole county and beyond. Any level of co-ordinated guild activity may have taken months if not years to recover.

Unlike the weavers and fullers discussed above, the dyers based in late-medieval Durham do not appear to have any extant documents recording craft-guild activity during this period. The earliest historical textual evidence highlighting any form of a structured dyers craft-guild does not appear until the 7th June 1576, when their company was incorporated by the alderman William Wright and his 'twelve assistant brethren' (Records of the College of Arms Durham Visitation Book of Richard St George, C.32). Although the actual numbers of dyers who attended this meeting is unknown, it would be plausible to suggest that they numbered somewhere between ten and twenty dyers (23 weavers had gathered to witness their craft's incorporation in 1450). A relatively small number of dyers being present is perhaps reflected by the single appointments at the meeting of one warden, John Frizzel, and one searcher, James Peacock (in the 1450 meeting, the weavers had chosen two wardens and two searchers). Based on this assumption, an average of fifteen dyers are shown as being active in Durham c.1576 in Chart 6.1.

The names of 27 dyers have been identified as operating in Durham before the 1576 incorporation, at least four of whom appear to have resided in the Borough of New Elvet. The actual earliest reference to a Durham dyer, which

dates to 1254, places one Robert Tinctoris residing in a tenement adjacent to a vennel and the River Wear in New Elvet (see composite map Fig 6.16, plot 5 (4.3. Elem.8; Camsell 1985, 637)). A probable dyer, Robert Littester of Elvet, is mentioned in a grant of property in Old Elvet dated to 1361; his wax seal survives on the grant (see Fig 6.3). The decision for any dyers to be based in Old Elvet, would, at first sight, not appear unusual; particularly as the known late-medieval tenements, for example, those at Kirkgate or those adjacent to Elvethall (Camsell 1985, 576), are only 404m (440 yards) from Elvet Bridge End and the associated easy access to the river via the common vennel. However, there is a notable height difference between the two locations and the incline would have impacted on any transportation logistics associated with dyeing textiles (although it is acknowledged that the current height of the ground may have built up since the late-medieval period). Nevertheless, perhaps for economic reasons associated with rental costs, it was a location that was being used by dyers, as evident in 1460 when the dyer Robert Weddale acquired several tenements there (*ibid.*, 1875, 572). Out of these 27 late-medieval Durham dyers, two others are worthy of further mention. The first is William Richardson, (described as a tinctore), who in 1503 made a complaint in the Crossgate Borough Court against William of Kendal in a plea of debt of 39s 11d. In an apparently unusual development, the defendant's guarantor, Laurence Toller pledges that woad and madder to the value of £10 is attached until the debt is settled, £10 being a very large sum at this time (Britnell 2008, 119). In 1523 the same dyer is recorded paying part of his New Elvet burgage plot's annual rent of 12s, due to the Hostillier, in candles worth 6s 8d (Camsell 1985, 691), perhaps evidence of a necessary diversification in trade for economic reasons. The second, a dyer named William Baxter (again his occupation is referred to as a 'tinctore') appears in the Feretrar's Rolls of 1430-31 (Fowler 1898, 467). He is recorded as renting tenements in close proximity to Elvet Bridge in the Borough of New Elvet; one being described as '*... ad finem novi pontis de Eluett*', ('at the end of the new bridge at Elvet'). A second entry in the same rolls describes the sum of 40s being paid by the same dyer for the building of a new *a'ppentice juxta pontem de Eluett*', ('a pentice adjacent to Elvet Bridge'). 40s at this time would have represented a large sum of money and it is

likely that this smaller building attached to the main building would have been in itself a significant subsidiary structure, perhaps replacing an older one (Musset, 2014, pers. comm., 4 July).



Fig 6.3. (1.1.Spec.32) A grant of property in old Elvet, containing a large seal marked '*Robert Littester of Elvet*' dated 1361. Image reproduced by permission of Durham Cathedral

William Baxter was evidently proficient in his trade, as he was still supplying dyed cloth to the Bursar some ten years later in 1440 (Fowler 1900, 626-627). Dyeing activity continued from this same location, undertaken by his (?)son Richard until at least 1452 (Camsell 1985, 636). It is relevant to highlight that the location of this one-time dyers' workshop tenement is the exact same one occupied by Robert Tinctoris some two hundred years earlier. It is the location of the modern day Swan and Three Cygnets Public House, a building which is located less than 30m from the lead cloth seal find site (see composite map 6.16). Records of the Dyers' and Litsters' Company, dated 1707 - 1842 (DCG 7/1 Add. MS 202), provide a useful insight into the innermost workings of a craft-guild in Durham, particularly during the early- to mid-seventeenth century. Apart from the expected details of meeting minutes, accounts, admission records and apprenticeship records, other important details such as the annual appointment of head wardens, for example Robert White in 1710, are captured. The Company held 'quarterly' and 'head' meetings in Durham's toll booth (paying 2s rent) until 1749. However, after this date meeting attendance numbers were presumably so low that rather than waste money renting the toll booth, members would gather in the homes of other members, such as at Jonathan Wood's house in 1750. At one particular meeting in 1743, only five members attended, while 25 members were recorded as absent. Although counting the names of those members who attended such meetings is one way of gauging the strength of the Company in any given year, it should be done with some care. It is evident that the same familiar names keep recurring and, in isolation, may not reflect the full strength of the Company. These regular 'attendees' appear to be the senior Freeman, inadvertently referred to in one particular head meeting as the 'eldest souls' [of the Company]. An example occurs in December 1711, when seventeen Freeman attended a head meeting, then, when a special meeting is called the following week '*to prevent confusion*' of a decision made at the previous meeting, 44 Company members' signatures appear in the minute book. Given that several of these new 'additional' signatures feature the same family name, it is perhaps an indication of the full strength of the Company as it includes Freeman fathers and presumably their apprentice sons. Evidence that entry to the Dyers' and Litsters'

Company was the same as the other craft-guilds in the city, i.e. by servitude or patrimony, is demonstrated in 1743, the entry in the record book reads:

Jonathan Wood son of Jonathan Wood of the city of Durham dyer hath bound himself an apprenticeship unto the said father by indenture to serve from twenty six day of December 1743 for seven years.

On 29th December 1740, members of the Company of Dyers' and Litsters' who had gathered in the toll booth for a head meeting witnessed how Mathew Wilson '*demande*d his freedom having served his time lawfully by judgment'. Not only did he have to pay £1.10s. to become a Freeman of the Company, but he also had to pay for a free supper for the Company members at 'Widow Potters' the following month. Widow Potter was presumably the wife of the Durham dyer Thomas Potter a man who regularly attended Company meetings during the first quarter of the seventeenth century.

The evidence of the presence of drapers in late-medieval Durham is similarly scarce. During the fourteenth century only four drapers appear to have been recorded, the occupation of three being implied by their surname only. The only exception is William de Furney who in 1380 occupied a tenement in the Borough of New Elvet (plot 13, map 6.14). In the early-fifteenth century the Bursar of Durham is documented seeking cloth from further afield than his own local suppliers, as he procured '3 uln of panno nigro', black cloth, from the Leeds-based draper Nicholas Best. However, in the following year 1515-16 he procured similar cloth from one William Myghlay de Dunelm, unusually described in the *Garderoba* procurements entry as a clothman (Fowler 1900, 664). The distinction between a maker and seller of woollen cloth – a clothier or clothman – and one who made woollen cloth and was a dealer in it – a draper, in this example – is taken as being the same or very similar occupation (source OED).

Although written on later seventeenth- or eighteenth-century paper, a copy of the bye-laws of the Drapers' and Taylors' Craft within the city of Durham or

suburbs of Durham, dated to 1549 (DU 5/3/1), is of great interest, particularly in view of Whiting's comments above on the probable similarities of craft guild ordinances (Fig 6.4). The bye-laws detail how a yearly gathering of its members, taking place within ten days of Corpus Christi day, would allow, by their members' common assent, to 'chuse six of the most cunning and discreet men of the said crafts to be their wardens and searchers for that year then following'. The level of fines set against any default, being twelve pence to be levied for the Bishop by his bailiffs or sergeants and another twelve pence to the said wardens and searchers, except that is, if they had a reasonable excuse. These laws highlight how membership of these crafts was restricted to those men who had completed a seven-year apprenticeship under a master, or those who were a son of a Freeman of the city of Durham from the same craft. In total 248 drapers are recorded in the city of Durham from 1565 – 1800; although the author has not been able to trace the names of those members who would have witnessed the signing of the original 1549 bye-laws. Like the four other craft guilds associated with textiles, the number of drapers in Durham peaks in c.1675 as 94 Freemen are recorded voting to elect an MP for the county (although this number includes some tailors), before then almost disappearing in c.1725, as only two members are recorded, but peaks again with 94 members in c.1775 (see chart 6.1 below).

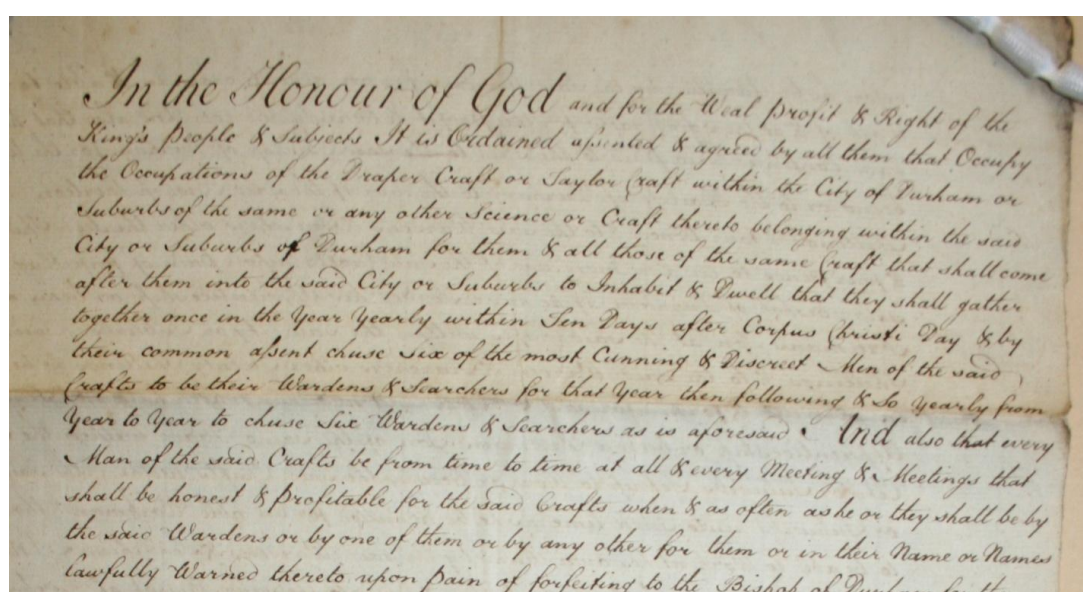


Fig 6.4. Copy of the bye-laws of the Drapers' and Taylors' guild, 1549. Image reproduced by permission of Durham County Records Office. DRO Du 5/3/1

On January 30th 1565, the same year that the Fullers had received their charter of incorporation under Letters Patent from Bishop Pilkington (discussed above), a second charter of incorporation was introduced; this time however, it was one granting self-governance to the city. It seems highly probable that the men empowered with publishing laws, statutes and ordinances would have been drawn from Durham's crafts or guildsmen. The practicalities of Pilkington's vision, contained within the charter, that *the citizens of Durham should become one society and one body for ever*, is succinctly explained by Fordyce (1857, 214), who describes the appointment of an alderman (Christopher Severties), and his twelve burgesses, who could then nominate an additional twelve other 'discreet' men to be assistant burgesses (they had to be inhabitants of the city of Durham). These men were then authorized, from time to time, to make, order and publish laws, statutes and ordinances for the benefit of the city's inhabitants (Hutchinson 1787, 19-20). Apart from the empowerments listed above, it was also within their power to hold a weekly market within the city on the day before the Sabbath, to hold three several fairs in the year, each of two days, and during these fairs hold a court of *pyepowder* (a court to determine disputes at fairs between pedlars and petty tradesmen who attended them). The constables of the city were instructed to aid and be obedient to the alderman. During the time of Bishop Mathew in 1602, a second charter of incorporation was granted to the city. In this charter, the vision receives an update, now declaring that the city's burgesses and inhabitants should be '*one body politic and corporate*'. Although for the first time we see the appointment of a mayor (Hugh Wright), it is the appointment of twelve aldermen that is of particular interest, as other prominent textile-related guildsmen taking up these roles; men such as: the draper William Hall (later mayor in 1611, 1612, 1613, 1614, 1615, 1616, 1618, 1619, 1622 and 1631, draper/tailor James Farales and the dyer Edward Wanless (later mayor in 1609). In addition, these twelve aldermen were to choose yearly, 24 discreet men out of the several arts, mysteries, or trades of the city, including: two of the drapers' and taylor's, two of the weavers' and two from the dyers' and fullers'. These men, who were inhabitants of the city and of Framwellgate were, along with the mayor and aldermen to form the Common Council for the city (Hutchinson 1787, 29): in essence we are witnessing how

the guilds' legitimate role in the governance of the city of Durham was finally defined.

In early-seventeenth-century Durham, further evidence of the influence prominent guild members held over the city can be demonstrated when, in 1598 on the death of Henry Smith a substantial charitable donation was made to the city of Durham, so that '*some good trade may be devised for the setting of youths and other idle persons to work*' (DPRI/1/1599/S3). The prominent draper William Hall and dyer Edward Wanless were appointed executors of the will. Not surprisingly they pursued the development of work linked to the textile trade and various clothworkers were brought in to oversee the establishment of weaving work. Property was purchased in the city – most notably 'New Place', a townhouse located between the Market Place and Walkergate – and here work continued through to at least 1616. That same year, one William Atkinson, master of the house of correction, was employed and given £60 to buy wool and to 'spin and employ children that way'. In 1669 a commission of pious uses was awarded to Bishop Crewe, from which he gave £100 a year from the charity for 'putting out poor children apprentices to such trades as the mayor and aldermen appoint'. Several other cloth-making-related ventures linked to Smith's charitable trust continued through to the mid-eighteenth century; however, they all eventually failed. It is worth noting that several additional properties were purchased by the governors of Smith's charity including a shop and burgage in the Market Place, known as Heighton's Burgage and dye-houses, although the locations of these buildings within the city were not given (Hutchinson 1787, 56-58). The 1615 charter granted by Bishop Mathew to the cloth-workers [alone] to erect a '*walkmill upon 12 acres of land on Brasside nygh and upon the River Weare*' and not to prejudice the three related trades of weavers, fullers and dyers, of drapers and tailors, and of fullers and walkers (DURH 3/96.70), was also linked to Smith's testamentary charitable gift.

The new powers of control held by the Mayor and Common Council over the Corporation and borough court were challenged in 1609 by the new Bishop of Durham William James. Ultimately, an action brought in the King's Court of

Exchequer in 1610 was given in favour of the Bishop which meant in practice that the borough's revenues and courts were let out by the Bishop. Possible new evidence that Bishop James sought to further weaken the stranglehold of power held by the common council is revealed in the Miles Stapylton indenture (see 6.5 below), when it is revealed for the first time that Bishop James appointed an 'outsider' – the Alnager General for England and Wales, into the office of Alnager for County Durham and its Liberties; an action effectively confiscating the Bishop's own alnage seal from the Marshall, or Clerk of all the Markets. This state of estrangement continued until 1646, when Parliament sold the borough's confiscated rights to a consortium of London aldermen. Ironically the consortium then re-sold the tollbooth rights to admit freemen, appoint bailiffs, hold markets and have a clerk of the markets back to the Mayor and Corporation. Despite resuming some control in 1660, following the restoration of Charles II, the Bishop of Durham would lose more influence in 1678 when the city was given parliamentary representation. The Corporation, by virtue of controlling admission to the guilds, was therefore able to manipulate Durham's electorate (Emsley and Fraser 1984, 22).

Bishop Mathew's charter of incorporation would effectively be kept in force until the year 1761, despite intervention by Bishop Crewe who tried unsuccessfully to implement his own revised charter in 1684. In essence, the city would witness orders and bye-laws being made at regular meetings (four per year) of the mayor, aldermen and commonality of the city of Durham. The orders and bye-laws would then be kept and observed by the wardens, stewards or freemen of the city's companies. Qualification for admission as a freeman of a trade company was generally achieved either by patrimony or by servitude, i.e. by being the son, in most of guilds the eldest son, of a freeman, or by serving an apprenticeship, originally of seven years. The 1602 charter (mentioned above) granted to the city by Bishop Matthew of Durham, the Freemen of the city were the only electors and the only candidates for election to the city council, an exclusive right which they retained until the passing of the Municipal Corporations Act of 1835. Except for a brief time during the Commonwealth period, when a member (a mercer) was returned in 1654 and

1656, the city did not secure parliamentary representation until 1678, from which date until 1832 the Freemen formed the exclusive franchise for the city's two seats, so greatly enhancing their status. The 1675 elections, which witnessed Durham craft guild freemen voting to appoint a Member of Parliament for the County of Durham, returned the following totals (Hutchinson 1787, 45):

- Drapers and Taylors – 94
- Weavers – 72
- Dyers and Fullers – 33
- Feltmakers – 10

Textile workers being embedded within the structure of Durham's governance became the norm; for example, in the 1728 meeting of the mayor, aldermen and commonality which took place in either the Guildhall or Tollbooth, those present included the dyer Ralph Gelson (alderman) and the weaver John White (common-council). From this same year, attempts were made to control those men who could be admitted as freemen of a company, as abuses such as exercising their trade in the city by those deemed not free (these could be fined 20 shillings per week), or apprentices gaining their freedom by illicit means, were common practice. One such control, overseen by the mayor and town clerk, required those claiming 'title to his freedom' be 'called' to attend four guild days in the year and his name to be recorded for such purposes (Hutchinson 1787, 33; Parsons and White 1827, 150). In essence, for tradesmen to be admitted as freemen they had to attend, on three separate occasions, a 'calls' meeting and pay a shilling to the mayor before being approved. One such record detailing this activity is shown in Fig 6.5 (Du. 5/1/24) and records how the fuller William Watson, eldest son of Robert, attended these meeting on three separate occasions from 1758 - 1759, before being approved in 1761. The death of two others on the same list was not an uncommon phenomenon in mid-eighteenth century Durham, the mortality rates of which are discussed below.

Cuthbert Smith Esq. Mayor.

		1758. 5. 12. 13.	1759. 1. 2. 3.	1759. 1. 2. 3.	
Clement Staff App: to Samuel Thompson	Sadler	1	2	3	Nov 4 th 1760
William Kirtou App: to William Dordshou	Merchant	1	2	3	June 11. 1760
James Laig App: to William Brown	Barber	1	2	3	Oct. 3. 1760
William Wastow eldest son of Robert	Fuller	1	2	3	Oct. 3. 1761
Anthony Watson App: to Richard Stcher	Barber	1	2	3	Oct. 3. 1760
Henry Wiseman eldest son of James	Cordw.	1	2	3	Mar. 27. 1761
John Marshall App: to Tho. Simpson	Smith	1	2	3	Oct. 3. 1760
dead — John Watson son of William	Merchant	1			
John Reah son of Richard	Shinner	1	2	3	
dead Charles Potter App: to Peter Robinson	Barber	1	2	3	

Fig 6.5. Calls at Guilds [of those to be made Freemen], 1757 - 1761.
DRO Du 5/1/24.

Final confirmation of the admission of freemen required the signature of the Mayor of Durham; Fig 6.6 records fuller George Fairlamb being sworn for a freeman in to the Company of Fullers, in the presence of Durham Mayor John Drake Bainbridge, in 1761.

Although incomplete, documents such as the booklet Du 5/1/21 (see Fig 6.7), are of particular interest, as they allow a 'snapshot' in time, effectively capturing the total number of freemen operating in the nine separate companies of Durham in 1751. Unfortunately, out of the four textile-related guilds, only the Fullers and Feltmakers and the Draper and Taylors appear. The latter lists 104 individual names, 20 of which, have 'mort' recorded against them, one is 'disenfranchised' while another entry is scratched out as this individual appeared to reside/operate in East Darlington; in total there were 82 active Drapers' and Taylors' Company freemen that year. By contrast the Fullers' and Feltmakers' Company records the names of 33 freemen, ten of which are also listed as 'mort', thus only 23 being active; however, the subsequent page in the booklet is missing and the total may have been higher than the original 33 recorded. The largest company operating in 1751 Durham recorded in the booklet is the Cordwainers, who, with 219 freemen listed, were more than double the size of the Drapers' and Taylors' Company. An 'update' on the

strength of the companies is provided by Du 5/1/23, which similarly records the number of freemen in the companies of Durham just ten years later in 1761. Fortunately this record, which exists as a small file of parchment and paper, appears complete as it sets out the numbers of freemen operating in sixteen different companies (compared to the eight above in DU 5/1/21). These records confirm that the Drapers' and Taylors' Company had 48 freemen, four of which were supposedly dead; the Dyers' Company, which was clearly struggling by this point, had only ten freemen, two of whom were again supposedly dead. The Weavers' Company had 26 freemen, four of which were papists and finally the Fullers' and Feltmakers' Company who had nineteen freemen, with two dead, one is incorrectly recorded as he was actually a goldsmith, two were sailors while a third was on board a man-of-war.



Fig 6.6. Admissions of Freeman, 1761.
DRO Du 5/1/23.



Fig 6.7. Lists of Freemen of the companies of Durham, 1751. DRO Du 5/1/21

The high levels of mortality of guild members identified within these records are not a phenomenon restricted just to the mid-eighteenth century. There is evidence that even as late as the mid-nineteenth century, the living and working conditions within the city were still dire. George Shaw's (a sub-committee member of the Committee of the Sanitary Association) statistical table of the mortality of the city of Durham for ten years, based on the 1851 census, reveals that those citizens residing in the street of New Elvet (including Water Lane) had a life expectancy of only 29.6 years. The life expectancy of those residing in the city as a whole was not much better with an average life of only 30.2 years. The worst street to live in was Leazes Place with an incredibly low life expectancy of only 19.6 years; but the same mortality statistics suggest that those residing in the North Bailey (which may have included the clergy) could expect to live on average for 51.4 years. This excessive mortality (compared with other towns) was attributable to various outbreaks linked to serious deficiency of water supply, drainage and the filthy and defective state of the conveniences of the poorer classes, together with the presence of open cesspools (Butler 1997, ii, viii, 28). The burden inflicted on the small medieval city by an ever-increasing population is discussed below, see section 6.8.

The cultural examination of the surviving documents and literature of the Durham City craft guilds, as set out above, has allowed a picture to emerge which not only details who the individual guild members were and how their companies and fraternities were structured, but also how members of them became entwined with the very fabric of Durham's governance. Documents accessed for this thesis cover guild activity from the sixteenth through to the end of the nineteenth century, they include, but are not limited to: Guild minutes, 1728 (Du 5/1/1); Admissions of Freemen, 1761 (Du 5/1/23); Calls at Guilds [of those to be made freemen], 1757 - 1761 (Du 5/1/24); Lists of Freemen of the companies of Durham, 1751 (Du 5/1/21); Lists of Freemen of the companies of Durham and lists of mayors, 1742 - 1761 (Du 5/1/22); Copy of the bye-laws of the company of Drapers' and Taylors', 1549 (Du 5/3/1-7); Copy of the bye-laws of the company of Drapers' and Taylors', 1628, 1696 and 1705 (Du 5/3/2); Names and places of abode of members of the Dyers' Company, 1772 DCG 7/3; Add.MS 1980 (formerly 'Cordwainers 3') (possible society of freemen friendly society listing members by trade) 1770 - 1784; TNA-DURH-20-130 Humble petition signed by Fullers' and Feltmakers'; TNA-DURH-20-130-25, Similar petition signed by members of the Drapers' and Taylors' Company, and DCG 7/1, Records of the Dyers' and Litsters' Company 1707 - 1842.

The analysis has identified that the total number of members of craft guilds, companies, societies or fraternities and others engaged in the textile trade in Durham from 1240 - 1800, includes some 1104 unique* individuals. During this period 156 of them were fullers, 135 dyers, 342 drapers and 471 weavers. Two peaks of significant textile-related activity are observed, the first occurring during the third quarter of the seventeenth century, with 10 fullers, 72 weavers, 23 dyers, and 94 drapers, and the second, a century later, during the third quarter of the eighteenth century with 39 fullers, 95 weavers, 17 dyers and 64 drapers all seemingly engaged in the textile trade at around the same time. A noticeable downturn in all textile-related activity is observed during the period 1720 - 1740. Chart 6.1 shows the totals of all those inhabitants of Durham City

who have been identified as being engaged in the cloth industry from c.1240 to 1800.

*Although Freeman totals from the 1675 County elections are included the names of many of these individuals are unknown, as are the names of 21 of the 23 weavers who had gathered to witness their craft's incorporation in 1450.

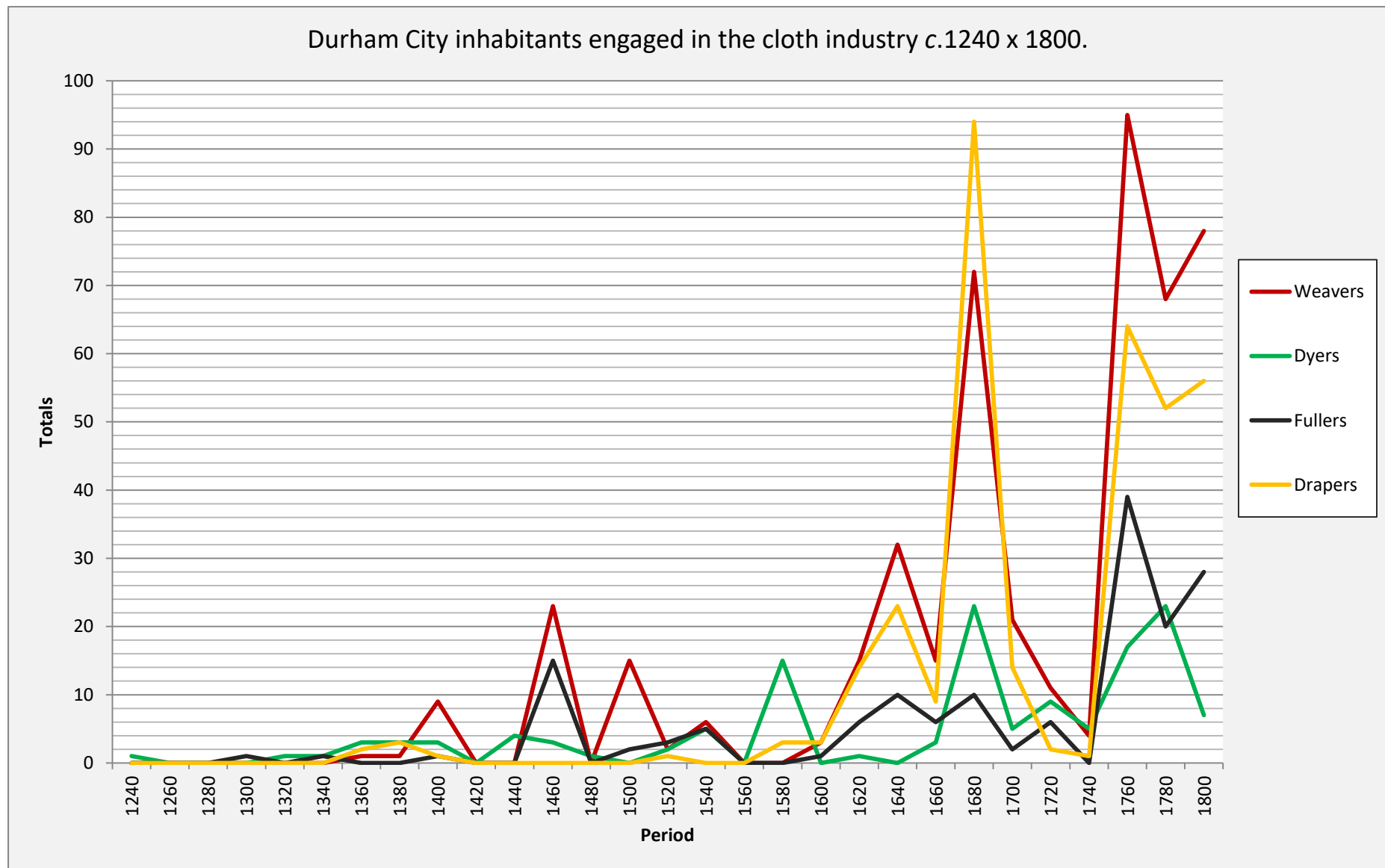


Chart 6.1. Durham City inhabitants engaged in the cloth industry c.1240 x 1800.

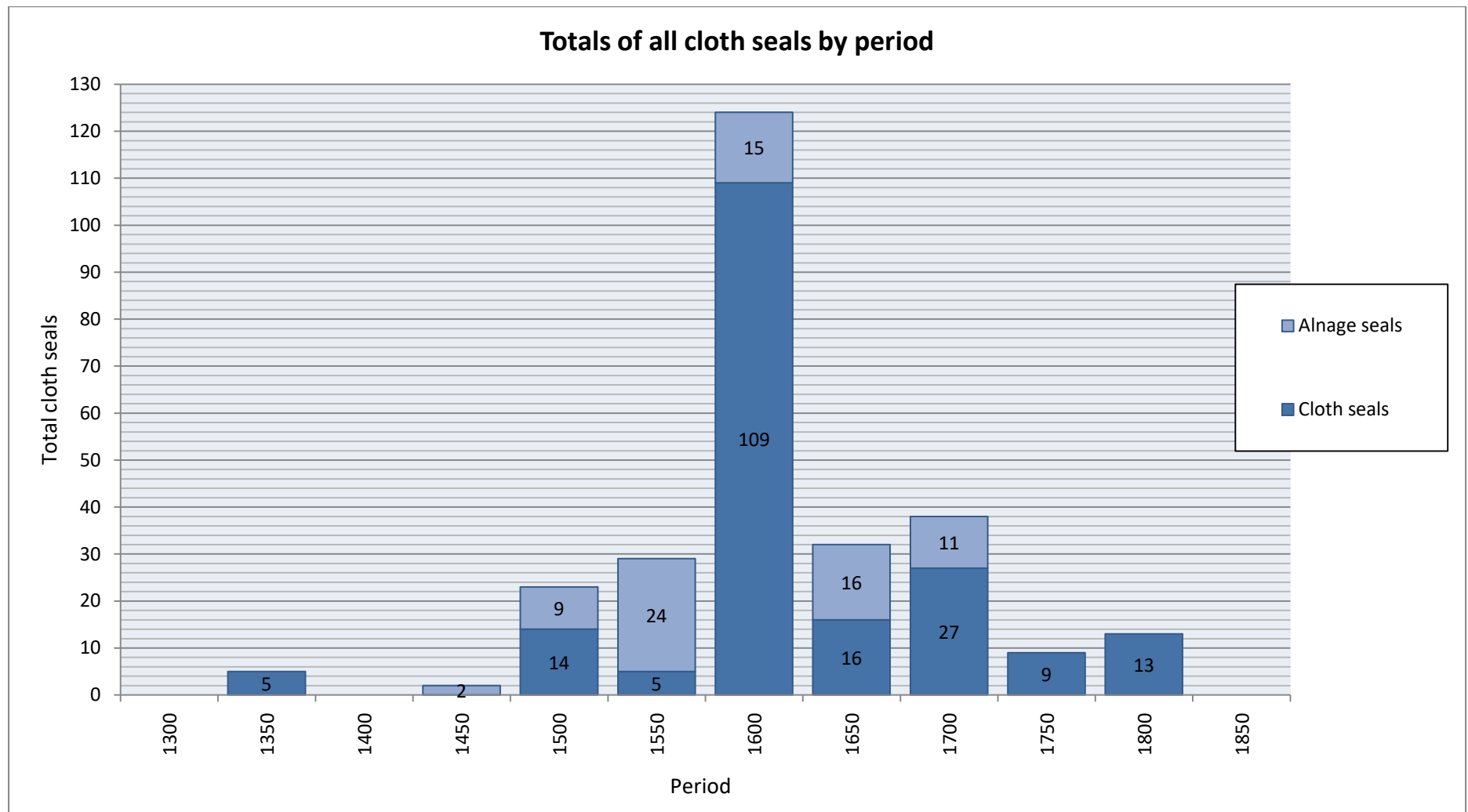


Chart 6.2. Totals of alnage and cloth seals by period.

6.5 Durham's elusive alnage officials

As we have seen above, Edward III clearly anticipated income for his Exchequer, in the form of subsidies, taken from newly-woven cloth, in late-thirteenth century Durham. Although the appointment of the King's named collectors is acknowledged, during the period from the thirteenth to the early-fifteenth centuries the names of any of the Bishop of Durham's own alnage officials continue to elude us even though we know that they were particularly active at Elvet's Marshalsea court, during the late-fourteenth century (discussed above). The earliest reference to the appointment of a Durham alnager occurs in 1448, when a superintendent was appointed by the bailiff of Durham to regulate merchandise. Letters Patent from Bishop Robert Neville to one Robert Kelsey Esq. confirmed the appointment, the official title given as 'Marshall, or Clerk of all the Markets in the Bishopric of Durham' (Hutchinson 1787, 14; Fordyce 1857, 213). Importantly he was also the keeper of the [Bishop's] alnage seal not just for the city of Durham but also the whole province. This is supported in Hogg's eighteenth-century transcripts of charters, grants, orders, etc.: '*Per breve de privato sigillo*' (Hogg, MS1 No. 7, 8-9). This officer was appointed by virtue of the *jura regalia*, ironically as we have already discussed, in pursuance of Statute 25 Ed. III st. 3 c.1 and subsequent laws (Bridbury 1982, 47-48). A yearly rent of 13s. 4d. payable in to the Bishop's exchequer allowed Kelsey or his deputies to distinguish the quality of the cloth with his seal and collect duties deemed payable. Both Hutchinson (1787, 14) and Fordyce (1857, 213) place this (new) appointment into the context of necessity, brought about by the very structure of governance established in the City of Durham at this time, i.e. aldermen, mayors, burgesses etc. In other words as Durham was an incorporated city, a clerk of the market was an essential office for the prevention of fraud and to oversee fair trading (see also Bishop Pilkington's later charter of 1565 below).

A third reference to Robert Kelsey, this time contained within a legal precedents book (Mick. Cap 33), confirms that this position was granted to Kelsey for life, by letter patent from Bishop Neville, during the 11th year of his pontificate [1448]. We also learn that Kelsey was [at some time] also the Bishop's Bailiff of

Stockton. With no additional late-medieval charters or Letters Patent seemingly surviving, it is necessary to return to the same precedent's book to identify any subsequent keepers of the seal of alnage. The book, which is possibly of late-seventeenth century origin and written in secretary hand, also describes how Seth Gyllowe (the Bishop's servant or Sergeant) had the office similarly granted to him for his life, by Letters Patent in the nineteenth year of Bishop Laurence Booth [1476]. Henry Loveless follows, again for the term of life, by Letters Patent during the reign of Bishop Richard Fox [1457 - 1476]. The Bailiff of Sedberg, Richard Buke was granted the 'office of Marshalsea' during the fourth year of the reign of Bishop Thomas Ruthall [1513]. An additional and clearly significant entry details an appointment to the same office granted to one William Rawe of Durham. On this occasion it was at the Bishop's pleasure and not as those earlier men who were appointed 'for life'. The intrigue does not stop there however, as the Letters Patent were actually issued by King Henry VIII on 18th December in 21st year of the King's reign [1530], perhaps evidence that any subsidy on newly woven cloth collected was finally being directed to the Crown and not to the Bishop of Durham's exchequer. A final entry in the precedents book indicates that on 12th November in the third year of Bishop Cuthbert Tunstall's reign [1533] a similar grant was made to one William Wright of Norton [Stockton]. Clearly these were all important men of their time, in addition to their alnage role; they were also engaged in other significant roles during or around the same time as their appointment. Table 6.1 details those individuals who were presumed to be operating as alnage officials in the County of Durham and its Liberties.

It is conceivable that William Wright of Stockton was the same man who later became a burgess of the city of Durham following Bishop Pilkington's 1565 charter of Incorporation (*ibid.*, 19). Irrespective of this, if it is the same man or not, any example of an influential inhabitant of the city of Durham being nominated as a burgess, optimises the whole fabric of Durham's governance from the time of Bishops Pilkington's 1565 charter of Incorporation through to Bishop Mathew's new charter of Incorporation in 1602. What is certainly credible is that in 1565 a man named William Wright, because of his experience,

influence and political or social standing, took up his place as one of twelve selected burgesses, alongside other men such as the draper Hugh Whitfield (DPRI/1/1577/W3/1-2) to help govern the city of Durham (and Framwellgate) (Hodgson, 1906, 74).

A curious note, added to the front of a copy of a lease of the boroughs of Durham which is dated 13th October 1627 (DCRO Du 1/51/421) reads:

'NB. This is the first lease I could find in the Auditor's Office, but it appears that a Patent was granted the 22.^d May 38 Eliz 1596 to Roger Morrass of Clerk of the Markets within the County Palatine of Durham and of the Office of Cleaner of the Market Place of the Borough of the City of Durham with all & singular wages profits commodities advantages rights & emoluments whatsoever to the said Offices belonging'.

Although there is no clear reference in this note to the fact that Roger Morrass was also the keeper of Bishop Tobias Mathew's alnage seal, as was the case with Robert Kelsey Esq. in 1448 (discussed above). Serious consideration should be given to the fact that Morrass may well have also had similar responsibilities in addition to his other 'rights of the said office' and that he was in fact also one of the County's alnage official's c.1596.

Probable Alnage Officials of the County Palatine of Durham and its Liberties				
Name	Year	Position	Bishop of Durham/Pontificate	Tenure/How appointed
Unknown	1354	Robert de Penreth and Robert de Thorneye (the King's Alnagers)	Thomas Hatfield 1345 - 1381	? / Edward III
Unknown	1392	Alnager (summons weavers to Elvet's Marshalsea Court)	Walter Skirlaw 1388 - 1406	? / ?
Robert Kelsey Esq.	1448	Office of Clerk of Marshalsea, or Clerk of all the Markets of the Bishop of Durham	Robert Neville 1437 - 1457	For life / Letters Patent
Seth Gyllowe	1476	Office of Clerk of the Marshalsea of the Bishop of Durham	Laurence Booth 1457 - 1476	For life / Letters Patent
Henry Loveless	c.1490s	Office of Clerk of the Marshalsea of the Bishop of Durham	Richard Foxe 1494 - 1501	For life / Letters Patent
Richard Buke	1513	The Office of Marshalsea	Thomas Ruthall 1509 - 1523	For life / Letters Patent
William Rawe	1530	The Office of Marshalsea	Cuthbert Tunstall 1530 - 1559	At the Bishops Pleasure / Letters Patent Henry VIII
William Wright of Norton	1533	The Office of Marshalsea	Cuthbert Tunstall 1530 - 1559	(?)Similar Grant
Roger Morras	1596	Clerk of the Markets within the County Palatine	Tobias Mathew 1595 - 1606	? / Letters Patent
Ludovic Stewart, 2nd Duke of Lennox and 1st Duke of Richmond (1574 -1624)	c.1610s	The offices of Alnager and collector of the subsidie and alnage and farm (also Alnager General for England and Wales 1605-1624)	William James 1606 - 1617	? / Indenture or Grant
Sir Robert Napier, 1st Baronet of Luton Hoo (1560-1637),	c.1620s (*1624)	The offices of Alnager and collector of the subsidie and alnage and farm	Richard Neile 1617 - 1627	? / Indenture or Grant
The English Civil War and the Protectorate 1649 -1659			Thomas Morton 1632 - 1659	N/A
Myles Stapylton (died 1685)	1666	The offices of Alnager and collector of the subsidie and alnage and farm	John Cosin 1660 - 1672	21 years /Indenture/ counter-part lease 21 years
* probably following the death of Ludovic Stewart in 1624				

Table 6.1. Alnage Officials operating in County Durham and its Liberties.

Two entries, contained within a late-seventeenth-century legal precedent book (Add.MS 319, folio's 121 and 124) written on paper in secretary hand, reveal an apparent, previously overlooked phase in the life of a former auditor, secretary, Keeper, or chief Librarian of the Bishop's Library on Palace Green, confidential advisor and ultimately one of the executors of Bishop Cosin: Myles Stapylton (Ornsby 1972, 27; Hodgson 1918, 134). In summary, both entries tell how the Bishop's deputy alnagers were assaulted in the execution of their duty at a place 'G' [?Gilesgate], in County Durham. Although, in folio 121 (see Appendix A) the date is not immediately clear as it merely states: '8 October', an additional entry in the adjacent margin, almost certainly a summary of the same assault, is clearly dated as 31 July, 22 Charles II [1670]. The entry describes how H.J. deputy of M.S. Esq. Alnager of the County Palatine of Durham in the execution of his duty was 'attacked by affray, badly beaten, wounded and badly handled so that his life was despaired of,' in addition; two pieces of *lanei panni* (linen cloth) are stolen. The cloth had previously been seized by H.J. and deemed forfeit to the Bishop because it had been offered for sale without being sealed by the alnager.

The Folio 124 entry (see Appendix A), dated 8 November, 22 Charles II [1670] essentially describes how the accused 'B', by force of arms at 'G' [?Gilesgate], refused A.J. the deputy of the alnager M.S. Esq. Alnager of and for the County Palatinate, access to his 'solar' where the cloth *panna landa* (linen cloth) was put to be 'scrutinised and tested'. On this occasion the relevant contravened statute is acknowledged: '*according to the tenner and effect of the statute issued, 5 Mary*'. Of particular interest is the actual statute mentioned, which dates from 1557 - 1558 (Statute 4 and 5. Philip and Mary. c5.) - 'An Act Touching the Making of Woollen Clothes' and its use in c.1670 Durham is of particular interest. The Act itself begins by reciting an earlier Act dated to 1552 (Statute 5 and 6 Edward VI. c6) - '*One good Act made for the true and perfect making of woollen cloth*' (The Statutes of the United Kingdom 1809, 425). It adds however, that it would be impossible for clothiers to observe all the points of this earlier Act. The Act then states that [woollen cloth] should only be made in market towns, in a city, or towns corporate where it has been made 'ten years past'. There are however,

some quite clear exceptions for all those dwellers of Lancaster and Chester and 'amongst other places'. As these two towns had 'Palatinate' status there is a presumption here that, as Durham was also a Palatinate, a market town and town corporate, it was therefore also allowed to make woollen cloth and would have similarly benefitted from some of the exemptions. The fact that alnage officials in 1670 Durham were inspecting and scrutinising cloth, as set out in a statute passed some 112 years earlier, suggest that it was either a convenient law to enforce, or that, possibly for reasons linked to the County Palatinate status, it was held with some high regard: the Act was only repealed by Statute 49. George G.3.109 (Harland 1865, 96; Raithby 1811, 100).

The reference within Folio 124 to a 'solar' is also of interest, for when combined with other information identified within the probate evidence (see 6.8 below), it allows us to build up a picture of weavers' dwellings in seventeenth-century Durham and in particular what types of activity were taking place within them. Pantin (1962, 202-203) describes late-medieval 'double-range' type tenements (the Tackley's Inn type), typical of those positioned on the main streets of towns, as having a first floor solar positioned above the shops which occupied the front range of the building. Although the widths of tenements positioned at Gilesgate were as narrow as those in the Borough of New Elvet (Camsell 1985, 379), it is plausible that typical Durham tenements were of a similar construction to the double-range type, but with a single shop occupying the commercial frontage of the building and with solar or chamber above. This argument is strengthened by the information gained from the dyer George Burdon's 1689 will which essentially describes a tall yet narrow construction containing a *basement*, a *shop*, a *fore chamber above the shop* and a *high foreroome*. It is clear, given the nature of his job that an alnage official would, on occasion, have to enter into the very heart of a weaver's home in order to scrutinise woven cloth. Therefore, given an accepted level of distrust, even dislike between a weaver and an alnager, together with the general uncomfortableness of letting another man in to one's home, then it would be of little surprise if conflict did not occasionally follow. Research by Egan suggests that evasion and fraud were an enduring problem faced by alnage officials;

however, they did not always help themselves with some officials being over-zealous in their duties, often through greed for the fees (1987, 21).

6.6 The Myles Stapylton indenture and other evidence

It is not immediately clear why both Raine and Hodgson's analysis of the correspondence of Myles Stapylton fails to add the important role of 'alnager' to the list of responsibilities entrusted to him, particularly as this is the same man in whom Bishop Cosin 'bestowed as much confidence of that prelate as he was willing to impart on any man' (Hodgson 1918, 134). However, what is certain is that the initials M.S., which appear in folios 121 and 124, are that of Myles Stapylton is confirmed by an indenture dated to the 'eighteenth year of Charles II reign and eighth year of the sea of Bishop John [Cosin]': 31 December 1666. The indenture is held at Durham University Library, Archives and Special Collections and is listed as a counter-part lease (CCB/D/1956/504/188381). The indenture (Fig 6.8 and transcribed copy Appendix B), is, without doubt, the most important extant piece of seventeenth-century evidence relating to the office of alnager in County Durham.

The indenture, which was most probably written by Myles Stapylton himself, conceivably during a time when he was residing in the New Bailey at Durham Castle (Hodgson 1918, 261), reveals important information relating to the complicated regulation of commercially-produced cloth in seventeenth-century County Durham. In the first instance we have sight of the full title granted to Stapylton: '*the office of alnage and collector of the subsidie and alnage and farm,*' here, demonstrating a single role rather than a range of roles, for example, those undertaken by the clerk of the markets and keeper of the seal of alnage as mentioned above. The types of cloth to be inspected and sealed are confirmed, '*all vendible and saleable woollen clothes, halfe clothes and pieces of clothes called or known by the name or names as well of the old as of the new draperies... made sent or offered for sale... within the said County Palatine of Durham*'; and we also have confirmation of the scale of jurisdiction, '*all towns, villages and hamlets within County Durham, including the liberties, Norhamshire, Islandshire and Crake*'. A reference within the indenture for assistance to enforce the office from

sheriffs, bailiffs and other officers, suggests that the collecting of alnage and subsidies was never going to be one of the most popular activities or indeed a safe one, as his deputies H.J. and A.J. would eventually discover. Although the term of the grant, 21 years, to be paid at a yearly fee of 20 shillings, differs from the grants for life to the clerks of the market mentioned above, Miles Stapylton would not see it renewed as he died in 1685, and was buried at Durham Cathedral.



Fig 6.8 Counterpart lease. Indenture appointing Miles Stapylton as Alnager of Durham, 1666 (see Appendix B for transcribed version).
Image © Durham Library

An intriguing additional revelation contained within the terms of the indenture are references to similar indentures or grants made between two previous Bishops of Durham, William James 1606 - 1617 and Richard Neile 1617 - 1627, and two distinguished men who were not actually based in County Durham. The grants, which appear to run consecutively, were made firstly to: Ludovic Stewart, 2nd Duke of Lennox and 1st Duke of Richmond (1574 - 1624), a man who was principally a Scottish nobleman and politician, but also a childhood

friend and cousin of King James VI of Scotland. Following the King's accession to the English throne in 1603, Lennox was subsequently elevated to Lord Steward of the King's Household, having already been installed as a Knight of the Garter. The second distinguished gentleman was Sir Robert Napier, 1st Baronet, of Luton Hoo in Bedfordshire (1560 - 1637), also referred to as Robert Sandy. He also served as the High Sheriff of Bedfordshire. The first, Lennox, was well known to Egan (1995, 10) and not just because several lead cloth seals carry his elaborate ligature (see Egan 1995. Occasional Paper 93. Suffolk Alnage seal, No.102. Fig 24), but as 'a royal favourite, appointed Alnager General for England and Wales from 1605 - 1624'. Although Robert Napier never reached such heights, it appears that he did have significant knowledge of the various statutes appertaining to cloth. He is described in a letter sent to the Lord Mayor of London in 1621 as a cousin of Lennox, when he was despatched (by Lennox) to meet with the Lord Mayor of London to seek speedy redress against a petition of complaint from the clothiers of Suffolk following re-searching and seizures of their cloth at the Leadenhall (Hanson and Overall 1878, 76). The fact that Robert Napier is not described in this correspondence as the Alnager for County Durham suggests that Ludovic Stewart still held the position in Durham at this time; this is despite the fact that, by 1621, Bishop Neil was the new Bishop of Durham. As discussed in 6.4 above, the appointment by Bishop James of Ludovic Stewart to the office of Alnager for County Durham may well have been for cynical, political or economic reasons. However, although it is likely that the term of the indenture or grant was for 21 years (Myles Stapylton sought a similar term), Ludovic Stewart would die before the term of office ran its full course. Therefore, at some time prior to his death in 1624, perhaps knowing he was ill, it is possible that Ludovic Stewart may have engineered an agreement with Bishop Neile for his cousin Robert Napier to be granted the position of Alnager for County Durham, on the event of his untimely death. On the death of Ludovic Stewart, the title Duke of Lennox was passed to his brother Esmé Stewart (who became the 3rd Duke of Lennox). However, Esmé Stewart died later that same year. In 1626, Esmé's wife, Katherine, Duchess Dowager of Lennox, possibly realising the magnitude of her alnage responsibilities, was forced to appeal to the King, asking him to appoint some persons to attend to

the duties of alnager [for England and Wales] until her four younger sons were old enough. She would place into the hands of the trustees appointed by the King £2000/- per year alnage money, retaining any surplus for her four sons (Bruce 1858, 467-477).

Based on the above evidence it appears that the date on which Robert Napier became Alnager for County Durham was either the same year as or soon after the death of Ludovic Stewart. However, as Napier died in 1637, the office of alnage would have again become vacant before the term had expired. A few years earlier in 1633, James Stewart (now the 4th Duke of Lennox) had accompanied his cousin King Charles I as part of his entourage, when he visited the city of Durham (Cath. MSS Allan No.8/10). By this time James Stewart would have been 21 years of age and old enough to understand the complexities of cloth production and alnage. Therefore, he would have been in a position to take over from Robert Napier, either after his grant had expired or following his death in 1637. however, there is no extant evidence that this ever happened. It is relevant to note that the title of Duke of Lennox and Richmond held the patent for the 'farm of subsidy and alnage of cloth in diverse counties' until c.1692, when The Alnage (Customs Collection) Bill, entitled 'An Act for transferring the collection of the duties of alnage to the custom-house', was laid before the House of Lords (House of Lords Journal 1692, 89-91). Therefore, in theory there was ample opportunity from 1637 until 1649 for James the 4th Duke of Lennox (and 1st Duke of Richmond) to regain the same office of Alnager for County Durham as was held by his father during the first quarter of the seventeenth century. The 1649 date is relevant, as it marks the beginning of an interruption in the collection of alnage and subsidy fees, which was brought about by the English Civil War and The Protectorate – 1649 - 1659.

In 1660 following the restoration of the monarchy, a proclamation by King Charles II, for 'the due payment of the subsidy and alnage upon all woollen clothes and draperies', effectively signalled the Crown's intentions to resurrect the payment of the subsidy and alnage on all woven cloths (of the old and new draperies). The declaration set out how James I had previously nominated and appointed Ludovic the late Duke of Lennox and Richmond to the position of

alnager and that now, the current 3rd Duke of Richmond and [6th Duke of] Lennox (Charles Stewart) would become the said alnager. This declaration coincided with Bishop John Cosin's appointment to the see of Durham and his secretary, Myles Stapylton could have therefore been ideally positioned to take advantage of the presumably unfilled 'Alnager of County Durham' position. It appears that Myles Stapylton may have actually used some of the same wording when writing the 1666 indenture as that which was used in Charles II's 1660 declaration.

In 1668, the Woollen Manufacture Bill (Statute 20 Car. II), 'An Act for the better regulating of the manufacture of broad woollen cloth... and other woollen drapery of the Kingdom', was ordered. The Bill, which was referred to the Lords' Committee's appointees to report on various ways and means for the advancement of trade at home and abroad could be made, contained an unusual reference to Durham. The Committee was instructed to ensure that the Alnager of the Bishopric of Durham [Myles Stapylton] was not prejudiced thereby (House of Lords Journal 1668, 227). Although little else is known on why Durham was singled out in this way, it is clear that the Palatinate of Durham had appointed its own man to scrutinise cloth and collect alnage and subsidy fees in the way that it was always done, prior to the time of Bishop James.

The 1666 Act of Parliament (18 Charles II.), 'For the encouragement of the woollen manufacturers... and prevention of the exportation of the moneys thereof, for the buying and importation of linnen' (Journals of the House of Lords Vol. XII), would have had a direct impact on Durham's weavers and for that matter the county's coffin makers too. Briefly, the Act prevented any persons being 'buried in any shirt, shift or sheet made of, or mingled with flax, hemp, silk, hair, gold or silver' or any coffin being lined with similar fabrics. It was intended that only [English] woollen cloth was allowed to be put into coffins (Litten 2002, 73-74). An affidavit was to be made within eight days of the burial in each parish register that the burial was made in woollen. Presumably at this time, it was the custom throughout England to bury loved ones dressed in finer quality funerary clothing and this may have included (more expensive) imported linen. Gilchrist (2012, 71) highlights how clothed burial of ordinary

people during the late-medieval period would see the deceased wearing what seemed to represent their Sunday best. Similarly too their coffins may have been lined with the best quality bleached white linen, rather than cheaper locally sourced supplies. It could be assumed, however, that as the English linen weavers were specialising in the production of the so-called 'housewife' linen (see 6.8 below), they might not have been adversely effected by the introduction of the Act. One particular entry in the parish church and cemetery records of St Oswald's, dated 1678, describes how one Robert Buck Esq. had to pay 50 shillings to the church warden, for the poor of the parish and 50 shillings to William Jennings, an informant who 'gave information according to the tener of the late Act of Parliament', a considerable fine for someone preferring not to use woollen cloth in the funeral of the spinster Faith Buck (presumably an immediate family member) (Raithby 1819, 598; Wickes 1884, 140; Headlam 1891, 147).

6.7 Durham's local borough and county courts

Throughout the late-medieval period, succeeding Bishops would claim Palatine powers on the land between the Rivers Tyne and Tees. Fraser (1991, 8) suggests that similar powers were claimed by the Benedictine Priors of Durham over their tenants following a written agreement in 1229: *le Conventit*.

The priors of Durham were responsible for halmote courts, free courts and *marescalia prioris* (marshalsey) – a court for the inspection of weights and measures – the control of which was normally delegated to the terrar, bursar or steward. Other courts including county, borough, chancery and the customary courts of forest and admiralty were in place in late-medieval Durham. Typically, courts such as the borough courts resolved trading squabbles, collected debts and upheld guild privileges, while free courts allowed tenants of the prior of Durham to sue for debt and bring action for trespass and other offences. The clerk of the market who 'had his court of marshalsey, enforced standards of baking, brewing and measures' (Emsley and Fraser 1984, 4; Dobson 2005, 25-27).

The rationale for these local courts derived from the fact that Durham, before 1536, was a Palatinate and, although still subject to the laws of the Realm, under the liberty of the Bishop of Durham could hold its own local courts as a measure of independence of jurisdiction. This judicial autonomy was retained in Durham long after it declined in other counties. The County Palatine not only included several wards based on episcopal manors found in the county of Durham but also parts of Northumberland: Bedlingtonshire, Norhamshire and Islandshire. For managerial purposes these areas were divided into administrative 'constabularies' based on townships. During the fourteenth century the free court of the prior of Durham allowed those owing suit to be judged only by their equals. An example of this occurred in 1348 when William de Huton sued John Chilton of Elvet for bad workmanship as a bolt of cloth was so badly 'watered' during the fulling process that it was damaged to the value of 40s; the jury found in favour of Huton but only awarded damages of 8d (Emsley and Fraser 1984, 11). As already discussed in 6.4 above, Elvet's Marshallsea court was also active during the late-fourteenth century, this 'manor court', probably conducted by either the Terrar or Bursar, had the authority of the Prior for amerciamment (a penalty in money imposed for misconduct). The appearance at the Prior's Marshallsea court of local weavers for non-cooperation with alnage officials is of particular relevance. Dobson (1973, 40) suggested that the tenants of the Old Borough had their public affairs regulated by means of the court held in the tollbooth which was situated on the north side of Crossgate. This Borough court witnessed some notable disputes between members of the textile trade towards the end of the fifteenth century. In 1498 Thomas Colman made a complaint against James Tebson based on a mutual agreement whereby Tebson would hire a linen weaving loom from Colman for the sum of 2d per week. It appears that, despite using the loom for a total of 80 weeks, the full amount due was never paid: Tebson subsequently denied the agreement existed. Records of the Crossgate Curia Court, dated 1524, describe how James Wrangham challenged William Bentam of wrong-doing. Wrangham apparently delivered '*13 yards of white cloth called scowring*' with a value of 6s. 8d. to Bentam to be dyed, however when it was returned 1 ½ yards was lost, costing Wrangham 3s.

4d. (Britnell 2008, 66). In this case it would be reasonable to assume that if the dyer Bentam did not mischievously cut away the missing 1 ½ yards of cloth for himself, then the lack of a tenter frame to reduce any shrinkage during the drying process may explain the loss.

Extracts taken from the Durham Quarter Session Rolls during the mid-sixteenth century provides us with evidence of commercial activity associated with the trade of textiles. One particular session of the peace, held at Durham in 1555, details how William Selby of Grindon Rigg in the Liberty of Norham (Northumberland) along with two others attacked and robbed Giles Storrie on the King's highway at Twizzell, putting him in mortal fear so that his life was despaired of; they feloniously took from him a large amount of cloth, including: *4 ells of velvet, 100 ells of linen, 4 gross of silk pointers of divers colours, 4 pairs of women's stockings, 36 ells of canvas, 100 ells of ribbon of divers colours, 24 silver rings, 12 clasps and a tunic of white russet cloth worth in all £40.*' (Fraser 1991, 77). Although Giles Storrie does not appear as a seller of cloth (merchant, draper etc.) in the local probate records, it is clear by the sheer volume of commodities which he carried that he was engaged in the cloth trade in some capacity. The location of the robbery, on the King's highway close to the River Tweed in Northumberland, is probable evidence of cross-border trade between Northern England and Scotland (Fig 6.1).

6.8 The Borough of New Elvet.

The find spot for the cloth seals and other associated cloth industry artefacts lies in the River Wear, adjacent to the medieval borough of New Elvet (see composite map 6.12). This section will explore the documentary and archaeological evidence for a concentration for the cloth industry in this area. Existing published evidence will be reviewed and new research brought to light.

Camsell (1985, 28, 51), while referring to Prior Bertram's charter which dates from 1188 - 1208, describes the Borough of Elvet as having the physical barrier of the River Wear on three sides: the east, north and west. The southern barrier

was in effect Ratonrawe, an old lane now called Court Lane, which separated New Elvet from its neighbour the Barony of Elvet although Ratonrawe actually acted as a link between the two main roads that dissected the new borough. New Elvet in the main comprised an urban area which featured a series of tenements that typically fronted the two roads which formed the road across Elvet Bridge branched off at its eastern side (Fig 6.2 and 6.16). The northernmost road which runs in an east-west direction started at the eastern side of Elvet Bridge before again meeting the River Wear some half a mile away as it loops back around. This riverside location was relevant as it forms the point where the old Scaltok Mill was situated. The road eventually led to Shincliffe Village 1.5 miles away. This northern branch which features tenements on both sides, known as Northrawe and Southrawe, passed close to a 30 acre area of open grazing known as Smelthalgh, now the Race Course sports ground, before then opening up into more open land which included several small crofts and eventually the mill (Camsell, 1985, 625-627). The second branch of the road, again commencing at the east end of Elvet Bridge, effectively runs in a north-south direction and came to form the main arterial route into the city centre from the south. This road, when heading south, soon leaves New Elvet for the Barony of Elvet before splitting into two further roads, the modern Hallgarth Street and Church Street. Church Street, as the name suggests, is the location of St Oswald's Church. This lane, running north-south, is relevant to this thesis as not only does it mark the boundary of the west end of New Elvet but here the narrow tenements, described above by Camsell as the 'west side', front the road before extending back in length to the river: the same stretch of the River Wear in which the lead cloth seals have been found. Although not complete Camsell's (1985, 634-635) illustration of sixteenth-century conjectural boundaries of tenements in New Elvet (Fig 6.9) can be used to pinpoint tenements leased to dyers, particularly on the western-most and northern boundaries abutting the river. A small lane or vennel which was in place from 1382 and later known as Water Lane dissects these tenements and allowed access to the river bank.

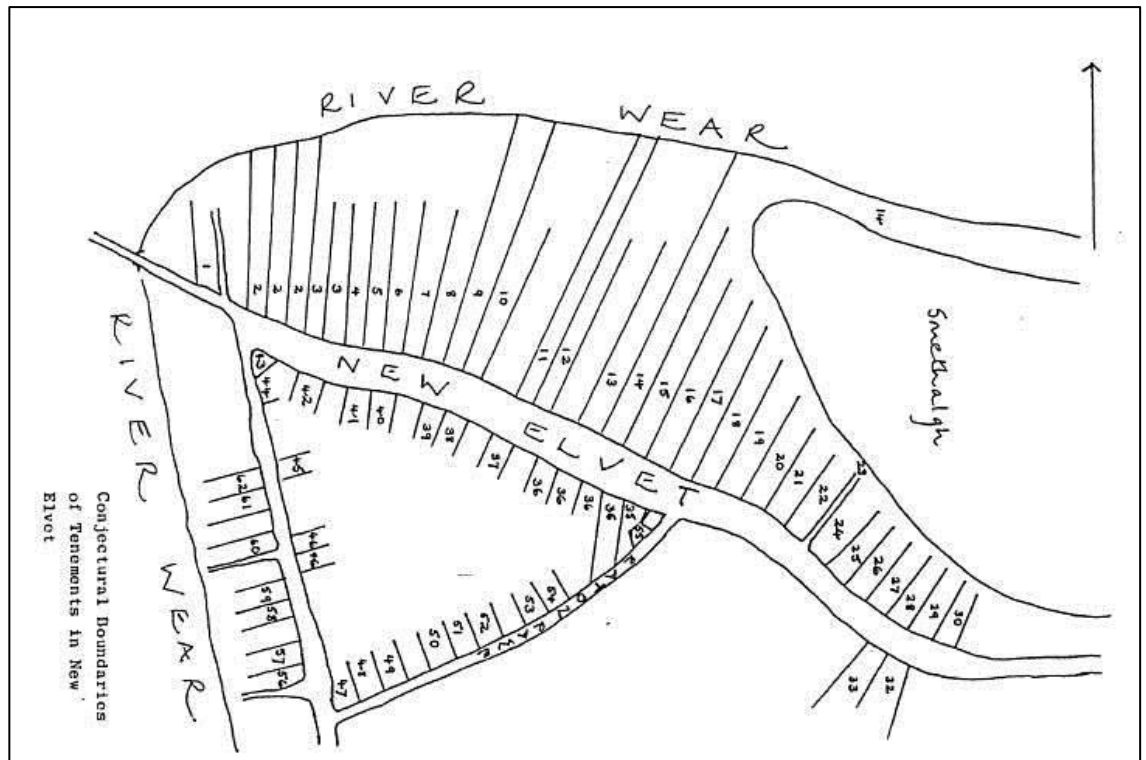


Fig 6.9. Camsell's conjectural boundaries of tenements in New Elvet.

There is archaeological evidence following the work of Carver (1974, 97-126) which suggests that the land immediately to the south of Elvet Bridge lying adjacent to the river was occupied during the late-thirteenth to early-fourteenth centuries. Although the excavations suggest that the site was damaged by flood water before being levelled, it was then re-developed with the building of burgage tenements which fronted the streets. Archaeological excavations at New Elvet I (Fig 6.12) revealed two coins of Edward I dated to 1279 - 1307, thirteenth and fourteenth century pottery sherds and a mid-fourteenth century bronze cauldron, found amongst well-dressed masonry (Carver 1974, 125, 138-140). A second site known as New Elvet II (6.12), located slightly closer to the River Wear, revealed typically seventeenth-century deposits, together with evidence of outhouses and cobbled yards: all of which had been covered over with successive flood debris deposits (Carver 1974, 141-147). Perhaps one of the most important discoveries 'feature 58', was the remains of a long stone wall which ran north-south effectively separating the tenements from the river; no doubt the construction of this 'river wall' was designed to keep flood water from submerging the tenements, outhouses, workshops and shops which were

constructed on the low lying flood plain on which the New Borough of Elvet had been built. Evidence that the retaining wall was continually being re-built or even repaired during the seventeenth and eighteenth centuries, can be clearly seen in the two paintings shown in Fig.6.16 and Fig 6.17.



Fig 6.10. The River Wear in flood at New Elvet 9th October 1903
(Elvet Bridge is located to the far left).
Image reproduced by permission of Durham University Library. MIA1/101.

Fig 6.10 captures the River Wear in flood conditions at the western boundary of New Elvet in 1903. In this image the river wall has clearly been breached. Although Carver (1974, 115) suggests that the river wall was constructed sometime between the late-fourteenth to early-fifteenth centuries, it was to be the dominant role played by the river that impacted on the varying fortunes of the development of the east side of New Elvet: most notably causing the thirteenth century destruction of the well-appointed and good masonry dwellings (Elvet I). Carver (1974, 126) suggests that a period of renewed prosperity gathered momentum from the seventeenth century onwards, as New

Elvet entered an industrial phase displaying evidence of national and international contacts.

Archaeological Services University of Durham (ASUD) undertook further work at New Elvet (ASUD 904A, 2002), with a series of excavation trenches being dug further north of Carver's original excavations at New Elvet I and II. This new excavation located at the former Embleton's Garage, 83 New Elvet (Fig. 6.12), uncovered deposits dating from the seventeenth century, together with evidence of a stone wall described as a 'retaining wall' which most probably divided the riverbank from the built-up area; perhaps similar in function to the stone wall identified by Carver above. Camsell (1985, 692) identifies a payment by the Sacrist of 115s 3d, dated to 1445 - 1446, for the building of a wall at the rear of a tenement in Elvet held by Beatrice Hunton for the sole purpose of *pro exclusione aque* 'keeping at bay [flood] water' (Sac, Cart., Ushaw Ms. 25). This same tenement plot was earlier held by John Litster in 1396 (Table 6.2). It seems that this mid-fifteenth-century construction of the retaining wall was an early example of the continued battle to protect low-lying New Elvet against flood water.

Shaw's statistical analysis of mortality rates in Durham discussed above is a useful tool for calculating the size of the population residing in any given borough in mid-nineteenth-century Durham. A map of Durham produced to accompany the Public Health Act report, dated 1849, shows the three main streets within the Borough of New Elvet. The first street, New Elvet (including Water Lane), which had a total of 1120 inhabitants, was ranked fourth most populous out of the 27 streets listed, coming behind Gilesgate (1863), Framwellgate (1520) and Claypath (1488) respectively. The second street, Old Elvet had a mere 537 residents, while the third, Court Lane, also within the Borough of Elvet, contained an additional 191 residents. Therefore, the total number of citizens residing within the New Borough of Elvet in c.1851, was 1848. These street sub-totals are set against a total of 12,682 for the whole city (excluding Sunderland Road and Sherburn Road). In 1801, the endemic overcrowding may not have been so severe, as it is estimated that there were 7000

inhabitants of Durham (Butler 1997, i, viii). Given that John Wood's map of Durham dated 1820 (Fig 6.22) is perhaps the most useful in terms of capturing the individual building outlines of Durham's built environment during the first quarter of the nineteenth century, and that this map differs only slightly from the 1849 map mentioned above (in relation to the overall footprint of buildings shown), then it is a relatively easy task to count the number of houses within the Borough of New Elvet that were in-situ during this time. Counting only those individual buildings with a commercial frontage, i.e. those with a possible shop at ground level and workshops or bedrooms above, excluding probable coach works and workshops located to the rear of these houses, lanes, alleys, inns and churches, then it appears that the total number of separate domestic properties being available for the 1848 inhabitants is approximately 180 – an average of ten people per house. However, it is acknowledged that tenements built to the rear of these properties, positioned within the back yards and gardens could have also housed many people. The 1851 report describes those areas of Elvet inhabited almost exclusively by the poorer classes as being the most noxious and filthy, with a prevalence of ash-pits, open privies, piggeries and a slaughter-house, and 'that no attention had ever being paid to the comfort or convenience of the inhabitants of these dismal tenements' (Butler, 1997, 15-16). Those houses at Old Elvet and on the west side of New Elvet which backed on to the river, are described as being in a filthy state, with their filth being flung upon the bank, a location that also receives the outfall from nearby Durham Jail. Water Lane does not fare much better as it is described as being in a particularly bad state, again with cesspools and privies, while one particular lodging-house there held 13-14 lodgers in one room, a second, during Fair-time, had 20 crowded into one room (*ibid.*, 1997, 16).

The seventeenth-century probate evidence mentioned below (section 6.8) describes similar close cramped dwelling conditions where domestic and working life was mixed. In Elvet there is evidence of beds and bedding being stored in the same rooms where working looms were located, so it is not difficult to imagine how these too were over-crowded and ill-ventilated dwellings. However, there is evidence during the early seventeenth century that

efforts were being undertaken to at least improve the cleanliness of the streets and vennels of Elvet if not the insides of the individual tenements themselves. A series of orders and regulations made by the juries of the Borough and Baronry of Elvet, dated c.1610, '*to be yerely redd in our Parish Church of St Oswald*' (Cath. MSS Allan No 8/8) ensured that those inhabiting the borough would be fined – usually '*upon panie of evie [every] fault*' – six shillings. These individual orders are of particular interest, for while being specific in their instruction, they also inform us of the common names and areas that were in use, on a daily basis, in the Borough at the time. Collectively they help build a picture of routine daily life. Some of the more relevant orders were:

- (6.) no resident could wash any *webbs or foule yarne* in St Oswald's well;
- (17.) that no one from the 'lower end' of Ratonrawe to Elvet Bridge End, shall let their dung lye in their front streets; and
- (19.) that the common vennel at Bridge End should be kept clean and dressed at such time as the constable doth command.

One order in particular (39.) is of greater interest, as for the first time, we learn of a dedicated 'footwaie' (footpath) running from Elvet Bridge to the grazing area known as great Smelthalgh, a location where it presumably would have linked up with the footpath depicted in the mid-fifteenth-century map (Fig 6.15), shown running between Smelthalgh and the rear of the tenements. It could be argued that the discovery of a footpath here is not of any great significance, but full interpretation of the order (see below) suggests that a physical barrier (willow trees), prohibited dyers (and others) operating out of any riverside workshop or tenement on Northrawe, from accessing the river water directly from the back of their properties. In addition, although dyers could walk along the footpath running behind the Northrawe tenements, the carriage of goods along it was prohibited. Therefore during the early-seventeenth century, those dyers operating out of Northrawe wishing to transport either copious quantities of river water or wet (dyed) cloth for rinsing, to and from their dye-houses, would have had to do so via the Northrawe front street (modern day Old Elvet). The common vennel located at

Elvet Bridge End would have then facilitated access to the water's edge. Further access to the river would have been possible by passing underneath one of bridge's dry land arches, as depicted in the sixteenth- and seventeenth-century paintings of Elvet Bridge (Fig 6.20 and Fig. 6.21). Others inhabitants of the Borough would have been able to access the same stretch of river via the same common vennel mentioned in order (19) or by the vennel at Water Lane (see composite map fig 6.16). Appendix C details the full order.

Earlier lists detailing the inhabitants of the New Borough of Elvet, dated to the first half of the seventeenth century, are revealed in a collection of lay tax books contained in various folios from the Mickleton and Spearman Collection (MSP.9). These lists include details of the various taxes imposed on the inhabitants of Durham, and include: a tax for the poor (f.295, dated 1644), towards the Bishopric Regiment (f.297, dated 1643), and various ship tax assessments: f.256 and f.284 both dated 1639; f.258 and f.258 both dated 1640; f.281 dated 1643 and f.262 dated to 1635, which details an assessment for the setting forth of a ship of 800 tons, valued at £6615. Due to the deteriorating political situation in France and Germany in 1628, King Charles I embarked on an ambitious attempt to levy ship money from the entire country. Each county, city and borough was assessed and charged with levying a specific amount (Jurkowski *et al.*, 1998, 185). A final folio (f.267a dated to 1643) details Protestation returns (those swearing an oath of allegiance to the Protestant religion). Typically these folios set out the names of all the men who own property, in what is described as: *'A true and just valuation of all the houses and closes and Garthes in the Borough and Baronry of Elvet, what they may be'*. Although the lists provide useful data for estimating populations, they also capture details of those engaged in the city's textile trade: men such as the fuller George Hunter who owns two houses, the weaver Richard Hirdman or the dyer Martin Litster, who owns a house and a close, are easily identified. While individual streets are not acknowledged, the total number of men and women with property can be calculated. Although totals fluctuate somewhat as properties are first assessed then re-assessed, the number of individual assessments of those owning property in the Borough of New Elvet never

exceeds 58. It is acknowledged that some owned more than one property. Given that the individuals are being taxed against each of these properties, it would be realistic to expect that they were in use during the first half of the seventeenth century. If this is the correct it could be estimated that commercial activity in the Borough of New Elvet c.1640, was approximately half the size of what it was c.1850; a position somewhat reflected in Speed's 1610 map of Durham (Fig 6.17). An additional source for the names of the inhabitants of the Borough of New Elvet is linked to the Recusancy Acts which ran from the time of Elizabeth I until 1650. For example, in 1616 Margaret Johnson presented herself at St Oswald's parish church, as she was required to do according to the statute provided for confining of recusants. Not only do the parish records confirm her place of residence 'within the suburbs of the city' but also the occupation of her husband John Johnson who is described as an Elvet weaver (Headlam 1891, 58). Inadvertently, this evidence alludes to the fact that craft-guild membership in Durham during this time may not have been exclusive to those who attended Anglican services.

6.9 The Probate evidence

The Durham Probate Records are held by the Archives and Special Collections Section of Durham University Library. Dating from the sixteenth century to the mid-nineteenth-century, they provide an invaluable insight into north-eastern people, their occupation, trade connections, family members and standard of living. The wills are often accompanied by inventories, bonds, letters of attorney or accounts; they are generally written in English, in secretary script, on paper or parchment. It should be recognised that there are inherent difficulties working with probate records; as legal documents they are themselves subject to certain inaccuracies or omissions occasioned by the laws, customs and practices in place at the time they were made (Heley 2009, 8). Responsibility for probate administration fell to the Consistory Court of Durham and all probate records were registered at Durham Cathedral. An online facility with a user-friendly interface allows for either a simple or advanced search of the North East Inheritance database. It is available at:

<http://familyrecords.dur.ac.uk/nei/data/advanced.php>. By applying a series of filters 49 drapers, 40 weavers, 24 dyers and 15 fullers could be identified as residing in Durham. This is compared to 224 drapers, 531 weavers, 122 dyers and 75 fullers recorded across the whole North-East Region. However, the limits of this thesis only permitted a full examination of a small selection of these probate inventories and accounts. In terms of identifying the types and quantities of cloth in use in Durham during the second half of the seventeenth century, the probate records are very informative. Perhaps one of the most important extant documents is that of the Durham draper Thomas Hall dated 1586 (DPRI/1/1586/H1/2-6 – see appendix D). His probate inventory, valued at £112, lists some 50 different quantities of cloth. Given the proximity of his business in relation to the main ecclesiastical centre in the region, it is perhaps not surprising to learn that the inventory includes such appropriately named textiles as: 12 *yardes baggeres graye* [badgers grey] with a total value of £2., and 6 *yardes of freres graye* [friar's grey] valued at 2s. 8d. a yard. Thomas Hall's accounts also help reveal where his credit and debit networks lay, for example an outstanding bill to the Leeds (Yorkshire) clothier Henrie Watson for the sum of *iiii^{li} xiii^s* (Fig 6.11) and a bond obligatorie to one Rowland Hagthropp of York (Yorkshire) to the sum of *viii^{li} x^s*, were both settled by the testator's appointed executors and accountants. In total, Thomas Hall owed money in the form of *bill obligatorie* to four different clothiers from Leeds. Other suppliers appear to have been based in Wakefield (Yorkshire), Kendal (Cumbria) and Durham.

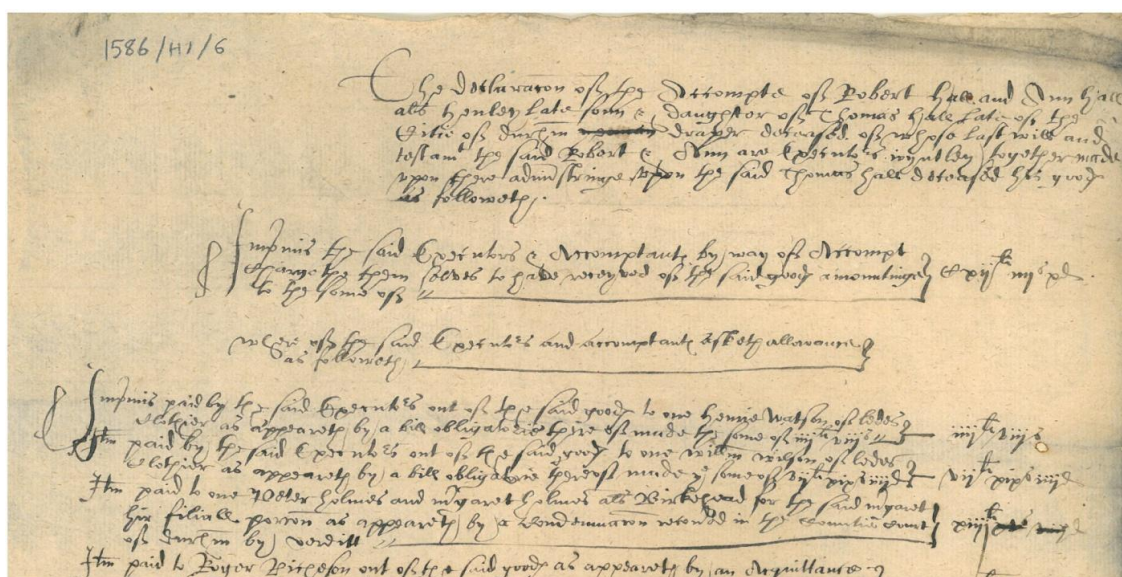


Fig 6.11. Probate Account of Thomas Hall of Durham City 1586 (DPRI/1/1586/H1/6).

The 1692 probate inventory of the Claypath-based dyer George Burdon (valued at £46) (DPRI/1/1692/B18/3 - see appendices G and H), is of great interest, particularly as it includes not just various items of stock and their associated values, for example:

3 stone of swarth [iron filings], 7s.; dyed cloth, stockings, yarns & wools, 2l.; rotten wood, 10s.; wood wash, 3s. etc.,

But also, many items of equipment presumably common to seventeenth-century English dye-houses, such as:

winches & standards, 10l.; cistern & pump 3l.; 2 vatts, 2 crosses, paire of scales & cauke (OED = 'northern form of chalk'), 1 stone mortar & pestle, 3 stone of lead weights and 2 bra[ss] weights (with a total value 9s.), and 90 yard of tenters [tenter frames] valued at 5l.

However, it is actually George's (presumed) father, also a dyer called George Burdon (of Gilesgate), and who had died just a few years earlier in 1689, which provides a greater insight into the workings of late seventeenth-century dyers based in Durham (DPRI/1/1689/B17/8 - see appendix F). His substantial inventory, valued at £300 (many of the items are probably the very same items which appear in his son's inventory detailed above), was prepared by his associates and neighbours, Robert Gray, A.[?Ambrose] Paxton and John Perkin.

It list hundreds of small debts not received and owing to the deceased. For example: John Halliman of Hart and Jane Harrison of Stockton, both owed 3d. each for *a pair of stockings*, while Isabell Dixon owed 4d. for *a hank of yarne*. In addition several goods are listed '*in the dye-house, shopp and other places*' (all claimed by his widow), they include: *table hour-glass, one stone mortar and pestell, three stone of lead weights and a barrow*. The *ninety yards of tenters* which are listed and valued at £6. 10s. appear to be the same tenter frames that were valued at a reduced £5 three years later in his son's inventory (Fig 6.14). According to Cheesman (2001, 21), George Burdon's dye-house was one of four such properties owned by him and some of his associates listed above, that formed a small cluster of dyeing activity in an area of Claypath close to the River Wear, currently occupied by the Millennium site.

The addition within his inventory of several important dyestuffs and to a lesser degree the mordants (some of which have already been discussed in Chapter four), is of particular relevance, as their inclusion informs us about much of the technological, cultural and social developments that were occurring in Durham during the late-seventeenth century. A synopsis of the inventory is set out as follows:

*four stone of swarth, 12s.; two stone ½ of Shoomack [sumac], 4s; Seven Stone of copperas, 6s; Eight pound of Gauls [galls], 5s; five stone and 10 pound of Allome [allum]; one pound of madder, 4d; & two stone ½ crust [crushed] madder, 4s; one stone of logwood, 3s; half a pound of Orgall [orchil]; 3 pounds of fustique [fustic], 8d.; three pounds of Indico [indigo] and Arnatto [annatto, a native to the tropical American area, extracted from the waxy pulp surrounding *Bixa orellana* L. seeds], 18s 9d, and Six ounces of Cotchinill [cochineal], 10s. (see Fig 6.10).*

As it was often the case in late- and post-medieval England, merchants and craftsmen specialised in particular dyes (Crowfoot et al., 2001, 19), further analysis of these dyestuffs and mordants could help us better understand the colours and dyeing techniques George Burdon was specialising in during the last quarter of the seventeenth century.

According to Hofenk de Graaff (2004, 288-290), the mordant dyestuff galls (or gallnuts) are created by small wasps laying their eggs in the leaves and young twigs of certain kinds of trees. They then form growths which are collected at the end of the summer as that is when they contain the most tannic acid. Liquid, collected by macerating the galls in hot water, is used in the dyeing process. In Western Europe galls have been used since medieval times to dye wool black. However, in the seventeenth century dyers moved away from combining indigo and madder to produce black to using galls on an indigo ground, or by combining galls with an iron mordant (*ibid.*, 2004, 288-290). When galls are combined with a chemical mordant such as copperas (Iron (II) Sulphate), or iron filings (both included in the inventory), then a range of darker colours can be produced from brown to black as well as various shades of grey. Galls mordanted with iron produced a good lightfastness, although care needed to be taken that the fibres were not damaged by any filings. Evidence that galls were being used within the North-East region is confirmed by Walton (1983, 227), who reports the presence of a red dye similar to Brazilwood, indigotin and oak galls dye in a seventeenth-century fragment of worsted damask from the excavations of a ditch outside the Civil War Castle bastion in Newcastle upon Tyne. The fact that eight pounds of galls were in Burdon's dye-house suggest they were kept in some form of container. This is of some relevance as a probable seventeenth- to eighteenth-century lead bag seal featuring the word 'Galls' (Cat. B.2384) was found in the River Wear, at the same find site as the cloth seals. This small find may represent direct evidence that galls were being imported to Durham in small sacks that could be secured by exactly this type of bag seal (Fig 6.25). Like galls, sumac is also a mordant dyestuff that contains gallotannin, (i.e. being hydrolysable tannin being decomposable in water with which they react to form gallic acid and sugar) and like other tannin-containing plants was used with iron to dye silk, wool and linen black and brown. Although sumac is obtained from certain shrubs and small trees, native to temperate zones it is unclear from where the 2½ stone owned by Burdon would have originated. Hofenk de Graaff indicates that dyers valued Sicilian sumac and that, like the French varieties, they were both used widely across Europe (2004, 286, 298).

As the dyes indigo, madder, and logwood, together with the mordant allum have already been discussed at some length in Chapter four, it is important to mention here the significance of the remaining dyestuffs in Burdon's inventory: fustic, annatto, cochineal and orchil. Firstly, the mordant dyestuff fustic. This yellow dyestuff was obtained from the heartwood of the dyer's mulberry tree, which is native to Central America, Antilles and Latin America. Of particular interest is a suggestion from Hofenk de Graaff (2004, 183) that although fustic came to Europe from the Americas in the sixteenth century, it rarely appears in seventeenth-century dyeing manuscripts. However, in the eighteenth century fustic, along with weld, were the two most important yellow dyestuffs until quercitron, obtained from the inner bark of the North American black oak trees was introduced (*ibid.*, 2004, 183). Further analysis of other dyer's probate inventories may help identify how rare the use of fustic was in seventeenth-century Durham. Based on the mordants listed in Burdon's inventory, he could choose to add alum to a solution of fustic to dye textiles (normally wool) yellow, or iron to turn them dark brown (*ibid.*, 2004, 183-184). Like fustic, annatto is also found throughout Central America, being obtained from the fruit of *Bixa orellana* L., a fruiting shrub or small tree. Annatto is a direct dyestuff giving a yellow – yellowish red or red orange colour. However, despite being introduced to Europe in the sixteenth century following the discovery of the Americas, it never gained any importance, although it does appear in seventeenth- and eighteenth-century Dutch dyeing recipes, being used in combination with cochineal dyeing as an after treatment to brighten the red colour (*ibid.*, 2004, 166-167), which may explain why annatto was in the Durham dye-house as cochineal was also present. The presence of six ounces of the mordant dye cochineal in seventeenth-century Durham is of no real surprise as this coccid dyestuff (dyes from scale insects) had been introduced into Europe from its tropical and subtropical South American and Mexican origins from as early as c.1518. While Walton refers to a piece of silk, recovered from the same Newcastle upon Tyne excavation discussed above, that gave a weak red result for either kermes or cochineal (1983, 227), Egan highlights London-based cloth seals, dating from the sixteenth-seventeenth centuries specifying cochineal '*In grayne*' and a Charles II post-Restoration four-part cloth seal featuring the word

INGRAINED ('ingrained' referring to red-dyed cloth). In 1680, £250 profit was taken in alnage and subsidy fees levied against ingrained cloths in London and Middlesex (Egan 1995, 4; Endrei and Egan 1982, 62, 65), although caution should be noted, as Hofenk de Graaff refers to 'grain' as being the common name for kermes, another red coccid dyestuff originating in Southern Europe and the Near East (2004, 52). Based on the amounts of cochineal used in the early-eighteenth century London dyer's recipe to dye cloth pink (discussed in Chapter four) – '*3 ounces of cochineal grained in spring water*' – it is clear that Burdon would only have had enough cochineal to dye two similar quantities of cloth, at a cost of 5s. per boil. The other costs incurred in the process are added in, including that of other dyestuffs, mordant, fuel, labour, tentering etc. then it would be quite a costly process indeed. Compared to the one pound of the alternative red dyestuff madder valued at 4d. found in Burdon's inventory, then cochineal is 20x more expensive at 320d. or 26s 6d. per pound. If Burdon's cochineal was used in conjunction with the mordants he had available at the time, then alum would have given him a crimson colour, iron a purple colour and copper a claret colour (Hofenk de Graaff 2004, 76-79).

The final important dyestuff in Burdon's' inventory is orchil, of which he possessed half a pound. Orchil, which is extracted from various lichen species – the most used being *Roccella tinctoria* DC., is again a mordant dye, giving bluish reds with alum, dull purple with copper or a brownish violet with iron. Probable sources available to Burdon, would have been from those lichens growing on rocks found on Mediterranean islands, the English south and English, French and Portuguese Atlantic coasts. Although it was used to dye cloth purple, it was also used as a ground colour before a second dyeing using Tyrian purple was undertaken (although no evidence has been found of Tyrian purple being used in Durham) (*ibid.*, 2004, 274-275).

Two Stone $\frac{1}{2}$ of Shoomark	0.4.0
Sealed Stone of roppers	6.0
Eight pound of Gault 5. $\frac{1}{2}$ Stone 8 10. pound of Allom 14. 10	
one pound of Madder 4. two Stone of ruff Madder 4	
one Stone of Logwood	0.3.0
half a pound of Or gall 3. pound of fustique	0.0.8
Six Nells, six Black lokes	0.2.0
two Noll brushes, three Shiffs	0.14.0
three pound of Indigo & Aruatto	0.18.9
Six pound of Colchicill	0.10.0
one pair of brass scales	0.1.0
Kindy yards of Doulars	6.10.0
one Red Shovel Longs & one red rake	0.1.2
one Mortar & pestle and the school of pamm & some madder & fust 3.0.0	

Fig 6.12. Probate Inventory 1689. George Burdon dyer of Durham (DPRI/1/1689/B17/8).

In summary, the wide range of different dyestuffs in Burdon's dyehouse would have allowed him to cater for a heterogeneous group of clientele. The clothing worn by all social classes in Durham, including the North-East region, whether ubiquitous working clothes, daily wear or luxury goods, could have all been coloured at his riverside dyehouse in Claypath. As a Durham Dyers' Guild member, master dyer and Freeman of the city, the standards he would have upheld, together with the techniques he used, would have been both common practice and known by all the company members. The merchant adventurers and their middlemen supplying the dyestuffs, particularly those imported from the Americas, would have been exactly the same men whom all of the Durham

dyers turned to for the very same supplies. However, based on the fact that he had hundreds of small debts still owing to him, together with large quantities of stock, Burdon must have been an extremely successful dyer; it seems that something, perhaps his years of dyeing experience, a secret dyeing recipe or two, his honesty or reputation brought him commercial success. What is in little doubt is that he was able to dye cloth with several variations of colour, from the more sombre blacks and browns, through yellows, greens, blues and reds, to the more vivid and prestigious coloured textiles associated with the upper classes, including crimson, scarlet, claret and purple. The dyestuffs he possessed would have been exactly the same as those used during the seventeenth and eighteenth centuries by both London-based and Dutch master dyers.

Anthony Emerson's 1665 probate will (DPRI/1/1665/E4/1-2 – see appendix I), suggests that perhaps an even greater level of prosperity was enjoyed by this Claypath-based dyer; although it is not clear whether this prosperity is linked to the area in general or simply within his specialised occupation. His fondness for his grandson Anthony Emerson is obvious as he is bequeathed significant land and property: *a parcel of ground commonly called Sherburn More [Moor], a house in Gilligate [Gilesgate] formerly in the possession of the fuller Henry Johnson, a house in Claypath, and a house in Claypath Gate*. In addition he bequeaths his grandson £200, while his daughter *Alice Wyckliffe is granted £10 per annum for the grandson's maintenance, and more for his education if needed*. His inventory of household goods was valued £35. It is unclear why Anthony Emerson's son Thomas (father of the grandson Anthony) is overlooked in the will, although he is identified as being a draper and may have already had some wealth.

The probate wills and inventories of the Durham weavers, Thomas Morland (of Elvet) dated 1598 (DPRI/1/1598/M6/1 - see appendix J), Thomas Johnson (of Elvet) dated 1610 (DPRI/1/1610/J2/1-2 – see appendix K) and Bartholomew Bolton 1662 (DPRI/1/1662/B10/1 – see appendix L), were examined for references to objects that were associated with textile manufacture. Thomas Morland had relatively small quantities of cloth, the longest lengths being some *twenty yards of course linen* and *twenty yards of course hardinge* [hardyn], his total inventory was only valued at £10. While Threlfall-Holmes (2005, 105)

suggests that hardyn differed from linen in that it was made from the woodier parts or hards of flax or hemp, whereas linen was made from the finer fibres. Baines (1985, 17-20) advises that fibres extracted from the long bast fibres found in the stems of flax plants must first have their seeds removed before then being retted and dressed before they can then be spun and woven to make linen. Hardyn was a relatively cheap cloth used for a variety of household uses such as bedding. Threlfall-Holmes's analysis mentioned above suggests that the Bursar of Durham's Cathedral Priory bought an average of 220.08 ells per year of this cheap textile after 1500 (Threlfall-Holmes 2005, 107). Additional evidence of domestic consumption for linen and hardyn in late-sixteenth and seventeenth-century Durham can be found in the 1586 probate inventory of the draper, Thomas Hall (discussed above), which lists 30 yards of hardyn including many sheets and towels also made from hardyn and four stone of linen. The Elvet weaver Thomas Johnson had quantities of flax listed in his inventory. However, the extent of his property is also worthy of note. The inventory describes domestic, raw materials and commercial objects located: *In the hall house, In the Chamber next to the hall house, In the upper Chamber, In the Stable, and In the Shop*; although it was only valued at £22. It appears that if Thomas Johnson owned his property outright, then like the dyer Anthony Emerson he was enjoying some measure of success at the time of his death. This may have been linked to either their specialised occupations or more generally, to the economic prosperity enjoyed by the city of Durham during the seventeenth century. Certainly a noticeable spike in textile-related activity is observed occurring during the second half of the century – see Chart 6.1. Like Thomas Johnson, the weaver Bartholomew Bolton also had several rooms in his main house including *a foreroome, a chamber, and a stable*; however, it is in *the room above the parlour* that is of most interest as it clearly demonstrates cramped living and working conditions. The room contained:

one paire of weavers Loomes, one halfe stone of woole, one paire of weigh scales and weights, (in amongst such domestic items as): two stoud [stand] bedstedds one with bedding, one Truckle bedstedd (a stoud bed is a stand bed, in this sense a truckle bed may be

positioned under it and pulled out for sleeping), *4 old Chists* [chests],
one brasse kettle and *one Corn Skepe* [a basket for corn].

Other items listed in the same room, and which may well be manufactured stock include: *7 pairs of sheets, one dozen of pillows, one dozen and a halfe of napkins* and *three table cloathe*; all of which are relatively cheap household linens. Although the full inventory was valued at £51, it may be prudent to compare the economic success of Durham's seventeenth-century weavers with those based in Norwich. Allison (1960-61, 76) identifies that approximately three quarters of the Norwich weavers who left inventories during the seventeenth century, had goods valued at less than £50, although a few more successful of them had between £300 and £400.

Analysis of these three weavers' probate inventories, including that of the draper Thomas Hall, has provided important evidence suggesting that the weavers of Durham c.1598 - 1662, were producing inferior (coarser) quality linens, for mainly domestic consumption. Although from an earlier time, many other cloth types were being woven in Durham, for example, those described in Richard Racket's 1468 inquisition (which incidentally included linen and diaper – small patterned linen), the production of a range of textiles made from the fibres of the flax plant appears to have become the staple activity for many of the city's weavers from the late-sixteenth through to the early-eighteenth century. This may be partially due to those reasons discussed in 6.3 above, linked to a combination of the availability of raw materials and cheap labour. It is however, relevant to highlight how not all the linen being consumed in Durham was locally sourced and this is due to an obvious distinction between fine and coarse linens. Although flax had to be imported into the Netherlands, almost certainly from England, a strong commercial enterprise ensured that the fine linen being produced by weavers across the country including Flanders and Brabant was then sent to Haarlem, a textile finishing centre located in the north-western Netherlands. Here the clear waters near the Kennermerland coast proved ideal for the bleaching process. This high quality linen was being imported from Haarlem in the Netherlands, particularly during the seventeenth century (Egan 1995, 110). However, this was already a long-established trade

route, for as early as 1390 the Port of London Customs Accounts record receipt of some 12,000 pieces of linen, each 50 ells long, although 6500 pieces came from North-Rhine Westphalia, 5500 pieces came from the Netherlands, typically woven in Flanders (Spufford 2002, 251). In addition, similar port records describe how both Holland and Flemish cloths were being imported into Newcastle upon Tyne from as early as 1494 - 1495, *peciis holand panni linei*, although in 1457, linen was actually exported from the port (Wade 1995, 37-39, 193). The uses to which this fine quality linen was being put is succinctly evident in the Vestry book of St Nicholas's Church (located in Durham Market Place), dated 1677 - 1678, which records the procurement of 'Holland' cloth to make a new surplice (Barmby 1888, 243).

The account books of Henry Best a farmer from Elmswell, a small hamlet in the East Riding of Yorkshire, dated to 1641, provide us with an important overview of the various types, uses and prices of linen, presumably all readily available in the north of England (Robinson 1857, 105-106). An entry within the account books entitled '*Short Remembrances for Buying of all Sorts of Linen Cloths*', describes those linen cloths that were being made in England and which he describes as being commonly called *huswife-cloth* [housewife cloth]. Although there were many discrepancies related to the breadths to which the linen was woven, a maid servant would expect to pay 14d.-15d. a yard for linen holiday aprons, cross clothes (worn on the head) and neck cloths (although some 150 years later, Fig. 6.11 shows several 'housewives' in Durham Market Place wearing similar linen aprons, cross cloths and neck cloths). Linen described as 'exceedingly good' and suitable for use as table cloths could command 16d.-17d. per yard (or an ell-wide). The 'finest and best' sort of linen, however, could command the much higher price of 2s. and seven groats a yard; this was much used by 'gentle folk' for shirts. The cheapest Scottish linen available in Yorkshire in 1641 was typically 18d. per yard, while the best Scottish linen, used for women's 'handkerchers' (for the neck) and pocket handkerchers, could command a respectable 2s. 6d. and eight groats a yard. However, compare these prices to that of Holland cloth which could command from 2s. 6d. to 6s. 8d. an ell. This 'stronger' cloth, apparently spun by the nuns in the Low Countries, was brought over by English merchants and sold to linen drapers. It was much used

for men's bands, gentlewomen's handkerchiefs, and cross-cloths and half-shirts etc. Additional types of finer English linens included the coarse 'lawn' at 4s. 6d.; 'cambric' at 8s. per yard, used for ladies' ruffs and the best of all cambric lawn which cost 10s. per yard, used for gentlemen's and ladies' ruffs (*ibid.*, 1857, 105-106). Some 37 years later, the Holland cloth purchased to make the surplices for St Nicholas's Church (described above) cost 2s. 6d. per yard and probably requiring ten yards in total, as the total cost was 1l. 15s. 11d., plus 7s. to make it (Barmby 1888, 235,243). According to Threlfall-Holmes, between 1460 - 1520 the highest price paid by the priory of Durham for Holland and Flemish linen was 10d per ell, these being the dearest linens they bought (2005, 110).



Fig 6.13. 'Housewives' in Durham Market Place c.1790. Images reproduced courtesy of Durham University Library.

6.10 Review of textual records highlighting textile related artisans

There is evidence suggesting a level of prosperity in the North-East during the seventeenth century. The historian Thomas Fuller, writing in the mid-seventeenth century, ranked the Bishopric of Durham amongst the middling shires of England (1811, 477). While Green (2003, 60), citing Weatherill's (1996) national survey of probate inventories, highlights the appearance of new goods in inventories between 1660 and 1760, to rank parts of the North-East as 'advanced as London and ahead of areas in the home counties'. Weatherill (1996, 13) suggests that the 'middling sorts' did not include the wealthier merchants or gentry; they were instead the men set apart from the 'lower' or 'upper sorts'. Although originally used in a commercial context to describe commodities, the phrase 'middling sorts' is used in a sociological context after 1640 (Wrightson 1994, 41).

Although we witness a 'rise of the guilds' in Durham during the mid-fifteenth century, their charters of incorporation may have been simple amendments to existing ones. In other words, organised and structured textile-related craft guilds may have been operating in the City from an earlier time – as alluded to in Chart 6.1. The search for the earliest evidence of a cloth trade in Durham could be linked to the geology of the hinterland surrounding the medieval city. An abundance of local quarries sufficient to produce stone suitable for grave slabs, together with itinerant, village, journeyman or even ecclesiastical masons would have been sufficient for a viable system of slab production. Ryder (1985, 5-14) maintains that in Durham and much of the North of England, suitable stone was readily available, so much so in fact that the use of cross slab grave covers extended down the social scale. His argument is supported by the number of secondary emblems which display a link to a trade; as 240 of the surviving 550 slabs have a secondary emblem of some type in County Durham. Given that there is an agreed consensus that the primary emblem on cross slab grave covers is the cross, the question of purpose of secondary emblems warrants further clarification. Here we have controversy linked to differences of interpretation. Ryder (1985, 10-14) defends the more traditional view linking

the secondary emblems to trade, rank or sex, while Edwards (1982) favours emblems carrying a more religious significance.

The second most popular emblem to be used on Durham cross slabs is shears. The stylized standard form of small shears which may well have been everyday medieval domestic utensils occurs on 62 Durham examples. Significantly however, out of the five shears which occur in Durham and the immediate parish boundaries, two in particular: No. 25 which was found at St Oswald's Church in 1864 (C. Hodgson Fowler 1870 No.1), and the second, No. 24 which was found at St Giles's Church and dated to the 13th century (now lost) both feature a larger form of shears each with broad square ends to the blades. These are clearly unlike the more common smaller shears typically found on other Durham slabs. Ryder (1985, 24) suggested that these larger 'square-ended' shears are actually cropping or fulling shears used in cloth manufacture. Ryder's interpretation that these large square-ended shears are symbolically linked to trade seems the more convincing. Graves (2000, 145), strengthens the argument that these 'blunt-ended' shears are indeed associated with the finishing of woollen cloth rather than sheep-shearing by highlighting how they are sometimes referred to as fullers shears (or tuckers shears in the West of England) and were often left in the wills of clothiers during the sixteenth century.

Therefore, if the great majority of recumbent cross slabs was produced in the medieval period, peaking in the twelfth and thirteenth centuries, then it is possible that the cross slab grave covers at St Oswald's and St Giles's once marked the burial places of Durham's earliest citizen engaged in the cloth trade. A much later grave stone (Fig 6.14), located at St Giles's Church, Durham, features a set of very similar broad shears, above the inscription 'Here lieth the body of WILLIAM JAMES Fuller; who died March the 22^d. 1702'; this would seem to point to the longevity of the trade image.



Fig 6.14. The grave stone of William James, Fuller, died 1702. St Giles's Church yard, Durham. Image @ Author

The names and occupations of some of the earliest individuals who rented land or property in the Borough of New Elvet, and who were engaged specifically in the cloth trade during the late-medieval period, can be found in documentary sources. The documentary evidence contains several variations of the names associated with the cloth trade for example; dyers are also known as tinctor, tinctoris or lister, with surname variations for Lister i.e. Litster, Littester or Lyttester. Fullers are often referred to as walker(s), while weavers are also known as websters or sometimes taylors.

The first key individual engaged in the cloth trade located in this research appears in a mid-thirteenth century entry within the Hostilliar's' accounts (4.3. Elem.8) which details the lease of land to one Reginal Mercenarius, located close to both the River Wear and Elvet Bridge in 1242. The land is described as lying adjacent to the land of Robert Tinctoris and the water (Fig 6.16). Importantly this entry places a dyer within 30m of the find site of lead cloth seals.

This was a prime location lying adjacent to the River Wear and Elvet Bridge and certainly a desirable one for those dyers wishing to access a ready supply of [relatively clean] running water (see quotes from James's book 'The Dyer's Assistant' below), while also being positioned within de Puiset's 'route centre' (Dobson 1973, 41). An entry within the Bursar's rentals (Camsell, 1985, 638) dated to 1424, describes the same plot of land as: '*once owned by Robert Lister, now by the heirs of Walter Lister*'. Although this named second dyer may well be a relation or indeed heir of Robert mentioned above, it is suggested here, despite a change in Robert's surname from Tinctoris to Lister, that it is the same individual. There is little doubt, however, as to the occupation of a third dyer who rented property on the same plot of land between 1430 to 1433, as an entry in the Feretrar's Rolls (Rott. Feretrar 1430-1433 (Fowler 1898, 467)) describes one 'William Baxter,' as the individual who rented for the sum of 4*l* 18*s* 8*d*, a tenement that used to belong to Simon Alman located at the end of the new bridge at Elvet – *ad finem novi pontis de Eluett*, and others on Northrawe and Ratonrawe (both located in the New Borough).

The occupation of William Baxter is clearly indicated in the next entry of the same Feretrar's accounts: '*William Baxter, tinctor.*' The entry concerns a significant cash payment of 40 shillings from Baxter for the building of a new pentice *ad construccionem novi appenticii juxta pontem de Eluett* (Fowler 1898, 467). At this date such a large sum of money would have funded a substantial structure (perhaps replacing an old one), attached to the wall of the tenement or burgage. Often during the late medieval period these pentices were constructed up against a high wall and would have a single sloping roof, similar to a modern lean-to, supported on one side with timber pillars, leaving an open or exposed side. William Baxter was evidently proficient in his trade as he was still supplying dyed cloth to the Bursar some ten years later in 1440 (Fowler, 1900, 626-627) and the supply continued from the same location by his son Richard until at least 1452 (Camsell 1985, 636).

Camsell's (1985, 105-123) analysis of the accounts of three of Durham's early landlords, those of the: Almoner, Bursar and Hostilliar, is important in

determining the names and occupations of those individuals based in the Borough of Elvet. However, it is, in fact, not a definitive list. As we have seen above the Priory had other property in the Borough of New Elvet, for example, the tenement leased to the dyer William Baxter which was actually leased out by the Feretrar: a specific lease which does not appear to have been identified by Camsell. The examination of other historical records can however, help to strengthen Camsell's findings, for example, an account of the free holdings of the land under the Prior and Convent of Durham entitled *Feodarium Prioratus Dunelmensis* dated to 1430, provides a list of names of individuals in possession of *tenementum supra Northrawe* and *burgagium super Suthrawe* both in the *burgo de Eluett* (Greenwell 1871, 73-75). The list includes a useful reference to a tenement which once belonged to the heirs of Henrici Litster and which was taken into the hands of the Bursar in 1430, as 8s had not been rendered (*ibid.*, 1871, 92). It is described as being located on Southrawe with a frontage of 18ft, lying between two waste burgages (plot 13, Fig 6.16). Although Camsell quite correctly referred to Henrici Litster as being granted the plot in 1361 (1985, 672), this additional evidence clarifies what became of it some 69 years later. Camsell suggests that the three most common terms found in the written records and used in Durham to describe plots of land were: *tenementum*, *messuagium* and *burgagium*. Although the tenement may have simply been used to describe a distinct unit of land with precise boundaries often fronting a street, the terms message and burgage may have been interchangeable, burgage being linked to plots of land held in 'burgage tenure' (*ibid.*, 1985, 64).

The value of Camsell's research can be demonstrated by accessing a second document: a miscellaneous charter dating from 1439 x 1432 (Misc. Charter. 5828/12) featuring a map (Fig 6.13) associated with a group of rolls relating to a controversy between Durham Cathedral Priory and its free tenants in the Borough of Elvet over a right to common pasture; a compromise agreement concluded on 20 September 1442 (Skelton and Harvey 1986, 192). The map shows a row of sixteen tenement plots on Northrawe facing south, each of which has a named tenant; one particular plot is marked as *Heredum Walteri Litster*. Therefore by referring to the map in isolation one could easily surmise that the

heirs of the dyer Walter Litster occupied the plot c.1442, but, it is only through Camsell's research that we learn that the dyer's heirs are recorded as also occupying the same tenement (plot 11, Fig 6.14) over one hundred years earlier in 1338 (Camsell 1985, 659).

By combining Camsell's research with other historical documents linked to the leasing of property in the borough of New Elvet, 19 named dyers, two drapers, three fullers and one weaver have been positioned within their New Elvet tenement plots (Fig 6.16). Four individuals in particular: William Richardson, tinctore 1523, and John Kechyng, tinctore, 1529, both held plot 1, John Litster 1396 and his son John 1404, leased plots 2 and 3, and finally Robert Lister who leased plot 4 between 1347 and 1369; all held tenements on the western edge of the Borough of Elvet at a location just downstream of Elvet Bridge: sites whose foundations fall within or extremely close to Carver's excavation (New Elvet I). The Hostilliar's rental records describe how the above William Richardson paid for part of his rent (6s. 8d.) in candles; perhaps an example of necessary diversification? A fifth individual John Walker (fuller?) leased a riverside tenement from the Bursar in 1538; again close to the site excavated by Carver (New Elvet II). These five plots alone are relevant as they form a concentration for the cloth industry in a position only 40m from the find spot of the cloth seals in the River Wear.

the tenement held by the heirs of Henrici Litster (mentioned above) in 1430 is described as being 18ft broad, while others in New Elvet are typically (5.7m) 19ft to (7m) 23ft broad, it is clearly conceivable that an additional 20 tenements could be 'squeezed' in to Camsell's western boundary adjacent to the River Wear. Although Wood's 1820 plan depicts approximately 30 tenements *in situ*, a vennel which measured 20ft wide (1.19.Spec.11 (see Camsell 1985 690)) circa fifteenth/sixteenth centuries is not depicted. Taking this into account the potential available space for riverside property on Southrawe lying between Elvet Bridge and Water Lane is approximately 184m (604ft). This real potential for (up to) an additional 16 tenements located immediately downstream of Elvet Bridge to those already identified by Camsell is important. The presence of 26 individual late-medieval cloth/textile workers (see table 6.2), supports the argument for a significantly higher number of similar craftsmen who may have leased these 'missing' tenements in what is clearly a prime location for cloth manufacture/finishing, but whose names and occupations are missing from the surviving archives.

The Composite Map of the Borough of New Elvet (Fig 6.16) has been produced with Adobe Photoshop software, by overlaying pertinent detail taken from various topographical, cartographic and archaeological sources (discussed above) on to a modern Ordnance Survey map of Durham City (Digimap Licence). In addition a methodical review of Camsell's paper on the Borough of New Elvet and her conjectural boundaries map (Fig. 6.9), together with several other historical documents, has helped produce a reasonably accurate representation of the tenement and burgage plots that would have been in the Borough of New Elvet, during the late medieval period, and in relation to the lead cloth seal find site.

By filtering out all other non-relevant trade occupations, and simply focusing only on those linked with the cloth/textile industry, i.e. the dyers, weavers, fullers and drapers (some caution should be observed where surname evidence only has been used to suggest/identify the occupation) it is possible, when viewing the map, to appreciate the importance for these craftsmen to possess a

tenement or burgage plot that abutted the River Wear. The identified dyers listed in plots 1 – 9, would have occupied some of the prime locations available to their craft guild or trade members within the whole of the city of Durham. Not only did these long narrow tenements have valuable commercial frontages, sufficient workshop space in which to undertake their cloth dyeing process, but also easy access (at the bottom of their individual tenement plots) to a reliable (and copious) supply of river water – a natural resource essential to their dyeing and finishing processes. An additional consideration should be that the large south-east facing tenter close managed by the Bursar was located at nearby Pellowleys and was easily accessible by crossing the River Wear either by Elvet Bridge or by way of a ford, accessible via a small lane at the end of Old Elvet, which was formerly used as the road to the ford (Ornsby 1846, 163).



Fig 6.16 Composite map of the Borough of New Elvet. Image © Author.

**List of late medieval dyers, drapers, weavers and fullers indicated on
Composite Map (Fig. 6.16) of the Borough of New Elvet, 1242 - 1529**

No.	Name	Occupation	Date	Reference/source
1	William Richardson	tinctor	c.1523	Hostilliar's Rentals (Camsell 691)
1	John Kechyng	tinctor	c.1529	Hostilliar's Rentals (Camsell 691)
2	John Litster	dyer [?]	c.1396	Sacrist's. Cart. (Camsell 691)
3	John Litster (son of John)	dyer [?]	c.1404	4.2. Sac. 32 (Camsell 692)
4	Robert Lister	dyer [?]	c.1349 - 1369	Sac. Rentals (Camsell 693)
5	William Baxter	tinctor	c.1430 - 1433	Feretrar's Rolls (Fowler 1898, 467)
5	Richard Baxter (?)son of William)	dyer	c.1452	Hostilliar's Accounts (Camsell 636)
5	Robert Tinctoris (also Litster)	dyer [?]	c.1242	4.3. Elem. 8. (Camsell 637)
6	Walter Litster	dyer [?]	Heirs of (pre 1424)	Almoner's. Rental (Camsell 638)
6	Robert Litster	dyer [?]	Heirs of (pre 1424)	4.3. Elem. 8 (Camsell 638)
7	Robert Thomson of Durham	lister*	c.1470	4.17. Spec. 46 (Camsell 639)
8	Gilbert Littester	dyer [?]	c.1365	4.16. Spec. 11 (Camsell 643)
9	Adam Lyttester of Durham	dyer [?]	c.1383	4.16. Spec. 30 (Camsell 703)
9	Henry Littestere	dyer [?]	c.1364	1.17. Spec. 45 (Camsell 643)
9	William Smith of Durham**	lister	c.1447	1.17. Spec. 50 (Camsell 644)
10	Richard Webster	weaver [?]	c.1382 - 1413	1.17. Spec. 49 (Camsell 645)
11	Walter Lister	dyer [?]	Heirs of (pre 1338)	1.17.Spec. 33, Misc. Charter 5828/12
12	Alan Tictor/Textor/Tixtor	tinctor [?]	No date(s)	Misc. Charters 2440, 2441, 2435 (Camsell 664)
13	Henry Littester of Elvet	dyer	c.1361 - 1364	3.17. Spec. 45 (Camsell 672)
13	William de Furneys	draper	c.1380	4.17. Spec. 25 (Camsell 673)
14	John Lister	dyer [?]	c.1407	4.2. Sac. 26 (Camsell 682)
15	John Walker	fuller [?]	c.1538	Bursars Rentals (Camsell 690)
16	Robert Walker	fuller [?]	c.1365	1.8. Spec. 12 (Camsell 676)
17	Walter de Scelton	fuller	c. 1317	3.17. Spec. 12 (Camsell 707)
18	Nicholas Draper	draper [?]	c.1367	Misc. Charter 2320 (Camsell 680)
19	Robert Draper of Elvet	draper [?]	c.1389	1.17. Spec 42 (Camsell 678)
(**Tenement described as 'abuts' River Wear to North!)				Table 6.2.

The tenement boundaries, identified in Fig 6.16, remained relatively unchanged from the post-medieval period through to the early-nineteenth century (this can be confirmed on both Foster's map of 1754, and Wood's plan of 1820 (Fig. 6.22)). Thus it would be reasonable to assume that dyers would continue to favour these prime waterside tenement plots through to the onset of industrialisation and subsequent demise of any form of dyeing in the borough. The assertion that dyers favoured riverside-sites is supported by Crowfoot *et al.*, (2001, 20), who suggest that most London-based dyers established their dye-houses close to the River Thames because of the availability of constant supplies of running water; this is further supported by the Southwark dyer's recipe (Fig. 4.4), which suggests the cloth is first boiled in '*River Watter*'. In addition, it is pertinent to highlight here a single cloth seal (Fig 6.17) which forms part of the Durham collection (Cat B.1183), and features the name James Haigh. This man was either James Haigh, a fulling mill owner from Halifax, Yorkshire c.1738 or James Haigh a silk and muslin dyer, from Leeds, Yorkshire c.1780 (see catalogue entry **225** and section 4.2.5 above for further discussion). These men may actually have been related. The latter Haigh reinforces the notion that dye-houses were established close to rivers when he makes recommendations to his fellow dyers, in his late-seventeenth century book '*The Dyers Assistant*'. The book includes several references to river water, such as '*after the wool is taken out of warm water...wash it again in the river*', and '*to set a vat which may contain...about sixty quarts of river water*' (Haigh 1778, 43-58).

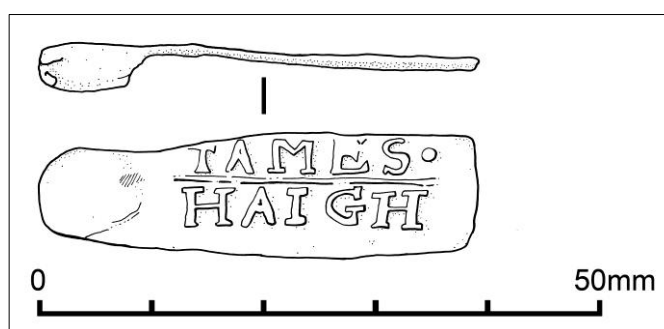


Fig 6.17. Lead cloth seal. James Haigh.
Acc No. B.1183. Illustration © Author. Scale (2:1).

There is evidence that tenter frames were being constructed and put to use elsewhere in Durham throughout the late- and early post-medieval period although several are recorded as lying waste. Camsell (1985, 98-100) highlights burgage rentals in an area of the North Bailey known as 'tenturclose,' with Mathew Spark paying a 'fee farm' rent of 6d. per annum to the Chaplain of the Chantry of St. Katherine in 1542. In addition, a single entry in the Borough of Crossgate Court records dating from 1522 features one Thomas Thyft, Chaplain, who complains that Hugh Robynson withheld 9s. for the rent of the '*clausure cum le tentor*' (Britnell 2008, 272). The Priory Bursar held 10 acres of meadow called Pellowleys (modern day Pelaw Leazes) at Gilesgate from at least 1438 to 1542. This area of land, with its south-east facing slopes, can be seen in the seventeenth-century painting rising up behind Elvet Bridge (Fig 6.21). Men such as William Chilton (1495), John Dixon (1507 - 1517) and Robert Valyante (1538 - 1542), all rented *tentoria apud Pellowlez*. Fluctuations of rental fees per tenter frame, for example from 2s to 3s, along with periods during which no rental income was generated i.e. 1438 - 1439 (Camsell 1985, 452-453), are perhaps indicative of the state of textile production and finishing in Durham during this period. While there is a tenuous link with the modern-day street name of Tenter Terrace, located just off North Road (in the old Borough of Crossgate), an unambiguous piece of evidence for the construction and use of tenter frames can be found in the Durham probate records of George Burdon dated to 1692 (discussed above). This Claypath-based dyer has listed in his inventory *90 yard of tenters* valued at 5l. (Fig 6.18).

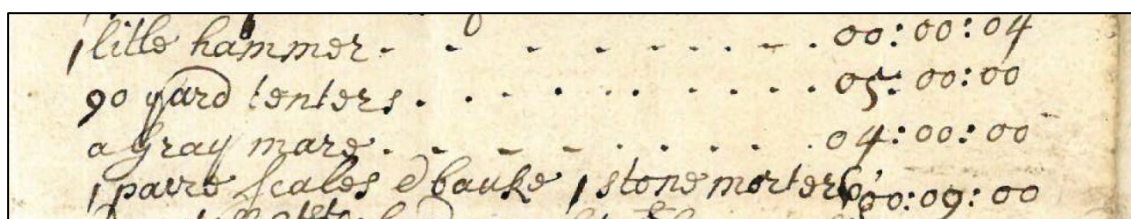


Fig 6.18. George Burdon, dyer of Durham. Probate Inventory 1692 (DPRI/1/1692/B18/2).

The stretching of cloth on tenter frames was governed by various statutes (e.g. Statute 21 Jac. I c. 18 (1623-4) (Egan 1987, 249). After fulling, cloth was hooked on to a top bar of a tenter frame, then on to a bottom bar which was then released; an action that placed the cloth under slight tension, allowing it to be stretched and the final width to be fixed. Jackson (1993, 60) suggests that the major problem with tentering was to ensure that the cloth shrank evenly to prevent overstretching a temptation for many that led to the introduction of legislation. Fig 6.19 shows the last remaining eighteenth-century tenter frames in Europe. These examples from Otterburn Mill, Northumberland, demonstrate clearly the relatively long lengths to which they could be constructed; it is easy to visualise how similar tenter frames to these surviving examples could have once been found in situ on the late-medieval Pellowleys hillside.



Fig 6.19. Surviving eighteenth-century tenter frames, Otterburn Mill, Northumberland. Image re-produced with kind permission from Janet E. Davis.

6.11 Topographic, cartographic, archaeological and other evidence

Important information on the built environment of late- and post-medieval Elvet can be obtained from analysis of the topographic, cartographic and archaeological evidence associated with the area. In total two paintings and four maps, all of which feature aspects of the Borough of New Elvet, have been examined. In terms of the information they contain, the paintings have proven invaluable, particularly as they capture activity at Elvet contemporary with the time they were originally painted – during the seventeenth- and late-eighteenth centuries. There is, however, a clear relationship with these two paintings and the four maps depicting the immediate area and these are considered both below and elsewhere in this chapter. In terms of the archaeological evidence, it should be noted that there are several specific categories of finds in the Durham River Wear Assemblage that are readily datable, for example, late-medieval pilgrim badges, hammered silver coinage, jetton and brass pins, together with many other everyday objects. Additional chronological points feature in the assemblage which can be assigned to the post-medieval period, such as pre-decimal coinage, trade and lead tokens and dress accessories. These have been supported by some associated pottery dating. In brief, material culture from the late-fourteenth to the early-twentieth century is well represented in the assemblage. Clearly the River Wear at Elvet is a finds-rich archaeological site and when considered against the nearby excavations of land reclamation infill dumps and the tract of land adjacent to the Elvet riverside, during the 1970s (Carver 1974) and in 2002 (ASUD), it points to continuity in terms of the structural remains and of the material artefacts recovered, dating from the late-thirteenth century to the present day. Fig. 6.16 shows the relationship of the cloth seal find site and the three nearby excavations.

In terms of providing important information on the built environment at Elvet Bridge, topographical artist Thomas Hearn's late-eighteenth century painting of Elvet Bridge (Fig 6.20) is very helpful. The painting depicts the River Wear flowing serenely underneath an un-widened Elvet Bridge (the bridge was effectively doubled in width in 1804-5, Roberts 2003, 95). Just downstream

from the bridge, the river is portrayed as flowing just a few feet away from riverside workshops, outhouses and possible accommodation, although these buildings appear to be relatively well protected by a substantial stone-built wall (as discussed in 6.8 above). A dry land arch, located at the eastern side of the bridge, formerly the site of the thirteenth-century St Andrew's Chapel (*ibid.*, 2003, 94-96), appears to facilitate safe passage by foot from the upstream side of the bridge to the water's edge on the downstream side of the bridge. The location of the man and woman positioned on the far river bank, between the river and the protective wall, is directly adjacent to area of the riverbed from which all of the cloth seals have been recovered. However, the first water (eastern) arch which is depicted in the painting, is actually now reclaimed land, therefore the river, as depicted in the painting, is much wider (and presumably shallower at the edges) than it is today.



Fig 6.20. East end of Elvet Bridge and adjacent tenements, c.1783.
Artist Thomas Hearn. © Trustees of the British Museum.

A second painting (Fig 6.21), this time by an unknown artist, almost captures the same perspective on Elvet Bridge, is dated a century or so earlier during the seventeenth century (Dyson, 2015, pers. comm., 5 June). This painting is perhaps, even more important than that of Thomas Hearn described above, as it shows the fine detail of several buildings located on the east-end of Elvet Bridge. The painting also portrays a sense of just how compact the suburbs of the city were as three of the city's five boroughs are shown, merged seemingly as one single tract of land: the Borough of Durham which includes Clayport, The Borough of St Giles, including Gilesgate and of course the Borough of New Elvet. Again we can see that access to the downstream side of the bridge was possible via the dry and partially dry arches located at the east end of Elvet Bridge. The stone-built protective wall is still in situ, this time however, depicted with several wooden gates and even a purpose-built ramp, all of which would have facilitated easy access to the river. The location of this ramp and the depicted adjacent tenement, out-buildings and/or workshops, is extremely close to the waterfront site excavated in 2002 by ASUD – the 'Embleton's Garage' site (see section 6.8 above), which uncovered deposits dating from the seventeenth century together with evidence of a stone wall described as a 'retaining wall' (fig. 6.14). On the south side of the bridge, positioned behind the protective wall, which runs in a north-south direction, there are shown to be at least four, possible five quite long but also narrow tenements: a feature typical of the borough. The rear of these tenements appear to be very densely populated with almost every inch of available land being built upon, including multi-level (between one and four stories high) building types. While these individual tenements would each have had commercial frontages the rear of them are all depicted as abutting the river. The density of the tenements depicted in this painting is not unlike that shown some three centuries later, in the picture taken during the flooding of Elvet in 1903 (see Fig 6.10 above).

Another important facet of this second painting of Elvet Bridge is the seemingly close proximity of the hillside which can be seen rising up beyond the River Wear and the Borough of New Elvet. The artist has effectively captured what is modern day Claypath or Clayport (the cluster of buildings on top of the hill

positioned to the left hand side), with its relatively steep, possibly terraced paddocks or gardens in the middle ground. These terraces, in turn, give way on the right hand side to a more sprawling and undulating sequence of hedge, ditch or long stone-walled field boundaries that run in a parallel north-south series, up from the river. It is these open fields, which actually form the hillside located in front of Gilesgate and which have a south-east facing aspect, that is the area described by Camsell (1985, 431) as being known as Pellowleys (modern day Pelaw Leases) – where the Bursar's tenter-frames were rented out during the fifteenth- and sixteenth-centuries. The buildings of the Borough of St Giles (which include modern day Gilesgate), begin to emerge on the far right horizon. The area of land that would have been located immediately behind Gilesgate (not visible in the painting), and which is still known to this day as Gilesgate Moor, is the area of common land, referred to in section 6.3 above, which the Gilesgate Grassmen favoured for their bleaching grounds.



Fig 6.21. Seventeenth century view of the east end of Elvet Bridge and tenements.
Unknown artist. Image © Durham University.

When considered together both paintings confirm that from at least the seventeenth century onwards it was possible to access an area of the river bank

just downstream of Elvet Bridge. It is certainly plausible that this same access to the river was available from the time that the bridge was finally completed, in the second half of the twelfth century. It is also possible that access to the waterside was made by animal-drawn carts, via either water lane or the common vennel. Wolff (1983, 121) describes the use of four-wheel ox-carts from as early as the mid-fifteenth century to transport cloth and dyestuffs and it would not be unusual to find evidence of similar activity at Elvet. Fig 6.27 shows a partially worn iron ox-shoe with three nail holes (one still contains a partial nail, found in the River Wear close to the find site of the cloth seals). Egan (2005, 187), citing Hume (1974, 239) confirms that a similar mid- to late-sixteenth-century find recovered from a river-side site at Southwark, London, is an ox-shoe [rather than horse] due mainly to its broad shape and absence of a calkin. Given the considerable weight of the large quantities of water that would have been required by dyers, combined with several bolts of rinsed or newly dyed (wet) cloth, then it is plausible that it was the norm for goods to be transported to and from the water's edge in this way. Therefore, as discussed here and elsewhere in this thesis, as dyers favoured building their dye-houses close to constant running (relatively clean) water, and as the rental records confirm that dyers did occupy nearby tenements from as early as the mid-thirteenth century, then a continuation of dyeing activity (rinsing dyed cloth, collecting water to boil/dye cloth etc.) was possible in the immediate vicinity of Elvet Bridge until at least the late-eighteenth to the early-nineteenth century.

The cartographic and pictorial evidence, most of which is post-medieval in date, supports Carver's theories of occupation during the seventeenth century (based on his findings at New Elvet II), as it shows how the area immediately to the east of Elvet Bridge was occupied. Christophe Schwyter's illustration of 1595 (taken from Mathew Patteson's map), John Speed's map of 1610, Forster's map of 1754 and Wood's plan of 1820 (Fig 6.18), all show successive occupation of this area. In fact, all of the surviving maps clearly show a continuous frontage leading away from the eastern end of Elvet Bridge. Forster's later map shows tenements with narrow street frontages, each with clearly defined burgage plots to the rear, in many cases these lead all the way down to the River Wear. In her

meticulous analysis of medieval New Elvet, Camsell (1985, 633) attempts to show both the street plan and conjectural boundaries of tenements in New Elvet and these are probably the most accurately produced to date (Fig. 6.9). The gaps immediately to the south of Elvet Bridge, an area described as the west side of New Elvet, should not be interpreted as vacant or waste tenements but simply a consequence of an absence of written records.

In isolation, the individual small finds from the River Wear can only tell us so much about their past. Even the adoption of Caple's theoretical approaches in the investigation of them, would only contribute a little to the broader picture (2006, 6). However, when considered as a collection, these individual objects can contribute greatly to our understanding of the historical activity which once occurred in close proximity to the find site. As with the spindle whorls, ox-shoes and bale seals above, other objects found in the river at Elvet, such as brass pins, lead weights and trade tokens, can help with our broader understanding of activity linked to the production of textiles which seemingly occurred in the immediate vicinity. For example, the use of small brass pins in tailoring, in late- and post-medieval England is well documented (Egan and Pritchard 2002, 297-301; Egan 2005, 51). In excess of over 900 copper alloy plain wound-wire and decorated head type of pins have been recovered from the River Wear at Elvet, all found widely dispersed across the find site. This abundance of pins has similarities with other large collections of pins, for example, those recovered from Whitefriars' Church, Coventry, dated to the mid-sixteenth century and those from several London-based excavations with fourteenth- and fifteenth-century deposits (Caple 2005). Although several other variations are present, the Durham wound-wire-headed pins feature the same type A, B and C as identified by Christopher Caple's research (2006, 128-137). These pins can therefore be loosely dated (based on their form) to the fifteenth and sixteenth centuries; pins from Durham over 40mm in length may date before 1500. Although the Durham pins which feature a decorative head would have been used to hold women's headdresses in place, the smaller plain types could well have been used to fix items of dress or for tailoring (Caple 2006, 128-137). Although no pinner's craft-guild was present in Durham, Newcastle upon Tyne

customs accounts dated 1499 - 1500, record the arrival of several shipments, each of which contained 36,000 pins (Wade 1995, 271). The activity of drapers and tailors, recorded as operating in the Borough of New Elvet from as early as the fourteenth century (see Table 6.2 above), may account for the high number of discarded pins. Figure 6.19 shows an example of the plain wound-wire head type pins from the Durham River Wear Assemblage.

The inclusion of three shield-shaped decorated lead weights in the Durham River Wear Assemblage are of interest, two of which are shown in Fig. 6.26. Although they have as yet not been fully researched, all three weights appear to feature a heraldic device – most probably a single lion and with a design of some form on the reverse. There is evidence that similar shield-shaped weights were introduced across England in the mid-fourteenth century (Egan 2010, 301; Briggs and Withers 2000, 35-36). However, the production of this design (shield-shaped) may have had some longevity and the weights themselves may have remained in use for some time. While the use of such weights implies merchants and traded commodities, the three Durham shield-shaped weights are likely to be associated with the standardised system of weights based on the avoirdupois rather than the Troy weight system, which had been in place since the time of Edward III (Satchell 1989, 133). As a sack of wool had been decreed to be 26 stone (one stone being set at 14lb) a whole series of heavier weights – like the 7lb (clove) Bretherdale wool weight, would have been used. However, the King's (or perhaps Bishop's) tax collectors may have also used a series of lighter weights (similar to the Durham weights) when checking the accuracy of weigh beams for assessing wool tax (*ibid.*, 131-140). There is also the possibility that these 'lighter' Durham weights could be linked to the hand-loom weavers discussed in 6.4 above. It is unlikely that those engaged in domestic-scale spinning of yarn could afford to buy such large quantities as a full sack of wool and they may have had to settle for smaller lighter weight purchases. This argument is strengthened by Allison who suggests that spinning was a valuable source of income for poor families (1960-61, 76).

One final small find from the River Wear at Elvet that is of relevance to Durham's textile industry is an early nineteenth century trade token bearing the company name, Hill & Co Woollen Manufacturer, Fig. 6.27. The token's full inscription is worth highlighting: (obverse) [D.] HILL & C^o WOOLLEN MANUFACTURERS DRAPERS HOSIERS TAILORS SHIPOWNERS SHIPPERS OUTFITTERS & C^o, (reverse): NEWCASTLE NORTHSHIELDS & SUNDERLAND WEST OF ENGLAND HOUSE THE CHEAPEST GOODS IN ALL ENGLAND ESTABLISHED 1825. This simple token is, in many ways, a direct link to some of the external factors that were impacting on Durham's already wavering textile industry. While the Industrial Revolution transformed European textile production during the nineteenth century, resulting in the mass production of a greater variety of cheaper plain and patterned textiles, economic success would have depended (in-part) in getting these goods, not just to local middle-market consumers, but if possible to those across the whole of the United Kingdom and indeed Europe. While Hill & Co possessed ships, presumably operating out of the three largest ports in the region, Durham remained land-locked. In 1835, just ten years after Hill & Co were established; the Durham-based woollen draper and clothes-dealer Robert Battley was declared bankrupt (Richards 1835, 368).

Although found in Hungate, York, the stone mould (Fig 6.29), used in the manufacture of lead cloth seals, is evidence that the production of such objects was occurring in the north of England. The confirmation by Bishop Tunstall in 1532 of a Plumbers' Company (formerly the Goldsmiths', Plumbers', Pewterers', Potters', Glaziers' and Painters' Company). Whiting (1941, appendix IV 397-401), suggests that craftsmen in Durham would have had the necessary permissions to manufacture similar objects had they been required to do so. However, there are no extant records of cloth seals being produced in or around the city.

Historical maps of the Borough of New Elvet, Durham.



Schwyter's map 1595*



Speed's map 1610



Forster's map 1754



Wood's map 1820

Fig 6.22. Historical maps featuring the Borough of New Elvet.
 . *Christophe Schwyter's illustration is taken from Mathew Patteson's map
 © The British Library Board (Maps 2265.[6.]



Fig 6.23. Cat. B.1376. Medieval brass pins from the Durham River Wear Assemblage. Image © Author.



Fig 6.24. A selection of decorated late-medieval lead spindle whorls from the Durham River Wear Assemblage. Image © Author.



Fig 6.25. Cat. B.2384. Seventeenth- to eighteenth-century lead bag seal. 'Galls' (i.e. oak-gall dyestuff). From the Durham River Wear Assemblage. Image © Author.

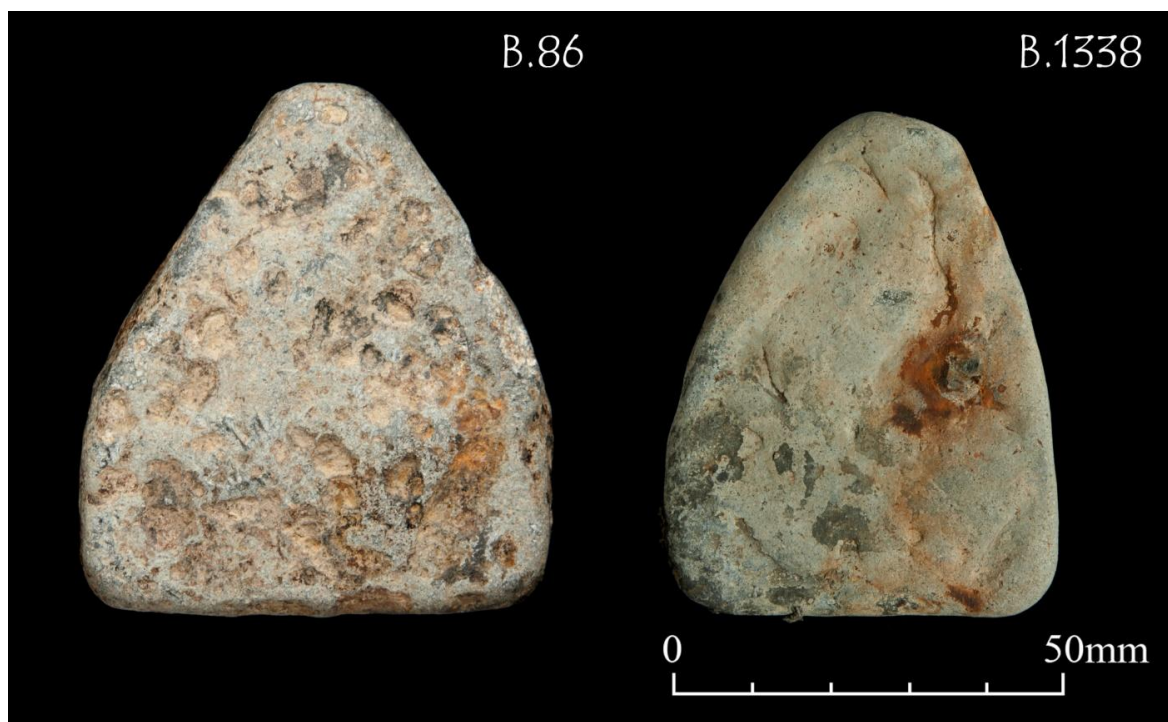


Fig 6.26. Cat. B.86 and B.1338. Late-medieval lead shield-shaped weights (B.86 recorded on PAS (NCL-24CAC0). From the Durham River Wear Assemblage. Image © Author.



Fig 6.27. Cat. B.350. Early-nineteenth century trade token 'Hill & Co Woollen Manufacturer'. From the Durham River Wear Assemblage. Image © Author.



Fig 6.28. Cat. B.739. Late- to post-medieval ox-shoe. From the Durham River Wear Assemblage. Image © Author.



Fig 6.29. Stone mould from Hungate, York (YORYM.2006.5201. SF1823). Image reproduced by kind permission of York Archaeological Trust for Excavation and Research Limited.

Chapter seven

7. Placing the cloth seals into a sequenced typology and chronology

The characteristic form of cloth seals indicates a particular function, and with the course of time the purpose for which they were originally made changed little – they were always attached to textile in one way or another (Fig. 7.1 shows different methods of attaching lead cloth seals to late-sixteenth- to seventeenth-century textiles). One of the key research findings of this thesis is the wide chronological date range to which the Durham cloth seals have individually been ascribed (see Chart 6.2), confirming that the assemblage spans the fourteenth- to the early-nineteenth-centuries. This new dating information is important, particularly as the assemblage contains a wide and diverse range of cloth seal types, types which collectively reflect the full range of functions for which these enigmatic objects were originally used in late- and post-medieval England. By combining these findings with other important information linked to the provenance of many of the cloth seals, we can now suggest – perhaps for the first time – evidence of previously unknown trade links between Durham and national and international suppliers of woollen, linen, other expensive fabrics and dyed or bleached textiles.

The Durham cloth seals have been considered below in several generalised groups: English weavers', clothiers' dyers' or searchers' personal seals; a crowned-portcullis county series of alnage seals; a county series of alnage seals; a four-part series of alnage seals; and imported (Continental) cloth seals. While these groups are further sub-divided, it is clear from this high level overview alone that the Durham cloth seal assemblage, in terms of having a diverse range of different types i.e. regulatory, taxation seals and seals once attached to imported textile, has much in common with other major English collections, such as those held in the British Museum (see Occasional Paper 93), the Museum of London (typically River Thames foreshore finds), Norwich Castle Museum and the Salisbury and South Wiltshire Museum (the Drainage Collection).



Fig.7.1. Cloth seals attached to surviving late-sixteenth to seventeenth-century textile. Image author, reproduced by kind permission Museum De Lakenhal, Leiden.

7.1 The sequenced typology of the Durham cloth seals.

Lead cloth seals are the tangible proof of a historical textile trade; as individual objects when considered in chronological sequence they reveal changes in supply and demand for cloth in late- and post-medieval Durham. Despite evidence that the inspection of cloth woven in Durham was taking place from as early as the mid-fourteenth century (see Table 6.1), cloth seals associated with this activity have not been found at New Elvet, although this may simply be linked to the fact that the textiles were never dyed and rinsed in the river at New Elvet during this period. However, there are two groups of seals that have been dated to the late-medieval period. The first group is directly associated with imported cloth from the important Low Countries' textile production

centres of Brabant and Flanders; while the second, although smaller in number, belong to the 'crowned-county' group of English alnage seals. Three of this first group, **255** (Tournai), **262** (Malines) and **274** (Ypres) can be ascribed to the fourteenth century, while others from this same group (**256** (again Tournai), **257**, **258**, **263** (Douai), **264** (Arras), **265**, **266** (again Ypres), **267** (Rouen) and **269**) can be dated to the fifteenth-sixteenth century (Fig. 3.29 -3.30). These cloth seals, which were once attached to fine linens and luxury woollens, were almost certainly brought to Durham via the ports of Hamburg, Antwerp, Boston and London then overland from Newcastle or Hartlepool by merchants primarily commissioned by the Bursar of the monastery of Durham as he needed to supply obedientaries and monks with cloth for liveries. Ling Huang (2015, 210) supports this assumption of a Netherlands trade connection, as late-medieval Hanseatic textiles were redistributed from the fairs of Brabant and Antwerp and markets of Zeeland. By the fourteenth century this was already a well established trade-route; high quality fabrics manufactured in the Low Countries had been shipped to the North-East of England from at least as early as the first quarter of the twelfth century, see 6.3 above (Fraser 1981, 166-168). It is also probable that the Durham merchants would have continued with trading commodities such as sacks of wool in part or full payment for this expensive cloth. Cloth seal **125** can be included in this important group associated with imported textiles. Although the provenance is unknown the fact that this 'Customs seal' can be dated to the late-fifteenth/early-sixteenth century, together with the fact that it was once attached to imported expensive fabric, possibly even 'cloth of gold', suggests a Low Countries origin.

A late-fifteenth-century date can be ascribed to a second group of important early seals – two (crown over ornate shield) county series of alnage seals. Both **108** and **110** (Fig. 3.15) could have once been stamped with the county name associated with the location in which the cloth was first woven and then examined by the alnage official. Unfortunately the legends of both seals are too worn (perhaps through poor striking) to allow the identification of their exact provenance and in any case Egan (2001, 58) suggests that a number of later alnage seals in this series did not actually include their place of origin. While

these two alnage seals may be direct evidence of activity linked to the sealing of cloth in Durham, it is just as likely that they were once attached to woollen cloth produced elsewhere in England before being transported to Durham. Several very close parallels for this series, also ascribed a late-fifteenth-century date, exist in the collections of the British Museum and Salisbury and South Wiltshire Museums. Another late-medieval seal is **48** which, in terms of its size and style, has similarities with alnage seals dated to the fourteenth century. However, with this example, the date is far from certain. The presence of the initials BM, fleur-de-lys and in particular an unusual privy mark that may or may not be a stylized plan of a castle, alludes to an association with the inspection of cloth woven in Durham, Durham Castle being the titular home of the Bishop of Durham. The pellet in the centre of the privy-mark corresponds with a well which is located in the Castle's inner bailey (Roberts 1994, 32). There may be a possible connection with Bishop Thomas Ruthall of Durham (1509 - 1524), who featured ornaments of fleur-de-lys on the arms of his chair, and at the end of his sceptre, and as mint marks on silver pennies struck at Durham (Hutchinson 1785, 400; Akerman 1844, 91). As discussed in 6.3 above, the Bishop of Durham was appointing his own alnage officials from as early as the twelfth century. If this seal is associated with the activities of a Bishop-appointed alnage official then it may be the earliest physical evidence of its kind to be found.

The crowned-portcullis county series of alnage seals, which typically date from the reign of Elizabeth I, represent some of the most frequently recorded seals found in England. It should be of no great surprise therefore, that 22 of them (8% of the total) are found in the Durham assemblage (Fig. 3.12-3.13). Like the alnage seals mentioned above this series of late-sixteenth-century alnage seals should also feature the name of the county in which they were originally examined, via the abbreviated legend, S'VLN'PAO'VEAL'I CO'... ('seal for the county of...'). However, through a combination of poor striking or wear, no county name has been identified; therefore, it is again unclear if these seals were once attached to woollen cloth woven in Durham or from another county. In terms of legend completeness cloth seal **79** features the greatest number of

letters and further expert analysis of the quite worn Lombardic lettering may help to identify the county name.

The largest group represented amongst the Durham cloth seals is that of the English weavers', clothiers', dyers' and searchers' personal seals. However, whereas 74 (27.5%) have been identified as falling within this category, this number could actually be significantly higher as several others in the assemblage are unidentifiable, for example, 26 (9.5%) are recorded as having a second disc only (Fig. 3.19-3.20) (cloth seals **156** and **166** from this group have a probable London provenance), while a further 25 (9%) are simply too worn to obtain any reliable information from them (Fig. 3.21-3.22), although it is equally possible that rather than being personal seals, a number of these unidentifiable cloth seals may be either alnage or seals for imported cloth. In addition, a further 20 (7%) cloth seals have been recorded as being 'late-eighteenth-century' cloth seals (Fig. 3.23-3.25) and although these may well be similar types of personal cloth seals, sufficient differences exist to warrant a separate classification for them in this catalogue. With regards to the main group of 73 personal cloth seals the provenance of several is known, for example, a small group of five from London (Fig. 3.10) and a somewhat larger group of 12 (4%) from Norfolk (Fig. 3.11). A sixteenth- to seventeenth-century date has been ascribed to the majority of these personal cloth seals.

Although the identification of the provenance of several of the personal cloth seals has not been possible, it would be wrong to ignore, or fail to appreciate, the significance of them here, especially when comparisons exist between them. In order to better understand these personal cloth seals it has proved necessary to try to identify those that have stylistic similarities on privy marks, ligatures or stamps. For example, cloth seals **1 - 7** (and possibly **39**) all feature the initials EB or IB in various combinations; these letters are typically positioned either side of an upright stem, above a conventional XX or WW-form base and below a 'four' symbol. Consideration therefore can be given to the possibility that these privy marks are those of the same Durham-based weaver or dyer. In addition, they may point to some longevity of the family business as a second name with

the same (?)surname 'B' initial apparently added to the privy mark, much in the same way as would be expected of a father (master) weaver or dyer and his son (apprentice) to do. For the eldest son to follow his father in to a craft guild was common practice particularly within the Durham Companies as the eldest son was allowed to become a freeman (through patrimony), while other sons would have to complete a seven-year apprenticeship (through servitude) in order to obtain his freemen status. Several other cloth seals in this group feature similar initials, for example **8** (FP), **9** (ROH), **11** (FM), **12** (N(?)M), **13** (HN), **15** (AM), **17** (RC), **18** (RBE) and **45** (MH). In this same respect weaver's or dyer's cloth seal **13**, is of particular interest as the privy mark contains multiple letters, T O M D L, which may be either an abbreviated form of the family name or a combination of family members' names.

The reverse of cloth seal **13** is stamped with the initials ID, presumably those of a searcher. The work of searchers is also evident on several other cloth seals from Durham, most notably on **31** (stamped OV), **34** (HY) and **38** (PA), while **32** has been stamped with two pairs of initials (HW/GO). Close parallels to these searchers' initials can be found in London; searchers often operated in pairs with each individual stamping the cloth seal with a single (?)surname initial (Bankhead in prep a). Similar searching activity was occurring in Durham from the sixteenth through to the early-eighteenth century as several Durham Company ordinances and minute books record the appointment of annually appointed pairs of searchers and wardens (see 6.4 for further discussion). An unusual variation on the searcher cloth seals (rectangular shaped) can be seen with **33**, and given that others of this type have been found in Yorkshire and London, it is likely that this cloth seal was attached to textile woven outside the County Durham. Apart from the Norwich and London personal cloth seals, others that were definitely once attached to cloth woven outside the county are **10** (Yorkshire), **50** (Wiltshire) and **55** (Suffolk). Although several examples of the privy mark depicted on **35** (which features letters either side of an ornate spangle remarkably similar to the embroidered cover of the book of prayer presented to Queen Elizabeth I by Christopher Barker in 1584) have been found on sites close to the River Thames in London, no direct association can be made

to the work of the London Dyers' Company as no floral motif is present. However, this is not the case for **57**, which features foliage to the side of a complicated privy mark bearing the initials P A H R C (or G). This seal may well be from a London-based dye-house positioned close to the River Thames. Other personal cloth seals in the assemblage can also be directly linked to the London Dyers' Company (Fig 3.10). One of which in particular is extremely important: recovered intact and containing a rare surviving scrap of textile, cloth seal **59** informs us of a time when heavily felted broad cloths were woven in the West of England, then shipped to London for finishing towards the end of the reign of Elizabeth I or early in the reign of James I. Here London Dyers' Company members (confirmed by the presence of a corded madderbag on the cloth seal and the letters WM above it) vat-dyed the cloth with first woad then later madder to produce purple-coloured cloth. The finished cloth was then almost certainly shipped from London to Durham via one of the North-East coastal ports before then being sent overland, probably by cart to Durham. The very fact that this particular cloth seal was found in the River Wear suggests that it may have fallen from the cloth while being rinsed following either a third dyeing or following a process where the lustre of the cloth was being improved (see recommendation by James Haigh 4.2.5). Cloth seal **58** is probably identical to **59**, although only one disc survives. In addition, because **57** also features a corded madderbag and that **60**, **156** and **166** (Fig. 3.19) are similarly linked to the activities of the London Dyers Company, there now exists additional archaeological evidence of the trade links between Durham and London during the early-post-medieval period. Chapter five details the scientific analysis and findings and a case study review of cloth seal **59**.

The twelve cloth seals in the assemblage with a Norfolk provenance (Fig. 3.11), representing 4.5% of the assemblage, form an important group of cloth seals and in terms of quantity are probably the third largest group available for analysis behind those found in the collections in London and Norwich Castle Museum. Typically these cloth seals were once attached to Norfolk worsteds, the most prolifically woven cloths in England during the seventeenth century (Allison 1961, 61-69; Egan 2001, 52). Those found in the River Wear at Durham

attest to a chronological span that effectively mirrors an important part of Norfolk's weaving industry, dating from the mid-sixteenth century through to the end of the seventeenth. With the exception of **69**, a probable Norfolk alnage seal, the rest can be linked directly to worsted weaving activity that took place in either Norwich or Norfolk. Represented amongst this group of eleven cloth seals are those associated with the Norwich Weavers' Company, **61**, **62**, **64**, **65**, **66** and **71** and the Norwich Russel Company, **63**. Although also associated with the Norwich Weaving Company, cloth seals **67** and **68** – the textile of which may have been scrutinised by wardens representing Norwich and Norfolk – may actually be from Suffolk or Cambridge. Perhaps the most important cloth seal in the assemblage from Norwich is the Walloon Community seal **73**. The legend of this cloth seal, which features a galley with mast and rigging, can be confidently restored (with the help of parallels) to WALON NORWICH ALIENS. These French-speaking immigrants, were searching and sealing 'new stuffs' or 'new worsteds' (collectively called caungeantry) in Norwich from as early as 1564 and by 1616 Walloon Community cloth seals featured a ship (Allison 1961, 66-67). The shipment of bales of worsted stuffs to the North-East region via the ports of Great Yarmouth and Newcastle upon Tyne during the mid-seventeenth century is well documented (see section 3.4 and appendix M). The discovery of twelve cloth seals in New Elvet that were once attached to this same worsted cloth, is unambiguous archaeological evidence of local consumer demand for new, cheaper varieties of textiles and that these new draperies were presumably not being manufactured in Durham during the first half of the seventeenth century (new draperies were being inspected by alnage officials in Durham from 1666) so necessitating imports.

The final group of English weavers', clothiers' and dyers' personal cloth seals in the assemblage, totalling 20 (7.3%) cloth seals, have been grouped separately in the catalogue for two reasons, firstly, due to the late dating of them – the eighteenth to early-nineteenth centuries – and secondly, due to the fact that this group also includes cloth merchant manufacturer seals. This group, characterised by the large disc diameters, are direct evidence of the manufacture and trade in broad and narrow woollen cloths and worsted fabrics

that were typically woven in the West Riding of Yorkshire. Leeds was the centre of the West Riding woollen manufacturing industry and during the seventeenth century production of the coarser kinds of woollen cloth relied on spinning, weaving and fulling taking place in the outlying villages and hamlets before the unfinished (undyed) cloth was sold to merchants operating out of the cloth halls of Leeds. During the eighteenth century the prolific West Riding narrow woollen cloth industry was legislated in part, by the 1737 Act 'for the better regulating the manufacture of Narrow Woollen Cloths in the West County of York' (Statute 11 Geo. 2. C.28 (Ruffhead 1765, 36)). In addition to the production of woollens, throughout the seventeenth and eighteenth centuries light-weight, coloured and patterned worsted fabrics including shalloons, bays and tammies were produced in the West Riding and these much sought after fabrics were widely exported to both English and European markets. This production was in part due to the availability of adequate supplies of the English grown long-staple wool associated with worsted manufacture. Heaton (1965, 264) suggests that although the making of such worsteds commenced in the West Riding around 1700, it was not until 1770 that production was such that it rivalled that in East Anglia. Scientific analysis of a scrap of textile that survives in **207** confirms that the fabric – a 2:2 twill weave with Z-spun yarns and c. 20 x 20 warp/weft threads per 10mm – is such a worsted fabric.

By the late-eighteenth century, following technical innovations in the textile industry, many water-powered cotton and worsted spinning mills had been established on the hillsides adjacent to the tributaries of the River Calder. However, a century later following the introduction of steam power, production moved to the more accessible lower ground. This transition, from rural water powered workshops to steam-powered mills proved to be a turning point in textile history as rapid industrialisation followed. The northern woollen towns of Bingley, Bradford, Halifax, Keighley, Leeds and Wakefield quickly developed into major centres of textile production and by the early-nineteenth century the manufacture of 'black and blue superfine [woollen] cloth' was of such quality that it 'equalled' and 'outstripped' that manufactured by the clothiers of the West of England (Baines 1822, 29-30; Bowden 1962, 44-46; Law 1988, 1-5). The

privy marks of a number of cloth seals from this group have been identified, for example **215** and **217** (William Prest, a successful Leeds-based gentleman merchant and Mayor in 1817), **226** (James Haigh, either a Leeds-based dyer or fulling mill owner near Halifax) and **222** and **223** (Joseph Sheepshanks, a woollen and worsted merchant based in Leeds and York). However, given the proliferation of woollen and worsted spinners and manufacturers scattered amongst the many towns and villages of Yorkshire's West Riding, the identification of the exact names of other clothier or merchant manufacturers which feature in this group remain elusive. Of some certainty, however, is the fact that during the eighteenth to early-nineteenth centuries, whether broad or narrow, white or coloured, any cloth woven in the West Riding that was to be sent north to Durham would have passed through one of the cloth or piece halls of Bradford, Leeds or Halifax (Heaton 1965, 359-363).

That there was a move in consumer demand in Durham for new draperies from the worsteds being produced in Norfolk (predominantly during the seventeenth century), to those woven in Yorkshire during the eighteenth century, is reflected in the cloth seals assemblage. The dating of the cloth seals suggests an abrupt termination of the Norfolk seals at the end of the seventeenth century before a transition to Yorkshire woollens and worsteds from the eighteenth century onwards. Presumably a significant reduction in any associated transport costs would have played its part in this transition.

In addition to the crowned-portcullis series already discussed, two further groups of alnage cloth seals exist in the assemblage. The first (Fig. 3.14-3.16) have been classified as a 'county series' of alnage seals and total 29 (10.6%) (this number includes **125** – the 'custom's seal' and **108** and **110** the two early crown-over ornate shield alnage seals discussed above), while the second group, with 27 (9.8%) cloth seals has been classified as 'four-part alnage/subsidy' seals (Fig. 3.17-3.18). Collectively alnage cloth seals amount to 28.5% of all those in the assemblage. The typically two-part county series (with the exception of **108**, **110** and **125**) have all been ascribed a sixteenth- to seventeenth-century date and unlike the earlier crowned-portcullis issues, the

provenance of several in the assemblage is known. Egan (2001, 48) suggests that some of these earlier county issues feature an abbreviated legend which can be transcribed to 'seal of alnage/subsidy of saleable cloth in the county of ...'. The closest example in the assemblage featuring a similar legend is **116**, which can be confidently restored to the abbreviated version, 'VIALIE LON SVLI IPAO', transcribed, 'seal of alnage of saleable cloth in London'. The presence of this cloth seal, along with close parallel **115** (both stamped with the arms of Tudor England) and **105** and **117** (which both feature the arms of London), together with the seven London Dyers' Company seals discussed above, strengthens the evidence for strong trade links between London and Durham during the late-sixteenth and early-seventeenth centuries. It seems that whatever the latest fashion in London, those same coloured woollens could easily be acquired and transported to Durham. Evidence that London's dominance – in terms of the shipment of manufacturing goods to Newcastle – continued through to the late-seventeenth-century is evident in Welford's (2010, 182-184) analysis of the Newcastle upon Tyne Port Books. Between 1695 and 1696, 23 consignments of manufactured commodities including cloth were shipped from London to Newcastle. Other counties that have been identified in the assemblage include York (**100**), dated to the reign of James I, Essex (Colchester) (**107**) and Devon, presumably Tiverton (**118**). Cloth seal **124** is of particular interest in this group of alnage seals as it is the only one in the whole assemblage that was used to mark faulty or substandard cloth – compared to the 20 out of 177 seals for faulty cloth found in Salisbury (Egan 2001, 56-58).

The second group of alnage seals, classed here as 'four-part alnage/subsidy seals', (Fig. 3.17-3.18) represent an important group in the assemblage, in part, due to the newly discovered information regarding the County's alnage officials (discussed in detail 6.5). The 27 alnage seals in this series effectively span the entire Stuart dynasty, only terminating at the start of the Hanoverian period. As many as six monarchs may be represented, James I, Charles I, Charles II, James II, William III and George I. This period of history includes the ten years of the English Civil War and the Protectorate (1649-1659) when no alnage seals were

issued. Coincidentally, it was during the reign of George I that the alnage statutes effectively ended in 1724: a date that should provide a terminus post quem for this series.

With the exception of four-part cloth seals **133** and **135** which are associated with Suffolk, **134** which, due to its small intricate design may have been once attached to a fine textile such as silk (not woven in Durham), **151** which features the arms of London and finally **132** which again is a cloth seal associated with London (several parallels have been found on the Thames foreshore). Consideration should be given to the fact that the majority of the remainder may have a direct association with the inspection of cloth woven in County Durham. The initials of the same alnage official, I(J) F (appearing to run consecutively) are present on two alnage seals used during the reign of Charles I, **139**, dated 1635 and **140** dated 1636. The survival of a scrap of woollen textile in **140** is of interest, particularly as linen manufacture was well established in Durham by the first half of the seventeenth century; however, there still remained a need for woollen goods, for example, bedding (blankets) or as burial cloth. Of additional interest is the fact that woollen textile survives trapped between the discs of six other (seven in total) alnage seals from this group. While this may say something about the nature of the fibre, a number of other ephemeral factors such as the amplitude, depth and flow of the river at the time of deposition would have had an impact on the textiles' survival. What appears probable is that the alnage seals, once lost in the river, were quickly covered by sediments to such a depth that not only were they protected from mechanical damage but also contained within an anaerobic environment sufficiently suitable to preserve the woollen fibres.

The final group of cloth seals which features in the assemblage is linked to the Swabian 'fustian district', a successful weaving region of Southern Germany. By the late-fourteenth century fustian weaving centres such as Ulm, Augsburg, Biberach, Memmingen, Nordlingen and Kaufbeuren, were well established. Cloth seals from this region are amongst the most common cloth seal finds in

England associated with imported textile, and this phenomenon is also reflected in Durham as 25 (9%) of them are included in the assemblage.

The dating of these 'fustian district' cloth seals has allowed for a correlation of them with the earliest documented evidence of fustian use in Durham; for example, the Hostilliar's expenditure for procurements of blankets or coverlets of fustian, c.1453, and later Bursar's expenditure which details procurements of grey, black and white (bleached) fustian from as early as c.1530 (Raine 1844, 44, 64, 138; Fowler 1898, 147, 153). Although there appears to be no indication in the surviving historical accounts that this fustian had a European provenance, the new evidence brought about by analysis of the cloth seals would suggest that it is very probable that the Bursar's and Hostilliar's procurements mentioned above were indeed of fustian originating from within the 'Swabian fustian district' of Southern Germany. With this new evidence, together with the fact that the accepted curtailment of fustian import into England coincided with the advent of the Thirty Year War (1614 - 1648) it can be concluded that this multi-use fabric was being consumed in Durham for c.160 years (see section 3.2.1 and 3.7.1 for further discussion). A possible reason for its popularity may be linked to the fact that imported fustian was deemed softer and finer than the coarser linens, a preferred fabric for undergarments and other clothing types (Pritchard 1990, 15). Ironically these imports may have had a detrimental impact on Durham's linen weavers, although linen was put to many other domestic uses. The sheer distance between Durham and Southern Germany is of particular interest – in excess of 900 miles – and it is likely that during the fifteenth and sixteenth centuries Hanseatic and other trading merchants procured bales of fustian from any one of a number of German fairs before transporting them to ports such as Antwerp or Hamburg where they were then sold to English, Spanish and Portuguese merchants (see section 3.11 for further discussion). Given that early in the reign of James I both the Virginia Company and the East India Company were transporting fustian cloth to the Virginian settlements on the coast of North America via London, then it is plausible that every bale of Swabian fustian to reach Durham did so via the ports of Antwerp or Hamburg, London or Newcastle upon Tyne (or Hartlepool). Burch et al.

(2011, 144) strengthen this suggestion by highlighting how, particularly during the sixteenth century, the port of London began to monopolise overseas trade not just with the supply of woollen textiles to Continental markets – primarily through Antwerp – but also as a distributor of imports. Additional costs incurred such as transportation, loading, unloading, customs due would have had a detrimental impact on the price of this softer fabric compared to any regionally supplied alternative; however, it shows how much it was valued by the citizens of Durham, who continued to buy it presumably because of its superior quality.

The 25 cloth seals in the assemblage with a Southern German provenance include cloth seals which feature a number of different devices and like those in other collections are often presented in different combinations, such as pinecone // 'A', pinecone // ox or a pinecone // bishop's crozier (see 3.11 for further comment on this symbol). While it may be obvious that those cloth seals which feature a pinecone // 'A' on a single cloth seal – representing the heraldic device and initial for the city of Augsburg – have an Augsburg provenance, it is by no means certain that all those cloth seals which feature a pinecone have exactly this same provenance. Different qualities of fustians, woven across the Swabian region, were often sent to Augsburg to be dyed black (Kellenbenz 1983, 259-272; Baur 2015, 152-154). Variations in the design of these devices i.e. the crude form of pinecone shown on **228**, **234** and **238**, compared to the more ornate versions depicted on later issues such as, **230**, **231**, **235** and **239**, may reflect historical advancement in dye manufacture technology. These improvements could simply correspond with a passage of time whereby the crude version reflected fustian woven during the mid- fourteenth to late-sixteenth centuries, compared to the more elaborate and ornate version used towards the end of the period of fustian export in the 1610s.

Based on the dating evidence of the cloth seals (see Chapter three), Chart 7.1 shows the historical distribution of four distinct groups of textiles imported into Durham c.1350 x 1820. The groups, which form discernible patterns, can be summarised as: fine and luxury textiles imported from the Low Countries

between the fourteenth to sixteenth centuries; Southern German fustian cloth imported during the sixteenth to early-seventeenth centuries; sixteenth- to seventeenth-century Norfolk worsteds and eighteenth to early-nineteenth-century woollens and worsteds from the West Riding of Yorkshire.

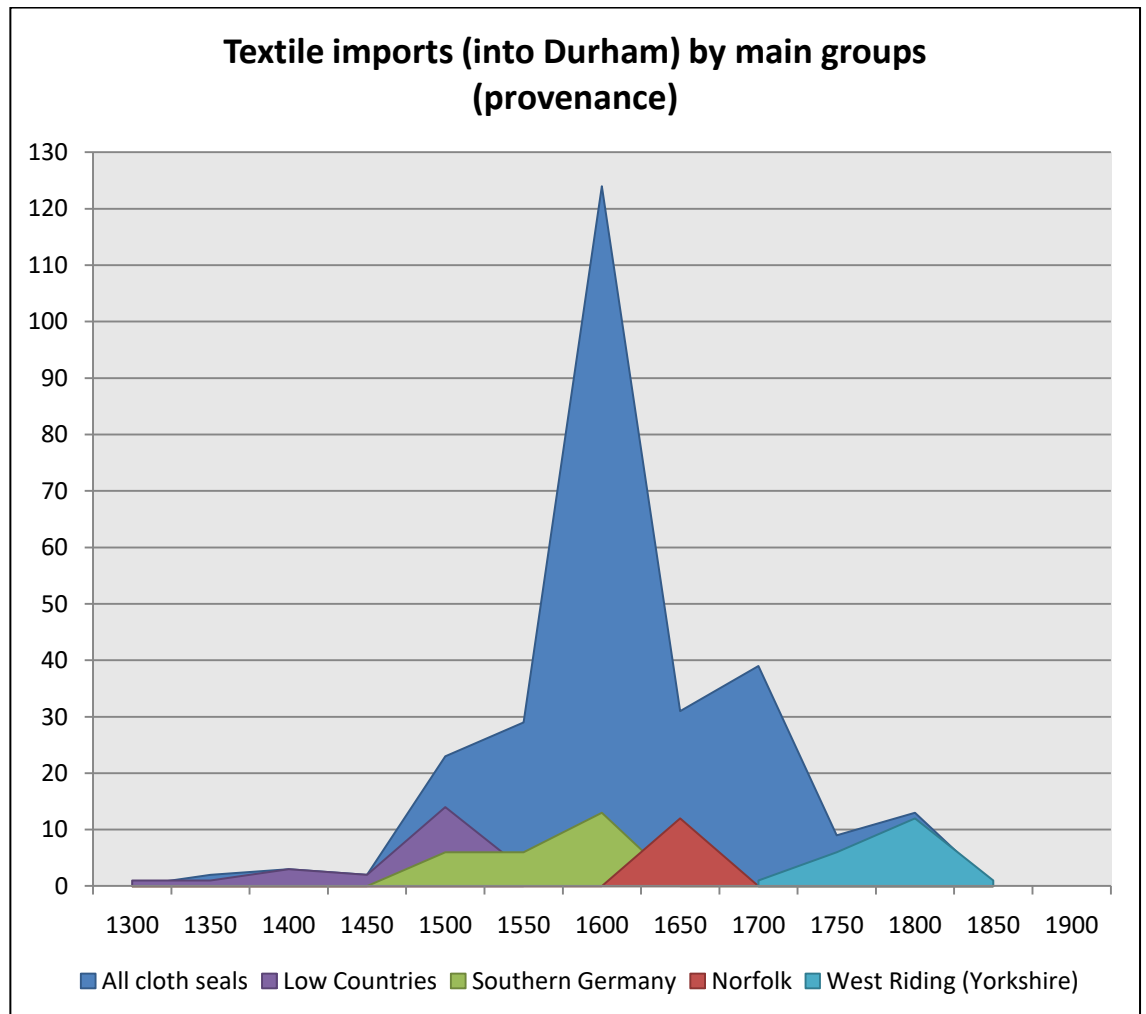


Chart 7.1 Distribution (by provenance) of textiles imported into Durham c.1350 x 1820 based on cloth seals.

Having placed the cloth seals into a sequenced typology and chronology, the following chapter will combine the new evidence presented in this thesis within the wider context of British and European economy and manufacture. It will use the evidence as a barometer of the change in manufacturing methods, evolving from the hand-made products of medieval craft guilds at the start of the period to the standardised, mass-manufactured, factory products of the later period.

Chapter eight

8. Integrated discussion of the new evidence from cloth seals and documents, placed into the wider context of British and European Industries.

The 275 lead cloth seals recovered from the submerged river bed of the River Wear at Elvet in Durham City, represent the largest assemblage of cloth seals available for analysis outside of London. They are a significant group of artefacts many of which are without parallel. The dating of the cloth seals confirms that they span the late- and post-medieval periods and for Durham, like many other English medieval cities, this marks a period of transition, of a change from an exchange to a capitalist society. The typology in which the cloth seals can be sequenced allows them to be placed into a chronological order which mirrors this transition, confirming developments in economics, technology, industrialisation, national and international trade and social progress (Egan 2005, 10-11; Newman and McNeil 2007, 116; Greene and Moore 2010, 24, 259). This chapter reviews the implications of the research carried out into the cloth seals, the additional research carried out into cloth preserved in the seals and the documentary and cartographic sources.

The importance of the Durham cloth seal assemblage exists at several levels. Not only do they provide the physical evidence of the extent of textile availability, production, trade and consumption in fourteenth- to early-nineteenth-century Durham, but, they also speak to the evolution of Durham from a regional medieval market town and pilgrimage centre to part of the manufacturing and industrial base of the North-East of England. They are part of the material culture evidence of the transformation of Durham's urban society from the medieval to modern era (Caple pers., comm. June 2016). The discovery of such large numbers of cloth seals in one relatively small area, coupled with a considerable number of other small finds from the same archaeological site, has facilitated a new and unique opportunity to understand the reality of daily life in the Borough of New Elvet, an area adjacent to the find site characterised by well appointed tenements, each with a commercial frontage, space for workshops and easy access to the river (Carver 1974, 125-126; Camsell 1985, 625-628). It

can now be posited that the dyeing of locally supplied and imported textiles was taking place in the immediate vicinity of the find site.

Consequently, there now exists a unique opportunity to gain a greater understanding of the activities of this low-lying city suburb, spanning from the period of its first conception, through its subsequent development and expansion, to its ultimate decline as a regional textile finishing centre. By binding together the evidence contained in this thesis, gained from analysis of the Durham cloth seals along with that obtained from historical documents, contemporary paintings and maps and other archaeological evidence, we can now, perhaps for the first time deliver not only new insights but also proper historical conclusions concerning the precise nature of the textile industry that was taking place in the Borough of New Elvet and how it influenced regional and wider English markets. It is now evident that throughout the late- and post-medieval period, the streets of New Elvet were marked by a high degree of specialisation. Certainly tenements located at the borough's western-most boundary and on Northrawe could be characterised by those artisans who dyed textiles.

8.1 Durham's late-medieval consumption of cloth

The lead cloth seals found in the River Wear in Durham City represent the material culture evidence of the production, trade and consumption of textiles in Durham and the textual evidence suggests that during the late-medieval period the main consumers of cloth in the city were the obedientaries and bursar of the large Benedictine monastery (Threlfall-Holmes 2005, 102-133; Dobie 2015, 31, 135). Consequently, it would be reasonable to expect to see cloth seals in the assemblage associated with this late-medieval market. This thesis, and the research presented in Chapter three, confirms that this is generally the case, particularly as mid-fifteenth- to mid-sixteenth-century cloth and alnage seals featuring London, Yorkshire, the Netherlands and Southern German provenances are present. Propitiously these locations correspond with the available textual evidence, for example, early-fifteenth-century bursar's

accounts which list procurement of linens from the drapers of Leeds, Thirsk and York, procurements of black cloth (*pannus nigro*) from York and London (Morimoto 1983, 39-42), together with purchases of 'Holland' cloth (c.1448-86), and both dyed and undyed fustian (c.1530) (Raine 1844, 44, 64, 138 191; Fowler 1898, 154-157, 276). However, if we simply rely on transcribed bursars' and other obedientaries' accounts to identify from where cloth was being sought, then we would not fully comprehend the wider picture of cloth procurement in late-medieval Durham. The archives and special collections of Durham fail to identify the many other European towns and cities from which cloth was actually being purchased. As a consequence, any real appreciation of the full lengths that the bursar or obedientaries went to in order to obtain their desired cloth has been missed. This is reflected in the many contemporary and modern historical narratives of the City's history. The reason that the exact location from which the cloth was originally woven appears not to have been recorded on the late-medieval monastic accounts may be due to a number of different reasons. For example, a bias in the academic selection of only those documents that appeared easier to transcribe (rather than more damaged or harder to interpret documents); the fact that those individuals originally tasked with recording *Garderoba* and other cloth expenses were unsure of the exact location in which the cloth had been originally woven before being sent to export from ports such as Antwerp or Hamburg (see 7.1); or that the monastic accountants were simply content in the knowledge that the quality of cloth need only be described by a reference to its price (Threlfall-Holmes 2005, 130).

The new material culture evidence presented by the discovery of the Durham cloth seals highlights for the first time just how, during the fourteenth- and fifteenth-centuries, the bursar and obedientaries of Durham's Cathedral Priory sought cloth from a much wider geographical textile production area than was previously realised. This new evidence confirms that not only were high quality linen and luxury woollens being imported from Flanders and Brabant – including cloth from the important textile production centres of Malines, Tournai, Arras, Ypres, Douai and Rouen (see map 3.5) – but also that these same high-quality textiles were being dyed by the dyers of Durham (the Dyers' and

Litsters' Company after 1576) operating out of tenement-based riverside workshops in the new Borough of Elvet. In addition, it can now be concluded that the presence of the 25 cloth seals in the assemblage that are associated with the successful Swabian 'fustian district', a weaving region in Southern Germany, are almost certainly associated with the many sixteenth-century bursar's account references to the procurement of '*fushayne*' (fustian) and '*whytfushayne*' (white fustian – undyed). Bales of this popular mixed fabric, usually with a warp of linen and a weft of cotton producing a smooth silk-like finish, would have been handled by Hanseatic merchants during their 900 mile journey to Durham (see section 3.11 for further discussion). The presence in the Durham assemblage of a single cloth seal (125) dated to the late-fifteenth to early-sixteenth-century is an important find in relation to furthering our knowledge on the purchasing strategy of the Durham's Cathedral Priory. The seal is actually a customs seal, once attached by customs officials to expensive imported fabrics such as velvets, silks or cloths of gold. Typically the cloth bought by the priory, i.e. cloths for liveries and vestments and other more expensive cloth such as black cloth or cloth for the prior's gown was not overly expensive, yet would have contained certain extravagances associated with such a household, particularly as the Priory would have possessed small quantities of these luxury materials for use as precious vestments (compared with the larger quantities held by royal and higher nobility households) (Threlfall-Holmes 2005, 129-131). It is certainly plausible that this customs seal may well have been attached to such fabric. However, there is always the possibility that the finished garment for which this precious cloth was intended, was actually meant for the wardrobe of the Bishop of Durham or for a member of a wealthy Durham based family such as the Neville's of Raby; Ralph Neville became the first Earl of Westmorland in 1397. In 1565, a townhouse located in Durham's market place and belonging to the Earl of Westmorland was seized following the Rising of the North (Roberts 2003, 23-24); this market place location is only 200m away from the find site.

The presence of weavers in Durham during the first half of the fifteenth century followed by the signing of their company's first ordinary in 1450, suggests a

period of increased local demand for cloth. It is likely that the growth in weaving activity during the second half of the fifteenth century was partially driven by a continuation of bursar's expenditure on *Garderoba* (which averaged £47 per annum) and that of the other obedientaries during this period (Dobie 2015, 137). Although the quantities of linen procured by the bursar between 1460 and 1500 fluctuated from c.40-350 yards - with similar procurements of hardyn and sackcloth - it is the number of suppliers that are recorded that is of interest. During the period 1464 - 1520 there are 148 individual suppliers of hardyn and 147 suppliers of linen (Threlfall-Holmes 2005, 106-115, 212-217). As discussed in section 6.3, it is apparent that many of these suppliers came from outside the county - York, Leeds, London etc.; however, Durham-based merchants/drapers are recorded as supplying linen and other textiles to the monastery. The 1468 inquiry into the controversy between the woollen and shalloon weavers is a useful yardstick for establishing the scope of textile production in Durham during the second half of the fifteenth century, as it confirms that the local production of woollen, worsted and linen cloths was already well established by this time. As this weaving activity would have been strictly controlled by wardens and searchers appointed to regulate and enforce guild bylaws - as attested to by the many cases brought before the panel of jurors of the local borough courts (Britnell 2008, 70, 304) - then it would be plausible to find evidence of this weaving and the regulation of it in the form of weavers' and searchers' cloth seals in the assemblage. In addition, with any increase in cloth production, so too the inspection work of alnage officials would have increased proportionately, an assumption partially endorsed by the appointment in 1448 of Robert Kelsey Esq. to the office of *Clerk to the markets and keeper of the Bishop's alnage seal*. As the work of Kelsey and his deputies to 'seal and collect duties deemed payable' was undertaken as per the relevant crown statutes of that time, the late- (and post-) medieval alnage seals present in the assemblage may reflect the activity of Durham's alnage officials.

The analysis of the Durham cloth seals (as detailed in Chapter three), does indeed seem to suggest that the weaving of cloth and the regulation of it was occurring in late-medieval Durham. This assertion is supported by the textual

evidence, for example, mid-fifteenth century charters of incorporation of textile-related craft guilds, the 1468 inquiry (discussed above), references to local suppliers of cloth in the bursar's accounts, together with the many contemporary borough court records relating to trading squabbles, such as the 1498 dispute between two Durham weavers over the hire of linen-weaving looms (see 6.7). However, the small problem of provenance remains, for while it is now evident that the trade of Durham included cloths imported from across Europe, the provenances of 121 (44%) of the cloth seals in the assemblage are unknown. Therefore, it is unclear just how many of those cloths that were sealed in the city were woven or dyed in it; for example, dyers, like those based in the Borough of New Elvet and elsewhere in the city would have been required by statute to add their personal seals to any cloth they dyed regardless of where it was woven. Consideration therefore, should be given to the fact that the majority of these 121 cloth seals – in particular those which feature an intricate privy marks bearing sets of initials – are associated with textile production and finishing in Durham itself, even though 'Durham' is not revealed in any legend, mark or stamp etc. It may well be more than coincidence that so many of this series of cloth seal have been recovered from a single find spot in Durham City.

An additional problem with this group of cloth seals is dating them, particularly as intricate privy marks have been used in Europe since the mid-thirteenth century. Generally speaking, in England cloth seals featuring similar privy marks are often ascribed a seventeenth-century date, but without more reliable dating evidence, such as the many cloth seals recovered from dateable contexts at the MOLA excavations at Tanner Street (Southwark) or Liverpool Street Station (Crossrail), London (Bankhead in prep a, and in prep b), then this assumption can only ever be a generalised one. In fact, cloth seals which feature intricate privy marks could easily be dated earlier, to the fifteenth or sixteenth centuries. The issue of dating cloth seals which feature similar privy marks could be partially addressed if the same (or similar) mark also appeared within the buildings or on the façades of Durham's built environment – similar to the merchant's mark on the font at St Mary's Church, Barnard Castle – although, if they do survive anywhere in Durham City then they remain elusive. A final note

on privy marks relates to the personal marks sealed in wax and present on the many probate records examined for this thesis, such as the four different wax seals on the inventory of the Durham weaver Bartholomew Bolton, dated 1662 (DPRI/1/1662/B10/2 – see appendix L). Unfortunately however, none of these impressions correlate with any of the marks on the Durham cloth seals.

The activity of late-medieval guild-appointed wardens or searchers in Durham also appears to be evident, as the initials of at least five men feature – see cloth seals **31** (OV), **32** (HW and GO), **34** (HY) and **38** (PA). Although ascribed here to a late-sixteenth- to seventeenth-century date, similar pairs of incised initials appear on cloth seals associated with the regulation of the work of the London Dyers' Company recovered from Tanner Street, Southwark, (Bankhead in prep a). However, the appointment in 1450 of two members of Durham's Weavers' and Websters' Company as wardens for that year, suggests that any two-part cloth seals found in Durham which feature pairs of initials, may in fact date from this mid-fifteenth-century date through to the early-eighteenth-century.

8.2 The impact of the Dissolution on cloth procurement in Durham.

It may be hypothesised that after 1539, following the surrender of Durham's Cathedral Priory to the Royal Commissioners, a period of economic and social change would have had an unfavourable impact on the import of cloth into Durham – particularly with that of the more expensive fabrics. However, even before this pivotal event had occurred, the evidence suggests that Bursar's expenditure on *Garderoba* (wardrobe – clothing for monks, retainers and servants) was only a quarter of what it once was at its peak – £206 in 1310/11, £60 in 1408/9 and £46 in 1509/10 – by 1536/7 (just two years before the monastery was surrendered) the bursar's annual expenditure on cloth only amounted to £42 (Dobie 2015, 16, 136-137). Chronological analysis of the Durham cloth seals, particularly those associated with the fine linens and luxury woollens manufactured in the Low Countries during this same late-medieval period, does not necessarily reflect a similar pattern of reduced expenditure. The relatively small sample size (n=13), actually appears evenly spread

between the fourteenth- to early-sixteenth-centuries; nevertheless, it is possible to observe a definitive cut-off point in the Brabant and Flanders group, as cloth seals from the Low Countries region, which can be ascribed a pre-sixteenth century date, are simply not present in the assemblage. By way of a contrast, a continuation in the use of the popular fustian cloth in Durham long after the Dissolution of the Monasteries is supported by the cloth seal evidence. While the earliest bursar's accounts detail procurement of a range of dyed and undyed fustians from as early as 1453 (Raine 1844, 44, 64, 138; Fowler 1898, 147, 153), the presence in the assemblage of the ornate version of pinecones, as depicted on cloth seals **229**, **230** and **234**, suggests that the import of the ever popular cloth into Durham from Southern Germany continued until the 1620s. This extended period of procurement of the cheaper, multi-use fustian (compared with the fine linens or luxury woollens) may have had something to do with the fact that the price of fustian brought it within reach of the ordinary citizens of Durham, particularly as it had a use for ubiquitous working clothes or daily wear. Additionally, in 1541, a dean and chapter were appointed to serve the Cathedral, along with a retention of the greater part of the priory's estate, which was sufficient to ensure a continuation of ecclesiastical life at Durham. Although these men of the church still had to be clothed, reform ensured that the days of priors being gowned with expensive black woollens was an exuberance of the past.

8.3 Cloth consumption in Durham transcending the Dissolution

As well as the cloth seals from Southern Germany, associated with imports of fustian cloth (discussed above), a second group – comprising 28 'county series' alnage seals – also represent consumption of cloth during the period which includes the Dissolution of Durham's monastery. This group of alnage seals (Fig. 3.14-3.16) represents important finds, not just because they highlight the work of English alnage officials from the late-fifteenth to the end of the seventeenth century, but also because they represent new material culture evidence of trade networks previously unknown. In addition the group also strengthens the evidence for significant trade links between London and Durham, This is most

evident with cloth seals **105**, **115**, **116** and **117**, which all represent purchases of woollens, woven and sealed in London during the reign of Queen Elizabeth I and King James I. These four alnage seals bring the total number of cloth seals sealed in the Capital but found in Durham to eleven (see section 7.1). Cloth seal **100** is a fine example of a rare type of alnage seal which features the arms of England and county code 'P' for York. Although Durham's cloth trade with York during the late-fifteenth and sixteenth centuries is well documented (see section 6.3), this alnage seal actually represents confirmation that York drapers were still supplying Durham with cloth in the early-seventeenth century. Some caution should be observed with this assumption, however, as with reference to the trade between Durham and London discussed above, it may be of some relevance to note that the only two other known alnage seals of this type (i.e. from York), were both found on the River Thames foreshore. This may suggest that woollens from York were first sent to London (possibly for dyeing) before then being subsequently re-directed to Durham. Two other previously unknown trade routes represented in this group of alnage seals are those between Durham and Colchester, Essex (**107**) and Durham and Tiverton, Devon (**118**). However, as with the York example discussed above, several parallels of both of these late-sixteenth- to early-seventeenth-centuries alnage seals have also been found on the River Thames foreshore. Therefore, it would be reasonable to suggest that after being woven these textiles were first sent to London – the national textile finishing centre – before being shipped to Durham.

It is likely that cloth seal **124** was once sealed to cloth woven in Durham. The seal is stamped with an 'F', which according to the 1464 Statute 4 Ed. IV c1 and 1551/1552 Statute 5 and 6 Ed. VI c6 (Egan 2001, 56), was used to identify faulty or sub-standard cloth. The narrower 'F' which features on **124** (rather than bulbous Lombardic earlier versions) is in a Roman style which may suggest a mid- to late-sixteenth-century date. Given that faulty cloth was marked as such, it is unlikely that it was used anywhere other than the immediate vicinity in which it was woven.

8.4 Durham's early post-medieval consumption of cloth

One particular group of alnage seals which can be dated to the period after the surrender of Durham's monastery are the 22 'crowned-portcullis' county series of English alnage seals (Fig. 3.12-3.13). This series, which was probably attached to woollens and is typically dated to the reign of Elizabeth I, should feature information associated with provenance, but no county names are evident on any of the seals. This paucity of specific information relating to the exact provenance of these alnage seals is again unfortunate, particularly in terms of confirming whether or not any of the seals are associated with the work of Durham's appointed alnage officials during the second half of the sixteenth century. Therefore given this lack of evidence, it is only possible to conclude that it is equally likely that this series of alnage seals was once attached to cloth inspected in a different English county prior to shipment to Durham. This is despite the fact that the new evidence discussed in sections 6.5 and 6.6 highlights how Durham's alnage officials were certainly active throughout the late-sixteenth and early-seventeenth centuries (see also Table 6.1).

The work of Durham's alnage officials comes under further spotlight with the inclusion in the assemblage of 27 'four-part' alnage/subsidy seals (Fig. 3.17-3.18). Of some relevance is the fact that the use of these alnage seals would have effectively spanned the period from the union of the Scottish and English crowns in 1603 to the end of the collection of alnage and subsidy in 1724. This dating evidence ties in nicely with the Myles Stapleton indenture, dated 1666, relating to '*the office of alnage and collector of the subsidie and alnage and farm ... made sent or offered for sale... within the said County Palatine of Durham*' (see appendix B), along with the information contained in the late-seventeenth-century legal precedent book relating to the work of the alnager's deputies. This new information reveals how during the early-seventeenth century subsequent Bishops of Durham appointed the position of Alnager for County Durham to first Ludovic Stewart, 2nd Duke of Lennox and 1st Duke of Richmond (and Alnager General for England and Wales from 1605 - 1624), then to Sir Robert Napier, 1st

Baronet of Luton Hoo in Bedfordshire. The latter may well have held the farm at the time when alnage seals **138** (dated 1635) and **139** (dated 1636) were used: although the initials 'JF' may well be those of a deputy. The only confirmed provenance amongst the 27 'four-part' alnage seals is that of **133**, which has been identified as originating from Suffolk. This relatively common find features the initials RS, presumably those of the county's alnager. However, as 78 (27.5%) of the cloth seals in the Durham assemblage are alnage seals, there has to be a high likelihood that many are linked to the work of alnage officials sealing cloth in Durham.

8.5 Durham's post-medieval consumption of cloth

The evidence highlighted in Chapter three suggests that by the eighteenth century, consumer demand in Durham for new draperies had moved from the worsted produced in Norfolk to those woollens and worsteds being produced in the northern woollen towns, for example Bingley, Bradford, Halifax, Keighley, Leeds or Wakefield. The transition, from rural water-powered workshops to steam-powered mills had proved to be an important turning point in textile history (Baines 1822, 29-30; Bowden 1962, 44-46; Law 1988, 1-5). The rapid industrialisation that followed turned these West Riding towns into important textile centres, and weavers based across the county border in Durham, for simple economic reasons, were unable to compete. Although the production of 'housewife' quality linen continued in Durham, other textile production, such as etamine [a loom-woven fabric from either worsted yarns or cotton, often dyed in the piece] (1753 - 1755) would become a speciality, the production of which shifted to the outskirts of the city (Berg and Berg 2003, 240). In terms of textile production and finishing, the transition from Elvet's tenement-based medieval craft-guild hand-loom weavers (and dyers) to later standardised, mass-manufactured, factory products was complete, the latter not occurring in the City.

8.6 Durham as a regional centre for dyeing cloth and linen weaving

If the provenance of 60% of those cloth seals in the assemblage which are attributed to the post-medieval period cannot be confirmed, then it would be reasonable to conclude that they may well have once been associated with textile production or finishing (dyeing) in the City after 1540. This conclusion is strengthened by the research findings set out in Chapter six, which highlights how – through analysis of the substantial archive repositories available in County Durham – both weaving and dyeing activity continued in Durham City through to the early-nineteenth century, although Beeton (1875, 273) identifies linen weaving still taking place in Durham in 1875. Of particular interest is the fact that although the weaving of woollens, worsteds and linens was established in the City from as early as the mid-fourteenth century, it is now evident that it was only Durham's linen weavers that ultimately prevailed (in any great numbers) through to the post-medieval period. It is now evident that weaving activity in Durham reached its zenith during the last quarter of the eighteenth century (see Chart 6.1), although even then those engaged in the craft only totalled a modest 116 – barely a five-fold increase on the 23 weavers who had gathered to witness the signing of their charter some 325 years earlier. An incidental observation that can be taken from the analysis of these records concludes that if the level of success any man achieved in his working life is ultimately measured in his ability to leave a will setting out how he disposes of his property among his relations, friends and creditors. Out of the 366 weavers identified as working in Durham between 1540 and 1800, only 37 achieved it (taken from Durham Probate Records pre-1857). This may say much about the levels of cheap labour employed in this trade, compared to the few who controlled and ultimately profited from it.

The textual evidence suggests that the ability of Durham's linen weavers to operate throughout the late- and post-medieval periods was in part due to the availability of locally grown flax and hemp, and cheap labour. The considerable quantities of inferior linens – the so called 'housewife's' cloth and (coarser)

hardyn listed in the inventories of Durham drapers, such as Thomas Hall (1586), together with the presence of flax, cheap household linens, sheets and towels of hardyn and weaving looms in the homes of the Durham weavers, Thomas Morland (of Elvet) 1598, Thomas Johnson (of Elvet) 1610 and Bartholomew Bolton 1662, help strengthen this suggestion. Perhaps of greater significance, certainly in terms of establishing the scale of linen weaving in Durham, is that the review of the textual evidence suggests that the City's linen weavers appear to have been more than just holding their own in terms of meeting the local demand for these cheaper household linens. For example, the 1689 probate inventory of the Durham dyer George Burdon (DPR/I/1/1/1689/B17/1-8) contains a considerable list of outstanding debts. Many small transactions, of typically dyed (presumably locally-woven) household cloths, such as '*a yard of blue hardyn 4d*', are recorded against the names of hundreds of customers who had travelled to Durham from numerous small villages and hamlets located across the county. This probate evidence, together with the steady rental income generated between 1660 - 1725, from the Gilesgate Moor bleaching grounds, suggests a period of sustained linen production in Durham throughout the seventeenth and early-eighteenth centuries. This evidence alone is reason enough to explain the presence of the 27 four-part alnage seals and the many unprovenanced seventeenth-century weavers', dyers' and clothiers' personal seals in the assemblage.

There is the real possibility, however, that, for a short period, Durham's weavers were in fact engaged in a wider 'regional' – perhaps even 'national' – scale of linen production. This notion is strengthened by evidence contained within contemporary seventeenth-century economic documents. For example, discussions in the English House of Commons - which centred on the seventeenth-century economic crisis – confirmed that during the last quarter of the seventeenth century it was only the counties of Durham, Yorkshire and Lancashire that were producing linen throughout the whole of England. Therefore, it is very likely that the produce of Durham's linen weavers extended well beyond its county borders (see section 6.3).

One final conclusion that may be drawn from the analysis of both the cloth seal assemblage and the available textual evidence is the continual dependency for Durham's consumers of fine linens on European imports. As with the late-fifteenth century Newcastle port records detailing imports of '*peciis holand panni linei*', some 200 years later '*Holland*' cloth was still in demand by such consumers as St Nicholas's Church in Durham's Market Place, for a new surplice (see section 6.9 for further discussion). The seventeenth-century 'Haarlem' cloth seals **252**, **253** and **254** are testament to these later procurements of fine linens.

Chapter Nine

9. Conclusions

The main aim of this thesis was to piece together and meaningfully interpret the findings taken from a cultural, scientific and technical study of 275 lead cloth seals recovered from a single submerged river-bed site located in the North-East of England. At the outset of the research there was a belief that an integrated and interdisciplinary study of these artefacts – the largest collection of cloth seals outside of London – could provide an extensive opportunity for cultural analysis. It seemed that there existed a real opportunity to both summarise and contextualize the evidence to help provide new insights into Durham's past, not only with an emphasis on the evolution of industry (Crossley 1990), but also to allow correlations between the cloth seals and their use in Durham with named individuals and places. Through incorporating a methodical approach, it was hoped that these enigmatic cloth seals could be placed into their past context of daily use.

In terms of exploring insights into the key issues linked to globalization and the spread of capitalism (Beaudry and Mehle 2016, 108), this thesis has answered an important question. The question, linked directly to the artefacts themselves, sought to ask just how do these small manufactured products effectively represent the transition from hand-made medieval products associated with medieval craft-guilds to the standardised, mass-manufactured, factory products of the later period? Chapter seven has sought to explain and summarise this transition. As it has proven possible to place the cloth seals into a sequenced typology and chronology (only made possible due to the dating and provenance evidence set out in Chapter three), new evidence of the changes in supply and demand for cloth in late- and post-medieval Durham has emerged. It is now evident, confirmed by a wide variety of textile provenances mapped through the passage of time, that for Durham it was not only local consumer demand for changes in fashion that drove change. Several other factors also influenced this 'surge' in consumerism. In terms of textile availability and use, for Durham the greatest change occurred during the two hundred year period dating from c.

1500-1700; a relatively short but dramatic period of transition that saw Durham's textiles purchases seesawing between important European and English centres of production. While it is true that the factors which influenced purchasing strategies hinged on such things as changes in fashion, other reasons such as innovations in textile manufacturing techniques, textile availability, the discovery to new trans-Atlantic trade routes (and with it exposure to new dyestuffs), the state of the economy, religion, changes in regulation and legislation, mortality and even conflict were also influential. Durham was never isolated in the North of England but was actually an integral part of a much wider European market place where vogue styles of any town or city could readily be worn by the citizens of another just a few weeks later. Chart 7.1 displays the transition from the medieval to the modern demand for textiles in a graphical form. In addition it could also be argued that this new evidence speaks to the evolving nature and continuity of human activity not just in County Durham or the North-East region, but also across Britain as well as the near Continent. Chapter eight, which features an integrated discussion of the new evidence from the cloth seals and documents, helps place the cloth seals into a wider context of British and European industries.

The new historic documentary research carried out here has provided an opportunity to compare, confirm or challenge the previously known historic and literary record for the city; particularly as there is an inherent weakness in the city's archaeological record (in terms of small finds). Although Durham's production and consumption of textiles during the late- and post-medieval periods is relatively well-documented, gaps, particularly in terms of identifying the exact location where textiles were originally manufactured, are present. We now have new evidence that the important Low Countries and northern French textile production centres, such as Malines, Tournai, Ypres, Douai, Arras, and Rouen were exporting luxury woollens and fine linens to Durham during the late-medieval period.

9.1 Aims and objectives

The first and perhaps main objective of this thesis was to create a catalogue and concordance of the 275 cloth seals; this is detailed in Chapter three. As it is the cloth seals themselves that essentially form the foundation for this study, all 275 of them were photographed with 167 being illustrated (this number was limited to due to the amount of time available). Evidence gathered, in terms of identifying parallels in national collections and from other online sources, has confirmed a wide European provenance for many of the Durham cloth seals, revealing trade connections never previously evidenced; while others are directly linked to the production of, or finishing of textiles in the Borough of New Elvet, Durham during the late- to post-medieval periods. Many of the cloth seals are unique examples. The second objective (set out in Chapter four) detailed sources of evidence relating to the analysis of archaeological and historical textiles, together with a technical history drawing on the dye and mordant analysis. The third objective was to undertake and present scientific and analytical analysis of archaeological textile extracted from three cloth seals selected as case studies. Analysis of these scraps of textile preserved in some of the cloth seals identified the dyes used to colour the cloth (for the first time in the UK). To extract this evidence the methodological approach adopted and used to structure this research centred on the use UHPLC-PDA analysis undertaken at the Centre for Textile Conservation and Technical Art History, University of Glasgow. Working successfully with Dr Anita Quaye and colleagues, to detect dyes in fragments of textiles caught in cloth seals has shown the capacity for cloth seals recovered from an anaerobic (watery) context to preserve evidence which is often lost from terrestrial artefacts. The fourth objective was to explore the historical narratives of the medieval city of Durham, placing them into their rightful historical, cultural and geographical context while also examining its built environment and relationship with a large, almost encircling river for evidence of textile-related activity. Despite their being an excellent historic and literary record available for Durham, other sources, perhaps less typical of an archaeological thesis such as probate wills and inventories, contemporary paintings, and other textual documents

(including craft-guild-related material) feature strongly in Chapter six and a series of maps, charts and tables were incorporated to help present the evidence. The fifth and final objective which is presented in two parts (Chapters seven and eight) identified specific trends (as evidenced in the preceding objectives). The fact that these two chapters placed the cloth seals into a sequenced typology and chronology, together with an integrated discussion of the new evidence placing the cloth seals and documents into a wider context of British and European industries, provided answers to some important questions linked to globalization and the spread of capitalism. It is clear that the new research findings presented in this thesis have changed our understanding of the Durham textile industry and the history of textile manufacture and trade in the North-East generally.

9.2 The heuristic cloth seal

A thematic study of the Durham cloth seal assemblage has proven that these artefacts are much more than just the physical evidence of the past. Analysis of them has confirmed that they represent a powerful and wide ranging testimony to some of the past citizens of Durham. It has proven possible to identify the names of the men and women who engaged with them in their everyday lives; names that may well have otherwise been lost in the archives and special collections. In essence an opportunity has been seized to understand the 'lives' of these objects and the social context in which they were being used (Standley 2013, 1). Not only have they have provided us with a non-traditional but informative account of the economic, social and technical changes which have affected Durham. But it has also proven possible to see the cloth seals as physical evidence which extends our knowledge of not just the material and meaning but also its uses in its rightful social context of daily life (*ibid.*, 2013, 8).

The research has built on what would once have been ubiquitous, cheaply-manufactured and throw-away items which are now, nonetheless, relatively rare outside certain auspicious environments; and that these items are proxies for a vast, complex trade in goods which have almost totally disappeared in

terms of survival – i.e. the textiles themselves. Moreover, the cloth seals tell of a range of social and economic actions and interactions which, without further surviving documentation, would also have disappeared from our historical awareness. The cloth seals have drawn us into a whole world of people in the past making, finishing, dyeing, scrutinizing, approving, marketing, procuring, and ultimately making clothing and other items out of the textiles. Archaeology is ultimately the study of people, their actions, organization and relationships, through the material evidence recovered (Graves, 2016, pers. comm., 1 August).

9.3 Limitations and further work

Through the findings presented in this thesis, it should now be clear to historians that, as artefacts, the Durham lead cloth seals have revealed a more diverse account of the history of the City's cloth trade than the written evidence alone suggests. Presumed by many to be enigmatic objects, they have actually proven to be of crucial significance for understanding the cloth trade in late- and post-medieval Durham: however, there is an enormous potential for further work. Several limitations, for example, of evidence and of time, have impacted on the research and further systematic studies, particularly of the documentary evidence related to textile production, should be undertaken. Other historical documents, for example, the late-medieval Bursar's and other obedientaries accounts, the ordinaries, founding charters and other craft-guild records, the parish records (most notably of St Margaret's and St Nicholas's church) and the national alnage accounts, could highlight even more evidence, not just of further textile consumption, the additional use of dyestuffs, the discovery of more trade routes, additional names of those individuals engaged in the trade, together with their places of work, but also further evidence of social change in what was, for Durham, a time of transition. In addition, closer dating evidence for many of the cloth seals could be obtained through a systematic study of the thousands of wax seal impressions evident on the wills and inventories of Durham's weavers', dyers', fullers' and drapers', particularly as these may correspond with the privy marks which feature on many of the cloth seals.

An opportunity exists to undertake further scientific and analytical analysis of scraps of textiles that have survived in 25 of the cloth seals (only three of which had been selected as case studies, see Chapter five). These rare survivals of what were once common and everyday fabrics have revealed information which can answer important questions on the development of fashion in Durham from the late- to the post-medieval periods. The discovery that UHPLC-PDA analysis can be successfully used to extract colourants related to dyes from textiles fragments preserved in lead cloth seals is reason enough to pursue further research into the use of dyestuffs during this period. Finally, a detailed study of the whole Durham River Wear Assemblage - some 8,500 artefacts (correct as of July 2016), would not only supplement the nearby-excavated archaeological evidence (Carver 1974 and 1979), but would facilitate a new and unique opportunity to understand the reality of daily life in both the Borough of New Elvet and the wider City of Durham.

Add. MS 319. Folio 121 Legal precedents book (Palace Green Library)

8 day Oct [1670]

By force of arms and at a place G in the aforesaid County and upon a H.J. deputy of certain M.S. esq. alnager of the County Palatine of Durham in the peace of God and the Lord and in the execution of his aforesaid office, attacked by affray and he has been beaten wounded and badly handled so that his life was despaired off and a theft of two pieces of pannni lanei and the aforesaid H had his cloth by the virtue of his office because it had been forfeited to the bishop because the cloth offered for sale without being sealed by the aforesaid H and other dreadful things were done to the aforesaid H to his harm and against the peace of the Lord Bishop

(Note in Margin)

31 July 22 year
Charles II
Assaulting the
Bishops Deputy
Alnager and taking
from him some
cloth by him seized
being disposed to
sale and not sealed.

Add. MS. 319. Folio 124 Legal precedents book (Palace Green Library)

8 Nov 22 Charles II [1670]

B by force of arm and at G in the aforesaid county voluntary refused and did not allow a certain A.J. deputy of a certain M.S. esq. Alnager of and for the County Palatine to enter the solar of the said B at G in the said county where the panna landa of the said B was put in order to be scrutinised and tested according to the tenner and effect of the statute issued 5 Mary in cases of this sort and provided against contempt and bad example and against the peace of the Lord

CCB/D/1956/504/188381 (Transcribed counterpart lease for 20/- the offices of Alnager and collector of the subsidie and alnage and farm. Miles Stapylton dated 1666).

This Indenture made the one and thirtieth day of December in the eighteenth year of the reign of our sovereign lord Charles the second by the grace of our god king of Scotland France and Ireland defender of the faith and **between** the R R father in God John [Cosin] by the grace of God lord bishop of Durham of the one party and Miles Stapylton of the City of Durham in the County of Durham Gent on the other party **Whereas** the said Reverend Father John Lord Bishop of Durham is now possessed and interested in the eighth of his sea and bishoprick of and in the granting of the offices of Alnager and collector of the subsidie and alnage and farm thereof and of the forfeitures of all vendible or saleable woollen cloths, halfe cloths and parts of cloths made and put to sale within the county palatine of Durham and within all of Cities Boroughs Towns villages hamlets and places whatsoever within the same County Palatine as well within Liberties as without **Now** this Indenture witnessed that the R Reverend father John lord of Durham for diverse good causes and confiscates him hereunto mooving hath grantes and by these presents for him and his successors Bishops of the sea of Durham for the time being doth grant unto the said Miles Stapylton god his executioner and agents the aforesaid officers of alnage and collector of the subsidies of alnage and also hath demised granted sett and to farm lett unto the said Miles Stapylton his Executors administrators and assigns the said subsidie and alnage and ferme said subsidie and alnage of all vendible and saleable woollen cloths halfe clothes and pieces of clothes called or knowne by the name or names as well of the old as of the new draperies made sent set or offered to sale or hereafter to be made sent set or offered to sale within the said County Palatine of Durham and within all Cities Boroughs Towns Villages, hamlets, and places whatsoever within the said County Palatine aswell within Liberties as without and every or any of them together with moyetie of all the sure forfeitures and summs of money as shall from time happen to be forfeited touching or concerning the said Clothes halfe Clothes pieces of Clothes or new draperies what so ever to have and hold exercise execute enjoy the said office of alnage and collector of the said subsidie and Alnage and ferme thereof and moyetie of forfeiture and other the premises above mentioned and every part and parcel therefore unto the said Miles Stapylton his executors administrators and assigns from the making hereof unto the end term and for and for and during the whole term of twenty and one years from thence forth next ensuring and fully to be completate and ended in as large ample and beneficial manner and form in every respect as the said Reverend father can or may grant the same by any waies or meanes whatsoever and in as large and ample manner and forme as a Right honourable Lodowick Duke of Lenox by virtue of Indenture or Grant thereof made to him by the Right Reverend father in God William [William James 1606 – 1617] then Bishop of Durham and Sir Robert Nap[lier] of Luton hoor in the county of bedford knight and baronet by vertue of indenture or graunt thereof made to him by the Right Reverend father in god Richard [Richard Neile 1617 – 1627] Lord Bishop of Durham or either of them their or either of their assigns have or did enjoy or might have enjoyed the said premises **yeilding** and paying therefore yearly during the said term for the set subsidie and alnage and ferme thereof and moyetie of forefeitures unto the said reverend father and his successors Bishops of the see of Durham for the time being at or in the exchequer at Durham the yearly rent of twenty shillings of lawful money of England at the feast day of St Martin the Bishop in winter only without fraud and covein and if it fortune the said yearly rent of twenty Shillings or any part thereof to be behind and underpaid in part or in all by the space of forty days next after the said feast where in it is reserved to be paid that then and from thenceforth this present indenture and lease to be utterly void and of none effect. and the said Miles Stapylton for himself his executors and assigns doth covenant and grant to and with the said Reverend Father and his successors by these presents that neither he the said Miles Stapylton nor his Assignes shall at any time during the continuence of this present lease attempt do or commit any act or acts thinger or things which shall or may be prejudicial or hurtful to the right and liberty of the county palatine of Durham or to the said reverend father and his successors or by reason of this grant or any of the officers and profits hereby granted. And the said Reverend Father doth hereby will and require his sheriffs bailiffs and other his officers within the said county palatine that they be from time to time aideing and assisting to the said Miles Stapylton or his assignes in the faithful execution of the said offices as is meete **In Witness** whereof the parties abovesaid to these present Indentures have interchangeably put their hands and seales the day and yeare above writer annoque domini 1666

DCL MSS. Allan 8/8. Extracts of orders and regulations made by the juries of the Borough and Barony of Elvet (c.1610) for the regulating of the same –

'to be yearly redd in our Parish Church of St Oswald's and the same to be saifely kept in the hands of the church warders with the rest of our records.'

17. *Item a panie laid that none from the lower end of Rattenzsroe to Elvett Bridge End shall let their dung lye before their forefronts in the street above 14 dais upon paine of evie fault of 6s.*

19. *Item a panie laid that the common vennel at bridge end shall be kept clean and drest at such times as the constable doth command as often as he need doth require and that whosoever doth denye to cometh to make clean the same being them commanded by the constable – shall be forfeit for every fault 6s.*

21. *Item a panie laid that – Hornsby and the tennants of W. Wanless lands shall make these passages sufficient in the common vennel to the waterside upon paine of evie fault 6s*

39. *Item a panie laid that the footwaie leading from Elvet bridg along the waterside between the garths and the water until it come to the great smithhaughe shal be used as it hath bene onely for a footwaie or walk and that none shall presume to make any carriage that waie viz between the garths and the water of weer to great smithhaugh either with waine cart or horse nor to rut up any of the willows planted and growing along the water for the defence of the water upon panie for evie fault comitted – Xs*

Signed

The Borough George Man

The Borough Robert Cooper

Thomas Hall, Draper of Durham City 1586

DPRI/1/1586/H1/1-6 (Inventory 1586/H1/2)

1586/H1/4

Book of all the Cloth

12. yards of felle	2-3-8
1. yards of gold in bolus att. 6. yards of yellow	2-9-6
12. yards of felle	2-13-4
1. yards of felle	0-12-0
3. yards of felle	0-12-0
2. yards of felle	2-0-0
12. yards of felle	5-12-0
9. yards of felle	1-0-0
4. yards of felle	0-18-4
5. yards of felle	2-2-2
9. yards of felle	0-4-0
1. yards of felle	0-15-0
3. yards of felle	2-0-0
12. yards of felle	2-10-0
7. yards of felle	0-17-6
2. yards of felle	0-5-10
1. yards of felle	0-10-10
3. yards of felle	0-9-9
3. yards of felle	0-5-0
1. yards of felle	0-1-4
1. yards of felle	0-1-4
1. yards of felle	0-5-6
1. yards of felle	0-7-0
1. yards of felle	8-3-7
15. yards of felle	1-2-9
6. yards of felle	0-16-1
10. yards of felle	0-13-4
4. yards of felle	1-7-9
9. yards of felle	0-2-6
3. yards of felle	0-1-4
2. yards of felle	0-16-0
6. yards of felle	2-12-0
12. yards of felle	2-10-0
12. yards of felle	0-20-2
12. yards of felle	0-2-6
6. yards of felle	0-5-0
1. yards of felle	0-9-9
4. yards of felle	0-0-2
6. yards of felle	2-6-0
7. yards of felle	1-6-0
12. yards of felle	2-10-0
9. yards of felle	2-15-0
12. yards of felle	0-0-0
12. yards of felle	1-2-9
1. yards of felle	1-12-0
39. yards of felle	0-10-0
63. yards of felle	0-2-3
27. yards of felle	0-1-0
3. yards of felle	0-0-0
4. yards of felle	0-0-0
2. yards of felle	0-0-0

Sum 51-17-9

Thomas Hall, Draper of Durham City 1586
DPRI/1/1586/H1/1-6 (Accounts 1/1586/H1/6)

George Burdon, Dyer of Claypath. 1689

DPRI/1/1689/B17/1-8 (List of [customer] debts owing to the deceased 1/1689/B17/5)

[illegible]

Gorge Burdon, dyer of Claypath. 1692
DPRI/1/1692/B18/1-3 (Will 1/1692/B18/1)

1692/B18/1

In the Name of god Amen I George Burdon of the City
of Durham in the County of Durham Dyer, being of good
Mind & whole in Health doe make publish & declare this
my last will & Testament (with Relation to my Corporall Estate
in manner & form following (that is to say) I doe hereby
give & bequeath unto my kindred & loving Brethren Edward
of gillgate in the County of Durham Merchant. All that my two
Wives Burdages & Thomas's several standing in Claypath in the
County of Durham now in the severall Occupations of John Ditchburne
& Thomas Hartshorne & also all that my dear Wife Burdage or
Consort's several standing & being in gillgate in the County now in
the Occupation of one Richard Price or his Assigns. & also all other
my Land's Tenements & Hereditaments wher I severall appearance within
the City or Suburbs of Durham or otherwise within the County of Durham
to hold to & to the said Edward. Hawcott & his Heirs, until such time as
he or they by & out of the Bonds Issues & Profits of & profits
shall have payed & to be paid unto the said Edward of one hundred
& eight pounds of Lawfull Money to be computed from the date hereof
being a debt by me justly owing for the purchase of Substances
wherewith & other stock in Trade with which I have been providently
supplied by the Care of my dear Wife Burdage & value aforesaid the sum
after the said debt & interest shall be so payed & received as
aforesaid. without any Tax Deduction or Allowance then I give & devise
the said two Wives Burdages & Consort's in Claypath & gillgate & all
other my Estate with the said severall appearance to my dear Wife Thomasine
Burdon her & her Heirs & Assigns forever provided that if my dear
Wife or her Heirs shall not satisfy & pay unto the said Edward the said
principal sum & interest that then the said & the said profits shall
to my dear Wife & her Heirs shall cease & determine & I doe hereby
constitute & appoint my dear Brother Edward Hawcott sole Executor of this my
last Will & Testament. in whom I bequeath all my debts & other Estate
to be most notwithstanding that after the said debt & interest shall be satisfied that
he shall pay to the said Edward the said satisfaction of such sum as he
shall receive out to him & the said Edward toward satisfaction of the
principal & interest charged upon my will & the said Edward's charge
for executing my Testament to which charge of & costs of my dear Wife
Burdon & her Heirs & Assigns all from & against the said Wife Burdon
the sum & her Heirs & Assigns of March in the third year of the reign of King William
& Queen Mary the first 1690/1

Witness my hand & seal
in presence of
Thomas Burdon
John Burdon
George Burdon

George Burdon

Gorge Burdon, dyer of Claypath. 1692

DPRI/1/1692/B18/1-3 (Inventory 1/1692/B18/3)

1692/B18/3

A true and perfect inventory of y^e Goods
 of Shattolls of Geo: Burdon of Durham
 in Claypath lately deceased. £. 8. 8

Imp: purst & apparrell 07:10:00
 a pair of drawers and an old watch 00:00:00
 10 Mathers 00:04:00
 for bark 00:04:00
 1 press & gawlocks 06:00:00
 17 dozen pressing papers 02:00:00
 old pressing papers 01:00:00
 3 sto: fwarth 00:07:00
 dyed cloth stockins yarns & wools 02:00:00
 rotten wood 00:10:00
 wood wash 00:03:00
 hay 00:09:00
 3 kidding saddles old 00:03:00
 one cart & cart gears 00:10:00
 one little lead wench & standard 04:00:00
 one great lead wench & standard 06:00:00
 fistran & pump 03:00:00
 2 fates 2 crosses 2 shells 2 jacks 2 racks 06:00:00
 2 wood trones & 2 wood horse 00:05:00
 one panne & bullet & 3 schoppes 00:10:00
 one tray & stand 00:05:06
 1 barrow 1 scoupe 2 swills & 2 schoppes 00:01:00
 1 fork }
 2 fire shovells 1 poir 1 coal racks 00:06:00
 2 cross bars & y^e grates under y^e lead }
 1 pair of hawches forms and table 00:01:00
 1 little hammer 00:00:04
 90 yard tenters 05:00:00
 a Gray mare 04:00:00
 1 pair scales & baule 1 stone mortar 00:09:00
 1 postell 3 sto: lead weights & 2 bra weights }
 2 old cloth brushes 2 fates & 2 shelles 00:08:00
 1 best Sunderland Dons at heart pole 00:07:00
 1 pair of Iron bars 00:03:00

46:11:10

Loff: Gray
 Jo: Perkin
 Christo: Limboz

Thomas Johnson, Weaver of Elvet. 1610
DPRI/1/1610/J2/1-4 (Inventory 1/1610/J2/2-3)

In the wchamber next to the gate south

Item and taken into 3 fappins 3 blankets — viij^s
 Item 3 pynes of comst pokes 2 pokes
 2 fappins 2 fappins one hynge table cloth — x^s
 Item 3 woffle 2 one formes one butter
 Lett one fappins one comst one fappins — viij^s

In the paper wchamber

Item 2 one bee fappins — viij^s
 Item one and wchamber 2 fappins one
 flocks hold one mattress — viij^s
 Item 4 fappins — viij^s
 Item one one wchamber and fappins pokes — viij^s
 one flocks — viij^s
 Item one flocks pokes — viij^s

In the stable

Item one wchamber and wchamber — x^s

In the wchamber

Item one wchamber and wchamber — viij^s
 Item one wchamber of wchamber — x^s

Witness Richard Johnson
 John Johnson
 with the wchamber
 witness given

1610/J2/3

The Inventory of all the goods & chattels
 moveable & immovable of Thomas Johnson of Elvet
 within the gift of St. Oswald's parish of Elvet
 the wchamber of Durham pokes into the flocks
 the wchamber of October and June 1610 by
 Thomas Johnson of Elvet the wchamber
 witness given

In the hall house

Item one wchamber of iron bars one flocks
 one wchamber pokes of comst one pokes of
 wchamber flocks — viij^s

Item two tables 2 wchamber 2 formes — x^s
 Item one wchamber one flocks one flocks
 Item one wchamber of wchamber 3 flocks 3 flocks
 Item 2 flocks 4 flocks wchamber flocks — x^s
 Item 5 flocks pokes 4 flocks one flocks wchamber
 one flocks one flocks — viij^s

Item one wchamber 2 flocks 4 wchamber flocks
 Item one wchamber flocks — x^s

Item one wchamber flocks — x^s
 Item one wchamber 3 flocks one wchamber flocks
 Item one wchamber flocks — viij^s

Item 8 flocks of flocks — viij^s

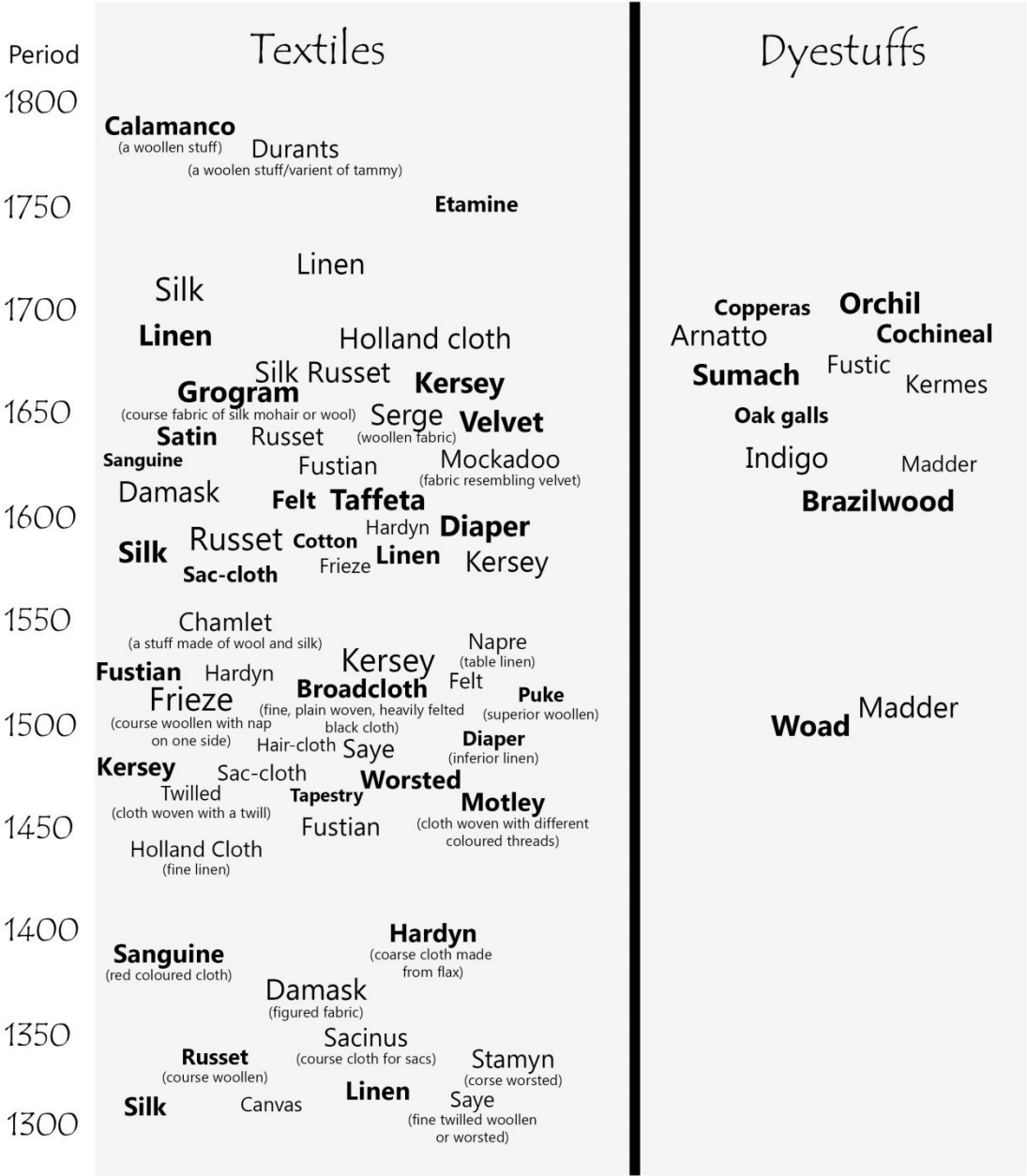
Item one wchamber flocks one wchamber flocks
 one flocks one wchamber flocks — x^s

Bartholomew Bolton, Weaver of Durham City. 1662
 DPRI/1/1662/B10/1-2 (Inventory 1/1662/B10/2)

Item one halfpenny of 1000 lb. — 4. 6. 8
 Item one pair of weight scales — 0. 3. 0
 weight 16 pound of 1000 lb. — 0. 7. 6
 Item one hay — 0. 0. 6
 Item 7 pair of sheep, one
 dozen of willow, one dozen
 and a half of napkins, three
 table cloths — 2. 11. 2
 in the stable
 Item 16 board — 0. 0. 0
 Item 1000 lb. wood in the
 stable — 7. 15. 0
 Item 1000 lb. — 6. 6. 8
 Suma totalis — 42. 4. 4
 Item of the deacons
 Item due from a bond from James
 Wilkinsons — 7. 0. 0
 Item due to him from another
 bond from James Wilkinsons — 2. 10. 0
 Ralph Dalton — in all 9. 10. 0
 John Richardson
 John Catthol
 Tho: Hand
 John Gaines

Known references to textiles and dyestuffs in use in Durham c.1300 x 1800.

Known references to textiles and dyestuffs in use in Durham c.1300 x 1800



Variations in font size/style are purely for atheistic reasons.

Glossary (main sources: O.E.D; Fowler 1900, 889-989; Egan 1995, 145-147; Threlfall-Holmes 2005, 17-210).	
Alnage	A form of regulation requiring a fee or duty (subsidy) to paid by the weaver to the crown (or bishop) per newly woven cloth
Alnager	Crown-appointed official responsible for enforcing the current assize of cloth (from at least 1353 – Statute 27 Ed.III St 1 C4)
Assize	Legislative statute i.e. cloth of Assize
Broadcloth	A plain woven, fine double width black woollen cloth, usually heavily felted
Bursar	A treasurer, usually responsible for all the income and expenditure [of the monastery]
Calender	Smoothing the surface (of new stuffs) to give a glossy sheen using stuff presses, dressing boards or pressing irons
Caungeantry	The collective name for 'new stuffs' or 'new worsteds' normally lightweight dry (non-greasy) fabrics
Clothier	A maker (weaver), seller, merchant or trader of woollen cloth. Also an employer of weavers
Draper	A dealer in cloth, often specialised i.e. linen-draper, woollen-draper
Ell (or <i>ulna</i>)	A variable measurement of the length of cloth, English ell = 45 in.; Flemish (or Dutch) 27 in.
Flax	The plant <i>Linum usitatissimum</i> cultivated for its textile fibre
Freeman	A man who possesses the freedom of a city, borough, company, guild, etc. generally achieved either by patrimony or by servitude
Fuller	A man who fulls (cleans and thickens) freshly woven cloth
Fustian	A popular mixed fabric usually with a warp of linen and a weft of cotton textile, which produced a smooth silk-like finish
Grain	The common name for kermes or other red coccid dyestuffs. 'Ingrained' refers to red-dyed cloth
Hardyn	Textile fibre made from the woodier parts or hards of flax or hemp
Kersey	A twilled, narrow cloth, woven from long wool often ribbed. Finer than broadcloth but coarser and heavier than 'new draperies'
Linen	A textile made from the fibres of the flax plant
Loom	A device used to weave cloth or tapestries
Litester	A dyer (with surname variations: Lister, Littester or Lyttester). See also Tincter
Marshalsea	A court for the inspection of weights and measures – the control of which was normally delegated to the terrar, bursar or steward
New Drapery	A general phrase referring to cloths or textile fabrics collectively
Obedientaries	Medieval monks tasked with the administration of monastic estates
Ordinaries	Regulations (of craft-guilds or trade associations)
Searcher	An official appointed by a craft-guild to examine the quality and specifications of newly woven cloth prior to its sale
Stuffs	A generic term to describe woven fabrics i.e. worsted 'stuffs'
Subsidy	The fee or duty charged for alnage, usually a few pence on each cloth
Tincter	A dyer. See also Litster
Vennel	A narrow passage, often used as a shortcut between rows of buildings
Worsted	A lightweight woollen fabric or stuff made from well-twisted yarn spun of long-staple combed wool. Can be given a surface gloss.

Bibliography

Unpublished Primary Sources – Archives and Special Collections, University of Durham:

DCG 7/3, Names and places of abode of members of the Dyers' Company, 1772.
Add.MS 1980, (formerly 'Cordwainers 3') Society of Freemen Friendly Society listing members by trade.
DCG 7/1, Records of the Dyers' and Litsters' Company, 1707 - 1842.
DCL MSS. Allan 8/8, Extracts of orders and regulations made by the juries of the Borough and Barony of Elvet, c.1610.
CCB/D/1956/504/188381, Transcribed counterpart lease for 20/- the offices of Alnager and collector of the subsidie and alnage and farm, 1666.
Add. MS 319. Folio 121, Legal precedents book, c.1670.
Add. MS 319. Folio 124, Legal precedents book, c.1670.
DPRI/1/1662/B10/1-2, Bartholomew Bolton, Weaver of Durham City, 1662.
DPRI/1/1610/J2/1-4, Thomas Johnson, Weaver of Elvet, 1610.
DPRI/1/1598/M6/1-3, Thomas Morland, Weaver of Elvet, 1598.
DPRI/1/1665/E4/1-5, Anthony Emerson, dyer of Gilesgate, 1665.
DPRI/1/1692/B18/1-3, Gorge Burdon, dyer of Claypath, 1692.
DPRI/1/1689/B17/1-8, George Burdon, Dyer of Claypath, 1689.
DPRI/1/1586/H1/1-6, Thomas Hall, Draper of Durham City, 1586.

Durham County Records Office:

Du 5/1/1, Guild minutes, 1728.
Du 5/1/23, Admissions of Freemen, 1761.
Du 5/1/24, Calls at Guilds [of those to be made freemen], 1757 - 1761.
Du 5/1/21, Lists of Freemen of the companies of Durham, 1751.
Du 5/1/22, Lists of Freemen of the companies of Durham and Mayors, 1742 - 1761.
Du 5/3/1-7, Copy of the bye-laws of the Company of Drapers' and Taylors', 1549.
Du 5/3/2, Copy of the bye-laws of the Company of Drapers' and Taylors', 1628, 1696 and 1705.

The National Archives:

TNA-DURH-20-130, Humble petition signed by Fullers' and Feltnakers', 1770 - 1784.
TNA-DURH-20-130-25, Similar petition signed by members of the Drapers' and Taylors' Company.

Chrutchley Archive Association, Southwark Local History Library and Archive:

Dyer's Recipe book. No. 2011/5/2.

Dyer's Recipe book. No. 2011/5/13.

Dyer's Recipe book. No. 2011/5/14.

Primary Sources: Printed –

Baines, E., 1822, *History, Directory & Gazetteer of the County of York. Vol.I – West Riding*. Baines. Leeds.

Fordyce, W., 1857, *The History and Antiquities of the County Palatine of Durham*. Vol. I. A. Fullarton and Co., Newcastle.

Fowler, J.T., (ed.) 1898, *Extracts from the Account Rolls of the Abbey or Durham*. Vol. I and Vol. II Surtees Society, 99 and 100. Andrews & Co., Durham.

Fowler, J.T., (ed.) 1900, *Extracts from the Account Rolls of the Abbey or Durham*. Vol. III, Surtees Society. 103. Andrews and Co., Durham.

Fuller, T. and Nuttal, P. A., (eds.) 1662, (New Edition 1811). *The Histories of the Worthies of England*. Vol. I. Thomas Tegg, London.

Greenwell, W., (ed.) 1857, *Bishop Hatfield's Survey: a record of the Possessions of the See of Durham*, Surtees Society, 32. Andrews and Co., Durham.

Greenwell, W., (ed.) 1871, *Feodarium Prioratus Dunelmensis. A Survey of the Estates of the Priory and Convent of Durham, compiled in the fifteenth century*, Surtees Society, 58. Andrews and Co., Durham.

Haigh, J., 1778, *The Dyer's Assistant in the art of dyeing wool and woollen goods. Extracted from the philosophical and chymical works of those most eminent authors, Ferguson; Dufay; Hellot; Geoffery; Colbert; and that reputable French dyers, Mons. De Julienne*. T. Wilson and R. Spence, York.

Hutchinson, W., 1785, *The History and Antiquities of the County Palatine of Durham*. Vol. I. Mr. S. Hodgson & Messrs. Robinsons, London.

Hutchinson, W., 1787, *The History and Antiquities of the County Palatine of Durham*. Vol. II. Mr. S. Hodgson & Messrs. Robinsons, London.

Raine, J., (eds.) 1844, *The Durham Household Book, or the Accounts of the Bursar of the Monastery of Durham, 1530 - 1534*. Surtees Society 18. J.B. Nichols and Co., London.

Secondary Sources: Crown Statute –

House of Lords Journal. 22 April 1668, in *Journal of the House of Lords: Volume 12, 1666 - 1675* (London 1767 - 1830). British History Online: <http://www.british-history.ac.uk/lords-jrnl/vol12/pp227-229> [first accessed 19 March 2016].

House of Lords Journal. 23 February 1692, in *Journal of the House of Lords: Volume 15, 1691 - 1696* (London, 1767 - 1830). British History Online: <http://www.british-history.ac.uk/lords-jrnl/vol15/pp89-91> [first accessed 4 January 2016].

Keble, J., 1684, *The statutes at large in paragraphs and sections or numbers from Magna Charta until this time*. Available [online]: http://gateway.proquest.com.ezphost.dur.ac.uk/openurl?ctx_ver=Z39.88-2003&res_id=xri:eebo&rft_id=xri:eebo:image:54144:144 [first accessed 4 January 2015].

Raithby, J., (ed.) 1811, *The Statutes at Large of England and Great Britain: From Magna Carter to the Union of the Kingdoms of Great Britain and Ireland. Vol. IV. I Mary, A.D. 1553 to 16 Charles I. A.D. 1640*. Vol. IV. Eyre and Andrew, London.

Raithby, J., (ed.) 1819, *Statutes of the Realm: Volume 5. 1628-80*. History of Parliament Trust, London.

Ruffhead, O., 1765, *The statutes at large: from Magna Carta to the end of the last parliament, 1761 [i.e. 1763]*, 9. Basket, Woodfall and Stratham, London.

The Statutes of the United Kingdom of Great Britain and Ireland, 1809. 49. George III 1809. His Majesty Statute and Law Printers, London.

Secondary Sources –

Akerman, J.Y., (ed.) 1844, *The Numismatic Chronicle and Journal of the Numismatic Society*. Vol. VI. Taylor & Walton, London.

Allison, K.J., 1955, *The Wool Supply and the Worsted Cloth Industry in Norfolk in the Sixteenth and Seventeenth Centuries*. PhD thesis, University of Leeds. Available [online] at: <http://etheses.whiterose.ac.uk/11293/> (first accessed January 2016).

Allison, K. J., 1960-61, 'The Norfolk Worsted Industry in the Sixteenth and Seventeenth Centuries', in *Yorkshire Bulletin of Economic and Social Research*. Part 1, The Traditional Industry. 12: 2, The New Draperies. 13, Hull.

Attreed, L., 2002, 'Urban Identity in Medieval English Towns', in *The Journal of Interdisciplinary History*, Volume 32. No.4 The Productivity of Urban Space in Northern Europe (Spring 2002). Available [online] at: <http://www.jstor.org/stable/3656146> (first accessed 9 January 2013).

Austin, D., 2007, *Acts of Perception: A Study of Barnard Castle in Teesdale*. Volume's I and II English Heritage and The Architectural and Archaeological Society of Durham and Northumberland Research Report 6. Roger Booth (Studio) Ltd., West Sussex.

Bailey, W., 1784, *Bailey's British Directory, or Merchant and Traders Companion for the Year 1784*. Bailey, W and Co., London.

Baines, P., 1985, *Flax and Linen*. Shire Albums 133, London.

Balfour-Paul, J., 1998, *Indigo*. British Museum Press, London.

Bancroft, E., 1814, *Experimental Researches Concerning the Philosophy of Permanent Colours: And the Best Means of Producing Them, by Dyeing, Calico Printing, &c.*, Vol. 1. Cadell and Davies. London.

Bankhead, G., in prep a. 'The Tanner Street, Bermondsey Lead Cloth Seal Assemblage – An Overview'. *Post-Medieval Archaeology*.

Bankhead, G., in prep b. 'The Broadgate Lead Cloth Seals (Crossrail – Liverpool Street Excavation) – Evidence of the Finishing and Sealing of Textile in Sixteenth Century Broadgate'. MOLA publication.

Barker, N. A., 2003, *'If the king had asked for an ass, he would have received his wish, this time: a study of the career of Thomas de Hatfield, Bishop of Durham (1345 - 1381), as a royal servant, 1336 - 1357*. PhD thesis, Durham University. Available [online] at Durham E-Theses: http://etheses.dur.ac.uk/4016/1/4016_1533.pdf (first accessed 4 February 2014).

Barber, B. J., 2011, *Guide to the Quarter Sessions of the West Riding of Yorkshire*. (2nd. edition). Yorkshire Archaeological Society, Occasional Paper No. 8.

Barmby, J., (Rev.), 1888, *Churchwardens' Accounts of Pitlington and other parishes in the Diocese of Durham*, Surtees Society, 84. Andrews & Co., Durham

Barmby, J., (Rev). 1890, 'Pittington and its church'. *Transactions of the Architectural and Archaeological Society of Durham and Northumberland*, III. Andrews & Co., Durham.

Barmby, J., (Rev)., 1896, *Memorials of St. Giles's, Durham; being grassmen's accounts and other parish records, together with documents relating to the hospitals of Kepier and St. Mary Magdalene*. Surtees Society, 95. Andrews & Co., Durham.

Baur, K., 2015, 'The Trade with Fustian from Germany to Denmark in the Later Middle Ages', in *Textiles and the Medieval Economy, Production, Trade and Consumption of Textiles, 8th -16th Centuries*. Oxbow Books, Oxford.

Beaudry, M.C. and Mehle, N., 2016, 'The material culture of the modern World', in A. Brooks (ed.) *Post-Medieval Archaeology* 50: 1, 108-120. Charlesworth Press, Wakefield.

Beeton, S.O., 1875, *Beeton's Counting House Book. A Book of Reference and a Ready Reckoner*. Ward, Lock & Tyler, London.

Benedict, P., 1981, *Rouen during the Wars of Religion*. Cambridge University Press, Cambridge.

Berg, T. and Berg, P., 2001, *R R Angerstein's Illustrated Travel Diary 1753 - 1755. Industry in England and Wales from a Swedish Perspective*. Science Museum, London.

Boas Hall. M., 1958, *Robert Boyle and Seventeenth-Century Chemistry*. Cambridge University Press, Cambridge.

Bonney, M., 1990, *Lordship and the urban community, Durham and its overlords 1250 - 1540*. Cambridge University Press, Cambridge.

Bowden, J.P., 1962, *The Wool Trade in Tudor and Stuart England*. Macmillan & Co Ltd., London.

Bridbury, A.R., 1982, *Medieval English Clothmaking. An Economic Survey*. Heinemann Educational Books Ltd., London.

Briggs, N. and Withers, P., 2000, *Lead Weights. The David Rogers Collection*. White House Publications & Galata Print Ltd., Powys.

Britnell, R.H., (ed.) 2008, *Records of the Borough of Crossgate, Durham, 1312 - 1531*, Surtees Society, 212. Boydell Press, Woodbridge.

Brown, J.W., 2010, *Lead production on the northeast periphery: A study of the Bowes family estate, c.1550-1771*. Doctoral Thesis, Durham University. Available [Online] at Durham E-Theses: <http://etheses.dur.ac.uk/558/> [first accessed 18 December 2015].

Bruce, J., (ed.) 1858, 'Charles I – volume 39: November 1-17, 1626', in *Calendar of State Papers Domestic: Charles I, 1625-26*, (London, 1858), <http://www.british-history.ac.uk/cal-state-papers/domestic/chas1/1625-6/pp467-477> [first accessed 4 January 2016].

Burch, M; Treveil, P; Keene, D., 2011, *The Development of Early Medieval and Later Poultry and Cheapside. Excavations at 1 Poultry and Vicinity, City of London*. Museum of London Archaeology, Monograph 38. Henry King Ltd., London.

Burnham, D. K., 1981, *Warp and Weft Terminology*. Routledge & Kegan Paul Ltd., London

Butler, D.J., 1997, *Durham 1849*. Durham Local History Society. ProntaPrint, Durham.

Calderdale History 2016, Available [online] at: <https://www.calderdale.gov.uk/wtw/index.html> [first accessed 29 March 2016].

Camsell, M., 1985, *The Development of a Northern Town in the Later Middle Ages, c.1250 - 1540*. Vol. I. Available [online] at: <http://ethos.bl.uk/SingleOrder.do?orderNumber=THESIS00782078> (first accessed 1 December 2013).

Camsell, M., 1985, *The Development of a Northern Town in the Later Middle Ages, c.1250 - 1540*. Vol. II. Available [Online] at: <http://ethos.bl.uk/SingleOrder.do?orderNumber=THESIS00755736> (first accessed 1 December 2013).

Camsell, M., 1985. *The Development of a Northern Town in the Later Middle Ages, c.1250 - 1540*. Vol. III. Available [online] at: <http://ethos.bl.uk/SingleOrder.do?orderNumber=THESIS00609034> (first accessed 1 December 2013).

Caple, C., 2005, 'The Wound Wire Headed Pins', in C. Woodford, *The Church of Our Lady of Mount Carmel and some conventional buildings at the Whitefriars, Coventry*, BAR (British Series) 389, British Archaeology Reports, Oxford. 359-360.

Caple, C., 2006, *Object: Reluctant Witnesses to the Past*. Routledge, Oxford.

Carr, C.T., 1905, *The General Principles of the Law of the Corporations (Being the Yorke Prize Essay for the Year 1902)*. Cambridge University Press. Cambridge.

Carver, M.O.H., 1974, 'Excavations in New Elvet, Durham City 1961 - 1973'. *Archaeologia Aeliana*. Fifth Series, II. 91-148.

Carver, M.O.H., 1979, 'Three Saxo-Norman Tenements in Durham City'. *Medieval Archaeology* 23. 36-74.

Cramp, R.J., 1984, *The Corpus of Anglo-Saxon Stone Sculpture Vol.1: County Durham and Northumberland*, Oxford, Oxford University Press for the British Academy.

Crossley D.W., 1990, *Post-Medieval Archaeology in Britain (The Archaeology of Medieval Britain)* Leicester University Press, Leicester.

Cheesman, B., 2001, 'The Gray Mayor's Tale: A footnote to Excavations in Claypath, Durham City, 1999'. *Durham County Local History Society Bulletin* 63. 5-35.

Cozens-Hardy, B. and Kent, E, A., (eds.) 1938, *The Mayors of Norwich 1430 to 1835*. Norwich.

Crossley, D., 1990, *Post-Medieval Archaeology in Britain*. Leicester University Press, Leicester.

Crowfoot, E; Pritchard, F; Staniland, E., 2001, *Medieval Finds from Excavations in London: 4. Textiles and Clothing c.1150 - c.1450*. Museum of London, The Boydell Press, Woodbridge.

Dobie, A.J., 2011, *Accounting, Management and Control at Durham Cathedral Priory c.1250 - c. 1420*. PhD thesis, Durham University. Available at Durham E-Theses online: <http://etheses.dur.ac.uk/609/> (first accessed 14 January 2014).

Dobie, A.J., 2015, *Accounting at Durham Cathedral Priory. Management and Control of a Major Ecclesiastical Corporation*. Palgrave Macmillan, Basingstoke.

Dobson, R.B., 1973, *Durham Priory 1400-1450*. Cambridge University Press, Cambridge.

Dobson, R.B., 2005, *Durham Priory 1400 -1450. Medieval Life and Thought*. Third Series, 6. Cambridge University Press, New York.

Drury, J.L., 1992, 'Medieval Smelting in County Durham: An Archivists point of view', in L. Willies and D. Cranstone (eds.) *Boles and Smeltmills, Report of a Seminar on the History and Archaeology of Lead Smelting* (Historical Metallurgy Society Ltd). 22-25.

Dufferwel, M., 1996, *Durham a Thousand Years of History and Legend*. Mainstream Publishing, London.

Edwards, N., 1982, *A reassessment of the early medieval stone crosses and related sculpture of Offaly, Kilkenny and Tipperary*. Doctoral thesis, Durham University.

Egan, G., 1987, Provenanced Lead Cloth Seals. Unpublished PhD thesis. University of London. Available [Online] at:
<http://discovery.ucl.ac.uk/1349956/1/488665.pdf> (first accessed 10 January 2013).

Egan, G., 1995, *Lead Cloth Seals and Related Items in the British Museum*. British Museum Occasional Paper 93, London.

Egan, G., 2001, 'Cloth Seals', in P. Saunders (ed.). *Salisbury & South Wiltshire Museum Medieval Catalogue*. Part 3. Salisbury and South Wiltshire Museum. Salisbury.

Egan, G., 2005, *Material Culture in an Age of Transition. Tudor and Stuart period finds c 1450- c 1700 from excavations at riverside sites in Southwark*. MoLAS Monograph 19, Museum of London Archaeological Services. Lavenham Press.

Egan, G., 2010, *The Medieval Household, Daily Living c.1150 – c. 1450. Medieval Finds from Excavations in London*. Museum of London, Boydell Press, Woodbridge. New Edition.

Egan, G., 2010, 'Medieval and Later Trade in Textiles Between Belgium and England. The Picture From Some Finds of Cloth Seals', in *Exchanging Medieval Material Culture*. Studies on Archaeology and History Presented to Frans Verhaeghe, Brussels. 55-66.

Egan, G. and Pritchard, F., 2010, *Dress Accessories 1150 - 1450 Medieval Finds from Excavations in London*. Museum of London. Boydell Press, Woodbridge. New Edition.

Emery, N., 2015, 'The Contribution of Archaeology', in Brown, D. (ed.) *Durham Cathedral: History, Fabric and Culture*, Yale University Press, New Haven and London. 159-166.

Emsley, K. and Fraser, C.M., 1984. *The Courts of the County Palatine of Durham from the earliest times to 1971*. Durham County Local History Society, Durham.

Endrei, W. and Egan, G., 1982, 'The Sealing of Cloth in Europe with Special Reference to the English Evidence', in *Textile History*, 13: I. 47-95.

Everson, V., 2001, *Parish Register Indexes etc. Apprenticeship Records held in the Durham records Office 1300 – 1900*. Vol. 617. Durham County Council, Durham.

Ewing, W., 1852, *Norfolk Archaeology or Miscellaneous Tracts relating to the Antiquities of the County of Norfolk*. Norfolk and Norwich Archaeological Society, Vol III. Charles Muskett, Old Haymarket, Norwich.

Feldman, R.A., 2005. *Recruitment, Training and Knowledge Transfer in the London Dyers Company, 1649-1826*. PhD thesis. The London School of Economics and Political Science.

Ferreira, E; Hulme, A; McNab, H; Quye, A., 2004, 'The Natural Constituents of Historical Textiles', *Chem. Soc. Rev.*, 33: 6. 329-336.

Fraser, C.M., 1967, 'The Pattern of Trade in the North-East of England, 1265 - 1350', *Northern History*, 4. 44-46.

Fraser, C.M., (ed.) 1981, *Northern Petitions. Illustrative of life in Berwick, Cumbria and Durham in the fourteenth century*. Surtees Society. 194. Northumberland Press Ltd., Gateshead.

Fraser, C.M., (ed.) 1991, *Durham Quarter Session Rolls 1471 - 1625*. The Surtees Society 199. Athenaeum Press Ltd, Newcastle-upon-Tyne.

Gilchrist, R., 2012, *Medieval Life. Archaeology and the Life Course*. Boydell Press, Woodbridge.

Good, I., 2001, 'Archaeological textiles: A Review of Current Research', in *Annual Review of Anthropology*, 30. 209-226. Available online at: <http://www.jstor.org/stable/3069215> [first accessed 1st July 2014].

Grant, J., 1850, *A Practical Treatise on the Law of Corporations in General, etc.* Butterworths, London.

Graves, C.P., 2000, *The Form and Fabric of Belief: An Archaeology of the Lay Experience of Religion in Medieval Norfolk and Devon*, BAR British Series 311.

Graves, C.P. and Heslop, D.H., 2013, *Newcastle upon Tyne 'The Eye of the North': An Archaeological Assessment*. Oxbow/English Heritage, Oxford.

Green, A., 2003, 'Houses in north-eastern England: regionality and the British beyond c.1600 - 1750', in S. Lawrence (ed.) *Archaeologies of the British: Explorations of Identity in Great Britain and its Colonies, 1600 - 1945*. Routledge, London. 55-76.

Greene, K. and Moore, T., 2010, *Archaeology an Introduction*. Fifth Edition. Routledge, London.

Groundwater, A., 2013, *The Scottish Middle March, 1573-1625: Power, Kinship, Allegiance* (Royal Historical Society Studies in History New Series), Woodbridge: Boydell.

Hamilton, P., 2007, *Haberdashery for use in Dress 1550 – 1800*. Published PhD thesis. University of Wolverhampton. Available [online] at: <http://ethos.bl.uk/OrderDetails.do?uin=uk.bl.ethos.443472> [first accessed 8 January 2013].

Han, J., 2016, *The Historical and Chemical Investigation of Dyes in High Status Chinese Costume and Textiles of the Ming and Qing Dynasties (1368-1911)*. PhD thesis University of Glasgow. Abstract available [online] at: <http://theses.gla.ac.uk/7181/> [first accessed May 2016].

Hanson, R. and Overall, W.H., 1878, *Analytical Index to the Series of Records Known as Remembrancia. Preserved Among the Archives of the City of London A.D. 1579 - 1664*. E.J. Francis & Co., London.

Harland, J., 1865, *Remains Historical & Literary Connected with the Palatine Counties of Lancaster and Chester*. Published by the Chetham Society, Vol. LXV.

Harte, N.B. and Ponting, K.G., (eds.) 1973, 'The Rise of Protection of the English Linen Trade 1690-1790', in *Textile History and Economic History Essays in Honour of Miss Julia de Lucy Mann*. Manchester University Press, Manchester. 74-113.

Hawes, T., 1989, *Index to Norwich City Officers 1453-1835*. Norfolk Records Society, Norwich.

Headlam, A.W., 1891, *The parish registers of St. Oswald's, Durham, containing the baptisms, marriages and burials, from 1538 to 1751*. Thomas Caldcleugh Printer, Durham.

Heaton, H., 1920, *The Yorkshire Woollen and Worsted Industries*, in *Oxford Historical and Literary Studies*. Vol. 10. Clarendon Press, Oxford.

Heaton, H., 1965, *The Yorkshire Woollen and Worsted Industries from the Earliest Times up to the Industrial Revolution*. Clarendon Press, Oxford.

Heley, G., 2009, *The material Culture of the Tradesmen of Newcastle-upon-Tyne 1545 - 1642. The Durham Probate Record Evidence*. BAR British Series 497. Archaeopress, Oxford.

Hinds A.B. and Bird W.H.B., 1908, *Calendar of the Close Rolls preserved in the public Records Office. Prepared under Superintendence of the Deputy Keeper of the Records. Edward III Vol. X. A.D. 1354 - 1360*. Mackie and Co Ltd., London.

Hittinger, D., 2007, *Tuchplomben: Trademark of the late Middle Ages and the Modern Era of the North German Coast*. Published Dissertation, University of Bamberg, Germany.

Hodgkin, J.E., 1902, *Rariora* 1. London.

Hodgson, J.C., (ed.) 1906, *Wills and Inventories from the Registry at Durham*. Part III. Surtees Society, 112. Andrews and Co., Durham.

Hodgson, C., (ed.) 1918, *Northumbrian Documents of the Seventeenth and Eighteenth Centuries, comprising the Register of the Estates of Roman Catholics in Northumberland, and the Correspondence of Miles Stapylton*. Surtees Society 131. Andrews & Co., Durham.

Hofenk de Graaff, J.H., 2004, *The Colourful Past. Origins, Chemistry and Identification of Natural Dyestuffs*. Archetype Publications Ltd., London.

Hudson, W. and Cottingham Tingey, J., 1910, *The Records of the City of Norwich*. Volume II. Jarrold and Sons, Norwich and London.

Hume, I.N., 1970, *A Guide to Artifacts of Colonial America*. Knopf, New York.

Huntley, J.P. and Stallibrass, S., 1995, *Plant and Vertebrae Remains from Archaeological Sites in Northern England: Data Reviews and Future Directions*. Architectural and Archaeological Society of Durham and Northumberland Research Report 4. Durham.

Hurry, J.B., 1930, *The Woad Plant and its Dye*. Oxford University Press, Humphrey Milford, London.

Jackson, C.A., 1993, *The Berkshire Woollen Industry 1500 – 1650*. Published PhD. University of Reading. Available [online] at:
<http://ethos.bl.uk/OrderDetails.do?uin=uk.bl.ethos.357014>
[first accessed 7 March 2014].

Jackson, C.A., 2008, 'Boom-time freak or heroic industrial pioneer? Clothing entrepreneurs in sixteenth and early seventeenth century Berkshire'. *Textile History*, 39: 2. 145-171. Available [online] at:
<http://economics.ouls.ox.ac.uk/13185/1/TEX39%202-01.pdf>
[first accessed 8 January 2013].

James, J., 1968, *History of the Worsted Manufacture in England*. Cass Library of Industrial Classics No.9. Frank Cass and Company Ltd., London.

Jolliffe, J.E.A., 1967, *The Constitutional History of Medieval England. From the Settlement to 1485*. Adam and Charles Black, London.

Jurkowski, M; Smith, C.L; Crook, D., 1998, *Lay Taxes in England and Wales 1188 - 1688*. Public Records Office Handbook 31, PRO Publications, Surrey.

Karadag, R; Yurdun, T; Dolen, E., 2010, 'Identification of Natural Red Dyes in 15-17th Centuries Ottoman Silk Textiles (Kaftans, Brocades, Velvets and Skullcaps) by HPLC with Diode Array Detection', *Asian Journal of Chemistry*. 22: 9. 7043-7056.

Kellenbenz, H., 1983, 'The fustian industry of the Ulm region in the fifteenth and early sixteenth centuries', in N.B. Harte and K.G. Ponting, (eds.), *Cloth and Clothing in Medieval Europe*. (Pasold Studies in Textile History 2). Heinemann Educational Books, London. 261-262.

Kerridge, E., 1985, *Textile Manufactures in Early Modern England*. Manchester University Press, Manchester.

Lachance, G.R. and Claisse, F., 1995, *Quantitative X-Ray Fluorescence Analysis: Theory and Application*. John Wiley & Sons Ltd., Chichester.

Law, E., 1988, *Huddersfield and District History. 18th Century Regulations of the Narrow Woollen Cloth Trade*. Available online at: <http://homepage.eircom.net/~lawedd/WOOLLEN.htm> [first accessed 10 August 2015].

Lewis, M., (ed.) 2012, *The Portable Antiquities Scheme Annual Report 2012*. The British Museum. Published by the Department of Britain, Europe and Prehistory, The British Museum, London.

Lewis, M., 2012, 'Report of the Portable Antiquities Scheme 2010', in *Post-Medieval Archaeology* 46. 1. Routledge, London. 211-227.

Ling Huang, A., 2015, 'Hanseatic Textile Production in 15th Century Long Distance Trade', in A. Ling Huang and C. Jahnke (eds.) *Textiles and the Medieval Economy, Production, Trade and Consumption of Textiles, 8th-16th Centuries*. Oxbow Books, Oxford. 214-215.

Litten, J., 2002, *The English Way of Death: The Common Funeral Since 1450*. Robert Hale, London.

Lucchetti, N. and Straube, B., 1999, '1998 Interim Report on the APVA Excavations at Jamestown, Virginia', *The Association for the Preservation of Virginia Antiquities*, 204. 19-22.

Maarleveld, T.J. and Overmeer, A., 2012, 'Aanloop Molengat – Maritime archaeology and intermediate trade during the Thirty Years' War'. *Journal of Archaeology in the Low Countries*, 4: 1. 127-129.

Mantler, M. and Schreiner, M., 2000, 'X-Ray Fluorescence Spectrometry in Art and Archaeology', *X-Ray Spectrometry*, 29. 3-17.

Mayes, W.M; Jarvis, A.P; Younger, P.L., 2005, 'Assessing the importance of diffuse mine water pollution: a case study from County Durham, UK'. 9th *International Mine Water Congress*. 497-505.

Millican, P., (ed.) 1942, *Minutes of the Norwich Court of Mayoralty 1630 - 1631* Norfolk Record Society Volume XV. Wyman and Sons Ltd., London.

Moens, W.J.P., 1887, *The Walloons and their Church at Norwich 1565 - 1832*. Huguenot Society Publication, Lymington.

Mordovin, M., 2014, 'Late Medieval and Early Modern Cloth seals in the Collection of the Hungarian National Museum', *Archaeologiai Értesítő* 139. 193-237.

Morimoto. N., 1983, 'The Demands and Purchases of Furs and Cloths of Durham Cathedral Priory from 1424 to 1450', *The Nagoya Gakuin University Review* 20: 1. 23-92.

Morrison, A., 1981, *Alum, North Yorkshire's fascinating story of the first chemical industry*. University of Aston, Birmingham.

Mortimer, T., 1765, *A New History of England from the Earliest Accounts of Britain to the Ratification of the Peace of Versailles, 1763*. J. Wilson and J. Fell, London.

Munro, J., 1994, *Textiles, Towns, and Trade; Essays in the Economic History of Late-Medieval England and the Low Countries*. Variorum Collected Studies Series CS 442. Aldershot.

Munro, J., 1999, 'The Symbiosis of Towns and Textiles: Urban Institutions and the Changing Fortunes of Cloth Manufacturing in the Low Countries and England, 1280 – 1570', *The Journal of Early Modern History*. 1-74.

Newbury, D.E. and Ritchie, N.W.M., 2013, 'Elemental Mapping of Microstructures by Scanning Electron Microscope-Energy Dispersive X-Ray Spectrometry (SEM-EDS): Extraordinary Advances with Silicon Drift Detector (SDD)', *Journal of Analytical Atomic Spectrometry* 28. 973-988.

Newman, R. and McNeil R., 2007, 'The Post Medieval Period Research Agenda', An Archaeology Research Framework for North West England Vol. 2 Research Agenda and Strategy. Archaeology North West Vol. 9/19.

Nowik W., 2001, 'The possibility of differentiation and identification of red and blue "soluble" dyewoods: determination of species used in dyeing and chemistry of their dyestuffs', in J. Kirby (ed.) *Dyes in history and archaeology* 16/17, Archetype, London. 129-144.

O'Connor S. and Brooks, M.M., (eds.) 2007, *X-Radiography of Textiles, Dress and Related Objects*. Butterworth-Heinemann, London.

Orduna, J.R., 1995, *Middelalderlige klædeplomber: blyplomber fra klæde importeret til Danmark indtil 1600*. University of Aarhus, Denmark.

Ornsby, G., 1846, *Sketches of Durham: being an attempt to indicate to the stranger some of the most prominent objects of interest in that place and neighbourhood; illustrated by historical, biographical, and architectural notices*. G. Andrews, Durham.

Ornsby, G., (ed.) 1872, *The Correspondence of John Cosin, D.D., Lord Bishop of Durham; Together With Other Papers Illustrative of His Life and Times*. Surtees Society. G. Andrews, Durham.

Ottaway, P.J. and Rogers, N.S.H., 2002, *Craft, Industry and Everyday Life: finds from Medieval York*. The Archaeology of York. The Small finds 17/15. Council for British Archaeology, York.

Overall, W.H. and Overall, H.C., (eds.) 1878, *Analytical Index to the Series of Records Known as the Remembrancia. Preserved Amongst the Archives of The City of London A.D.1579 - 1664*. Francis & Co., London.

Pantin. W.A., 1962, 'Medieval English Town-House Plans', in *Medieval Archaeology* 6. 207-239.

Parsons, W. and White. W. 1827, *History, Directory, and Gazetteer, of the Counties of Durham and Northumberland and the Towns and Counties of Newcastle-upon-Tyne*. Vol. I. Edward Baines, Leeds.

Perring, D., 2002, *Town and Country in England: frameworks for archaeological research*. CBA Research Report 134. Council for British Archaeology, York.

Pim, H.B., 1909, 'Proceedings at meetings (7th April 1909)', in *The Archaeological Journal*, 66. 103-409.

Ponting, K.G., 1971, *The Woollen Industry of South West England*. Adams and Dart, Bath.

Postgate, J, R., 1979, *The Sulphate-Reducing Bacteria*. University Press, Cambridge.

Pritchard, F., 1990, *Missing Threads from Medieval Textiles in North West Europe. Archaeological Textiles*. Occasional Paper Number 10. G.W. Belton Ltd., London.

Raine, J., (ed.) 1835, *Wills and Inventories Illustrative of the History, Manners, Language, Statistics, &c., of the Northern Counties of England, from the Eleventh Century Downwards*. Part I. Surtees Society, 2. J. B. Nichols and Co., London.

Raine, J., (ed.) 1837, *Charters of Endowment, Inventories and Account Rolls of the Priory of Finchale*. Surtees Society, 6. J. B. Nichols and Co., London.

Raine, J; Greenwell, W.; Hodgson, J.C.; Wood, H.M., (eds.) 1860, *Wills and Inventories Illustrative of the History, Manners, Language etc., of the Northern Counties of England, from the Eleventh Century Onwards*. Part II, Surtees Society 38. J.B. Nichols and Co., London.

Ramsay, G.D., 1942, 'The Report of the Royal Commission on the Clothing Industry, 1640', in *English Historical Review*, LVII. 482-493.

Rawcliffe, C; Wilson, R; Clark, C., (eds.) 2004, *Norwich Since 1550*. Hambledon Continuum, London.

Richards, J., 1835, 'Bankrupts (July 21, to August 18, 1835)', in *The Legal Observer or Journal of Jurisprudence*'. Volume X. Richards & Co., London. 368.

Richwood, D,L., 1970, *The Norwich Accounts For The Customs on Strangers' Good And Merchandise 1582 – 1610*. Norfolk Record Society. Cox & Wyman Ltd., London.

Roberts, J; Boyle, F; Frederick, W., 1895, *Extracts from the Records of the Merchant Adventurers of Newcastle-upon-Tyne*. Vol. 1. Andrews & Co., Durham.

Roberts, M., 2003, *Durham 1000 Years of History*. Tempus Publishing Ltd., Stroud.

Robinson, C. B., (ed.) 1857, *Rural Economy in Yorkshire in 1641, Being the Farming and Account Books of Henry Best, of Elmswell, in the East Riding of the County of York*. Surtees Society, XXXIII. Andrews & Co., Durham.

Robson, D., 1997, 'Animal Fibre Analysis Using Imaging Techniques. Part I: Scale Pattern Data', in *Textile Research Journal* 67: 10. 747-752.

Robson, D., 2000, 'Animal Fibre Analysis Using Imaging Techniques. Part II: Addition of Scale Height Data', *Textile Research Journal* 70: 2. 116-120.

Rodenburg, N.M., 2011, '*Seal and Deal*' Cloth Production and Trade between the Netherlands and Scania during the Late Middle Ages and Early Modern Times'.

Master Thesis Department of Archaeology and Antique History. Available [online] at:
<http://lup.lub.lu.se/luur/download?func=downloadFile&recordId=1968456&fileId=1974547> (first accessed 10 November 2015).

Rollason, D., 2015, 'The Anglo-Norman Priory and its Predecessor, 995-1189', in D. Brown (ed.) *Durham Cathedral: History, Fabric and Culture*. Yale University Press, New Haven and London. 27-39.

Royal Commission. 1851, *Great Exhibition of the Works of Industry of All Nations. Official Descriptive & Illustrative Catalogue*. Vol II. Spencer Brothers, London.

Ryder, F.P., 1985, *The Medieval Cross Grave Cover in County Durham*. Architectural and Archaeological Society of Durham and Northumberland Research Report No.1. Macdonald Press Ltd., Spennymoor.

Ryder, M.L., 1983, *Sheep and Man*. Duckworth and Co., London.

Ryder, M.L., 1984, 'Medieval sheep and wool types', *Agricultural History Review* 32. 14-28.

Satchell, J.E., 1989. 'The Bretherdale Wool Weight', *Transactions of the Cumberland & Westmorland Antiquarian and Archaeological Society*, 89. 131-140.

Saunders, P., (ed.) 2001, *Salisbury & South Wiltshire Museum Medieval Catalogue*. Part 3. Salisbury and South Wiltshire Museum, Salisbury.

Serrano, A; van Bommel, M.R; Hallett, J., 2013, *Evaluation between ultrahigh pressure liquid chromatography and high-performance liquid chromatography analytical methods for characterising natural dyestuffs*. *Journal of Chromatography A* 1318: 102-11.

Singer, C., 1948, *The Earliest Chemical Industry*. The Folio Society, London.

Skelton, R.A. and Harvey, P.D.A., (eds.) 1986, *Local Maps and Plans from Medieval England*. Clarendon Press, Oxford.

Spink., 2007, *Coins of England & The United Kingdom*. 42nd Edition Standard Catalogue of British Coins. Spink & Son Ltd., London.

Spufford, P., 2002, *Power and Profit: The Merchant in Medieval Europe*. Thames and Hudson, London.

Stamp, E., 1933, *Calendar of Fine Rolls Preserved in the Public Records Office*. Prepared under the Superintendence of the Deputy Keeper of the Records. XIII. Henry IV. A.D. 1405 - 1413. HMSO, London.

Standley, E.R., 2010, *Trinkets and Charms: The use, meaning and significance of later medieval and early post medieval dress accessories*. Volume I. Published PHD Thesis. Durham University. Available [Online] at: Durham. E-Theses Depository <http://etheses.dur.ac.uk/436/> (first accessed 4 January 2013).

Standley, E.R., 2013, *Trinkets and Charms. The use, meaning and significance of dress accessories 1300 - 1700*. Oxford University School of Archaeology, Oxford.

Surtees, R., 1840, *The history and antiquities of the County Palatine of Durham*, vol. 4. J.B. Nichols and Sons. London.

Surtees, R. and Simmons, J., (eds.) 1840, (Re-printed 1972). *The History and Antiquities of the County Palatine of Durham*. Vol. IV. E.P. Publishing Ltd., Durham.

Thirsk, J. and Cooper, J.P., (eds.) 1972, *Seventeenth-Century Economic Documents*. Clarendon Press, Oxford.

Threlfall-Holmes, M., 2005, *Monks and Markets. Durham Cathedral Priory 1460 - 1520*. Oxford University Press, Oxford.

Tillott, P.M., (ed.) 1961, 'The Later Middle Ages: Economy and Industrial Prosperity', in *The Victoria History of the County of York: The City of York*. Victoria County History. London. 84-91.

Torgan, B; Turan Taskopru, C.D; Yusuf Yildiz, E., 2015, 'Characterization of Dyestuffs and Metals from Selected 16–17th-Century Ottoman Silk Brocades by RP-HPLC-DAD and FESEM-EDX', in *Journal of Liquid Chromatography and Related Technologies* 38: 5. 591-599.

Van Bommel, M. and Joosten, C., 2012, *Textiel uit scheepswrak Aanloop Molengat*, Amsterdam/Amersfoort (internal report RCE).

Van Uytven, R., 1983, 'Cloth in Medieval Literature of Western Europe', in N.B. Harte and K.G. Ponting (eds.) *Cloth and Clothing in Medieval Europe*. (Pasold Studies in Textile History 2). Heinemann Educational Books, London. 151-183.

Vane, W.L., 1914, (re-printed 2004). *The Durham Light Infantry. The United Red and White Rose*. Andrews UK Ltd., Durham.

Vanden Berghe, I., 2012, *Finish Folk Textiles (18-20th c. AD) and Historical Finnish Textiles (11-17th c. AD). Organic colorant analyses*. IRPA/KIK, Royal Institute for Cultural Heritage, Belgium.

Wade, J.F., (ed.) 1995, *The Customs Accounts of Newcastle-upon-Tyne 1454 - 1500*. Athenaeum Press Ltd., Gateshead.

Walton, P., 1981, 'An Excavation in the Castle Ditch, Newcastle-upon-Tyne 1974-6 - The Textiles', in M. Ellison and B. Harbottle (eds.) *Archaeologia Aeliana*, Fifth Series, IX. 217- 231.

Walton, P., 1983, 'The excavations of a 17th -century Bastion in the Castle of Newcastle-upon-Tyne, 1976-81 - The Textiles', in M. Ellison and B. Harbottle (eds.) *Archaeologia Aeliana*. Fifth Series, XI. 190-228.

Walton, P., 1988, 'Dyes of the Viking Age: A Summary of Recent Work', in *Dyes in History and Archaeology* 7. 14-19.

Walton, P., 1990, 'Textiles in Northern Archaeology', in Pritchard, F and Wild, J. P. (eds.) NESAT III. *North European Symposium for Archaeological Textiles* Monograph 3. Archetype Publications, London. 215-226.

Watts, S.J., 1975, *From Border to Middle Shire: Northumberland, 1586-1625*. : Leicester University Press, Leicester.

Weatherill, L., 1996, *Consumer Behaviour and Material Culture in Britain 1660 - 1760*. 2nd Edition. Routledge, London.

Welford, J., 2010, *Functional Goods and Fancies: The Production and Consumption of Consumer Goods in Northumberland, Newcastle upon Tyne and Durham c. 1680-1780*. PhD Theses, Durham University. Available [Online] at Durham E-Theses Depository: <http://etheses.dur.ac.uk/327/> (first accessed 30 May 2016).

Whiting, C.E., 1941, 'The Durham trade guilds', parts I and II, *Transactions of the Architectural and Archaeological Society of Durham and Northumberland*, 9: 2, 143-262, and 9: 3. 265-416.

Wickes, S., 1884, *Sepulture. Its History, Methods and Sanitary Requisites*. P. Blakiston, Son & Co., Philadelphia.

Wild, J.P., 1970, *Textile Manufacture in the Northern Roman Provinces*, Cambridge.

Wildman, A.B., 1954, *The Microscopy of Animal Textile Fibre, Including Methods for the Complete Analysis of Fibre Blends*. Wool Industries Research Association, Leeds.

Wildman, A.B., 1961, 'The Identification of Animal Fibres', in *The Journal of the Forensic Science Society*, 1: 2. 115-119.

Wilson, R.G., 1971, *Gentlemen Merchants: the Merchant Community in Leeds, 1700 - 1830*. Manchester University Press, Manchester.

Wolff, P., 1983, Three Samples of English Fifteenth-Century Cloth. In N.B. Harte and K.G. Ponting (eds.), *Cloth and Clothing in Medieval Europe*. (Pasold Studies in Textile History 2). Heinemann Educational Books, London. 120-125.

Wrightson, K., 1994, 'Sorts of People in Tudor and Stuart England', in J. Barry and C. Brooks (eds.) *The Middling Sort of People: Culture, Society and Politics in England 1550-1800*. Macmillan Press, London. 28-51.

Personal Communication

Jones, J., (2013), Conversation with Gary Bankhead. 30 January.

Musset, P., (2014), Conversation with Gary Bankhead. 4 July.

Nix, M., (2014), Email correspondence with Gary Bankhead. 24 July 2014.

Kania, K., (2015), Conversation with Gary Bankhead. 28 April.

Lennard, F., (2015), Conversation with Gary Bankhead. 26 May.

Dyson, H., (2015), Conversation with Gary Bankhead. 5 June.

Caple, C., (2015), Conversation with Gary Bankhead. 20 September.

Walton Rogers, P., (2016), Email correspondence with Gary Bankhead. 8 January.

Caple, C., (2016), Conversation with Gary Bankhead. 10 June.

Graves, P., (2016), Conversation with Gary Bankhead. 1 August.

URLs

Dyers' image from British Library

<http://www.bl.uk/catalogues/illuminatedmanuscripts/ILLUMIN.ASP?Size=mid&IllID=54981>

Christophe Schwyter's map of Durham, 1595 Copyright © The British Library Board. Available [online] at:

<http://www.bl.uk/onlinegallery/onlineex/durham/placeface/durhcity/030map000002265u00006000.html> (first accessed 14 April 2013)

Fig. 6.1. North East England 1:50000 scale colour raster map accessed from <http://digimap.edina.ac.uk/roam/os> digitally edited using Adobe Photoshop software.

Fig 6.20. *Elvet Bridge* by Thomas Hearn. Image available online at:

http://www.britishmuseum.org/collectionimages/AN00260/AN00260131_001_l.jpg