ENGLISH SEIGNIORIAL AGRICULTURE,
1250–1450

Bruce Campbell's book is the first single-authored treatment of medieval English agriculture at a national scale. Methodologically innovative, it deals comprehensively with the cultivation carried out by or for lords on their demesne farms, the documentation for which is more detailed and abundant than for any other agricultural group either during the medieval period or later. A context is thereby assured for all future work on the medieval and early modern agrarian economies. The book also makes a substantive contribution to on-going historical debates about the dimensions, chronology, and causes of medieval expansion, crisis, and contraction. Topics dealt with include the scale and composition of seigniorial estates, the geography of land-use, pastoral husbandry, arable husbandry, land productivity, levels of commercialisation, and the size of the population in relation to the consumption of food at any given time.

Bruce M. S. Campbell is Professor of Medieval Economic History at The Queen's University of Belfast.
Cambridge University Press
0521304121 - English Seigniorial Agriculture, 1250-1450
Bruce M. S. Campbell
Frontmatter
More information

Cambridge Studies in Historical Geography 31

Series editors:
ALAN R. H. BAKER, RICHARD DENNIS, DERYCK HOLDSWORTH

Cambridge Studies in Historical Geography encourages exploration of the philosophies, methodologies and techniques of historical geography and publishes the results of new research within all branches of the subject. It endeavours to secure the marriage of traditional scholarship with innovative approaches to problems and to sources, aiming in this way to provide a focus for the discipline and to contribute towards its development. The series is an international forum for publication in historical geography which also promotes contact with workers in cognate disciplines.

For a full list of titles in the series, please see end of book.
ENGLISH SEIGNIORIAL AGRICULTURE,
1250–1450

BRUCE M. S. CAMPBELL
Professor of Medieval Economic History
The Queen's University of Belfast
For
Mary Campbell
and in remembrance of
Reginald Arthur Mortimer Campbell
who instilled in me their love of the English countryside
Contents

List of figures  page xiii
List of tables  xvi
Preface and acknowledgements  xix
Abbreviations  xxiv
Weights, measures, values, and boundaries  xxv

1 Introduction: agriculture and the late-medieval English economy  1
1.1 The seigniorial and non-seigniorial sectors  1
1.2 The changing economic context of agricultural production  3
1.3 Strategies for raising (and reducing) agricultural output  10
1.4 Risks, dilemmas, and debates  16

2 Sources, databases, and typologies  26
2.1 Sources  26
2.1.1 Manorial accounts  26
2.1.2 IPM extents  37
2.1.3 Other sources  40
2.2 Methods and databases  41
2.2.1 Approaches to the analysis of demesnes, estates, and regions  41
2.2.2 The databases  46

3 The scale and composition of the seigniorial sector  55
3.1 The seigniorial share of agricultural output and land-use  55
3.2 The scale and composition of estates  60
3.3 The scale and composition of demesnes  63
3.3.1 Aggregate value  63
3.3.2 Arable land-use  67
3.3.3 Pastoral land-uses  71
Contents

3.34 Arable versus pasturage 85
3.35 The relative unit values of grassland and arable 89
3.4 Demesne land-use combinations and their geography 94

4 Seigniorial pastoral production 102
4.1 Types of pastoral husbandry 103
4.2 Working animals 120
4.21 Draught-horses 123
4.22 Draught-oxen 131
4.23 Working animals in perspective 133
4.3 Non-working animals 134
4.31 Breeding replacement draught beasts 135
4.32 Cattle-based dairying 143
4.33 Sheep 151
4.34 Swine 165
4.35 Non-working animals in perspective 169
4.4 Animals versus crops 171
4.41 Stocking densities and farming systems 172
4.42 The relative contributions of crops and livestock to gross revenues 183

5 Seigniorial arable production 188
5.1 The objectives of production 189
5.11 Sustainability 189
5.12 Consumption 193
5.13 Exchange 203
5.2 The principal field crops and their attributes 213
5.21 Wheat 214
5.22 Rye 219
5.23 Winter mixtures 221
5.24 Barley 222
5.25 Oats 224
5.26 Spring mixtures 226
5.27 Grain-legume mixtures 227
5.28 Legumes 228
5.29 Winter-versus spring-sown crops 230
5.3 Trends in cropping, 1250–1449 231
5.31 The scale of cultivation 232
5.32 Bread grains 238
5.33 Brewing grains 243
5.34 Pottage and fodder crops 245
5.35 Net change 247
Contents

6 Crop specialisation and cropping systems 249
  6.1 Seigniorial cropping systems, 1250–1349 250
  6.11 Individual cropping systems 250
      6.12 The overall configuration of cropping systems pre-1350 273
  6.2 Seigniorial cropping systems, 1350–1449 275
  6.21 Individual cropping systems 276
      6.22 The overall configuration of cropping systems post-1349 301
  6.3 Crop specialisation and commercialisation 303

7 Arable productivity 306
  7.1 Productivity as an issue 306
  7.2 Crop yields 309
      7.21 Seeding rates 309
      7.22 Yields per seed 315
      7.23 Yields per unit area 326
  7.3 Unit land values 347
      7.31 Unit land values as recorded in the IPMs 350
      7.32 Grain prices and land values 355
      7.33 Production costs and the annual net value of land 356
  7.4 Temporal trends 364
      7.41 Harvest reliability 364
      7.42 Trends in unit land values 367
      7.43 Trends in yields of individual crops 370
      7.44 Trends in weighted aggregate grain yields 375

8 Grain output and population: a conundrum 386
  8.1 Total grain output 386
  8.2 Total kilocalorie output 396
  8.3 The total population capable of being fed 399
  8.4 Grain output, population, and GDP 406

9 Adapting to change: English seigniorial agriculture 1250–1450 411
  9.1 Agriculture before the Black Death: constraints versus incentives 411
      9.11 Supply-side constraints 414
      9.12 Demand-side incentives 424
  9.2 Agriculture after the Black Death: adapting to a major demand-side shock 430
  9.3 The medieval antecedents of English agricultural progress 436
Contents

Appendix 1 Demesne-level classification of husbandry types 441
Appendix 2 Demesnes represented in the Norfolk accounts database 453
Appendix 3 Demesnes represented in the FTC accounts databases 467

Consolidated bibliography 471
Index 497
Figures

1.01 Prices, wages, and real wages in England, 1208–1466 5
2.01 Chronology of surviving manorial accounts (demesnes under direct management only): Norfolk, 1230–1450 32
2.02 Chronology of IPM survival: England, 1300–49, and fifteen eastern counties, 1270–1349 38
2.03 Density of IPM coverage: England, 1300–49 48
2.04 Distribution of all accounts used, 1250–1349: England, Norfolk, FTC counties 52
2.05 Distribution of all accounts used, 1350–1449: England, Norfolk, FTC counties 53
3.01 Value of demesne land per lay estate: England, 1300–49 62
3.02 Value of land-use per demesne: England, 1300–49 63
3.03 Mean aggregate value of demesne land-use: England, 1300–49 64
3.04 Total acreage of arable per demesne: England, 1300–49 68
3.05 Mean arable acreage of demesnes: England, 1300–49 70
3.06 Ratio of arable acreage to meadow acreage: England, 1300–49 74
3.07 Ratio of meadow value to pasture value: England, 1300–49 77
3.08 IPMs recording heath and moor: England, 1300–49 81
3.09 IPMs recording marsh: England, 1300–49 83
3.10 IPMs recording herbage, pannage or pasture as a percentage of those recording woodland: England, 1300–49 84
3.11 Value of arable as a percentage of the combined value of arable and pasturage: England, 1300–49 87
3.12 Ratio of the unit value of grassland to the unit value of arable: England, 1300–49 91
3.13 Ratio of the unit value of meadow to the unit value of pasture/herbage: England, 1300–49 92
3.14 National classification of demesne land-use, 1300–49 98
4.01 Demesnes practising pastoral type 1, 1250–1349 109
4.02 Demesnes practising pastoral type 1, 1350–1449 110
List of figures

4.03 Demesnes practising pastoral type 2, 1250–1349
4.04 Demesnes practising pastoral type 3, 1250–1349
4.05 Demesnes practising pastoral type 3, 1350–1449
4.06 Demesnes practising pastoral type 4, 1250–1349
4.07 Demesnes practising pastoral type 4, 1350–1449
4.08 Demesnes practising pastoral type 5, 1250–1349
4.09 Demesnes practising pastoral type 5, 1350–1449
4.10 Demesnes practising pastoral type 6, 1250–1349
4.11 Demesnes practising pastoral type 6, 1350–1449
4.12 Types of horsepower employed on demesnes: England, 1250–1449
4.13 Adoption of horsepower on Norfolk demesnes, 1250–1449
4.14 Plough-teams and plough-types in Norfolk, 1250–1449
4.15 Unit value of meadowland: England south of the Trent, 1300–49
5.01 Levels of arable commercialisation within the FTC counties, 1288–1315
5.02 Levels of arable commercialisation within the FTC counties, 1375–1400
5.03 Total sown acreage on the estate of Norwich Cathedral Priory, 1260–1440
6.01 Demesnes practising cropping type 1, 1250–1349
6.02 Demesnes practising cropping type 2, 1250–1349
6.03 Demesnes practising cropping type 3, 1250–1349
6.04 Demesnes practising cropping type 4, 1250–1349
6.05 Demesnes practising cropping type 5, 1250–1349
6.06 Demesnes practising cropping type 6, 1250–1349
6.07 Demesnes practising cropping type 7, 1250–1349
6.08 Key to crop rotation diagrams
6.09 Rotation of crops on 405 acres at Redgrave, Suffolk, 1338–51
6.10 Rotation of crops on 250 acres at Rickinghall, Suffolk, 1334–46
6.11 Rotation of crops on 117½ acres at Bircham, Norfolk, 1341–9
6.12 Rotation of crops on 171 acres at Little Ellingham, Norfolk, 1342–5
6.13 Demesnes practising cropping type 1, 1350–1449
6.14 Demesnes practising cropping type 2, 1350–1449
6.15 Demesnes practising cropping type 3, 1350–1449
6.16 Demesnes practising cropping type 4, 1350–1449
6.17 Demesnes practising cropping type 5, 1350–1449
6.18 Demesnes practising cropping type 8, 1350–1449
6.19 Rotation of crops on 152 acres at Thorpe Abbotts, Norfolk, 1356–63

111 112 113 114 115 116 117 118 119 128 130 132 147 211 212 235 253 254 255 256 257 258 259 264 265 266 269 272 278 279 280 281 282 283 287
List of figures

6.20 Cultivation of winter-sown grains on Norfolk demesnes, 1250–1449 293
6.21 Cultivation of spring-sown grains on Norfolk demesnes, 1250–1449 294
6.22 Cultivation of legumes on Norfolk demesnes, 1250–1449 295
6.23 Rotation of crops on 395 acres at Brandon, Suffolk, 1366–75 296
6.24 Rotation of crops on 303 acres at Felbrigg, Norfolk, 1400–8 297
6.25 Rotation of crops on 193 acres at Langham, Norfolk, 1364–9 298
6.26 Rotation of crops on 94½ acres at Keswick, Norfolk, 1370–7 299
6.27 Rotation of crops on 14 acres at Reedham, Norfolk, 1377–85 300
7.01 Seeding rates of individual grains: Norfolk, 1250–1449 314
7.02 Composite seeding rates: the FTC counties, 1288–1315 315
7.03 Composite seeding rates: the FTC counties, 1375–1400 316
7.04 Gross yields per seed of individual grains: Norfolk, 1250–1449 327
7.05 Net yields per acre of individual grains: Norfolk, 1250–1449 328
7.06 Cultivation, seeding rates, and yields of legumes: Norfolk, 1250–1449 329
7.07 Yield variability of individual grains: Norfolk, 1250–1449 330
7.08 Composite measures of grain productivity: Norfolk, 1250–1449 331
7.09 Weighted aggregate grain yields: Norfolk, 1250–1449 339
7.10 Weighted aggregate grain yields: FTC counties, 1288–1315 340
7.11 Weighted aggregate grain yields: FTC counties, 1375–1400 341
7.12 High and low unit valuations of arable: England south of the Trent, 1300–49 349
7.13 Mean unit value of arable: England south of the Trent, 1300–49 351
7.14 Trends in the mean unit value of demesne arable: fifteen eastern counties, 1270–1349 368
7.15 Weighted aggregate grain yields in Norfolk, pre- and post-1350 377
9.01 Unit value of agricultural land: England south of the Trent, 1300–49 413
A2.01 Distribution of Norfolk demesnes utilised in the analysis 466
<table>
<thead>
<tr>
<th>Table</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.01</td>
<td>Geographical coverage of principal databases, 1250–1349 and 1350–1449</td>
<td>34</td>
</tr>
<tr>
<td>2.02</td>
<td>Principal agricultural and land-use typologies and their derivation</td>
<td>45</td>
</tr>
<tr>
<td>3.01</td>
<td>Mean land-use composition of lay demesnes: England, 1300–49</td>
<td>66</td>
</tr>
<tr>
<td>3.02</td>
<td>Size distribution of arable demesnes: England, Norfolk, and FTC counties, pre- and post-1350</td>
<td>69</td>
</tr>
<tr>
<td>3.03</td>
<td>Composition of pasturage on lay demesnes: England, 1300–49</td>
<td>72</td>
</tr>
<tr>
<td>3.04</td>
<td>Component variables used for the classification of demesne land-use</td>
<td>95</td>
</tr>
<tr>
<td>3.05</td>
<td>Core demesne land-use types, 1300–49: variable means and standard deviations</td>
<td>97</td>
</tr>
<tr>
<td>4.01</td>
<td>National classification of pastoral-husbandry types, 1250–1349 and 1350–1449</td>
<td>107</td>
</tr>
<tr>
<td>4.02</td>
<td>Pastoral trends within the working sector: England, Norfolk, and the FTC counties, 1250–1449</td>
<td>124</td>
</tr>
<tr>
<td>4.03</td>
<td>Pastoral trends within the non-working sector: England, Norfolk, and the FTC counties, 1250–1449</td>
<td>136</td>
</tr>
<tr>
<td>4.04</td>
<td>Sources of replacement horses and oxen on demesnes in the FTC counties, 1288–1315 and 1375–1400</td>
<td>138</td>
</tr>
<tr>
<td>4.05</td>
<td>Composition of livestock gains on demesnes in the FTC counties, 1288–1315 and 1375–1400</td>
<td>152</td>
</tr>
<tr>
<td>4.06</td>
<td>Composition of livestock losses on demesnes in the FTC counties, 1288–1315 and 1375–1400</td>
<td>153</td>
</tr>
<tr>
<td>4.07</td>
<td>Trends in mean stocking densities: England, Norfolk, and the FTC counties, 1250–1449</td>
<td>174</td>
</tr>
<tr>
<td>4.08</td>
<td>Mixed-farming systems and stocking densities, 1250–1349 and 1350–1449</td>
<td>178</td>
</tr>
<tr>
<td>4.09</td>
<td>Stocking density and grain acreage on demesnes in the FTC counties, 1288–1315 and 1375–1400</td>
<td>181</td>
</tr>
</tbody>
</table>
List of tables  xvii

4.10 Relative contributions of crops and animals to estimated gross revenues from sales and transfers within the FTC counties, 1288–1315 and 1375–1400  184

5.01 Aggregate disposal of crops in monetary value by lord and ownership type within the FTC counties, 1288–1315  194

5.02 Aggregate disposal of crops in monetary value by lord and ownership type within the FTC counties, 1375–1400  196

5.03 Alternative measures of commercialisation in crop production on manors in the FTC counties, 1288–1315 and 1375–1400  206

5.04 Absolute and relative weight, food value, extraction rate, price, and cartage costs of the principal field crops, c. 1300  215

5.05 Disposal of aggregate net crop receipts within the FTC counties, 1288–1315 and 1375–1400  216

5.06 Trends in the mean sown acreage of demesnes in hand: England, Norfolk, and the FTC counties, 1250–1449  237

5.07 Trends in crop prices relative to wheat: England, Norfolk, and the FTC counties, 1250–1449  239

5.08 Trends in seigniorial crop production: England, Norfolk, and the FTC counties, 1250–1449  240

6.01 National classification of cropping types, 1250–1349  250

6.02 National classification of cropping types, 1350–1449  277

6.03 Proportions sold and rates of sale by cropping type within the FTC counties, 1288–1315 and 1375–1400  304

7.01 Definitions of agricultural area, land productivity, and the rate of yield  307

7.02 Individual and composite seeding rates: Norfolk and the FTC counties, pre- and post-1350  312

7.03 Frequency distribution of mean gross yields per seed by crop: Norfolk and the FTC counties, pre- and post-1350  318

7.04 Frequency distribution of gross yields per seed and per acre on the estate of the bishopric of Winchester, 1209–1349  320

7.05 Weighted aggregate grain yield per seed in wheat equivalents: Norfolk, the FTC counties, and the estate of the bishopric of Winchester  323

7.06 Frequency distribution of mean yields per acre: Norfolk and the FTC counties, pre- and post-1350  332

7.07 Weighted aggregate grain yield per acre in wheat equivalents: Norfolk, the FTC counties, and the estate of the bishopric of Winchester  335

7.08 Alternative measures of arable productivity on six demesnes, c. 1300–49  342

7.09 Frequency distribution of mean value per acre of arable: England south of the Trent, 1300–49  348
List of tables

7.10 Weighted aggregate coefficient of variation: Norfolk, 1250–1449 366
7.11 Frequency distribution of weighted aggregate coefficient of variation: Norfolk, 1250–1449 367
7.12 Trends in mean gross yields per seed on the estates of the bishopric of Winchester and abbey of Westminster, 1225–1453 371
7.13 Indexed seeding rates, gross yields per seed, gross yields per acre, and gross weighted aggregate grain yields: Norfolk, c. 1250–1854 374
7.14 Changes in arable productivity on five demesnes of Norwich Cathedral Priory between 1300–24 and 1400–24 378
7.15 Indexed trends in mean net weighted aggregate grain yields per seed and per acre on the bishopric of Winchester’s demesne of Rimpton in Somerset, 1209–1403 383
8.01 Estimated arable acreage of England in 1086 389
8.02 Estimated national grain output and the population it was capable of feeding, c. 1300 392
8.03 Estimated national grain output and the population it was capable of feeding, c. 1375 394
8.04 Alternative estimates of national grain output and the population it was capable of feeding in 1086 397
8.05 Estimates of population and grain supply: England, 1086–1871 400
8.06 Alternative population estimates of medieval England 403
8.07 Alternative estimates of population, GDP, and net grain output as a percentage of GDP for 1086 and c. 1300 407
9.01 Classification of agricultural land by unit value: England south of the Trent, 1300–49 412
Preface and acknowledgements

This is not the book that I originally set out to write; had it been so it would have been completed far sooner. Instead, it is the book to which I have been led by a fortuitous succession of research projects; for research, once begun, has a habit of assuming a momentum of its own. Rather than charting a straight and direct course to a predetermined destination it has been a case of seizing opportunities and following where they lead. My original agenda and techniques have also been overtaken by a fast-changing historiography and the advent of increasingly powerful personal and lap-top computers and menu-driven software which have transformed the potential for data collection and analysis. Evolving an appropriate methodology, including robust methods of classification, has also been a matter of trial and error. With hindsight I can see how more data could have been collected more systematically and analysed and classified more rigorously. Nevertheless, I have resisted the temptation to act like Penelope at her loom. Instead, I offer what I have done, uneven though it is, in the hope that others will improve upon and extend it: there are many unexplored and unresolved issues and the wealth of under-utilised and unexamined archives is great.

My original aim was to write a book about seigniorial agriculture in medieval Norfolk but set in a broader regional and national perspective. The Norfolk accounts database (Appendix 2) was therefore the first to be constructed of the core databases upon which this book is based. Work on it was ongoing throughout the 1970s and early 1980s, aided by periods of study leave and successive grants from the Research and Scholarships Fund of The Queen’s University of Belfast. In 1983–4 the tenure of a Personal Research Fellowship awarded by the then Social Science Research Council enabled the Norfolk accounts database to be completed and also made possible a preliminary investigation of the inquisitiones post mortem (IPMs) at national level. At that time these two databases were intended to form the substance of this book. Then, in 1987, John Langdon, now Professor of History at the University of Alberta, generously put at my disposal the information on
xx Preface and Acknowledgements

crops and livestock which he had transcribed from a national sample of manorial accounts and which constitutes the core of the national accounts database (Appendix 1) which features so prominently in this book. It was from this point that the possibility of writing a book on seigniorial agriculture within England as a whole became a realistic proposition. Before this could be acted upon, however, an invitation from Dr Derek Keene to collaborate in an investigation of the provisioning of London c. 1300 proved too good to turn down, and the ‘Feeding the city (FTC) 1’ project – ‘London’s food supplies 1270–1339’ – was conceived.

‘Feeding the city 1’ built upon existing experience and knowledge, greatly broadened the range of analysis, and employed lap-top computers for the first time to input data in the archives. The project was funded by the Leverhulme Trust from September 1988 to August 1991, co-directed by Derek Keene, and based at the newly founded Centre for Metropolitan History at the Institute of Historical Research, London, where he was director. Its aim was to investigate the impact of London’s demand for food and other supplies on the agriculture and on the distribution systems of the metropolitan hinterland c. 1300, when the capital reached an early peak in its population and was one of the largest of European cities. To this end, the ‘Feeding the city 1’ accounts database was created, covering the years 1288–1315, together with a corresponding IPM database covering the years 1270–1339. This project, in turn, begot two others, with further repercussions for work on this book. A second grant from the Leverhulme Trust financed the creation of the national IPM database during the period August 1991 to December 1994, in conjunction with the project ‘The geography of seigniorial land-ownership and use, 1270–1349’, co-directed by Mr John Power, then Lecturer in Geography at The Queen’s University of Belfast, and based at QUB. Additional funding from Queen’s permitted analysis of the national IPM database to be completed over the period 1995–7. Meanwhile, a research grant from the Economic and Social Research Council (grant number R000233157) for the period October 1991 to July 1994 enabled the ‘Feeding the city 2’ accounts database to be created (Appendix 3) in conjunction with the ‘Feeding the city 2’ project (‘London and its hinterland c. 1300–1400’). Like ‘Feeding the city 1’, this project was based at the Centre for Metropolitan History, where it was co-directed by Dr Derek Keene, Dr James Galloway, and Dr Margaret Murphy. Its aim was to replicate and refine the approach and method of the earlier project with reference to the final years of the fourteenth century, by which time London and the region that supported it contained a much reduced population with a very different pattern of consumption.

The national IPM database and the two FTC accounts databases are of an exceptionally high quality and hence have added materially to the depth and scope of this book. I am grateful to the Leverhulme Trust, the ESRC, and The Queen’s University of Belfast for providing the funding that made creation
and analysis of these databases possible. My thanks are also due to the Rockefeller Foundation for hosting the research workshop ‘Agricultural productivity and economic change in the European past’ which Mark Overton, now Professor of Economic History at the University of Exeter, and I co-convened at their Bellagio Study Centre, Lake Como, Italy in March 1989. This proved formative for the work on seigniorial land productivity which constitutes Chapter 7 of this book. Publication, in colour, of Figure 3.14 was made possible by a grant from The Scouloudi Foundation in association with the Institute of Historical Research, University of London.

Constructing and analysing these substantial databases would not have been possible without the assistance and expertise of others. Jenitha Orr, then a research officer in the Department of Geography, QUB, helped analyse the Norfolk accounts database and thereby establish the approach followed in much subsequent work. John Power, at that time also a research officer in the Department of Geography, advised on the inputting of the national accounts data and analysed the completed database (to which Dr David Postles of the Department of English Local History in the University of Leicester and Martin Eccleston, an external MA student at the University of Bath, both contributed data). To John must go the credit for developing and refining the method of classifying land-use and farming systems using cluster analysis which is employed in Chapters 3, 4, and 6. He also developed the inputting systems used in the creation of the FTC1 and FTC2 accounts databases and the national IPM database, all of which were mechanised from the outset.

James Galloway and Margaret Murphy were responsible for creating both FTC accounts databases, tasks which they undertook with dedication and skill. Technical and administrative support at the Centre for Metropolitan History was provided by Owen Myhill. Richard Britnell, now Professor of Medieval History at the University of Durham, and Dr Harold Fox of the Department of English Local History at the University of Leicester, as advisers to both FTC projects, offered many useful insights. With Dr Robin Glasscock of the Department of Geography, University of Cambridge, Harold Fox discharged a similar function on the national IPM project. The formidable job of extracting data from 9,000 individual IPM extents was carried out with commendable care and cheerfulness by Dr Roger Dickinson and Marilyn Livingstone. Development and analysis of the IPM database, including its incorporation into a Geographical Information System (GIS) was undertaken by Ken Bartley, then research fellow in the Department of Economic and Social History, QUB. Such was the scale and complexity of this task (and some further work on the national accounts database) that it took four years to complete. This book would have been the poorer without that work, especially the many computer-generated national-scale maps that Ken was instrumental in creating. All the other maps were produced using a variety of technologies by Gill Alexander of the School of Geosciences, QUB, whose
Preface and Acknowledgements

Work was partially funded by a grant from the QUB Publications Fund. They were photographed by the Queen’s Photographic Unit and Moira Concannon of the Ulster Museum. Dr Paul Ell reworked the data upon which Figure 1.01 is based. Emma Touffler checked the format of the footnotes and created the consolidated bibliography.

For permission to consult manuscripts, and for help and advice from the staff concerned, I would like to thank the following public and private institutions and private owners: Bedfordshire Record Office; Berkshire Record Office; Buckinghamshire Record Office; Essex Record Office; Hampshire Record Office; Hertfordshire Record Office; Centre for Kentish Studies, Maidstone; Lancashire Record Office; Corporation of London Records Office; Greater London Record Office; Norfolk Record Office; North Yorkshire Record Office; Northamptonshire Record Office; Nottinghamshire Record Office; Oxfordshire Record Office; Public Record Office; Surrey Record Office; West Suffolk Record Office; Birmingham Reference Library; Bodleian Library, Oxford; British Library; Cambridge University Library; Canterbury Cathedral Archives; Guildhall Library, London; John Rylands Library, Manchester; Joseph Regenstein Library, University of Chicago; Lambeth Palace Library; National Register of Archives; Nottingham University Library; Westminster Abbey Muniments; Christ’s College, Cambridge; Eton College; King’s College, Cambridge; Magdalen College, Oxford; Merton College, Oxford; New College, Oxford; St George’s Chapel, Windsor; Winchester College; Elveden Hall, Suffolk (the Earl of Ivecagh); Holkham Hall, Norfolk (the Earl of Leicester); Raynham Hall, Norfolk (the Marquess Townshend); and Pomeroy & Sons, Wymondham. Thanks are due to those friends who have given hospitality on my many and various visits to archives and libraries. In particular, Christine Beaven was an ever-willing landlady in London, while Lyn, Tim, Joanna and Rebecca Atkinson treated me as a member of their family during my long stints in the Norfolk Record Office. While working in the latter office I was alerted to much that I might otherwise have missed by the then Deputty County Archivist, Paul Rutledge.

For permission to draw upon previously published materials, I am grateful to the British Agricultural History Society; the Economic History Association; the Economic History Society; Histoire et Mesure; the Historical Geography Research Group; the Institute of British Geographers; the Journal of Historical Geography; Manchester University Press; University of Pennsylvania Press; Medieval Institute, Western Michigan University; Past and Present; Transactions in GIS.

It was Jack Langton who, in 1972, by pressing a question at a Cambridge Occasional Discussion in Historical Geography, prompted me to switch my attention from court rolls to account rolls and thereby start on the quest that has eventually led to this book. Along the way many friends and scholars have helped shape and hone my thinking, including Professor Robert Allen,
Preface and acknowledgements

Dr Mark Bailey, Professor Mike Baillie, Professor Kathleen Biddick, Professor Ian Blanchard, Professor Richard Britnell, Dr Gregory Clark, Professor Chris Dyer, the late Professor David Farmer, Professor George Grantham, Professor Maryanne Kowaleski, Professor John Langdon, Paul Laxton, Nicholas Poulter, Dr Richard Smith, Dr Christopher Thornton, and Professor, Sir Tony Wrigley. Over many years, commencing with shared postgraduate days in Cambridge and long train journeys to Norwich, I have learnt much from arguing and collaborating with Mark Overton, who will recognise but not necessarily agree with much that is in this book. His work has been material to those sections which endeavour to place medieval seigniorial agriculture in a more securely documented chronological context. Derek Keene similarly helped focus and sharpen my thoughts about the scale and significance of medieval urban demand — especially that of the metropolis — for producers in the countryside. More generally, my thinking about the medieval English agrarian economy has been strongly influenced by the privilege of teaching post-medieval Irish economic history — where many of the same historical issues recur in a different guise — to generations of undergraduates at Queen’s.

My immediate family will be as relieved to see the publication of this book as I: their forbearance and encouragement have meant a lot. So, too, have the patience and faith of Dr Alan Baker who, as general editor of this series, has had to wait longer for this volume than any other but never doubted, or at least expressed doubts to me about, its eventual delivery. Vicky Cuthill, formerly history editor of CUP, gave much constructive advice and remained supportive even when it became clear that the finished text would be well over the originally contracted length. Marigold Acland, her successor at the Press, has been similarly positive. Mark Bailey and Richard Britnell read earlier versions of the text and made constructive suggestions on how it could be improved. Virginia Catmur copy-edited the text with care and tact. Above all, this book could never have been written without the secure and well-resourced base provided to me by The Queen’s University of Belfast. It is here that I have pursued and brought to fruition the research that I began almost thirty years ago when a postgraduate under Alan Baker’s supervision at the University of Cambridge.

BRUCE M. S. CAMPBELL

Michaelmas 1998
Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AHEW</td>
<td>The agrarian history of England and Wales</td>
</tr>
<tr>
<td>AHR</td>
<td>Agricultural History Review</td>
</tr>
<tr>
<td>BL</td>
<td>British Library, London</td>
</tr>
<tr>
<td>BLO</td>
<td>Bodleian Library Oxford</td>
</tr>
<tr>
<td>CCA</td>
<td>Canterbury Cathedral Archives</td>
</tr>
<tr>
<td>CUL</td>
<td>Cambridge University Library</td>
</tr>
<tr>
<td>ECHR</td>
<td>Economic History Review, 2nd series</td>
</tr>
<tr>
<td>EHR</td>
<td>English Historical Review</td>
</tr>
<tr>
<td>FTC</td>
<td>‘Feeding the city’</td>
</tr>
<tr>
<td>GDP</td>
<td>Gross Domestic Product</td>
</tr>
<tr>
<td>GIS</td>
<td>Geographical Information System</td>
</tr>
<tr>
<td>IPMs</td>
<td>Inquisitiones post mortem</td>
</tr>
<tr>
<td>JEH</td>
<td>Journal of Economic History</td>
</tr>
<tr>
<td>JHG</td>
<td>Journal of Historical Geography</td>
</tr>
<tr>
<td>JLL</td>
<td>J. L. Langdon</td>
</tr>
<tr>
<td>NA</td>
<td>Norfolk Archaeology</td>
</tr>
<tr>
<td>NRO</td>
<td>Norfolk Record Office, Norwich</td>
</tr>
<tr>
<td>PP</td>
<td>Past and Present</td>
</tr>
<tr>
<td>PRO</td>
<td>Public Record Office, London</td>
</tr>
<tr>
<td>RO</td>
<td>Record Office</td>
</tr>
<tr>
<td>TIBG</td>
<td>Transactions of the Institute of British Geographers</td>
</tr>
<tr>
<td>TRHS</td>
<td>Transactions of the Royal Historical Society</td>
</tr>
<tr>
<td>UL</td>
<td>University Library</td>
</tr>
<tr>
<td>WACY</td>
<td>Weighted aggregate crop yield</td>
</tr>
<tr>
<td>WAGY</td>
<td>Weighted aggregate grain yield</td>
</tr>
<tr>
<td>WAM</td>
<td>Westminster Abbey Muniments</td>
</tr>
<tr>
<td>WFCP</td>
<td>Wood, forest, chase, park</td>
</tr>
</tbody>
</table>
Weights, measures, values, and boundaries

The units used in this book are those that contemporaries used:

**Weight:**

English weights are based on the pound avoirdupois:

- 16 ounces (oz.) = 1 pound (lb.) = 0.4536 kilogram (kg)
- 2,240 lbs. = 1 ton = 1.016 tonne
- 14 lbs. = 1 stone = 6.3504 kg
- 16 stones = 1 wey = 101.6064 kg
- 10 weys = 1 ton = 1.016 tonnes

**Volume (dry):**

- 8 gallons = 1 bushel (bus.) = 35.238 litres (l)
- 8 bus. = 1 quarter (qtr.) = 2.819 hectolitres (hl)

**Area:**

- 40 perches (per.) = 1 rod = 0.1012 hectares (ha)
- 4 rods = 1 acre (ac.) = 0.4047 ha
- 640 acres = 1 square mile = 259 ha

**Volume by area (a measure of yield):**

- 1 bus. per ac. = 0.8707 hl per ha
- 1.1485 bus. per ac. = 1 hl per ha

**Length:**

- 3 feet = 1 yard = 0.9144 metres (m)
- 1,760 yards = 1 mile = 1.6093 kilometres (km)
Weights, measures, values, and boundaries

Value:
12 pence (d.) = 1 shilling (s.)
20 s. = 1 pound (£)

Boundaries:
All counties and their boundaries are as they existed before 1974.

Statute versus non-statute (customary) measures:
The medieval acre was of a variable size. Statute acres were measured with a perch of 16½ feet. Non-statute acres were measured with perches that could be 16, 18, 20, 22 or even 24 feet, yielding customary acres equivalent to 0.94, 1.19, 1.47, 1.78, and 2.12 statute acres. Perches in excess of 30 feet are also sometimes recorded. Large customary acres in excess of 1½ statute acres were most characteristic of Cornwall and parts of northern and north-western England.

The size of the bushel also varied, especially according to whether it was heaped or struck. With a modest amount of heaping, 8 heaped gallons would actually have amounted to 9 struck gallons and 8 heaped bushels to 9 struck bushels; a difference of 12.5 per cent.

Multiples:
Millions and billions are abbreviated to ‘m.’ and ‘b.’ A billion is 10¹².