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Forthcoming conferences

Farmers, consumers and innovators: the world of Joan Thirsk

This conference will be held at the University of Leicester
on Saturday 20 September 2014.

Tom Williamson, 'Revisiting "The Common Fields": settlement patterns and field systems in England, *c*.800–1250' • James Bowen, 'Early modern enclosure and agrarian communities in pastoral Shropshire' • Nicola Whyte, 'The common fields and social relations in early modern Norfolk' • Craig Muldrew, 'Were spinners an industrial workforce in the early modern countryside?' • Jon Stobart, 'The village shop, 1660–1760: innovation and tradition' • John Broad, John Chartres and David Hey: round table on 'Countries and regions in early modern England' • Susan North, 'Galloon, fringe, ribbon, incle and points: purchasing fashionable dress and accessories in rural England, 1550–1750' • Mark Dawson, 'Oatcakes: farming and diet in the north midlands' • Richard Hoyle, 'Peter Walkden and the world of goods: an early eighteenth-century Lancashire consumer'.

A booking form can be downloaded from the Society's Web site at www.bahs.org.uk or obtained from Chris Dyer, Centre for English Local History, University of Leicester, 5 Salisbury Road, Leicester LE1 7QR.

British Agricultural History Society
Winter Conference 2014 on
Rural worlds in motion: histories of migration and migrants

This conference will be held at the Senate House, University of London,
on Saturday 6 December 2014.

British Agricultural History Society
Spring Conference 2015

This conference will be held at the University of Bangor,
30 March – 1 April 2015.

Details of both the BAHS conferences will be circulated and made available on the Society's Web site at www.bahs.org.uk.

Rural History 2015

The second congress of the European Rural History Society (EURHO) will be held at the University of Girona, Spain, on 7–10 September 2015. The call for panel proposals closes on 30 September 2014. There will be a later call for individual papers, which will open on 1 December 2014 and close on 31 January 2015.

Further details can be found on the conference Web site at www.ruralhistory2015.org.

The material world of English peasants, 1200–1540: archaeological perspectives on rural economy and welfare*

by Christopher Dyer

Abstract

Archaeology provides valuable insights into the later medieval peasant economy. This evidence gives some support for the view that around 1300 there was widespread rural misery, but the main finding is that peasant material culture was always varied and complex, and that peasants were able to make choices, take initiatives, and on occasion enjoy some modest prosperity.

This article examines the later medieval peasant economy through archaeological evidence. Archaeologists who read this may find that material known to them is being used in ways which are alien to their way of thinking. Readers who are used to investigating the countryside through written sources will hopefully find new things, which are hidden in unfamiliar literature. The article is written not just out of zeal for interdisciplinary communication, but also as a contribution to the long-running debate on the medieval peasantry. Peasants were once portrayed as sunk in unrelieved poverty, as victims of their environment, both natural and social. The thesis which blamed widespread poverty around 1300 on processes of ecological degradation has been set aside, and now emphasis is placed on disasters of famine and plague, and on the analysis of statistical series of grain prices, land sales and other measurable trends, which often reveal deprivation. Modifying this gloomy view, a body of historical opinion now recognizes that peasants might have behaved rationally, and could have been resourceful and enterprising.[1]

In enquiring into the well-being of peasants, and their management of resources, historians have used manorial records, tax lists and other written sources which can be made to yield

* This article began life as a lecture to the North American Conference on British Studies in Philadelphia in 2004, and evolved through various experiences, such as writing the chapters on peasant life for volume 13 of the Wharram Percy series (thanks to Stuart Wrathmell) and attending the series of seminars entitled 'Perceptions of Medieval Landscape and Settlement' in 2007, sponsored by the Medieval Settlement Research Group and funded by the AHRC. Specific queries were answered by Umberto Albarella, James Barrett, Richard Jones and Richard Thomas. I am grateful for the helpful advice of two referees, and the forbearance of the editor.

[1] On deprivation, see M. Bailey, 'Peasant welfare in England, 1290–1348', *EcHR*, 51 (1998), pp. 223–51; for more upbeat analyses, B. Dodds, *Peasants and production in the medieval north-east. The evidence of tithes, 1270–1536* (2007); C. Briggs, *Credit and village society in fourteenth-century England* (2009).

information about land, cultivation, productivity and longevity. Archaeologists have a different vocabulary: 'peasant' is largely absent from their formal writing. Their view of the past tends to assign importance to culture: for example, they explain the distribution of goods away from their place of origin not as the result of trade, but through travel or gift giving. There is no shortage of material remains and their interpretation, as studies of rural settlements and landscapes have played a central role in medieval archaeology.[2] The first section of this inquiry will begin with some evidence for a low standard of peasant welfare. Indications of a more complex and varied interpretation will then be assembled under the headings of landscape, agriculture, industrial occupations, houses and households and finally individuals. The concluding section will highlight changes during the period.

I

The most striking indications of the difficulties and hazards facing the medieval peasantry come from their bones. A number of churchyards have been partially excavated, but Wharram Percy's has yielded the largest sample with 687 burials. The burials, though not closely dated, mostly belong to the period before 1400.[3] At first sight the statistics of the age of death suggest that the population was quite long-lived, as 40 per cent of the adult dead were buried after they reached the age of 50 (adult refers to those aged 18 and above). This shows that people could reach a good age in significant numbers, but a full picture of mortality must include the whole population. Babies and infants are underrepresented because of the difficulty of recovering the bones of the very young, especially as at least a few of these were buried not in the churchyard but in or near houses. Even so 45 per cent of all burials were of those aged below 16, and 15 per cent were infants (that is, under one year old). Chemical analysis of infant bones showed that breast feeding continued for a year or two, which potentially gave babies a good start in life, and contributed to intervals between births.[4] The good quality of nutrition did not subsequently persist, as adolescents grew slowly on the basis of a mainly vegetarian diet, attaining at 14 years the stature of a modern ten-year-old. Young medieval peasants, because of inadequate nutrition, were still growing into their 20s.[5] The mean height for adult males was 1.69m, and for females 1.58m, which was a little higher than the urban working class in the nineteenth century, but below people buried in the city of York between the thirteenth and sixteenth centuries.[6] Various bone conditions such as reduced cortical thickness provide further evidence of a deficient diet, and pitting of the eye sockets (cribra orbitalis) associated with porotic hyperostosis (125 cases), and the presence of Harris lines, indicate that many Wharram peasants experienced episodes of stress in their early lives, caused by hunger or infectious diseases such as dysentery. Such crises account for cases of periostosis (58 cases), the

[2] C. Gerrard, *Medieval archaeology. Understanding traditions and contemporary approaches* (2003), pp. 99–107, 128–32, 138–42, 151–5, 186–8; N. Christie and P. Stamper (eds), *Medieval rural settlement. Britain and Ireland, AD 800–1600* (2012); R. Gilchrist, *Medieval life. Archaeology and the life course* (2012), pp. 29, 118–23, 232–4.

[3] S. Mays, C. Harding and C. Heighway, *Wharram. A study of settlement on the Yorkshire Wolds*, XI, *The churchyard* (University of York Archaeological Publications 13, 2007), pp. 77–192.

[4] Ibid., pp. 93–4.

[5] Ibid., pp. 95–100.

[6] Ibid., pp. 118–20.

formation of new bone after an interruption to growth. The Wharram villagers were not as prone to infections as their contemporaries living in the poor urban parish of St Helen on the Walls in York, and their health was not damaged by smoke pollution as was that of the town dwellers.[7] Instead they experienced the characteristic strains of rural labour. The men were accustomed to lifting heavy weights, and women had developed strong right arms through work in the fields. The women's bones bear traces of the squatting position and bent backs adopted when they performed domestic tasks without seating. Men and women were prone to osteoarthritis.[8] The main conclusion of the Wharram bone study must be the extent of episodes of deprivation, of which one may have been the famine of 1315–17. A piece of evidence for the consumption of 'famine foods' comes from the hamlet of West Cotton, where a horse bone had not just butchery marks, which might have been preparatory to feeding the meat to dogs, but also the breaking of the bone to extract marrow for human consumption.[9]

In addition to bone evidence, we can cite the existence of small thirteenth-century houses which resemble in their construction buildings of the previous three centuries, with post holes for vertical timbers sunk into the ground (earth fast), or occasionally horizontal timbers were either buried in slots or rested on the ground surface. Such buildings have been recorded at Long Marston in North Yorkshire, Tatton in Cheshire, Coton in Warwickshire, Hatch Warren in Hampshire and in settlements near Lydd on Romney Marsh, so in a variety of terrains and regions. Sometimes there are no signs of timbers at all, suggesting that the houses rested on the ground or were founded on mud walls. Only floors (which were usually insubstantial) or eaves drip trenches mark the outline of the buildings. These meagre traces of habitation mark the former existence of houses in the twelfth- and thirteenth-century phases of the village of Caldecote in Hertfordshire.[10] Some of these houses were notably smaller than the standard 6m-by-15m rural late medieval house, particularly those at Coton, which in the mid-late thirteenth century phase measured 8–12 m long and 4–4.5 m wide.

These are the types of material evidence which would support a picture of an immiserated peasantry, yet these indications of ill health and houses of poor quality and restricted size should not dominate our overall interpretation. Among the Wharram Percy burials it should be noted that, shocking as the incidence of bone conditions associated with traumatic experiences of disease and hunger may be, the majority did not show signs of hyperostosis and periostosis. Coton (on the Wolds) was a very unusual settlement which was abandoned in about 1300: as the name (meaning cottages) implies, its inhabitants consisted entirely of

[7] Ibid., pp. 101–2, 166–70, 172–4, 191–2.

[8] Ibid., pp. 118, 125–7, 154–8, 190–1.

[9] A. Chapman, *West Cotton, Raunds. A study of medieval settlement dynamics AD 450–1450* (2010), p. 528.

[10] G. Beresford, *Caldecote. The development and desertion of a Hertfordshire village* (Society for Medieval Archaeology monograph series 28, 2009), pp. 81–9; L. Barber and G. Priestley-Bell, *Medieval adaptation, settlement and economy of a coastal wetland. The evidence around Lydd, Romney Marsh, Kent* (2008), pp. 62–6, 75, 80; Northamptonshire Archaeology, 'Excavations of the deserted medieval village of Coton at Coton Park, Rugby, Warwickshire' (1998); S.J. Sherlock, 'Excavations at the Well House, Long Marston, North Yorkshire', *Yorkshire Archaeological J.* 76 (2004), pp. 113–33; P. J. Fasham, J. G. Keevill and D. Coe, *Brighton Hill South (Hatch Warren): an Iron Age farmstead and deserted medieval village in Hampshire* (Wessex Archaeology Report 7, 1995), pp. 77–151; N. J. Higham, 'The Tatton Park project, part 2. The medieval estates, settlement and hall', *J. Chester Archaeological Soc.* 75 (1998–9), pp. 79–101.

smallholders, suggesting a socially imbalanced community, sited on a bleak upland. Finally the West Cotton horse bone was unusual. Horses were not normally eaten by people in late medieval England, even as famine food.

II

Historical and geographical approaches to landscape once separated the good-quality arable lands from the hills, forests, moors and marshes, which it was believed had a secondary role These marginal lands would only be occupied and cultivated in times of high pressure from population, and extending corn growing on to poor soils has been perceived as contributing to the crisis of the early fourteenth century, and particularly the Great Famine of 1315–17.[11]

The archaeological approach takes the longer view, and puts more emphasis on sustainability. Open fields predominated in the 'central province' running down through eastern and midland England to the chalk country of the South, from Northumberland to Dorset. Finds of pottery on the surface of fields suggest that the extensive ploughland of the open fields had been cultivated before the Norman Conquest, in one view before 850, and in another soon after that date.[12] As crops were grown on parts of the same open fields into the eighteenth century, many generations of cultivators were evidently practising an agrarian routine which gave an acceptable return from the land. From pottery scatters, air photographs of former fields, and occasional continuities of field boundaries, we know that much of the land cultivated in the middle ages had also been exploited between the first and fourth centuries AD, and indeed since prehistory. Pollen samples suggest that land sometimes continued in use as arable across the divide of AD 400, perpetuating elements of the Roman countryside into the middle ages.[13] The shortfalls in production around 1300 look like a very temporary episode in a long-term story.

Much historical thinking about the rural economy slips easily into references to villages and villagers, implying that the normal settlement was a nucleated village linked with common arable fields. Study of both existing settlements and abandoned sites shows that in many regions small hamlets or single farmsteads predominated, and that most people at any time between 1200 and 1540 did not live in nucleated villages. The implications of this from the point of view of the wealth and well-being of the inhabitants are still debated. Documentary evidence (confirmed by topographical studies) suggests that the people occupying dispersed settlements, compared with the nucleated villagers, had more options open to them in terms of the balance between arable and pasture, because a lower proportion of their holdings lay in

[11] The population-resources model and its deficiencies is discussed in the context of a topographical study in H. M. Dunsford and S. J. Harris, 'Colonization of the wasteland in County Durham, 1100–1400', *EcHR* 56 (2003), pp. 34–56.

[12] B. K. Roberts and S. Wrathmell, *An atlas of rural settlement in England* (2000) ; T. Williamson, *Shaping medieval landscapes. Settlement, society, environment* (2003), pp. 67, 89 ; S. Parry, *Raunds area survey. An archaeological study of the landscape of Raunds, Northamptonshire, 1985–94* (2006), pp. 91–8, 126–35, T. Williamson, *Environment, society and landscape in early medieval England. Time and topography* (2013), pp. 177–82.

[13] R. Jones and M. Page, *Medieval villages in an English landscape* (2006), pp. 31–57; S. Upex, 'Landscape continuity and fossilization of Roman fields', *Archaeological J.*, 159 (2002), pp. 77–108; P. Dark, *The environment of Britain in the first millennium A.D.* (2000), pp. 130–56.

open fields, and they were more likely to hold crofts and closes under their own control. They would often devote some of their enclosures to the grazing of animals, and those living in woodland and upland landscapes might have had access to large common pastures.[14]

The traditional emphasis on cultivation leads to a neglect of the more pastoral economy of the uplands and wetlands. In these sometimes thinly settled environments archaeologists are presented with opportunities, because the land was less intensively managed in modern times and elements of older landscapes have been preserved.

In the coastal salt marshes Roman drainage had a large impact, notably on the Severn estuary. The sea walls and gutters were neglected in the post-Roman retreat, requiring restoration of the drainage system in the tenth century, and a new campaign of reclamation in the twelfth and thirteenth centuries.[15] Although changes in wetlands have traditionally been represented as decisive drainage schemes, organized by great lords, various phases of human intervention with incremental effects can be observed. The wetlands could have been exploited in their natural state, for summer grazing for example; then they could be modified to make the pasture more accessible; and finally drained, settled and ploughed. Drainage channels and earlier watercourses on the Norfolk coast and on Romney Marsh show the successive stages of management and improvement. Creeks were straightened, some of the boundaries were marked by ditches, and the salt marsh was provided with drove ways with bridges over old streams and new dykes which enabled stock to be managed in the summer grazing season. Such improvements did not require great reserves of capital or political power, and could be accomplished by individuals or by peasant communities.[16] Excavations of a very large area on Romney Marsh reveal roads and small rectangular fields defined by ditch digging and the siting of fences and hedges, and subsequently walls were built to protect the agricultural land from inundations. Lords throughout the country with interests in the wetlands, such as the Benedictine monasteries, played a part in the building of sea defences, but so did peasants, who contributed to drainage works and developed agricultural holdings based on scattered houses and cottages.[17] Fenland lords, such as monks of Ely priory, wrote eloquently about the rich environment, which could be celebrated as a *locus amoenus*, an ideal place, but peasants also appreciated the resources – not just the lush pastures and the potentially productive arable land once drainage work was completed, but also the turf, sedge, rushes, reeds, fish and fowl of the watery fen and marsh, all of which had their uses and a value in the market. The scale of coastal salt making in Lincolnshire, and of peat extraction in Norfolk, is apparent from abundant physical remains.[18] This is relevant to the theme of sustainability, as the settlement of

[14] C. Dyer, 'Dispersed settlements in medieval England. A case study of Pendock, Worcestershire', *Medieval Archaeology*, 34 (1990), pp. 97–12; S. V. Smith 'Houses and communities: archaeological evidence for variation in medieval peasant experience', in C. Dyer and R. Jones (eds), *Deserted medieval villages revisited* (2009), pp. 66–75.

[15] S. Rippon, *The Severn Estuary. Landscape evolution and wetland reclamation* (1997), pp. 104–219.

[16] M. Gardiner, 'Archaeological evidence for the exploitation, reclamation and flooding of salt marshes', in J. Klapste (ed.), *Water management in medieval rural economy* (2005), pp. 73–83.

[17] Barber and Priestley-Bell, *Medieval adaptation*, pp. 29–112; S. Rippon, *Landscape, community and colonization. The North Somerset Levels during the first to second millennia* (CBA Research Report 152, 2006), pp. 277–9.

[18] C. A. M. Clarke, *Literary landscapes and the idea of England, 700–1400* (2006), pp. 79–89. Archaeological insights into fenland resources include F. McAvoy, 'Marine salt extraction: the excavation of salterns at

the fenlands and marshlands, far from indicating the desperate search for new lands among an impoverished population, gave opportunities to many people who congregated in some large settlements, like those in south Lincolnshire and eastern Cambridgeshire, or who occupied hamlets and farmsteads scattered over the reclaimed land. The settlements often persisted through the fourteenth-century crisis, and there is little sign in the fenland of the desertion of villages that occurred on nearby dry land.

Some of the hamlets on moorlands, notably on much-studied Bodmin Moor in Cornwall and Dartmoor in Devon, conformed to the expectation of those who regard marginal lands as outlets for surplus people in times of demographic pressure, as they were established in the age of expansion in the twelfth and thirteenth centuries, and abandoned in the fourteenth.[19] The advance and retreat is apparent not just from the excavated houses and their associated field systems that bear witness to cultivation on some high and exposed hill sides, but also from the analysis of pollen deposits preserved in peat bogs, which show fluctuations in the proportion of land supporting cereals and the weeds associated with cultivation.[20] The main function of the moors, however, was not to provide space for permanent settlements but for grazing livestock brought from the villages and hamlets on lower ground in the summer season. To facilitate the management of cattle and sheep, boundaries were marked by walls and ditches designed to keep the animals from entering private land. Droveways gave the livestock access to the moors, and pounds were maintained for assembling animals and establishing ownership.[21] Bodmin Moor was dotted with shieling huts where herdsmen sheltered during the grazing season, though they may belong to the early middle ages.[22] These temporary dwellings are a prominent feature of the northern uplands of Cumbria and Northumberland where some date from the thirteenth century.[23] Industry sometimes covered the moorland landscape with diggings and waste heaps, notably from tinning in the South West, lead mining in Derbyshire and widespread iron ore mining and quarrying. Pastoral and industrial activities enabled some uplands to support a considerable population at the right season, and permanent settlements

Note 18 *continued*
Wainfleet St Mary, Lincolnshire', *Medieval Archaeology*, 38 (1994), pp. 134–63; G. Lucas, 'A medieval fishery on Whittlesea Mere, Cambridgeshire', *Medieval Archaeology*, 42 (1998), pp. 19–44; T. Williamson, *The Norfolk Broads. A landscape history* (1997), pp. 80–7.

[19] N. Johnson and P. Rose, *Bodmin Moor. An archaeological survey*, I, *the human landscape to c.1800* (1994), pp. 83–93; G. Beresford, 'Three deserted settlements on Dartmoor: a report on E. Marie Minter's excavations', *Medieval Archaeology*, 23 (1979), pp. 98–158; D. Austin, 'Excavations in Okehampton deer park, Devon, 1976–1978', *Proc. Devon Arch. Soc.*, 36 (1978), 191–239; on the redating of the last phase of the sites from the early fourteenth century to c.1400, see R. Sylvester, 'Abandoning the uplands: depopulation among dispersed settlements in western Britain', in Dyer and Jones (eds), *Deserted villages revisited*, pp. 145–6.

[20] D. Austin and M. J. C. Walker, 'A new landscape context for Hound Tor, Devon', *Medieval Archaeology*, 29 (1985), pp. 147–52.

[21] A. Fleming and N. Ralph, 'Medieval settlement and land use on Holme Moor, Dartmoor: the landscape evidence', *Medieval Archaeology*, 36 (1982), pp. 101–37; H. Fox, *Dartmoor's alluring uplands: transhumance and pastoral management in the middle ages* (2012), pp. 66–7; 191–209.

[22] P. Herring, 'Shadows of ghosts: early medieval transhumants in Cornwall', in S. Turner and R. Sylvester (eds), *Life in medieval landscapes. People and places in the middle ages* (2012), pp. 89–105.

[23] H. G. Ramm, R. W. McDowall and E. Mercer, *Shielings and bastles* (1970), pp. 9–43; M. Hair and R. Newman, 'Excavation of medieval settlement remains at Crosedale in Howgill', *Trans. Cumberland and Westmorland Archaeological Soc.*, 99 (1999), pp. 141–58.

could be sustained, such as farms on Exmoor (Somerset) which have survived into modern times.[24]

We can humanize our approach to landscape by attempting an imaginative reconstruction of the experiences of those who lived in the past. It is legitimate to ask 'how did the landscape look, smell, sound?' When this inquiry into the perceptions is applied to moorlands, they do not seem as dangerous and threatening as they appear to modern observers.[25] Dartmoor, to those who lived and worked on it, was a beneficial, useful asset, covered with tracks and landmarks that were familiar and helpful. The common experience of inhabiting a distinctive environment would give the people of the moors the basis for a shared identity. The implications for sustainability are two-fold: those who lived in the habitable and even hospitable moorland environment had developed a way of life which made rational use of the local resources; the peasants of lowland villages around the moors benefited from the uplands for feeding their animals.

Woodland management was not an exclusively seigniorial practice, as peasants on occasion could have either collective or individual control of woods. Both timber and wood were being produced systematically long before the first detailed written records. Species such as hazel were cropped in coppices, or in the underwood which grew beneath larger trees. The people who wove hurdles, basket work, or wattle panels, all of which are found when wet deposits are excavated, had access to quantities of rods and twigs which had grown for a few years before they were cut and then allowed to grow again.[26]

Exploitation of natural resources has left its mark in the organic material excavated in towns. Wild fruits and nuts, but also rushes, reeds, heather, bracken, broom and gorse were gathered on commons, heaths, moors and fens partly for peasants' own use, and partly for transport to towns where they are found preserved in the bottom of damp rubbish pits, or in carbonized form after they had been burnt deliberately or by accident.[27] Hunting is often linked with gathering, but the very limited number of bones from game, such as deer, from village or hamlet sites (with one exception) suggests that peasants had little opportunity for hunting. Fishing, however, brought to coastal communities both food for households, and income from fish sales, judging from the heaps of shells, and paraphernalia of lead weights and iron fishhooks from sites such as Denge West in Sussex in the fifteenth century.[28] Garden produce, represented by pips and stones of berries and fruits (raspberries, strawberries, plums, damsons, apples and so on) would have been supplied to urban householders by peasants practising horticulture.[29]

[24] H. Riley and R. Wilson-North, *The field archaeology of Exmoor* (2001), pp. 92–7.

[25] K. Altenberg, *Experiencing landscapes; a study of space and identity in three marginal areas of medieval Britain and Scandinavia* (2003).

[26] C. Treen and M. Atkin (eds), *Wharram. A study of settlement on the Yorkshire Wolds*, X *Water resources and their management* (York University Archaeological Publications 12, 2005), pp. 200–10.

[27] G. Hughes, 'Excavations within a medieval and post-medieval tenement at Stone, 1993', *Trans. South Staffs. Archaeological and Historical Soc.* 37 (1995–6), pp. 58–104.

[28] Deer bones, many of them in a single deposit, in J. M. Steane and G. F. Bryant, 'Excavations at the deserted medieval settlement of Lyveden, Northamptonshire', *Northampton Borough Council Museums and Art Gallery J.* 12 (1975), pp. 152–7; Barber and Priestley-Bell, *Medieval adaptation*, pp. 183–7, 189–90, 224–7, 228–39; another site with abundant shell evidence: T. Allen, 'Swine, salt and seafood: a case study of Anglo-Saxon and early medieval settlement in north-east Kent', *Archaeologia Cantiana* 124 (2004), pp. 117–35.

[29] J. Greig, 'The investigation of a medieval barrel-latrine from Worcester', *J. Archaeological Science*, 8 (1981), pp. 265–82.

To sum up this discussion of landscape, archaeologists encourage us to have some confidence in the wisdom of the cultivators of the past, and to respect their skill, experience and organizational ability. In particular, much can be learnt from studies of moors and marshes, and from environmental evidence, about the productive management of land beyond the arable fields.

III

The themes of archaeological analysis of agricultural production include choice, flexibility and change. In the central province the distinctive earthworks of cultivation, ridge and furrow, show how much adaptation occurred within open-field farming. Changes are almost impossible to date, but many are likely to be pre-modern. Ridges were extended over land that had previously been unploughed, such as meadow. Ridges were divided, or adjacent ridges amalgamated. Ridge and furrow was laid out over former houses when villages were declining, and fainter earthworks on the edge of the field system suggest a retreat from cultivation.[30] In the case of meadow land, ditches of unknown date could have belonged to the 'catchwork' systems which were designed to channel and spill overflow water from rivers and streams over grassland to encourage early and abundant growth of grass, before the introduction of elaborate floated water meadows in the seventeenth century.[31] These observations reinforce historical impressions of the flexibility of husbandry, and they demonstrate changes scarcely recorded in the written sources.

The identification of varieties of wheat, barley and other crops from botanical remains has come as a revelation, and we now know more about breeds of livestock. Cereal grains, and also pieces of straw and other parts of the cereal plant, are most commonly preserved when they were charred, and are often recovered from settlement sites in the vicinity of hearths, ovens and kilns. Both bread wheat and rivet wheat are encountered, and are sometimes found intermingled in the same deposits.[32] In the fifteenth century both types were being grown in the same year in close proximity, judging from the presence of straw with ears attached, in thatched roofs blackened (and preserved) by smoke from an open hearth.[33] The spikes (awns) on the ears of rivet wheat deterred birds, and rivet wheat was more resistant to some diseases. On the other hand bread wheat thrives in heavy soils and rivet wheat was apparently not so well suited to the climate of northern England. Peasants had to make choices of which variety suited their needs, though the presence of both suggests that they might have been avoiding risk, in the same way that they could opt for maslin, a mixture of wheat and rye. Barley came in different varieties, two-row, four-row and six-row, but although in modern experience two-row barley yields better and is well suited for malting and brewing, medieval peasants

[30] D. R. Wilson, 'Alterations to ridge and furrow: some examples illustrated', in M. Aston and others (eds), *The rural settlements of medieval England* (1989), pp. 183–90; D. Hall, *The open fields of Northamptonshire* (Northamptonshire Rec. Soc. 38, 1992), pp. 125–39. S. Upex, 'A classification of ridge and furrow by an analysis of cross profiles', *Landscape History,* 26 (2004), pp. 59–75. The sites of village houses bearing the marks of later cultivation can be seen at Stretton Baskerville, Warwickshire, and Sulby, Northamptonshire.

[31] H. Cook and others, 'The origins of water meadows in England', *AgHR* 51 (2003), pp. 155–62; G. Brown, 'Irrigation of water meadows in England', in Klapste (ed.), *Water management*, pp. 84–92.

[32] L. Moffett, 'The archaeology of medieval plant foods', in C. M. Woolgar and others (eds), *Food in medieval England. Diet and nutrition* (2006), pp. 47–9.

[33] J. B. Letts, *Smoke blackened thatch. A unique source of late medieval plant remains from southern England* (1991), pp. 18–21.

preferred the six-row variety.[34] Cultivators, both individuals and collectively, seem therefore to have faced a complex range of decisions, not just how much land to devote to winter-sown or spring-sown crops; whether to grow wheat, rye, barley or other crops; what value they would gain from growing legumes (peas, beans or vetch) rather than grain; and whether to select single crops such as barley instead of a mixture such as dredge consisting of barley and oats. They also needed to select the best varieties of cereals or legumes. Regional variations in the soil and climate presumably influenced the decision-making.

In the case of livestock the documents occasionally hint at different breeds: an estate might send for a ram from another county to improve the flock, or oxen mentioned in court records were said to be black or red.[35] Animal bones which accumulated as rubbish on urban sites originated in the country, where more livestock in total were kept by peasants than on the estates of their lords. The marked differences in the size and shape of bones in these large samples show, for example, that in the county of Norfolk the beef consumed in the town of Thetford came from a breed of cattle more 'slender' than those encountered in Norwich.[36] Breeds of sheep, with their wool, which varied in length and fineness, can be distinguished using the fibres still adhering to parchment.[37] Perhaps peasants tended to keep the breeds which were predominant in their neighbourhood, but those living on a frontier between locally distinct breeds must again have been able to exercise a choice.

Peasants had to weigh the utility of the products for their own households and also assess their value in the market. One type of barley might have made better bread, and therefore would contribute to the subsistence of the peasant family, but another variety might have been more suited for brewing and would fetch a higher price if sold. Sale of barley in malted form is thought to have figured in the peasant economy of West Cotton in Northamptonshire, because malt kilns were built with a capacity beyond the needs of a single household.[38] Younger cattle tended to be sent to the towns for the butchers, while peasant households consumed the meat from old beasts which had completed their useful lives as dairy cows or plough oxen. Similarly young pigs went to market, and the peasants ate meat from the slaughtered sows only after they had produced a series of litters.[39]

Samples of grain preserved by burning can be compared with written records of crops, especially tithes which reflect the grain and legumes harvested by peasants (Table 1). They can be broadly similar, as in the case of a sample from Wharram Percy and the tithes from nearby Bishop Wilton, but they can differ markedly, as at Bishop's Cleeve, Gloucestershire.[40] Those who believe in the superiority of documentary evidence would say that the material evidence

[34] Moffett, 'Plant foods', pp. 49–50.

[35] R. Trow-Smith, *A history of British livestock husbandry to 1700* (1957), pp. 111–12, 160–2.

[36] U. Albarella, 'Meat production and consumption in town and country', in K. Giles and C. Dyer (eds), *Town and country in the middle ages. Contrasts, contacts and interconnections, 1100–1500* (Society for Medieval Archaeology monograph series 22, 2005), pp. 143–4.

[37] M. L. Ryder, *Sheep and man* (1983), pp. 472–4.

[38] Chapman, *West Cotton*, pp. 225–9.

[39] Ibid., pp. 522, 524–5; U. Albarella, '"The mystery of husbandry": medieval animals and the problem of integrating historical and archaeological evidence', *Antiquity* 73 (1999), p. 871.

[40] S. Wrathmell (ed.), *Wharram. A study of settlement on the Yorkshire Wolds*, XIII, *A history of Wharram Percy and its neighbours* (York University Archaeological Publications 15, 2012), pp. 319, 332; D. Enright and M. Watts, *A Romano-British and medieval settlement site at Stoke Road, Bishop's Cleeve, Gloucestershire* (Bristol and Gloucestershire Archaeological Report 1, 2002), pp. 53–5, 72.

TABLE 1. Samples from two late medieval settlement sites of burnt grain/legumes, compared with tithe receipts from a similar period (percentages). There are more similarities between the archaeological and documentary evidence in the Wharram Percy figures than in those from Bishop's Cleeve, which may be caused by the local circumstances in which straw was burnt or grain dried.

(a) Wharram Percy, Yorks

Crops	*Wheat*	*Barley*	*Dredge*	*Oats*	*Legumes*	*Unknown*	*Total*
Sample of burnt grain	44	25	–	11	present	20	100
Tithes (from the nearby parish of Bishop's Wilton) 1298	45	26	22		7	–	100

(b) Bishop's Cleeve, Glos

Crops	*Wheat*	*Rye*	*Barley*	*Oats*	*Legumes*	*Total*
Sample of burnt grain	73	1	9	7	10	100
Tithes 1396–7	36	0	55	1	8	100

is unrepresentative, but the tithe figures reflect the cumulative total for all of the producers in a parish, while the burnt grain arises from specific episodes in the use of crops in an individual household, such as the drying of a consignment of grain, or the burning of bundles of straw as fuel or after the removal of a thatched roof.

A primary peasant concern was to obtain decent yields, which could be helped by manuring, and one of the sources of nutrients came from the individual dung heaps maintained by peasant households. Locations of these middens have been tentatively identified near houses.[41] Here animal dung, soiled litter from stalls and stables, household refuse and other organic material accumulated. There is some uncertainty about the collection of human ordure, as not many latrines or cesspits have been identified near peasant houses, but this valuable source of fertilizer was surely not neglected. At Shapwick in Somerset rubbish pits were dug in the yard behind a house in the village in the twelfth and thirteenth centuries, but not after 1300, as if the waste matter was then going on to the fields.[42] The household rubbish lay exposed to the elements (and to scavengers) for many months, as is shown in some villages by the number of animal bones much gnawed by dogs.[43] The carting and spreading of manure is well attested because the household refuse included broken pots, and modern field walking locates a thin spread of potsherds over the medieval arable fields. Open-field furlongs were manured by the cart more than land held in severalty or assarts. The evidence tends to be more abundant on fields nearer the settlements, because the cultivators wished to economize on cart journeys,

[41] S. Wrathmell, *Wharram. A study of settlement on the Yorkshire Wolds*, VI, *Domestic settlement 2: medieval peasant farmsteads* (York University Archaeological Publications 8, 1989), p. 33; Barber and Priestley-Bell, *Medieval adaptation*, pp. 75, 77.

[42] Latrine pits have been identified at two east midland villages: G. Beresford, *The medieval clay-land village* (Society for Medieval Archaeology monograph series 6, 1975), pp. 13–18; C. Gerrard with M. Aston, *The Shapwick project, Somerset. A rural landscape explored* (Society for Medieval Archaeology monograph series 25, 2007), pp. 987–90.

[43] Chapman, *West Cotton,* p. 520.

and could manure the outer furlongs by folding sheep on them.[44] They would concentrate (we suppose) their more valuable cereals, such as wheat, on the land with most manure, and select that same land for more intensive cropping. As the pottery can be dated, the extent of manuring at different periods can be established. At Whittlewood on the wooded Northamptonshire/Buckinghamshire border the area of manured land expanded after 1100, partly because more land was being brought into cultivation, and partly because more manure was being applied to raise productivity. In the champion arable farming township of Bingham in Nottinghamshire thirteenth- and fourteenth-century pottery was abundant, mainly because of an intensification of cultivation.[45] Marling was another method of improving the soil for cultivation, but it is a practice that appears only patchily in the documents. The pits are now visible in the fields, but are usually undateable. At Compton Verney in Warwickshire, where 11 are still visible in a parish of 1668 acres, cultivation effectively ceased in the mid-fifteenth century, and was only resumed on a large scale after 1950, so the pits probably belong to the medieval period.[46]

Attention turned after planting to nurturing the growing crops. Weed infestation is revealed whenever botanical evidence from corn fields is analysed, whether from pollen, grains and seeds, plant material preserved in wet conditions, or whole plants included in thatch. The species which grew on cultivated ground included charlock, corn cockle, cornflower, poppy, dock, knotgrass and stinking chamomile.[47] Weed growth was most effectively counteracted by ploughing thoroughly and repeatedly before sowing, which would destroy the roots of the unwanted plants before harrowing and sowing: coulters and shares of plough are not found in excavations because these large pieces of iron would be taken back to the smith to be reworked. The iron parts of smaller tools that were used for weeding, spuds and weeding hooks, were more likely to be lost and therefore available for discovery in excavation.[48] The spuds and hooks, fitted to long wooden hafts, were designed to cut the stems of individual weeds at ground level, which was slow and laborious work, and required deftness to avoid damage to the crops. Hoes did not figure prominently among implements on peasant sites, presumably because corn was not grown in rows, though beans, which were dibbled, might have been arranged to allow hoeing.

The evidence for weeds is not quantifiable, in that we can count the number of seeds or pollen grains, but cannot know how densely the weeds grew in the cornfield, nor can the damage that they caused to cereal crops be measured. It is not known if peasant crops were more or less affected than those of the demesne, though documents suggest that peasant holdings in the thirteenth and early fourteenth centuries would have been able to muster good quantities of labour for weeding, including women and children.

The storage of crops contributed to the efficiency of arable farming. When a toft is excavated, or the foundations of buildings planned on well-preserved deserted sites, it is commonly found

[44] R. Jones, 'Signatures in the soil: the use of pottery in the identification of medieval farming regimes', *Archaeological J.* 161 (2004), pp. 159–88.

[45] Ibid., pp. 166–9, 184–5; P. Allen, 'Settlement patterns in the parish of Bingham, Nottinghamshire, from the mesolithic to modern times', *Trans. Thoroton Soc.* 115 (2011), pp. 33–62.

[46] C. Dyer, 'Compton Verney: landscape and people in the middle ages', in R. Bearman (ed.), *Compton Verney. A history of the house and its owners* (2000), pp. 67–8.

[47] Letts, *Smoke blackened thatch*, pp. 39–41; Enright and Watts, *Bishop's Cleeve, Gloucestershire*, pp. 49–61.

[48] I. H. Goodall, *Ironwork in medieval Britain. An archaeological study* (Society for Medieval Archaeology monograph series 31, 2011), pp. 79–83, 92–3, 102–3.

that the peasant house was accompanied by one or two buildings for agricultural use. One of these would be a barn: if it consisted of two or three bays (a length of 10–15m) it would have had space for the storage of 30 or 40 quarters of grain in straw, which would have been sufficient to keep under cover all of the crops of a standard yardland, or two-oxgang holding.[49] They would no doubt suffer from the depredations of rats and mice, and there is evidence of insect damage on preserved cereal grains.[50] Effective storage contributed to the well-being of the peasant family, as their food supplies would be protected, but it could also enable crops to be held back from the market until prices rose in the spring.

At every stage of the cultivation process haulage was needed for ploughing and harrowing, for carting the crops in from the fields, and for carrying threshed grain to market. Finds of horseshoes, and of harness buckles and other items of horse furniture, are sometimes concentrated in buildings which can be identified as stables. High proportions of horse bones are also recovered from some sites.[51] These strands of material evidence, taken together, point to the adoption by peasants of horses for agriculture in particular regions, such as the Yorkshire wolds.

Horticulture on peasant sites can be detected from seeds, pollen and other botanical residues deriving from vegetables and fruits such as cabbage and apples, and also from flax and hemp, important industrial crops.[52] Peasant poultry keeping should be reflected in the bones of fowls and geese, and even by the recovery of egg shells, but both bones and eggs are too fragile to survive in great numbers.[53]

Animal bones from village sites show that animals were kept for a number of years for the sake of their long-term economic contribution. Housing (byres, stables and sheephouses) was provided for at least part of the flocks and herds. This was regarded as unnecessary in east midland villages where apparently cattle were kept at night and in bad weather in yards.[54] High-quality welfare provision could not be afforded, and there are a number of pointers to the hard life of peasant animals. Poor feeding (as well as the breed), may account for their small stature. Sheep in Yorkshire attained a withers height of 531mm, while cattle stood at 1120mm. Chickens were no larger than modern bantams.[55] Specimens of pitted animal teeth have been interpreted as evidence for poor nutrition. The lower limb bones of cattle and horses sometimes bear the signs of hard labour.[56]

To sum up, perspectives on peasant agriculture from archaeology make us more aware of the

[49] Wrathmell (ed.), *Wharram Percy*, p. 321.

[50] Treen and Atkin, *Water resources*, p. 189.

[51] Steane and Bryant, 'Excavations at Lyveden', pp. 152–7; M. Ponsford, 'Excavations at a Saxo-Norman settlement, Bickley, Cleeve, 1982–89', *Somerset Archaeology and Natural History* 146 (2003), pp. 60, 66.

[52] Chapman, *West Cotton*, pp. 485–90, 495–6.

[53] R. Ivens, P. Busby and N. Shepherd, *Tattenhoe and Westbury* (Buckinghamshire Archaeology Society monograph series 8, 1995), pp. 436–43.

[54] Beresford, *Clay-land village*, pp. 13–18.

[55] P. A. Stamper and R. A. Croft, *Wharram. A study of settlement on the Yorkshire Wolds*, VIII, *The south manor area* (York University Archaeological Publications 10, 2000), pp. 179, 182. The heights means that in relation to the author of this article (who is of average height), a sheep's back would have reached his knees, and a cow his mid-chest.

[56] M. L. Ryder, 'Animal remains from Wharram Percy', *Yorkshire Archaeological J.* 46 (1974), p. 45; P. Rahtz and L. Watts, *Wharram. A study of settlement on the Yorkshire Wolds,* IX, *The north manor area and north-west enclosure* (York University Archaeological Publications 11, 2004), p. 271; R. Thomas, 'Diachronic trends in lower limb pathologies in later medieval and post-medieval cattle from Britain', in G. Grupe, G. McGlynn and J. Peters (eds), *Limping together through the ages: joint afflictions and bone infections* (Documenta Archaeobiologiae 6, 2008), pp. 187–201.

choices available (the variety of crops and animal breeds, for example), and provide insights into husbandry practices such as manuring, weeding and storage.

Industrial processes, even in settlements with an apparently entirely agricultural economy, leave tell-tale traces, such as fragments of slag or other metal-working residues: occasionally peasants may have done work for themselves, or alternatively itinerant metal workers repaired a cooking pot or a plough and left traces of their visit.[57] Sometimes a tool with a specialized craft use is found on a peasant site, such as a single example of a chisel found at Barton Blount (Derbyshire) and another at Upton (Gloucestershire).[58] Had a tool been lost by a visiting mason engaged on building in the village, or did a villager work part-time in stone cutting? Rural butchery was either practised by peasants who slaughtered animals occasionally and sold joints to their neighbours, or by specialists who bought animals and retailed meat. These activities are known from bones on rural sites normally encountered in butchers' wastes, such as pieces of skull and jaws. Some country butchers did not use the same methods as their specialist urban contemporaries, in that they did not begin work on the carcasses by splitting them down the backbone.[59]

Smiths could leave a striking material signature. The building in which iron was worked, like that at Goltho in Lincolnshire, is marked by an abundance of ash, coal and slag, and contains such specialist structures as hearths bearing signs of intense burning, and water pits for cooling hot iron. Such workshops are not found in excavations in every village, because a smith would tend to work not just for his own community, but served a wider area: the smith's workshop at Great Barford in Bedfordshire was sited on the edge of the straggling village, which was convenient for travellers and for neighbouring settlements.[60]

In some places, however, industry, combined with farming, employed a number of households, and enabled smallholders to survive, or better-off peasants to increase their incomes. Communities in the North West were able to prepare flax and hemp fibres by retting the plants in purpose-made ponds. Peasant spinning with a distaff everywhere leads to the discovery of spindle whorls, often themselves home-made from stone, fired clay or reused potsherds. Also connected with the preparation of yarn, were iron teeth from heckles for separating fibres. At the Buckinghamshire sites of Westbury and Tattenhoe finds included 15 whorls and 11 heckle teeth.[61] Distaff spinning, mostly by women, could be combined with other work in house, yard and field. The yarn (both woollen and linen) need not have been intended for weaving in the village, but in many cases was probably supplied to looms in a town or in a village with a cloth-making specialism.

Like many industries, iron smelting was practised in woodland landscapes, and peasants worked part-time, not just at the bloomeries where the iron was made, but also on preparing the charcoal for fuel. In Rockingham Forest in Northamptonshire 600 charcoal burning sites

[57] R. H. Hilton and P. A. Rahtz, 'Upton, Gloucestershire, 1959–1964', *Trans. Bristol and Gloucestershire Archaeological Soc.* 85 (1966), pp.112, 117.

[58] Goodall, *Ironwork*, pp. 45, 52–3.

[59] Treen and Atkin, *Water resources*, pp. 164–7.

[60] Beresford, *Clay-land village*, pp. 46, 90–1; J. Timby et al., *Settlement on the Bedfordshire claylands. Archaeology along the A421 Great Barford bypass* (Bedfordshire Archaeological Monograph 8, 2007), pp. 188–95, 207–10.

[61] M. C. Higham, 'Some evidence for 12th and 13th century linen and woollen textile processing', *Medieval Archaeology* 33 (1989), pp. 38–52 (the ponds described here were attributed to seigniorial investment, but there is no evidence for this); Ivens and others, *Tattenhoe and Westbury*, pp. 359–61, 378, 380.

have been identified, and they are only part of the original total. Lyveden in the same area was located near sources of clay, iron ore and wood fuel, from which tiles were made and iron worked, but pottery manufacture was the major activity in the thirteenth and fourteenth centuries. Similar wares were produced at the same time at nearby Stanion. Rural potting can sometimes be located through documents, but only archaeology reveals the number of pots and the distances over which they were carried, because the fabric of pots from each place of manufacture can be identified from geological analysis. Wares from Lyveden and Stanion predominated in the large urban market of Northampton and were used by many thousands of households in towns and villages within 30 miles. Excavation at Lyveden reveals the transience of industry: one household apparently gave up potting and lived entirely from farming between 1350 and 1450. A proportion of centres of pot making throughout the country ceased to operate after a prolific period around 1300, leading to the suspicion that in hard times poor peasants turned to a craft which offered an income, but as conditions improved gave up the hard work and meagre rewards. The craft, like many in the period, drew on the labour of the whole household. At Olney Hyde in Buckinghamshire small finger marks made when the clay was soft show that children aged between 9 and 11 were helping to make pots in the fourteenth century.[62]

Some rural industries are known mainly from their widely scattered products. The cutting of limestone grave covers flourished around the quarries of Barnack in Northamptonshire in the twelfth and thirteenth centuries. They were carried for more than 50 miles, but ceased to dominate their region around 1300. In the next two centuries the rural craftsmen on the border between Derbyshire and Staffordshire supplied the demand for alabaster grave stones.[63] We cannot know if some industries were being practised part-time by peasants, or by full-time specialists. The tin industry of Cornwall and Devon, for example, has left us with a landscape scarred with heaps of prospecting pits and spoil from workings, and excavations and field survey have revealed the foundations of mills used to crush and smelt ore. These remains bring home to us the scale of the industry, the complexity of its extraction methods, and its mechanization with water-power. No doubt peasants with land and livestock invested in tin works, and smallholders who needed extra earnings migrated to the moors for employment in the summer, but there were also specialist tinners financed by urban merchants who did not necessarily form part of the peasant economy. A close connection between a peasant household and mining in the Derbyshire lead industry is suggested by finds of lead ore and a small amount of smelted lead in excavations of an upland farmstead near Brassington.[64]

[62] G. Foard, 'Medieval woodland, agriculture and industry in Rockingham Forest, Northamptonshire', *Medieval Archaeology* 45 (2001), pp. 65–95; Steane and Bryant, 'Lyveden, Northamptonshire', pp. 4–53; P. Chapman, P. Blinkhorn and A Chapman, 'A medieval potters' tenement at Corby Road, Stanion, Northamptonshire', *Northamptonshire Archaeology* 35 (2008), pp. 215–70; M. R. McCarthy and C. M. Brooks, *Medieval pottery in Britain, AD 900–1600* (1988), pp. 285–90, 432–3; D. C. Mynard, 'A medieval pottery industry at Olney Hyde', *Records of Bucks.* 26 (1984), pp. 73–4.

[63] L. A. S. Butler, 'Minor medieval monumental sculpture in the east midlands', *Archaeological J.* 121 (1964), pp. 118–25, 147–9; S. Badham, 'Evidence for the minor funerary monument industry, 1100–1500', in Giles and Dyer, *Town and country*, pp. 174–6, 181–4.

[64] S. Gerrard, *The early British tin industry* (2000); D. Austin, G. A. M. Gerrard and T. A. P. Greeves, 'Tin and agriculture in the middle ages and beyond: landscape archaeology in St Neot's parish, Cornwall', *Cornish Archaeology* 28 (1989), pp. 5–251; G. A. Makepeace, 'Report on the excavations of a medieval farm at Hill Top Farm, Aldwark, near Brassington,

To conclude, the material evidence can lend support to written sources, by demonstrating the tendency of industry to be concentrated in particular regions or villages. Archaeology reveals a greater variety of crafts, a higher level of participation, a larger scale of output and a wider field of distribution than has generally been realized.

V

Up to the 1980s archaeologists excavated the foundations of buildings (mainly dwelling houses) and the architectural historians surveyed and analysed standing structures, such as the cruck-framed houses of the West and the Wealdens of the South East. The great discovery of recent years is that those engaged in both disciplines were studying the same types of buildings, some of which fell down or were dismantled (making them available for excavation), while others survived. One factor in establishing the connection was the advent of radio carbon dates, and then the more precise tree ring method which has been applied to hundreds of standing structures. In spite of the technical factors which restrict the application of the method, by the year 2001 a useful sample of 712 late medieval buildings had been dated. In the countryside, excluding houses of aristocrats and gentry, 27 were assigned dates before 1366, including a peasant house at Cottingham in Northamptonshire which was built from timbers felled in 1262. Another 40 belong to the period 1367–1433, and then comes a notable increase to 126 houses between 1434 and 1533. A recently published sample of midland houses, identified as belonging to peasants (Figure 1), confirms the importance of the building activity in the fifteenth century and especially in 1440–1500.[65]

Peasant houses of the period 1250–1350 do not survive as standing structures in large numbers, but that is not necessarily the result of the poor standard of their materials or workmanship, but because of the remorseless attrition of the centuries: we should wonder that any such structures still exist.[66] Excavation has produced hundreds of ground plans of buildings of the period 1250–1500, most of them between 10 and 15m in length (30 to 45 feet) with foundations of various local materials: flint, chalk, granite, limestone or sandstone. In regions with limited supplies of stone the foundations consisted of padstones on which timbers could be rested, and sometimes the walls were of cob or earth, which was a long-lasting material if protected from rain and flood. The foundations are thought to have supported timber superstructures, for which evidence sometimes survives in the form of sockets or padstones set in a wall.[67] From surviving buildings, the skill with which joints were designed compels us to think they were constructed by specialist carpenters. A high proportion of these excavated buildings have been dated to 1250–1350, and therefore belong to the period of agrarian crises. Even then

Note 64 *continued*
Derbyshire, 1992–5', *Derbyshire Archaeological J.* 121 (2001), pp. 162–89.

[65] S. Pearson, 'The chronological distribution of tree-ring dates, 1980–2001: an update', *Vernacular Architecture* 32 (2001), pp. 68–9; N. Alcock and D. Miles, *The medieval peasant house in the midlands* (2012), pp. 15–20; in Kent many houses are dated to 1440–1519, with a peak in the 1480s: S. Pearson, *Medieval houses in Kent* (Royal Commission on Historical Monuments, England, 1994), p. 68.

[66] C. Currie, 'Time and chance: modelling the attrition of old houses', *Vernacular Architecture* 19 (1988), pp. 1–9.

[67] Christie and Stamper (eds), *Medieval rural settlement,* pp. 15–16, 129–30, 139–40, 142, 256–61.

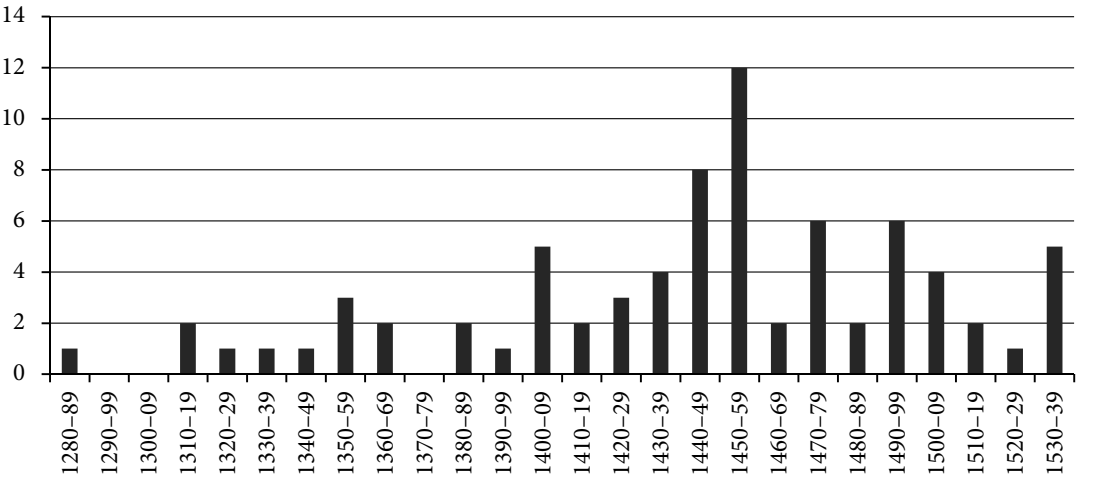


FIGURE 1. Dated peasant houses from the midlands, selected by Alcock and Miles. Total number of houses in the sample = 78.

some peasants deployed resources to build houses of some size and substance, and in addition provided their holdings with agricultural buildings, especially barns but also accommodation for livestock. Cattle were usually housed separately from people, as the long house that combined dwelling space and a byre under the same roof was most frequently found in particular regions, such as the South West.

A major part of the investment in buildings of the whole period 1250–1550 arose from the cutting, transport and fitting of the timber. A house of standard three-bay dimensions from Mapledurham in Oxfordshire, dated to 1335, was constructed with timber from 111 trees.[68] Features of excavated houses include iron hinges, latches and locks, and large-headed iron nails serving as door studs, which must have been purchased. It should be said, though, that common finds on village sites are the socketed stones which enabled a door to be hinged without the expense of ironwork.[69] Late medieval houses, often of one storey, were heated by a single open hearth, and the hole through which smoke escaped was surrounded by tiles or slates to protect the thatched roof from sparks. These generalizations are not just based on the houses of a wealthy minority of peasants, as the same type of house is found repetitively across settlements which have been excavated on a large scale, such as Great Linford in Buckinghamshire and West Whelpington in Northumberland, and their foundations can be seen in rows along the village streets of well-preserved abandoned settlements such as Firsby in Lincolnshire.[70] Houses that belonged to cottagers have survived and have been surveyed by

[68] Alcock and Miles, *Peasant house*, pp. 80–1.

[69] Chapman, *West Cotton*, pp. 361–5.

[70] D. C. Mynard and R. J. Zeepvat, *Excavations at Great Linford, 1974–80* (Buckingham Archaeological Soc. monograph ser. 3, 1991); D. H. Evans and M. G. Jarrett, 'The deserted village of West Whelpington, Northumberland', 3rd report, part 1, *Archaeologia Aeliana*, 5th ser. 15 (1987), pp. 199–308; D. H. Evans, M. G. Jarrett and S. Wrathmell, 'The deserted village of West Whelpington, Northumberland', 3rd report, part 2, *Archaeologia Aeliana*, 5th ser. 16 (1988), pp. 139–92; P. Everson, C. C. Taylor and C. J. Dunn, *Change and continuity. Rural settlement in north-west Lincolnshire* (1991), pp. 211–13.

architectural historians, and a few have been excavated, so the dwellings of smallholders are under-represented, but not hidden from view.[71]

Although a substratum of poor quality and old-fashioned housing is found in the medieval countryside in the thirteenth century, of a sort which was singled out as evidence for peasant poverty at the beginning of this article, the majority of excavated houses reflect a 'great rebuilding' beginning in the mid-thirteenth century, that featured some form of foundation and timber frames. The methods of construction, based on crucks or box-framing, became standard techniques until the spread of brick in the early modern period.

The houses reveal their inhabitants' way of life, and this has a wider significance for understanding the peasant mentality. Peasants belonged to communities, represented in the material evidence by village plans with greens, and by buildings such as chapels, parish churches, church houses (especially in the South West) and guild halls (most often in the East). However the ditches, banks, hedges, fences and walls around individual plots or tofts suggest a strong sense of private space and individual property, which is confirmed by the relatively frequent finds of locks and keys. Within the houses, the inner rooms, the chambers, with their restricted access, provided more privacy than the hall where meals were served and a hearth lit, in which signs can be detected of a domestic hierarchy. In the South East, in the fourteenth and fifteenth centuries, jettied upper floors increased the number of private rooms, and it became more common to floor over at least a single bay of houses in other parts of the country.[72] Perhaps these domestic arrangements hint at the adoption among peasants of an attachment to property and ambitions for self-advancement?

The contents of the houses should tell us something about the wealth of the inhabitants, and pottery, being the most plentiful find, can lead to judgements about a village's or household's economic status. Pottery is usually recovered in quantities, because each household owned a number of vessels, and breakage required regular replacement. In general the amount of pottery of the thirteenth century was more plentiful on rural sites than that of the previous two centuries. Exceptions to this abundance suggest pockets of relative poverty, and these were not just in remote uplands, as pottery can be scarce on thirteenth-century sites in the Sussex weald, for example.[73] An alternative explanation for small amounts of pottery could be a cultural preference for vessels for preparing and consuming food and drink made of perishable wood and leather, or of metal which could be recycled. On sites with plenty of pottery a sign of relative poverty might be the overwhelming predominance of local wares, such as the large amounts found at Wharram Percy from the kilns of Staxton only 15 miles away. This rather drab and functional ware had the advantage of being readily available.[74] The proportion of ordinary cooking pots and bowls tended to be higher on poorer sites. At Coton, for example, a community of smallholders with a poor standard of housing, only 4 per cent of the sherds came from jugs.[75] By contrast, a site in a village such as Brighthampton in

[71] C. Dyer, 'History and vernacular architecture', *Vernacular Architecture* 28 (1997), pp. 2–3; Beresford, *Caldecote*, p. 101.

[72] M. Johnson, *English houses, 1300–1800. Vernacular architecture, social life* (2010), pp. 65–86.

[73] M. Gardiner, 'The characterization of medieval Wealden settlements: excavations at Ivenden, Combe Farm, Mayfield, East Sussex', *Sussex Archaeological Collections* 136 (1998), pp. 95–110.

[74] Stamper and Croft, *South manor area*, p. 74.

[75] Northamptonshire Archaeology, 'Coton', p. 113.

Oxfordshire is probably more typical of southern England. Between the twelfth and sixteenth centuries the inhabitants acquired pottery that had been made at 12 different (mostly rural) centres of manufacture, with perhaps three or four producing their wares at any one time, within a radius of 40 miles.[76] One gains the impression that peasants, and particularly the wives who bought the pottery, were discriminating consumers, who were presented when they visited their local market towns with a range of pots of varied design from which to choose. On other peasant sites relative affluence is suggested by decorated or specialized pots, such as chafing dishes for keeping food warm, or other dishes for fish or for collecting dripping. These tend to be less plentiful than on urban or aristocratic sites, and the colourful Saintonge ware jugs from south-western France are usually absent.[77] The pottery may tell us about varied standards of diet, as a shortage of jugs might suggest infrequent drinking of ale, while the dripping pans would be used by relatively affluent households, which were accustomed to roasting meat.

Finally, to concentrate on the material evidence for diet and food culture, which provides much qualitative information, but cannot tell us if peasants were well-nourished. The charred grains which are found on rural settlement sites confirm that barley and wheat figured prominently among their crops, but provide no precise guide to the cereals eaten.[78] Animal bones are a better indication of consumption, showing the predominance of beef over mutton, when the size of the animals are taken into account, even though the sheep bones can outnumber those from cattle.[79] Small and fragile bones which tend to decay, for example from poultry, are underrepresented. Bone evidence does not allow a calculation of the frequency with which meat was eaten, or the overall quantity.

Not all grain was carried to mechanical mills for grinding, as handmill stones or querns (or rather pieces of broken stones) are commonly found in or near to peasant houses. They may have ground all of their own flour in defiance of the lord's monopoly, or more likely kept handmills for occasional convenience, and for milling malt. The basic food is often thought to have been bread, but baking arrangements are not always easily discovered. Most houses were not provided with bread ovens built into a wall, but buildings can be identified as specialist bakehouses, some of which may have served as seigniorial ovens used by the whole community. Households in the North and West may not have baked in ovens but used iron plates or bakestones.[80] Peasants seem often to have boiled their food, judging from the number of ceramic and metal cooking pots, and this would have economized on fuel, making pottage the universal peasant dish. A few peasants in their kitchens followed aristocratic models of food preparation, because occasional finds of stone mortars point to

[76] S. Ford and S. Preston, 'Medieval occupation at the Orchard, Brighthampton', *Oxoniensia* 67 (2002), pp. 287–312; D. Hinton, 'Deserted medieval villages and the objects from them', in Dyer and Jones (eds), *Deserted villages revisited*, pp. 101–4.

[77] Ibid., p. 103; D. H. Brown, 'Pots from houses', *Medieval Ceramics* 21 (1997), pp. 83–94.

[78] Moffett, 'Plant foods', pp. 41–2, 49–50.

[79] N. Sykes, 'From *cu* and *sceap* to *beffe* and *motton*', in Woolgar and others (eds), *Food*, pp. 60–3; Stamper and Croft, *South manor*, p. 172.

[80] S. Smith, 'Towards a social archaeology of the late medieval peasantry: power and resistance at Wharram Percy', *J. Social Archaeology* 9 (2009), pp. 391–416; P. Rahtz, 'Upton, Gloucestershire, 1964–1968', *Trans. Bristol and Gloucestershire Archaeological Soc.* 88 (1969), pp. 86–7; J. G. and D. G. Hurst, 'Excavations at the deserted medieval village of Hangleton, part 2', *Sussex Archaeological Collections* 102 (1964), pp. 104–5; Wrathmell (ed.), *Wharram Percy*, pp. 332–3, 354.

the crushing, pounding and mixing of food, following the commonplace practices among aristocratic cooks.[81]

Not all food came from the locality, and in particular sea fish was consumed in inland communities. Shellfish, such as oysters, were brought in small quantities to sites in Buckinghamshire located 70 miles from the sea. At Wharram Percy fish bones have been recovered, including cod, which can be shown by stable isotope analysis to have come from the North Atlantic. This would probably have reached the Yorkshire wolds from a port such as Hull as dried stockfish. Stable isotope analysis of human bone from Wharram's churchyard has suggested that part of the diet had a marine source.[82]

The archaeology of houses and households impress upon us the importance of regional variety as well as social and cultural differences. A standard of comparison comes from the houses excavated in the north Buckinghamshire village of Great Linford, houses often 5m wide and 8, 12 or 16m long (between 25 and 50 feet) were built with stone foundations and timber frames. They were accompanied by agricultural buildings of similar construction. Pottery of many forms and functions, with a variety of objects including four spurs, four pieces of stone mortar and a metal harness fitting with an enamel design of a lion or leopard lead us to regard them as well-equipped and even pretentious households. At the other extreme at Coton small cramped houses were inhabited by people using a limited range of mainly locally made pottery. The Great Linford model, to generalize on the basis of dozens of excavations, is probably representative of the majority of peasant households in southern, midland and north-eastern England, which had some spending power and acquired a mentality of individual improvement.

VI

Individual lives can be glimpsed from surviving traces of peasant clothing. Shoes can be preserved in wet conditions, such as the child's shoe from the pond at Wharram Percy. As it was originally made of goat skin, it was likely to have been made by an urban cordwainer, either in the nearby market town of Malton, or in York itself. This relatively sophisticated and costly item had its life prolonged by its not very affluent owners by no less than four separate patchings with inferior leather.[83] Remnants of clothing occur on low status rural sites in the form of metal fastenings and ornaments, above all buckles, belt ends or chapes, brooches, points (metal ends of leather fastenings) mostly made of alloys of copper (bronze or brass) rather than the inferior lead- and tin-based alloys. Some of them were harness fittings presumably for horses used for riding rather than field work. Copper-alloy objects can be numerous, more than 500 of them having been recovered from excavations at Tattenhoe and

[81] C. Dyer, 'Did peasants need markets and towns? The experience of late medieval England', in M. Davies and J. Galloway (eds), *London and beyond* (2012), p. 32.

[82] Ivens, Busby and Shepherd, *Tattenhoe and Westbury*, p. 436; J. H. Barrett, 'The fish bone', in Treen and Atkin, *Water resources*, 169–75 ; J. H. Barrett *et al.*, 'Detecting the medieval cod trade: a new method and first results', *J. Archaeological Science* 35 (2008), pp. 850–61; Mays, Harding and Heighway, *Churchyard*, pp. 94–5.

[83] Treen and Atkin, *Water resources*, pp. 145–8. Patched shoes were also found at Lydd quarry on Romney Marsh, and at Wainfleet, Lincolnshire: Barber and Priestley-Bell, *Medieval adaptation*, pp. 198–200; McAvoy, 'Marine salt extraction', pp. 152–8.

Westbury in Buckinghamshire. These pieces of cast metal were made in towns, many of them in London, and the cost of the materials is reflected in their small size which was often less than 3cm across. They were useful, but more than half of those in one large sample had some form of decoration, with various common motifs such as floral and leaf designs, animal and bird heads, geometric patterns, and occasionally a heraldic device; a few have traces of gilt. It has been argued that these possessions reflected the superior status of their wearers within village society.[84] Objects with religious significance include a paternoster bead from Wharram Percy, and from a number of rural sites pewter or lead badges and *ampullae* (miniature flasks originally containing holy water), which peasants who had been on pilgrimage had brought back from shrines such as Walsingham in Norfolk.[85]

Many peasants, particularly in eastern England, owned seals with which they could authenticate documents – usually grants of free land. The metal matrices, incised with simple designs with which wax was impressed, are found by the hundred, often not in settlements but in the fields where they were lost, discarded or scattered with other domestic debris from the manure heap. These are recovered along with many other metal objects of our period, the abundance of which in eastern England are likely to reflect the relative wealth of the region.[86] Of course documents tell us that most households owned a brass cooking pot or pan, and the wealthier ones had a basin and ewer for washing hands in a fashion normally associated with the refined manners of the aristocracy, but these relatively large objects are not found because they were recycled when they were broken or worn.[87] The scarcity of more valuable objects in the archaeological record is well illustrated by coins, which are found in small numbers, or not at all, on peasant sites. We know that they used money, but they were careful not to lose their silver pennies and groats. The types of coin tell us something about the peasant economy: only one gold coin has been found in a peasant house, but many of the silver coins that have been recovered were halfpennies and farthings.[88]

Peasants acquired non-essential, showy and even pretentious metalwork, though that discovery has to be qualified by their cautious and thrifty tendency to make do, mend and recycle. Shoes were patched; objects of copper alloy, if broken or worn, especially the brass pots which were owned by almost every household, were sent for recasting; ceramic pots of low value sometimes had holes plugged by metal patches.[89] Finally evidence must be mentioned for games and pastimes, such as nine-mens'-morris boards incised on stones, bone dice, buzz bones (bones from pigs' feet with holes through which a string or thong was twisted to make a satisfying sound when allowed to unwind), pipes or flutes made again from bones, and metal 'jews' harps'.[90] Time

[84] Ivens, Busby and Shepherd, *Tattenhoe and Westbury*, pp. 305–6, 336–6; A. Graham, 'Evidence for the medieval hamlets of Pykesash and Ash Boulogne: archaeological excavations at Ash', *Somerset Archaeology and Natural History* 148 (2005), p. 27; S. Smith, 'Materializing resistant identities among the English peasantry. An examination of dress accessories from English rural settlement sites', *J. Material Culture* 14 (2009), pp. 309–32.

[85] Gilchrist, *Medieval life,* pp. 158, 159, 160.

[86] A. Rogerson and S. Ashley, 'Medieval seal matrices from Norfolk, 2007', *Norfolk Archaeology* 45 (2008), pp. 422–8; A. Bevan, 'Spatial methods for analysing large-scale artefact inventories', *Antiquity* 86 (2012), pp. 492–506.

[87] C. Dyer, 'Living in peasant houses in late medieval England', *Vernacular Architecture* 44 (2013), pp. 21–2.

[88] C. Dyer, 'Peasants and coins: the uses of money in the middle ages', *British Numismatic J.* 67 (1998), pp. 30–47.

[89] Wrathmell, *Domestic settlement*, p. 39.

[90] D. Dudley and E.M. Minter, 'The excavation of a

was available for such frivolous pursuits, but no expenditure was required because the items (except for the last mentioned jews' harps), were made cheaply from materials of no value.

VII

In conclusion no simple story can be told from the material evidence. We can make some assessment of the peasant economy both in the thirteenth and fourteenth centuries, and in the period 1350–1540. All generalizations must be qualified by reference to regional variety in culture and the economy.

The conventional historical view of expansion in the two centuries after 1100 is matched by many settlements which have a first phase dated by pottery to the twelfth or thirteenth centuries, perhaps the consequence of new land being colonized, or the reorganization of settlement. An expansion in the area of cultivation is indicated by landscape evidence for the laying out of fields, pottery scatters originating from manuring, and the appearance in botanical samples of pollen deriving from crops and weeds which grew in cornfields. Rural industries seem more abundant in the thirteenth century than in earlier centuries, and growth in general may have quickened after c.1200.

In the midst of this expansion, the deprivation within peasant society is brought home to us by material evidence. The human bones in the churchyard reveal the low nutritional status and poor health of the Wharram Percy population. Cost cutting and economizing could have harmed peasant capacity for effective production. Livestock had access to only limited quantities of fodder, which contributed to their stunted growth: the potential fodder crops, such as peas and beans, were needed for human consumption. Peasants could only buy goods on a limited scale, and depended on recycling and mending to prolong the life of their possessions. They ate the meat obtained from elderly cattle and sheep, because they sent younger animals to market. Their food was often prepared by boiling, reflecting the scarcity of fuel, and they saved on mill tolls by grinding corn, or at least malt, by hand. They can be portrayed as industrious, working hard to earn a little extra, by cutting vegetation both for use in the home and farm, and for sale. They were prepared to do tedious tasks, such as weeding, and to engage in distaff spinning for a small return.

In the thirteenth century we are aware of a marked divergence within peasant society, in which some show symptoms of poverty, while others were bettering themselves. Signs of the first category were the construction in different regions of timber houses, which tended to be small and insubstantial. Possible indices of deprivation included settlements with little metalwork or pottery, or those with dull and functional ceramics of local manufacture. In the second group we can discern peasants with hopes of material improvement. The best available benchmark of economic well-being, the dwelling house, was subject to a 'great rebuilding' with

Note 90 *continued*
medieval settlement at Treworld, Lesnewth, 1963', *Cornish Archaeology* 5 (1966), pp. 56–7; Stamper and Croft, *South manor*, pp. 151, 153; Treen and Atkin, *Water resources*, pp. 123–4, 143–5; D. Andrews and G. Milne, *Wharram. A study of settlement on the Yorkshire Wolds*, I, *Domestic settlement, 1: areas 10 and 6* (Society for Medieval Archaeology monograph 8, 1979), pp. 120–1, 128–9; M. A. Hall and P. B. Pettitt, 'A pair of merels boards on a stone block from Church Hole Cave, Creswell Crags, Nottinghamshire, England', *Trans. Thoroton Society* 112 (2008), pp. 135–42.

foundations and durable timber frames. Such structures were affordable presumably because a range of commodities were sent to market. In some localities the products of part-time crafts made a significant contribution to household incomes. Production was helped by making choices in the variety of crops to be sown and breeds of animals to be kept. The exploitation of new lands in the wetlands, uplands and woodlands speak of confident projections of future benefits, and care was taken to organize manuring and crop storage. Items of consumption included modest but unnecessary luxuries such as copper-alloy dress accessories, sea fish, meals prepared with mortars and decorated pottery jugs for serving ale.

The 'crisis' of the early fourteenth century can be detected in abandoned houses both in hamlets and villages, and field and environmental evidence for a retreat from cultivation in the last years of the thirteenth century and the early fourteenth. Some shrinkage in towns reflects the general malaise. Building activity associated with lordly wealth, such as work on monasteries and cathedrals, was reduced presumably because the elites were receiving lower incomes, especially from peasant rents.[91]

In the century or two after 1350 the number of abandoned settlements rose, the amount of land manured by dung carts declined, and proportions of grass and tree pollen (preserved in peat deposits) increased. Pastoral husbandry grew in quality as well as quantity: bone evidence shows that the size of animals was rising, perhaps because of an improvement in nutrition as grazing land became more plentiful and more field crops were used as fodder.[92] The decline in the number of houses and acreage of corn was accompanied by a rise in individual spending power demonstrated by the number of houses started after about 1400, rising to peaks (depending on the region) between the 1440s and the 1480s, which are decades conventionally associated with economic depression. Two-storey houses were becoming more common outside the South East. A growing number of houses were provided with roofs of stone slates, hearths were more likely to be equipped with some form of chimney, and finds include the occasional stone mullion and glazed window.[93] At Caldecote in Hertfordshire the well-built dwellings were accompanied by substantial farm buildings such as barns.[94] At Wharram Percy some imported pottery was bought by peasants, and everywhere locally made wares improved in quality. The numbers of churches rebuilt and adorned in the fifteenth century (which we know from written sources were often funded by the parochial community) suggest that peasants had money to support good causes.

Some of these generalizations about peasant England from an archaeological perspective confirm and reinforce views deriving from documentary evidence, but much data and many insights are only available from archaeology. The material evidence is not always consistent or decisive, but it contributes helpfully to debates about the peasant economy, and enriches our understanding of the peasant past.

[91] C. Dyer, 'The crisis of the early fourteenth century. Some material evidence from Britain', in D. Boisseuil, P. Chastang, L. Feller and J. Morsel (eds), *Écriture de l'espace social. Mélange d'histoire médiévale offerts à Monique Bourin* (2010), pp. 491–506.

[92] R. Thomas, 'Zooarchaeology, improvement and the British agricultural revolution', *International J. Historical Archaeology* 9 (2005), pp. 71–88.

[93] Andrews and Milne, *Domestic settlement*, p. 73; P. Thompson and S. C. Palmer, 'Iron Age, Romano-British and medieval settlements excavated on the Transco Newbold Pacey to Honeybourne gas pipeline in 2000', *Trans. Birmingham and Warwickshire Archaeological Soc.* 116 (2012), pp. 81–3, 120–1.

[94] Beresford, *Caldecote*, pp. 95–137.

The medieval origins of south Pennine farms: the case of Westmondhalgh Bierlow*

by David Hey

Abstract

The scattered farmsteads of the Pennine foothills of south-west Yorkshire rarely offer visual clues to the antiquity of their sites. Most of their names are first recorded in the early modern period, yet if we examine the surnames that are associated with them we find that many were founded well before the Black Death. This is a much older settled landscape than at first appears. The importance of the hamlet as the basic unit of farming systems is emphasized, and evidence is provided for small arable townfields, divided into doles, and extensive moorland commons whose boundaries are marked by deep ditches that have wrongly been interpreted as linear defences from the Romano-British or Anglian period.

Modern studies have provided us with a general understanding of how farms were created on the edges of moorland in different parts of England during the period of population growth between the twelfth and early fourteenth centuries. The pioneering work of Margaret Faull and Stephen Moorhouse on West Yorkshire, of John McDonnell on the North York Moors, of Angus Winchester on the Lake District, the northern Pennines and the Scottish Borders, and of Harold Fox on Dartmoor is well known.[1] In recent years the late Richard Britnell and Brian Roberts have led a team in an ESRC-funded project on settlement and waste in the Palatinate of Durham, including the western High Pennines, where the extent of waste by the early fourteenth century differed little from today.[2] Yet there is still much scope for local studies of the predominantly pastoral and weakly manorialized territories that characterized the gritstone moorlands and which differed considerably from, say, 'the islands of cultivated land in a sea of waste' on the magnesian limestone district of south-east County Durham.

In 2001 George Redmonds and I wrote an account of how the present landscape of a Pennine moorland township in the parish of Huddersfield was largely created in the first half

* I am grateful to two anonymous referees for their helpful comments on an earlier draft of the text.

[1] M. L. Faull and S. A. Moorhouse (eds), *West Yorkshire: an archaeological survey to AD 1500* (4 vols, 1981); J. McDonnell, 'Medieval assarting hamlets in Bilsdale, north-east Yorkshire', *Northern Hist.* 22 (1986), pp. 269–79; A. Winchester, *The harvest of the hills: Rural life in northern England and the Scottish Borders, 1400–1700* (2000); H. Fox, *Dartmoor's alluring uplands: Transhumance and pastoral management in the middle ages* (2012).

[2] H. M. Dunsford and S. J. Harris, 'Colonization of the wasteland in county Durham', *EcHR* 56 (2003), pp. 34–56; R. H. Britnell, 'Fields, farms and sun-division in a moorland region, 1100–1400', *AgHR* 52 (2004), pp. 20–37.

of the fourteenth century.[3] The place-name evidence implied that little settlement had taken place before the Elizabethan period and the earliest surviving vernacular architecture was seventeenth-century in style. However, onomastic evidence, mainly in the form of surnames taken from the Wakefield manor court rolls, showed that the basic structure of the township had been created before the Black Death and had survived that disaster. A similar approach has been adopted here.

I

On the Pennine foothills to the north-west of Sheffield a young couple rear ostriches and alpaca, as well as geese and horses. Inscribed on a slate by the farm entrance is the name Snell House. The outward appearance of this farm is that of a typical nineteenth-century smallholding at the highest point of cultivation on a steep hillside, some 850 feet above sea level. Yet the documentary evidence tells us that this land has been farmed for over six-and-a-half centuries. The book of customary fines of the lordship of Hallamshire, otherwise known as the manor of Sheffield, records that in 1342 Elias Snel 'gave 6*d*. for licence to hold one plot of land in Westmondhalgh by the gift of Hugh de Whitley'.[4] Westmondhalgh was the ancient name of one of the four townships or bierlows in the soke of Bradfield within the manor of Sheffield, and White Lee Farm (formerly Whitley) lies a quarter-of-a-mile to the west of Snell House, so there is no doubting the identification (Figure 1). In the Bradfield poll tax returns of 1379, a William Snell paid at the basic rate of 4*d*.[5] After that, the family disappeared from local records. Snell House is not mentioned in the relevant English Place-Name Society volume, but the surname of these medieval peasants – one that was derived from an old personal name or nickname – provides a strong clue to the origin of their small farm in the years of rising population before the calamity of the Black Death.[6]

Further down the steep hillside that rises from the Ewden Valley, at about 650 feet above sea level, Raynor House takes its name from another medieval surname, in this case one that arose from a personal name that had been brought to England by the Normans. In a late thirteenth-century confirmation deed that can be dated to before 1270 Thomas de Furnival, lord of Hallamshire, granted Thomas, the son of William Reyner 'of the new mill' (*newmyln)* in the valley bottom, properties that included 'a messuage with the appurtenances called Rayner House in Westmondhalgh'.[7] A William Reyner paid the basic rate of poll tax in 1379 and he, or his namesake, was recorded as a witness to local deeds in 1383 and 1402.[8] A Thomas Rayner was

[3] G. Redmonds and D. Hey, 'The opening-up of Scammonden, a Pennine moorland valley', *Landscapes* 2 (2001), pp. 56–73.

[4] Sir A. S. Scott-Gatty (ed.), 'Records of the court baron of the manor of Sheffield', *Trans. Hunter Archaeological Soc. (hereafter THAS)*, 1 (1918), pp. 257–329.

[5] Carolyn C. Fenwick (ed.), *The Poll Taxes of 1377, 1379 and 1381;* III, *Wiltshire – Yorkshire* (British Academy Records of Social and Economic History, 37, 2005), pp. 317–19.

[6] A. H. Smith, *The place-names of the West Riding of Yorkshire* (8 vols, 1961–3), I, pp. 221–44. The naming of farmsteads after the surnames of their earliest occupiers was first discussed by George Redmonds. See, for example, his *Names and history: People, places and things* (2004), pp. 72–3, which considers some farm names in the Holmfirth district a few miles further north.

[7] T. W. Hall (ed.), *A descriptive catalogue (3rd volume) of Sheffield manorial records …* (1934), p. 137.

[8] T. W. Hall (ed.), *A descriptive catalogue of miscellaneous charters and other documents relating to the*

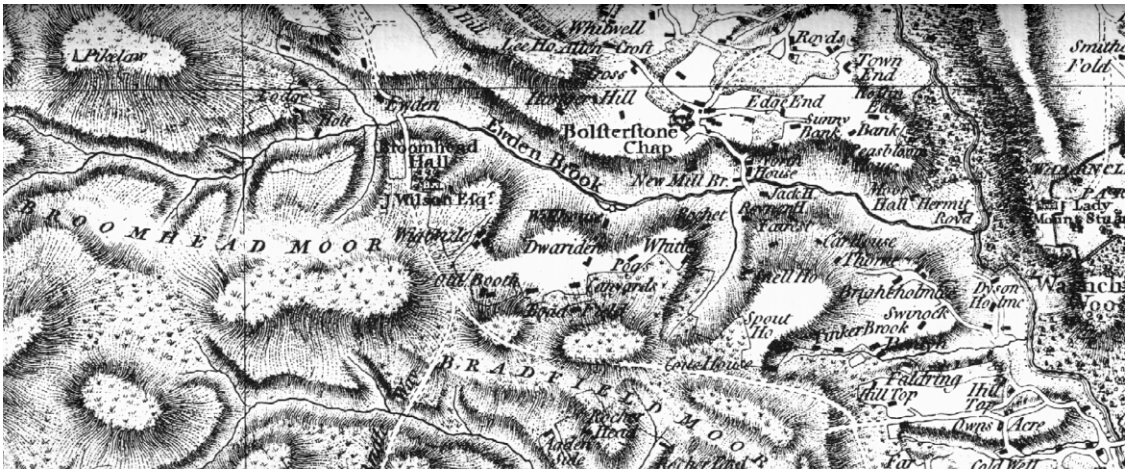


FIGURE 1. Detail of Thomas Jefferys' map of Yorkshire, showing the farms mentioned in the text

Source: Thomas Jefferys, *The county of York survey'd …* (1772) is available in major public libraries and as a CD (Digital Archives Association, 3 Cedarways, Appleton, Warrington WA4 5EW, UK, 2008).

still there in 1440,[9] but the surname disappeared from local records in the following century and, in later times, the farm was sometimes recorded as Reynard House in the mistaken impression that it had taken its name from the fox. It survives as a working farm today.

Linking the medieval documentary evidence to existing farms is not always as straightforward as this. The same pre-1270 grant to William Reyner included the nearby Case House, a farmstead that has either been demolished or which has taken a new name after its last appearance in the records in 1570.[10] John Case paid poll tax in 1379 and in 1424 a John Case surrendered 'a rood of cultivated land near le new Milne'.[11] The surname is an occupational one for a maker of boxes, etc., but here again the local family either failed in the male line or migrated, for they were not recorded in the Bradfield parish register which begins in 1559. A similar nearby example of a farmstead that cannot now be identified is Gillott House, whose name was derived from a surname that developed from the Middle English personal name, Gille. The manorial book of customary fines recorded Thomas Gillott in 1416 and noted that in 1439 Richard Gellott surrendered 'one messuage and one bovate of cultivated land in Wigtwisle [the neighbouring hamlet to the west] to the use of John Gellott his son'.[12] Gillott House was named in a manorial survey in 1637[13] and a Thomas Gilliott was taxed in the township on

Note 8 *continued*
districts of Sheffield and Rotherham (1926), p. 40; id., *Descriptive catalogue of charters, copy court rolls and deeds forming part of the Wheat Collection* (1920), p. 20.

[9] T. W. Hall (ed.), *A descriptive catalogue of Sheffield manorial records from the 8th year of Richard II to the Restoration* (1926), p. 14.

[10] Sheffield Archives (hereafter SA), Crewe Muniments, 658. A likely candidate is Jack House, which is in the right place and is unrecorded before the first edition of the six-inch Ordnance Survey map in 1855.

[11] Scott-Gatty, 'Records', p. 283.

[12] Ibid., pp. 279, 291.

[13] J. G. Ronksley (ed.), *An exact and perfect survey and view of the manor of Sheffield with other land by John Harrison, 1637* (1908, repr. 2009).

two hearths in 1672,[14] but the farm name has disappeared and it is unrecorded by the English Place-Name Society. Here again, the surname provides essential evidence of the early history of the farm.

Other farm names in the same small neighbourhood were topographical in origin, but the surnames that were derived from them suggest continuity of occupation from the medieval period to modern times. Fairhurst Farm is sited by 'the fair wood on the hill', close to Raynor House. John del Fayrhirst paid the lay subsidy in 1297 and was recorded as 'John de la Fayrhurst of Hallumschir … in Westonhallge' in an undated, thirteenth-century deed.[15] A William del Fairhirst witnessed a local deed in 1323 and obtained 'a license to hold a wood and a bovate of land in Wigtwisle' in 1335, and John de Fairehurst inherited land there in 1402.[16] By the time of the 1637 survey of the manor of Sheffield, however, the farm had been subdivided and had passed into other hands. The surname survived as Fairest, but the Arthur Fearest who paid hearth tax in a neighbouring township in 1672 was the only householder with this surname in the West Riding returns.[17] In the 1881 national census returns all but eight of the 103 people named Fairest lived in south-west Yorkshire, within walking distance of the original farm.[18]

In 1303 Henry son of Walter of Wygetwezil granted John de Fayrhirst 'all that plot of land in Dueridene called Newlands'.[19] Dwarriden was a farmstead that was replaced in the twentieth century by a plantation on the southern bank of a reservoir about a mile to the west of Fairhurst. The name means 'dwarf valley' because of the echoes that reverberate from shouts.[20] In 1404 John Morton held a messuage in Dwarriden that had once belonged to Henry Dwarriden.[21] His surname did not survive but Dwarriden House was recorded in the 1637 survey of the manor.

Further down the lane to the east of Fairhurst we come to two other ancient farms with topographical names, Carr House and Thorn House, but the evidence from their names is not as clear cut. Carr is derived from an Old Norse word that passed into local speech for a marshy area, overgrown with brushwood, in this case the land descending to Ewden Beck now preserved by a wildlife trust. Roger and Richard del Kerre were listed amongst the poll tax payers in 1379 and the manorial book of customary fines has fifteenth-century references to Old and New Carrs, but these may have been other marshy areas further up the valley. The first definite reference to Carr House is in the 1637 manorial survey. The same problem occurs with Thorn House. William and Henry de Spina (the Latin word for thorn) witnessed local thirteenth-century deeds[22] and William del Thorne paid the lay subsidy in 1297, but other medieval references to Thornfield and Thornland are too imprecise for us to locate them with certainty. Again, the first definite reference to Thorn House is in the 1637 manorial survey.

[14] D. Hey *et al.* (eds), *Yorkshire West Riding Hearth Tax assessment, Lady Day 1672* (2007), p. 392.

[15] W. Brown (ed.), *Yorkshire Lay Subsidy, being a ninth collected in 25 Edward I (1297)* (Yorkshire Archaeological Soc., Rec. Ser., 16, 1894), pp. 72–6; SA, Wilson of Broomhead deeds, 90.

[16] Hall, *Descriptive catalogue … Wheat collection*, p. 10; Scott-Gatty, 'Records', pp. 260, 271.

[17] Hey *et al.* (eds), *Hearth Tax*, p. 392.

[18] S. Archer, *The British nineteenth-century surname atlas* (Archer Software CD, ver. 1.10, 2011).

[19] SA, Wilson of Broomhead deeds, 89.

[20] Smith, *West Riding*, I, p. 223; A. Gatty, *A life at one living* (1884), p. 205.

[21] Scott-Gatty, 'Records', p. 272.

[22] Hall (ed.), *Descriptive catalogue (3rd volume)*, pp. 137–8; Hall, *Descriptive catalogue … Wheat Collection,* pp. 4–5.

We are on more certain ground with White Lee Farm, high above the valley at almost 1000 feet above sea level. The style of the nineteenth-century farmhouse and its outbuildings, together with the large, rectangular fields that surround it, suggest a post-enclosure creation, yet the documentary evidence shows that this 'bright clearance' amongst the woods at the edge of the moors has been farmed since the middle ages. In an undated thirteenth-century deed Thomas son of Ralph de Witteley held 'five acres one rood of land … enclosed between Witteleymoor towards the east and the wood of Dweridene towards the west' and the land of Robert le Walker on the south, which retains the name of Walker Edge Farm to this day. The manorial book of customary fines notes that in 1283 Hugh de Whitley gave 20*d*. for admission to one rood of new land in Westmondhalgh and that in 1342 William de Stabulo paid 2*s*. for a licence to hold 'half a bovate of land in Whitley'. In 1433 William de Morton held 'one Messuage and six Acres of cultivated land in Whitley' and in the following year Thomas Smalfeild farmed 'two bovates of land in Westmonhalgh at Whitley'. By 1557 the property was thought of as 'a messuage and two oxgangs in Westmondhalgh at Whitelegh'.[23]

II

These farm names show that the scattered pattern of settlement along the southern side of the deep Ewden Valley that survives to this day is medieval in origin, if not even earlier. The present limit of cultivation up to the moorland edge had been reached by the twelfth or thirteenth centuries, though new land in the carrs and woods below continued to be cleared until the mid-fourteenth century. Old Booth Farm, at the very limit, takes its name from the Old Norse word for a manorial cattle-rearing farm or vaccary. The lords of Hallamshire had two such farms on the edge of the Pennine moors, here and at Fulwood Booth, further south in the parish of Sheffield, which they re-stocked with 40 cows, four bulls and eight oxen in 1184.[24] John de Bothe paid poll tax in the chapelry of Bradfield in 1379 and John Bothe the younger and Joan de Bothe were recorded there in 1440.[25] Manorial vaccaries were abandoned in the later middle ages, and in later times the farmers at Old Booth concentrated on rearing sheep until Broomhead Moor was fully converted to grouse moor in the late nineteenth century.

Old Booth Farm is sited at the north-western edge of a remarkable natural landscape, known as Canyard Hills, which consists of a series of huge conical mounds and depressions that have been formed by a massive landslide (Figure 2). The name is not recorded before 1592, when John Morton of Canyas was one of the jurors for the soke of Bradfield within the manor of Sheffield. In 1617 Nicholas Morton of Canions fulfilled the same role and in 1643 he was described as a yeoman 'of Cannis'. John Harrison's survey of the manor of Sheffield in 1637 noted Canier House, the farm that stands on a ledge or shelf just below the landslip and which is now known as Canyards (though the local pronunciation is Kenyers). The name was still written as

[23] Hall (ed.), *Descriptive catalogue (3rd volume)*, pp.137–8; Scott-Gatty, 'Records', pp. 258, 261, 287, 288; Hall (ed.), *Sheffield Manorial Records … also … Lindsay Collection*, p. 78.

[24] *The Great Roll of the Pipe for the thirtieth year of the reign of King Henry II, A.D. 1183–1184* (Pipe Roll Soc., 33, 1912), p. 100.

[25] Hall (ed.), *Descriptive catalogue of miscellaneous charters*, p. 8.



FIGURE 2. Aerial view of the natural landslip once known as Moldicliff but now named Canyards Hills, with Canyards bottom right and Old Booth farm top right

Source: Photo reproduced by courtesy of Meridian Airmaps Ltd

Canniers in 1782.[26] Its etymology is uncertain, but *canne*, an Old English word for a cup or a can, was used topographically for depressions and deep hollows.[27]

[26] T. W. Hall, *Sheffield Manorial Records*, p. 131: Ronksley (ed.), *Exact and perfect survey*, p. 13; Borthwick Institute, York, will of George Helliwell, Canniers, Bradfield, Doncaster Deanery (proved Mar. 1782).

[27] M. Gelling and A. Cole, *The landscape of place-names* (2000), p. 100.

In earlier centuries this landslip area was known as Moldicliff, meaning the earth-covered cliff.[28] The nineteenth-century antiquarian, Joseph Hunter, noted that in 1388 Thomas de Moldiclif of Westmonhalgh gave lands to William de Morton, who lived at Dwarriden, just below Moldicliff. The Mortons farmed here for nearly three centuries and Hunter mentioned the will in 1651 of 'Nicholas Morton of Muldicliffe, which was then called Caniers'. For a time, the two place-names overlapped; in 1594, for instance, Nicholas and John Morton were said to be 'of Moodyclyf', but the old place-name gradually disappeared.[29] However, the surname that was derived from the farm name survives to the present day, albeit far away from its source. The Bradfield poll tax returns for 1379 listed John de Moldclyf, Adam de Moldcliffe and Thomas Moldelclif, and in 1441 Thomas de Moldeclyff was one of the jurors of the manor court.[30] The name died out locally before the Bradfield parish register began in 1559, but John Mouldcliffe was taxed on one hearth a few miles further north in Holmfirth in 1672. At the time of the 1881 national census all 15 people named Moodycliff(e) were living in the Huddersfield district. Today the name is found only in Dumfries to where a Huddersfield Moodycliff migrated two generations ago.[31]

A mile or so down the old bridleway that was converted into a moorland turnpike road in the 1770s and which still separates the medieval farms from the moors is the ruined site of Broomhead Hall, with Broomhead Farm just beyond, on the headland that was once covered with broom or gorse. Once more, our earliest dating evidence comes from surnames. Henry de Bromeheude witnessed a local deed that dates from before 1290.[32] His descendants have made Broomhead into a familiar Sheffield district surname to this day. A William Bromed paid 4*d*. poll tax in 1379 but, by then, the family had moved two or three miles south to Bradfield and John Weleson paid his 4*d*. at Broomhead. In 1398 this John Wilson de Bromhead was referred to as John, the son of William, the son of John de Waldershelf, so he was the first to bear the hereditary surname. The Wilsons were small farmers there on the same scale as most of their neighbours until the sixteenth century, when their fortunes began to improve, first by a profitable marriage and then by service in the households of the Earl of Shrewsbury at Sheffield and Sir Thomas Wentworth at Wentworth Woodhouse. In 1640 Christopher Wilson built a substantial stone hall at Broomhead, which was demolished and rebuilt as a large Tudor Gothic mansion in 1831 by James Rimington, a barrister who had succeeded Henry Wilson in 1819 as his nephew and heir and whose descendants changed their name to Rimington-Wilson.[33] In the years leading up to the First World War their grouse moor beyond the turnpike road was the most celebrated in England.

Other scattered farms in the eastern part of the bierlow or township were created in the thirteenth or early fourteenth century beyond the Domesday Book hamlets of Onesacre and Worrall. Spout House, which stands about 1000 feet above sea level, bears a name that was derived from a water outlet. An undated, thirteenth-century deed mentions Le Sputesyke as a

[28] Smith, *West Riding*, I, p. 243.

[29] J. Hunter, ed. J. W. Clay, *Familiae Minorum Gentium* (4 vols, Harleian Soc., 37–40, 1894–6), II, pp. 807–10.

[30] Hall (ed.), *Descriptive catalogue of miscellaneous charters*, p. 35.

[31] Information from George Redmonds.

[32] Hall (ed.), *Descriptive catalogue (3rd volume)*, pp. 137–38.

[33] D. Hey, *Historic Hallamshire* (2002), pp. 58–9.

boundary here, and another deed of 1316 records 'all that messuage, with the outbuildings land and tenements at le Spouthous … in the territory of Onesacre in Bradfield'.[34]

Some farms in this group are evidenced by surnames long before they were recorded as place-names. Swinnock Hall, which was first mentioned by name in 1582, referred either to a burnt oak or one that was somehow associated with swine, but the surname is recorded much earlier.[35] Thomas de Swynok appeared as a witness to five local deeds between 1309 and 1332[36] and John Swynok paid 6*d*. as a tailor in the Bradfield poll tax returns for 1379. Adam and John de Scwynok were recorded in 1403, John Swinnock in 1416, Thomas de Swinock in 1439, and John Swynok in 1441, long before the first reference to the farmhouse, which survives as a modest nineteenth-century, mock-Jacobean, gabled structure.[37] By then it had passed to another family and the Swinnock surname had disappeared.

Another example of the use of surnames in establishing the early history of Pennine farms is Coumes, to the south of the valley formed by the Coumes Brook as it flows towards the Don. Margaret Gelling defined *cumb* as a 'short, broad valley, usually bowl- or trough-shaped with three steeply rising sides',[38] a description that fits this south Yorkshire valley perfectly. The manorial book of customary fines notes a Peter de Combes in 1277 and a John del Coumb who surrendered two acres of land in le Coumbes in 1339.[39] Forty years later, John de Combe paid 4*d*. poll tax. John Harrison's survey of 1637 noted other properties close by with the names Tagglands, Taggland Ing, Taggland Wood and the Taggstones. The relevant English Place-Name Society volume has no reference to these names before the seventeenth century and its editor suggested that their source was teg, a young sheep in its second year. Yet the manorial book of customary fines records a Thomas Tegg who was admitted to half a rood of land in this neighbourhood in 1284.[40] Succeeding generations of this family (whose surname may have started as a nickname from a sheep) appear regularly in the records centuries before the first references to the minor place-names. A John Tagge witnessed a deed at Bradfield in 1341 and Richard Tagge of Worrall held land in that hamlet in 1350. Richard Tagge and Magota Tagge paid their poll tax in 1379, Richard Tagg witnessed a deed in Westmondhalgh in 1403, and John Tag and Elizabeth Tag appeared before the manorial court in 1440–1.[41] The Taggs were farming at Hawkesworth Head, further south in the chapelry of Bradfield in the sixteenth century,[42] but they had disappeared from this neighbourhood by the time that the hearth tax was levied in 1672.

[34] J. Hunter, revised A. Gatty, *Hallamshire* (1869), p. 470; Hall (ed.), *Descriptive catalogue … Wheat Collection*, pp. 9–10.

[35] Smith, *West Riding*, I, p. 239.

[36] Hall (ed.), *Descriptive catalogue … Wheat Collection*, pp. 9–13.

[37] T. W. Hall, *A descriptive catalogue of land-charters and court rolls from the Bosville and the Lindsay Collections* (1930), pp. 120; Hunter, *Hallamshire*, p. 471; Scott-Gatty, 'Records', p. 290; Hall (ed.), *Descriptive catalogue of Sheffield manorial records*, p. 26.

[38] Gelling and Cole, *Landscape of place-names*, pp. 103–9.

[39] Scott-Gatty, 'Records', pp. 257, 261.

[40] Ronksley (ed.), *Exact and perfect survey*, pp. 322–3; Smith, *West Riding*, I, p. 242; Scott-Gatty, 'Records', p. 258.

[41] Hall (ed.), *Descriptive catalogue … Wheat collection*, p. 14; id., *Sheffield manorial records*, p. 198; id., *Descriptive catalogue of miscellaneous charters*, pp. 7, 33; id., *Descriptive catalogue of land-charters and court rolls*, p. 120.

[42] Hall (ed.), *Descriptive catalogue (3rd volume)* p. 17.

III

In researching the landscape and the social and economic history of a locality, one of the historian's first tasks is to identify the administrative and tenurial arrangements. Westmondhalgh bierlow was defined by the River Don in the east, the deep Ewden Valley to the north, and by moorland to the west and south. Unlike the neighbouring Waldershelf bierlow to the north, it contained no sub-manors; the whole of its territory lay within the manor of Sheffield. Bierlow was an Old Norse term for a township that was also used in other parts of the West Riding and Westmond seems to have been derived from an Old Norse personal name.[43] A *halgh* was a nook of land and the term was sometimes used in an administrative sense to denote a territory that was detached from the main unit.[44]

The huge manor of Sheffield was divided into four sokes, including that of Bradfield, in which Westmondhalgh lay. The lord held no demesne or forestland in this bierlow, nor were any granges established by abbeys or priories. Instead, the land was farmed by small freeholders and copyholders with security of tenure. Our earliest evidence of settlement comes both from deeds and the manorial book of customary fines. It was common practice for farmers to hold some of their land by freehold and the rest by copyhold. Copyholders could bequeath their property to their heirs upon payment of an entry fine, a transaction that was entered into the manor court rolls, and by the late middle ages the entry fines were fixed 'by ancient custom'. Copyholders had the right to fell and use any wood that grew on their own lands, to dig and sell any coal, slate or stone that lay under their lands, and to get stone, turf, clods, earth and clay from the commons.[45]

The tenures of the copyholders were sometimes recorded as either 'hastler' or 'mattock' land. Thus, in 1398 Thomas Locksley held a 'plot of Mattockland called Gilson land' in Dwarriden and in 1500 Thomas Morehouse surrendered a tenement and a bovate of hastler land in Westmondhalgh. The tenants of hastler land – a term probably derived from the Latin word for a spear – were the ones from whom the various officers such as the constable were chosen. They were the occupiers of the ancient farms. By contrast, mattock land took its name from the tool used for grubbing up small assarts or intakes.[46]

The typical Hallamshire farmer was a smallholder with generous common rights on the local moors and often a second occupation to improve his standard of living. Of the 253 married couples or single persons who paid the 1379 poll tax in the soke of Bradfield 236 paid the basic rate of 4*d*., thirteen paid 6*d*. and four paid 12*d*.[47] Likewise, the lay subsidy returns of 1545–6 show that the district had a high proportion of householders who were taxed on small amounts of land.[48] The moorland farms in this part of the south Pennines were very different from those in County Durham, where farm sizes varied considerably and some were many hundreds of acres in extent, and different again from the southern two-thirds of Bilsdale on the North York Moors, where Rievaulx Abbey established a chain of granges.[49]

[43] Smith, *West Riding*, I, p. 229.

[44] Gelling and Cole, *Landscape of place-names*, pp. 123–33.

[45] D. Hey, *The fiery blades of Hallamshire: Sheffield and its neighbourhood, 1660–1740* (1991), pp. 49–53.

[46] Scott-Gatty, 'Records', pp. 268, 301; for a discussion of hastler land see Hey, *Historic Hallamshire,* pp. 20–1.

[47] Fenwick (ed.), *Poll Taxes*, III, pp. 317–19.

[48] R. B. Smith, *Land and Politics in the England of Henry VIII* (1970), pp. 120–22.

[49] Dunsford and Harris, 'Colonization' pp. 34–56; McDonnell, 'Medieval assarting hamlets', pp. 269–73.

Neither the soke nor the bierlow were the units where decisions about farming arrangements were made. In this type of countryside on the edge of the Pennines, where settlements were scattered, as in wood-pasture districts elsewhere, the hamlet was the unit that mattered. The popular meaning of hamlet is a small group of farmsteads and cottages, but the term was also used in a more technical sense to describe a small, compact area with its own communal fields and common. These hamlets do not feature much in surviving records, though occasionally their inhabitants brought their agreed rules and regulations about farming practices to the manor court for ratification. The memory of some of these hamlets survived well into Victorian times, for the first editions of the six-inch Ordnance Survey map often mark their boundaries, long after their townfields and commons had gone. Hamlets were ancient institutions. The Yorkshire folios of Domesday Book are not very informative but within the soke of Bradfield they name small estates at Onesacre, Worrall, Holdworth and Ughill, all of which were regarded as hamlets in later centuries. Onesacre and Worrall lay in the south-eastern part of Westmondhalgh bierlow and it is reasonable to think that the other two hamlets to the northwest – Brightholmlee and Wigtwizzle – were amongst the 16 berewicks of Hallamshire that were noted, but not named, in Domesday Book.

Each of the hamlets in the Pennine foothills of south-west Yorkshire had one or two communal townfields, where oats, and occasionally other cereals, were grown in selions, or strips. From the sixteenth century onwards, local farmers began to agree on piecemeal enclosure schemes, which replaced the old arrangements. Just to the north of Westmondhalgh bierlow, for instance, in 1674 the townfield at Midhope was enclosed by the agreement of the six farmers who held land within it.[50] We usually have to rely on occasional references in scattered records, such as 'a messuage in Worall and an oxgang in the fields of Worall' in 1350,[51] 'a dole lying in Onesacre towne field, 1a. 1r. 1p.' in 1637,[52] or 'an acre of land lying in two selions in the Field of Brightholme Lee' in 1568.[53] Further information about the Brightholmlee townfield, which lay immediately west of the group of farmsteads at the centre of the hamlet, is provided by Harrison's survey of the manor of Sheffield in 1637. Martin Smilter was the tenant of a 20-acre farm, which included: 'the well acre lying in Bright holme lee Towne's field 1a. 1r. 4p., a dole under Lee Knowle in the Towne field 3r. 36⅖p., a dole lying in Leewood 3r. 36p., a dole in the Lee wood head 24⅖p., dead man's halfe acre lying in Townefield 3r. 2p., a rood land in Townefield (arable) 2r., another rood land in the Townfield 1r. 37⅕p., a dole in Towne field (arable) 3r. 20p., a nooke of wood ground lying in Lee wood in Townefield 1r. 8p.', a total of 6 acres and 38 perches. His neighbour, Dioney Gillett, tenanted a smallholding of 9¼ acres, including 3a. 1r and 27p. in: 'a Dole in the Little field (arable) … 1a. or. 20⅗p., another Dole in the little field (arable) 2r. 19⅖p., a Dole lying in Bright holme Lee Towne field 3r. 10⅗p., another Dole in the Townfield 3r. 17p.'[54]

The most detailed information about the workings of these small arable townfields comes from Wigtwizzle, the westerly hamlet in the bierlow. In a topographical survey of the Bradfield

[50] East Riding of Yorkshire Archives, DDBM/14/8, 9.

[51] T. W. Hall (ed.), *A descriptive catalogue of early charters relating to lands in and near Sheffield* (1938), p. 17.

[52] Ronksley (ed.), *Exact and perfect survey*, p. 323.

[53] Hall (ed.), *Sheffield manorial records*, p. 128.

[54] Ronksley (ed.), *Exact and perfect survey*, pp. 324–28.

district of 1741, John Wilson, the antiquarian and owner of Broomhead Hall, recorded 'The doles which belong to my farm at Wigtwisle situate in the Byer Dole in Townfields of Wigtwisle'.[55] The Wilsons had owned property there since at least 1422 and in 1623 had inherited Wigtwizzle Hall through marriage. John Wilson had 39 doles, each of which had different neighbours on either side. He noted:

> N.B. That the said fields are in five parts, out of which I have two … Every dole that lyeth lengthways in the said fields, the North or North West Reyn or Bank belongeth to it, and every dole that lyeth crossways in the said fields the West Reyn belongeth to it.

These reins or banks acted as the headlands. He continued:

> Two parts of the wast land or mean [i.e. common, not demesne] ground in the aforesaid Townfields belongeth to me. By having two parts in the said fields we put into the same or such of them as are pastured, twice as many beasts or sheep. … the times for putting joyst [agist] or other beasts into the same being on May Day and for taking the same out again on Michaelmas Day; the sheep to be put into the same on Michaelmas Day and to be taken out again at Lady day.

He then explained how the fields were cultivated on a rotation basis:

> In the said Fields in Twelve takings up of plowable Land; one of which is every year new broke or riven up with the plow; so that it is twelve years in going about before the same part comes to be plowed again. And one of these parts so taken up is to be plowed four years and then laid down again; by which means it happens that they always have four parts of the twelve corn every year and the other eight pasture.[56]

IV

It seems likely that the townfields were associated with the older settlements and that individual farms were created within the hamlet territories in the years leading up to the disasters of the early fourteenth century.[57] Wigtwizzle was 'Wicga's river fork', a place-name derived from an Old English personal name attached to the confluence of two streams flowing down to the Ewden Beck.[58] A William Wigtwesulle was a juror for the soke of Bradfield in 1441, but this is the last reference that we have to the surname.[59] Only the small cluster of households, described by John Wilson in 1741 as four messuages and a cottage, had doles in the townfields, but the other farms that were scattered within the hamlet shared with them the extensive

[55] The meaning of 'Byer Dole' is unclear: it may be a reference to the doles that belonged to the bierlow, i.e. the communal doles of the township.

[56] SA, Ronksley Collection, 11924 *et seq*., transcribed in C. F. Innocent, 'The field system of Wightwizzle', *THAS* 2 (1924), pp. 276–8. The Wigtwizzle townfields are now completely covered by a conifer plantation and some older deciduous trees.

[57] An inquisition *post mortem* of Thomas Lord Furnival in 1332 referred to the decay of population and an inability to find tenants in his lordship of Hallamshire; E. Curtis, 'Sheffield in the fourteenth century: two Furnival inquisitions', *THAS* 1, pt i (1914), pp. 31–53.

[58] Smith, *West Riding*, I, p. 229

[59] Hall (ed.), *Descriptive catalogue of miscellaneous charters*, p. 33.

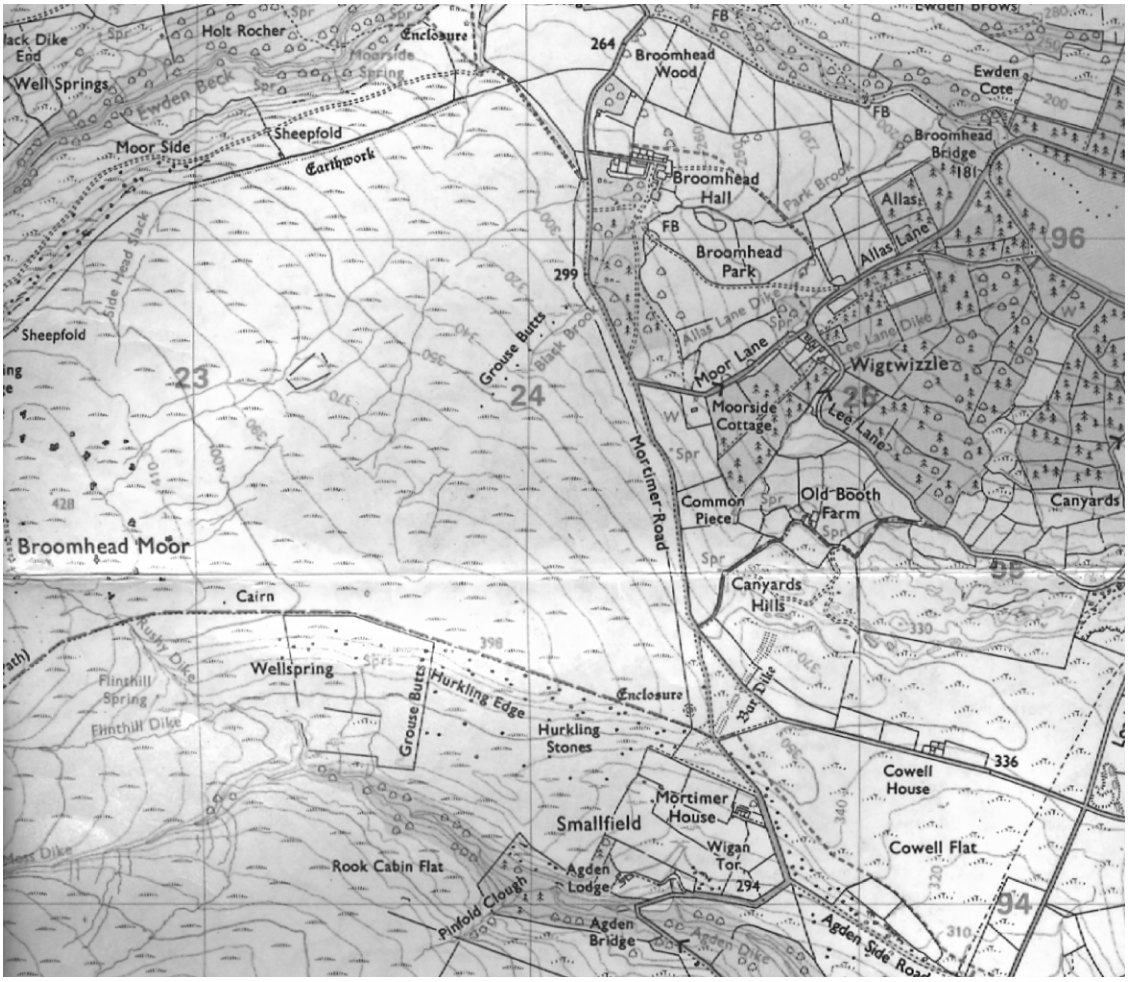


FIGURE 3. Detail of the current OS Explorer map (1:25,000 scale), showing Bar Dike and the 'Earthwork' on Broomhead Moor

moorland common that Wilson estimated was 'near four miles in length and more than two in breadth and contains 1960 acres of land'. His antiquarian researches had revealed that near the end of the thirteenth century Thomas, the son of Thomas de Furnival, lord of Hallamshire, had confirmed a grant of this 'free common of pasture on the moors for the inhabitants to depasture their cattle'.[60] This confirmation formed part of a series of grants to both the rural and urban members of the lordship at that time.

The two linear earthworks that mark the boundaries of Wigtwizzle Common are shown on OS maps in italic letters as 'Bar Dike' to the southeast and 'Earthwork' a mile-and-a-quarter to the northwest (Figure 3). The Bar Dike is 380 yards long and it ends at the top of the dramatic landslip of Canyard Hills on the north and above a steep descent to Agden Dike to the south (Figure 4). The bank on its south-eastern side is, in part, ten feet higher than the bottom of the

[60] SA, Ronksley Collection, 1528, 1529.



FIGURE 4. Bar Dike, the south-eastern boundary of Wigtwizzle hamlet.

Photo: author.

ditch. Bar Dike has always been interpreted as a Romano-British or early Anglian earthwork, comparable with the Roman Rig in South Yorkshire or the Grey Ditch in north Derbyshire, but it has no obvious connection to either of these or to any other linear earthwork and it does not fit into a wider system of defences. No dating evidence has been found from the limited archaeological surveys that have been made. In 1741 John Wilson noted that the 'large ditch called Bardike' was then a boundary between Wigtwizzle and Smallfield commons and that 'the horseway from Broomhead to Sheffield and Nether Bradfield lies through it.'[61] This ancient bridleway was the one that was turnpiked as 'Mortimer's Road' in the 1770s and which still separates the cultivated land from the moors.

Harrison's survey of the manor in 1637 also makes it clear that Bar Dike separated the moorland commons of Wigtwizzle and Cowell (which formed part of the hamlet of Smallfield),[62] so the question arises as to whether this was an ancient ditch that was re-used as a boundary or whether the dike was constructed in the medieval period for this purpose. The name Bar Dike has been taken to mean a defensive structure, but Kenneth Cameron notes that in the

[61] SA, Ronksley Collection, 1541.

[62] G. Scurfield, 'Seventeenth-century Sheffield and its environs', *Yorkshire Archaeological J.* 58 (1986), pp. 147–71, which reconstructs the lost map that accompanied Harrison's survey.



FIGURE 5. The earthwork that formed the north-western boundary of Wigtwizzle hamlet

Photo: author.

Derbyshire part of the Peak District (which borders on the soke of Bradfield), the Celtic word *barr*, meaning 'top, crest', referred to steep ridges and that the eighteenth-century antiquarian, Samuel Pegge of Beauchief Hall, had observed that that it was used in the local dialect to mean a horseway up a steep hill. Pegge stated that: 'In the Peak of Derbyshire all those steep and precipitous roads which run down from the cliffs to the valleys, where the villages are generally plac'd, they call Bars, whence Bakewell Bar, Beely Bar, Baslow Bar, Rowsley Bar, etc.'[63] This description fits Bar Dike exactly: it is at the highest point on an ancient bridleway.

The other ditch further north has attracted less attention, perhaps because it does not have a name attached to it, but it is similar in style to Bar Dike and is much longer, stretching for three-quarters of a mile or so above the Ewden Beck valley (Figure 5). In 1741 John Wilson wrote, 'I take the ditch on the adverse or north side of this Common of Wightwisle, lying by a close belonging to the Duke of Norfolk called the Lea, to have been thrown up as the encampment for the army from the North or the Northumberland army'.[64] But the ditch stops at the western side of the route that Wilson supposed it defended, and why would a commander split his troops into two groups a mile apart? The military explanation does not seem credible.

[63] K. Cameron, *The place-names of Derbyshire* (3 vols, 1959), I, pp. 40–1.

[64] SA, Ronksley Collection, 1543.

We are left with the question of why Wigtwizzle Common did not extend northwards beyond this earthwork, down the slope to the natural boundary created by Ewden Beck. The answer is provided by the final note in John Harrison's manorial survey in 1637, which seems to have been added as an afterthought, for it bears no relation to what he had written before in his account. It reads:

> There is a close lying in the soke and parish of Bradfeild called the side taken out of Wiggtwisell Common and is my Lord Marshalls as belonging to the mannor of Sheffeild, but is now occupied to Uden, that is part of Boulster stone lordshipp: This peice lyeth betweene Uden water and Boulsterstone Lordshipp North & Wiggtwisell Common South East & West: And cont[ains] 131a. or. 22p.[65]

This matches the size of Moor Side, the name now given to the slope between the earthwork and the Ewden Beck. Bolsterstone lordship was a medieval sub-manor that lay within the adjoining bierlow of Waldershelf in the soke of Bradfield; its early lords were knights who failed to establish dynasties. It seems that when Thomas de Furnival confirmed grants to the inhabitants of the outlying parts of Hallamshire some special arrangement was made to include the southern bank of the Ewden Beck within Bolsterstone lordship and that this considerable ditch was dug to mark the otherwise vague boundary. Bar Dike could have been dug to mark the division between the Wigtwizzle and Smallfield commons about the same time.

In the west Wigtwizzle Common extended more than three miles over the moors to the natural escarpment known as Howden Edge, high above the Derwent Valley, which still separates Yorkshire from Derbyshire. Another ditch (which now marks part of the boundary of The National Trust's High Peak estate) had to be dug to separate the lord of Hallamshire's sheep pastures from the commons of Wigtwizzle and Agden. Harrison's 1637 survey noted:

> Holden ffarme … an outpasture for sheep being moorish Ground called the Dayne lying betweene a parte of little Holden in the use of Robert Barber in parte and Wiggtwisell Common in parte and Boulsterstone Lordship in part east and Boulsterstone Lordship.[66]

This ditch is not as deep as the other two but it remains a prominent feature.

To answer the question posed earlier, it appears then that the medieval inhabitants of Wigtwizzle dug deep ditches to mark the northern, south-eastern and western boundaries of their extensive common. No ditch was needed in the east because the cultivated lands between Broomhead and Old Booth lay next to the common, immediately beyond the ancient bridleway. The other hamlets in Westmondhalgh bierlow – Brightholmlee, Onesacre and Worrall – also had large commons, but they were not as extensive as Wigtwizzle's.

[65] Ronksley (ed.), *Exact and perfect survey*, p. 382.

[66] Ibid., p. 299. Similar linear earthworks include the medieval boundary of the manor of Glossop within the Forest of the Peak across Bleaklow, which now forms part of the Pennine Way, and the head-dike on Alston Moor, illustrated in Winchester, *Harvest of the Hills*, p. 54.

V

John Harrison's manorial survey of 1637 mentions eight other small farms by name in the central part of Westmondhalgh bierlow: Bitholmes, Coldwell, Foldrings, Hill House, Hob Lane House, The Poggs, Rocher, and Wharncliffe Side. Four of these have no earlier documentary references, but an Adam de Bithemes witnessed a deed in the bierlow in 1330,[67] Hill House was recorded in 1492, Rocher in 1566, and the Poggs was described in an earlier survey of 1611 as 'One house three baies, two parlers, one chamber, one barne, three baies in decay, one hay house, one bay in decay and another house fallen downe', so it must have been already old.[68] Poggs Farm covered nearly 57 acres in 1637 and was the largest of this group but it is now lost under the Broomhead reservoir. This group lies close to several farms that were documented in the middle ages but as no surnames were derived from them – Bitholmes has no other references – we cannot say how old they are.

During the seventeenth century the timber-framed buildings within the bierlow were replaced by stone halls, farmhouses, cottages and outbuildings. Wigtwizzle Hall, which was demolished in 1935, was the earliest. It consisted of a hall, western wing and three-storeyed porch bearing a 1610 datestone, but the timber-framed eastern wing, which provided the kitchen and service rooms, was not encased in stone until later. In the middle decades of the seventeenth century Nicholas Stead and his son, Thomas, built the similarly gabled Onesacre Hall in two stages and used some of the old cruck timbers in the roof.[69] The Hallamshire cruck buildings date from the late fifteenth to the early seventeenth century and several survive in cottages and barns in Westmondhalgh bierlow; that at Raynor Farm has been dated by dendrochronology to 1593.[70] When hearths were taxed in 1672, Broomhead Hall had eight, Onesacre Hall and Wigtwizzle Hall six each, three other houses had four hearths, and another four had three, so it was possible to earn a good living on the margins of cultivation.[71] Other surviving seventeenth-century houses include Rocher, Old Booth, and a range at another farm in Wigtwizzle. The house that Thomas Hawkesworth, yeoman, built at Dwarriden in 1693 has been demolished but a photograph shows it as a L-shaped building whose rooms matched those that were recorded in his inventory in 1728: kitchen, house, parlour, little parlour, dining room and three chambers above.[72] Like his neighbours, Hawkesworth concentrated on rearing livestock, but some of the farmers had an extra source of income. Nicholas Downing of Raynor House (died 1699) was described as a yeoman but he also had a blacksmith's 'bellows, iron, tongs, stithie [anvil], etc.';[73] George Thompson of Brightholmlee (died 1729) was a fellmonger;[74] and Daniel Roberts of Brightholmlee (died 1699) was not only a farmer but a cloth maker with looms, shears, a

[67] Hall, *Descriptive catalogue … Wheat collection*, p. 13.

[68] Smith, *West Riding*, I, p. 235, 226; SA, Ronksley Collection, 158.

[69] S. Jones, 'Stone houses in the vernacular tradition in south Yorkshire, 1600–1700', *Archaeological J.*, 137 (1980), pp. 386–87.

[70] Hey, *Historic Hallamshire*, pp. 92–4.

[71] Hey *et al.* (eds), *West Riding Hearth Tax*, pp. 392–3.

[72] B. Duffield *et al*, *The archive photographs series: Around Stocksbridge, the second selection* (1998), p. 34; Borthwick Institute, will and inventory, Doncaster Deanery (proved Feb. 1727/8).

[73] Borthwick Institute, will and inventory, Doncaster Deanery (proved May 1699).

[74] Ibid., will and inventory, Doncaster Deanery (proved June 1729).

dying lead, etc. and woollen and linen cloth in two of his chambers or on his tenters outside to rival the yeomen-clothiers in the heart of the West Riding woollen district further north.[75]

The expansion of the cutlery industry had not started when Thomas Jefferys published his county map of Yorkshire in 1772, the earliest map to show the farmsteads of Westmondhalgh bierlow (Figure 1). The settlement pattern hardly differed from that described in Harrison's survey of 1637 and it was basically that which had been established before the Black Death. A few new farms were built on the former commons after the enclosure award of 1826, but the limits of cultivation in the west had already been reached. In 1819, Joseph Hunter, a regular visitor to Broomhead Hall, wrote,

> All without the [ancient] enclosures was barren, or produced only a scant feeding of grass to the sheep which ranged at large upon these hills. Here and there a few stunted trees were to be found; but the fern and the heath and the foxglove seemed to be the plants to which the soil was most congenial, mixed indeed with the slender wires of the bilberry, the cow-berry, or the more highly valued cranberry … The district is now passing into the state of general cultivation; such parts, I mean, as are capable of being made productive … The inhabitants are as rugged as their soil.[76]

The huge moor that had served as Wigtwizzle Common to the west of the turnpike road remains intact. It was converted into a grouse moor and has long been carefully managed for that purpose.[77] Most of the successors to the medieval farmsteads survive on the hillsides, stretching up from the river valleys; some are still working farms, others have been converted into modern residences, and a few were demolished when the Broomhead and More Hall Reservoirs were constructed along the Ewden Valley in the 1920s and '30s. When the Rev. Alfred Gatty visited Dwarriden in 1884 he found that the Rimington-Wilsons had already planted some larches, Scots firs and pines,[78] but this small plantation was extended all along the banks of the reservoirs once they were completed in 1933. The narrow, winding lanes retain a strong sense of the medieval holloways that linked the farms and they make a sharp contrast to the straight roads that were created across the former commons by the parliamentary enclosure commissioners. This is an ancient landscape that is easy to read once the documentary evidence has been thoroughly analysed and the ancient administrative arrangements understood.

[75] Ibid., will and inventory, Doncaster Deanery (proved May 1699).

[76] Hunter, *Hallamshire*, p. 459.

[77] D. Hey, 'The grouse moors of the Peak District', in P. S. Barnwell and M. Palmer (eds), *Landscape history after Hoskins*, III, *Post-medieval landscape* (2007), pp. 68–79.

[78] Gatty, *A life at one living*, p. 205.

Boundaries and property rights: The transformation of a common-pool resource*

by Jesper Larsson

Abstract

This article examines how a common-property regime evolved within the context of property rights reforms, using empirical data from a Swedish parish over three centuries, from the sixteenth to the nineteenth. By adopting a transaction-cost approach, I argue that the standard depiction of how collective rights were transformed into individual rights has been oversimplified. One of the features that made the common-property regime successful was the interplay between *de jure* and *de facto* property rights. The land consolidation reforms of the early nineteenth century were costly for almost all landowners in the region, and required the adaptation of a well-established common-property regime to individually owned forestland.

The dramatic changes in Western European societies between the sixteenth and nineteenth centuries had a profound effect on agriculture. An agricultural revolution that started in England included technological innovations, changes in cropping systems, and a significant increase in land productivity. Changes in property rights were also very important during this time. Land tenure became more clearly defined, and a redistribution of arable land and meadows took place. Open fields were abandoned, and scattered strips of land were merged into large fields and assigned to individuals. Many commons were divided into individually owned parcels.

Explanations for this development have differed, but the aim of this article is not to discuss what drove change. Rather, it is to focus on the importance of property rights and discuss how changes in property rights affected the economy of peasants or small farmers who depended on land held collectively for agriculture. The article contributes to the discussion about private versus common property rights, and their changing importance for agriculture over time. It addresses this question by analysing the development of property rights from the sixteenth century to the mid-nineteenth century in an agricultural area in upland Sweden, where the use of common-pool resources for animal husbandry was important. We will follow the

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transformation of a parish's outlying forested land from open access to a common-property regime and finally to a common-property regime conducted on private property, where the commons were converted to privately owned land but animal husbandry was still conducted as a collective activity. We will discuss how these changes happened and how they affected the peasants who used the forests for grazing their animals.[1]

This article focuses on two aspects of the change. First it considers how the property regime for what had originally been open-access land developed from the sixteenth century to the mid-nineteenth century. This is very much the story of how the peasants, with support from the local court, developed an efficient common-property regime. Second, it asks what happened to this common-property regime after a land reform designed to consolidate holdings transformed the commons into privately and individually owned strips?[2]

Was the development of an evolutionary road to private property a response to increasing demand for scarce natural resources as the population grew and more peasants used the forest for grazing?[3] Or was division of the commons into private strips of land a break from the way the peasants used the forest? If so, how did the peasants manage the new conditions and what implications did the latter have on the way the peasants practised their animal husbandry? To address these broader questions, one must look into how the peasants acted to protect their land from overuse. The question of how the boundaries changed is of particular interest since enforcement of the boundaries of a resource unit is a way to exclude other users.[4] It is also important to study the interplay between the peasants and the local authority and how this interplay changed over time.

The purpose here is not to discuss whether or not land privatization was successful or who gained and who lost from the land reforms in more general terms. The focus, instead, is on how a common-property regime evolved. By adopting a transaction-cost approach, I will argue that the standard depiction of collective rights transformed to individual rights has been oversimplified. Indeed, land privatization was expensive for almost all landowners in the region, and required adaptation of a well-established common-property regime to individually owned forestland.

[1] I use the word *peasant* to mean the user and owner of land in the study area. There were no large-scale landowners. The Swedish word *bonde* (pl. *bönder*) is usually translated to *peasant* for the period before 1870, as people who paid rent to 'a dominant group of rulers'. For the period after 1870, *bonde* is usually translated to *farmer*. However, as Carl-Johan Gadd, 'The agricultural revolution in Sweden, 1700–1870', in J. Myrdal and M. Morell (eds), *The agrarian history of Sweden: from 4000 BC to AD 2000* (2011), p. 122, has pointed out, 'In one important respect the meaning of the word *bonde* in the eighteenth and nineteenth centuries was narrower than "peasant". The *bonde* differed – socially, economically, and legally – from both people of rank and the rural landless and semi-landless such as crofters, cottagers, and the like.'

[2] The land reforms in Sweden had two main features: consolidation of arable and meadow strips and parcelization of common land. Both increased private property rights. This article mainly discusses the latter.

[3] Harold Demsetz, 'Toward a theory of property rights', *American Economic Rev.*, 57 (1967), pp. 347–59.

[4] Elinor Ostrom, *Governing the commons: the evolution of institutions for collective action* (1990), pp. 91–2; ead., *Understanding institutional diversity* (2005), pp. 223–6, 260–2.

I

(a) Property systems

The conventional typology of property systems, stemming from Roman law, divides them into four basic property regimes: state property, private property, common property, and non-property.[5] As Daniel Cole points out, 'One major problem with this conventional typology of property regimes is that it simply does not fit many real-world circumstances'.[6] This was certainly true for property rights in medieval and early modern Western Europe, where the three main categories of land for agricultural purposes were arable fields for cultivating crops, meadows for harvesting winter fodder, and outlying land for grazing animals and collecting firewood, peat, timber, etc. In a very general view, the arable fields and meadows were private property and the outlying land was common property. But if one looks more closely at the notion of arable land and meadows as private property during this time, one will realize that ownership rights for private property were much more limited compared to the more 'universal' rights most owners of fields and meadows have in Western society today. In particular, rights of alienation, exclusion, and use were all circumscribed.

In a similar way to many other peasantries around the world, for centuries peasants in Western Europe had used different property systems for different ecologies. Robert Netting identified five key variables that he considered the most important in differentiating common-property rights from individual rights in land, based on the nature of land use.[7] If (1) the value of production per unit area is low, (2) the frequency and dependability of use or yield is low, (3) the possibility of improvement or intensification is low, (4) the area required for effective use is large, and (5) the labour- and capital-investment group is large, common property is more likely to develop and be sustained. If, on the other hand, variables 1–3 are high and variables 4 and 5 are small, peasants will be more likely to develop private property. However, different ecologies were not the only aspects that mattered. Peasants also used different property systems according to agricultural seasons and uses of the land: what was private land during the growing season was used as commons for grazing after the harvest and when it was fallow. The peasants used different property rights as a means to achieve different goals in the management of natural resources. Establishing property rights can be viewed as an action to achieve these goals and was very far from giving universal rights to property in a Blackstonian sense.[8]

That the same piece of land could be used by different sets of property rights to achieve these goals is clearly shown in the management of arable fields. Arable fields were managed in open-field systems, i.e. a village's arable land consisted largely of a few large, fenced blocks

[5] Daniel W. Bromley, *Environment and economy, property rights and public policy* (1991), pp. 21–31; Daniel H. Cole and Elinor Ostrom, 'The variety of property systems and rights in natural resources', in Daniel H. Cole and Elinor Ostrom (eds), *Property in land and other resources* (2012), pp. 41–2.

[6] Daniel H. Cole, *Pollution and property: comparing ownership institutions for environmental protection* (2002), p. 6.

[7] Robert McC. Netting, 'What alpine peasants have in common: observations on communal tenure in a Swiss village', *Human Ecology* 4 (1976), pp. 135–46.

[8] William Blackstone, *Commentaries on the laws of England* (4 vols, sec. edn, 1766–9), II, p. 2.

of land in which individual peasants held numerous scattered unfenced strips.[9] Although the harvest from an individually owned strip belonged to the individual peasant, much of the work in the open field had to be synchronized with the owners of the other strips. After the harvest, the field was open for all individuals who owned strips to graze their animals. Thus the grazing fodder resource from the privately owned strips of arable land belonged to all landowners in common in proportion to their landholding in the field. The same was true when the field was fallow.[10] The logic behind the open-field system has been extensively debated and numerous explanations for it have been proposed, such as reducing the risk of crop failure, extension of the growing season due to different microclimates, population pressure, ideology, and technical reasons. Two researchers who have published extensively on the subject are McCloskey and Fenoaltea. McCloskey, who views the open-field system as inefficient, has argued that the key to understanding the scattered strips was that peasants were prudent and tried to avoid risk.[11] Fenoaltea, on the other hand, stressed that the open fields must have been justified by the maximization of productivity in cultivation and that the open-field system allowed combining the advantages of the large estate with the family farm (large-scale production and small-scale farming).[12] Despite the fact that the arable land was privately owned, its uses, individual and common, depended on collective agreements within the village community. Even though this article focuses on outlying land, it is essential to include the open-field system in the background. First, arable land, meadows, and outlying land were part of the same agricultural system as mixed farming, and changes in one part affected the others. Lynn White Jun. has concluded that one of the chief functions of the open-field system was to create a balanced system of animal and cereal production. When tillage spread at the expense of outlying land, the fallow fields in an open-field system were used for grazing. It provided good protection of crops against cattle and at the same time minimized the fencing for each farmer, and manure was deposited on the next year's arable land.[13] Dahlman argues that collective property rights were preferred to private ownership of the communal grazing grounds, on the fallow open field or on the commons. Livestock production was subject to important economies of scale, and owning the grazing grounds collectively lowered the transaction costs between the farmers involved.[14] Second, the end of the open fields was connected to the dissolution of the commons. It was caused by changes in agricultural practice as well as ideological change, where changes in property rights were essential. The debate over common versus private property rights in agriculture and the almost universal choice by states to create private property, even in the face of peasant opposition, had a great impact on agriculture practice, even in remote areas of Europe.

[9] Donald N. McCloskey, 'The persistence of English common fields', in William N. Parker and Eric L. Jones (eds), *European peasants and their markets: essays in agrarian economic history* (1975), pp. 76–8; Stefano Fenoaltea, 'Transaction costs, Whig history, and the common fields', *Politics and Society* 16 (1988), p. 177.

[10] W. A. Ault, *Open-field farming in Medieval England: a study of English by-laws* (1972), pp. 16–17; McCloskey, 'Persistence', p. 83; Fenoaltea, 'Transaction costs', p. 177; Gadd, 'Agricultural revolution', p. 124.

[11] McCloskey, 'Persistence', pp. 88, 113–19; id., 'The open fields of England', in David W. Galenson (ed.), *Markets in history, economic studies of the past* (1989), pp. 34–46; id., 'The prudent peasant: new findings on open fields', *J. Economic Hist.* 51 (1991), pp. 344, 348, 355.

[12] Fenoaltea, 'Transaction costs', pp. 174, 215.

[13] Lynn White Jun, *Medieval technology and social change* (1962), pp. 55–6.

[14] Carl J. Dahlman, *The open field system and beyond: a property rights analysis of an economic institution* (1980), pp. 111–21.

(b) Outlying land and property rights in the Swedish context

The peasants' use of outlying forest as pasture and common was slightly different from the arable land use described above. The right to use a common land area was, as in many parts of Western Europe, based on being a landowner and having a homestead in a village.[15] An individual farm's share in the common was proportional to the farm's share in the village.[16] Thus, it was not possible to sell one's use of a common without selling the farmstead, or a part of it, with its arable land. The right to sell outlying land came only after the land consolidation reform, when many commons were divided into individually owned parcels.

The outlying forest did not only serve as pasture.[17] Many important resources used for subsistence in the peasants' households were collected there, such as timber for buildings, firewood, wood for fences, leaves for fodder, and birch bark for roofing.[18] Also, peasants in many areas had to deliver large amounts of firewood and charcoal from the commons to mines and iron works as tax payments.[19]

The peasants' involvement in the changes in property rights in Sweden has been extensively discussed. Research conducted before the 1970s stressed an almost invariable joint-property system on outlying land – i.e. the outlying lands were common-pool resources – and outlined how this was changed by judicial decisions in a series of land reforms between 1749 and 1827. The land reforms were seen as an external force destroying a world of collective action.[20] Long-term development of property rights in agrarian societies has often been described as a unilinear development from collective to individual rights to land.[21] Since the 1970s, an important approach to understanding the development of property rights in Sweden has been to investigate the struggle between different groups for more exclusive control of natural resources. The control of woodlands, which were to a large degree commons prior to the land reforms, has been emphasized as an important part of this struggle.[22] More recent research from other parts of Sweden has stressed the view that peasants were involved in the process and that they supported and even initiated the land consolidation reforms at the local level.[23]

[15] In northern Sweden, common land also consisted of large areas to which neither communities nor individuals could assert property rights. The Swedish Crown claimed these areas. Kerstin Sundberg, 'Nordic common lands and common rights: some interpretations of Swedish cases and debates', in Martina De Moor, Leigh Shaw-Taylor, and Paul Warde (eds), *The management of common land in north-west Europe,* c. *1500–1850* (2002), pp. 178, 182.

[16] Ibid., p. 184.

[17] In the plains of Sweden, with less woodland, pastures at the infields were more important than pastures in the outlying land (commons), Wolter Ehn, *Mötet mellan centralt och lokalt: studier i uppländska byordningar* [The meeting of central and local authorities: studies on village by-laws in Uppland] (1991), pp. 66–7. The same is true for many fully developed open-field villages in England, McCloskey, 'Persistence', p. 85.

[18] *Sveriges Rikes Lag Gillad och antagen på Riksdagen åhr 1734* [Sweden's Law, approved and passed by the Parliament in 1734] ([1780] 1984), pp. 71, 80; Sundberg, 'Nordic common lands', p. 184.

[19] Lars Ersgård, *Det starka landskapet: en arkeologisk studie av Leksandsbygden i Dalarna från yngre järnåldern till nyare tid,* [The powerful landscape: an archaeological study of the Leksand district in Dalarna from the late Iron Age up to modern times] (1997), pp. 94–5.

[20] Werner Rösener, *The peasantry of Europe* (1994), p. 2.

[21] Demsetz, 'Toward a theory'.

[22] Ronny Pettersson, 'Äganderätten, laga skifte och skogarnas avtagande' [Property rights, enclosure and the preservation of forests], in Mats Widgren (ed.), *Äganderätten i lantbrukets historia* [Ownership in agriculture history] (1995), p. 130.

[23] Gadd, 'Agricultural Revolution', p. 151; Staffan Granér, *Samhävd och rågång: om egendomsrelationer,*

However, these studies have focused on the transition to private property and have not taken into account the fact that common-property regimes could evolve, be efficient, and serve the participants' needs well.[24]

Research has also emphasized that change in property rights started as early as the seventeenth century. At that time it was a 'bottom-up' process and not one initiated by the government. The important actors were often large-scale landowners, but scholars have stressed that the development was also driven and supported by many peasants.[25] The transformation of the commons into smaller units with clear boundaries managed by defined user groups has been interpreted as an evolutionary process towards privately owned land. The development had an evolutionary character and was not a sudden transition from one type of property right to another.[26] The dissolution of village communities during the eighteenth and nineteenth centuries has been seen as the final stage of this process. However, as discussed earlier, the idea of a linear transition from collective to individual rights is oversimplified. One can instead argue that collective rights are connected to individual rights and that peasants used a mixture of property rights. Individual ownership in the village was a prerequisite for peasants to be co-owners of the commons and to be members of collective action in the agrarian society. Collective rights could not exist without individual property rights.[27]

Instead of considering common-property regimes as a stage in an evolutionary process to private property, it is better to consider them as a form of property right with its own logic. A developed common-property regime indeed has some features that are similar to private property, with the most important being the exclusion of outsiders. However, a common-property regime is a way of privatizing rights to goods without dividing the goods themselves.[28] With private property, the goods are divided up. Any property regime is costly to enforce: peasants had to invest time and labour in its defence.[29] Investigating these costs is a way to determine if the transition from common property to private property happened gradually or was a sudden break. Looking at how the change affected peasant animal husbandry will also provide insights into the transition.

Note 23 *continued*
ägoskiften och marknadsintegration i en värmländsk skogsbygd 1630–1750 [Thy neighbours' property: property relations, enclosures and market integration in a forest district of central Sweden 1630–1750] (2002), p. 286; Birgitta Olai, *Storskiftet i Ekebyborna, Svensk jordbruksutveckling avspeglad i en Östgötasocken* [The first phase of the Swedish enclosure movement – the storskifte: Swedish agricultural development as reflected in a parish in Östergötland] (1983), p. 99.

[24] Cole and Ostrom, 'Variety of property', pp. 50–2; Ostrom, *Governing*, pp. 58–61; Ostrom, *Understanding*, pp. 255–8.

[25] Maria Ågren, *Jord och Gäld, Social skiktning och rättslig konflikt i södra Dalarna ca 1650–1850* [Land and debt: social differentiation and legal conflict in southern Dalecarlia, *c.*1650–1850], p. 263; Granér *Samhävd*, pp. 299–300.

[26] Granér *Samhävd*, p. 302; Staffan Granér, *Thy neighbour's property: communal property rights and institutional change in an iron producing forest district of Sweden 1630–1750* (2005), p. 17.

[27] Cole and Ostrom, 'The variety of property', pp. 43–4; Mats Widgren, 'Individuellt eller kollektivt ägande i bondesamhället?' [Individual or communal property in agrarian societies?] in Mats Widgren (ed.), *Äganderätten i lantbrukets historia* (1995), p. 9.

[28] Margaret A. McKean, 'Common property: what is it, what is it good for, and what makes it work?', in Clark C. Gibson, Margaret A. McKean, and Elinor Ostrom (eds), *People and forests: communities, institutions, and governance* (2000), p. 36.

[29] Ronald H. Coase, 'The problem of social cost', *J. Law & Economics* 3 (1960), pp. 1–44.

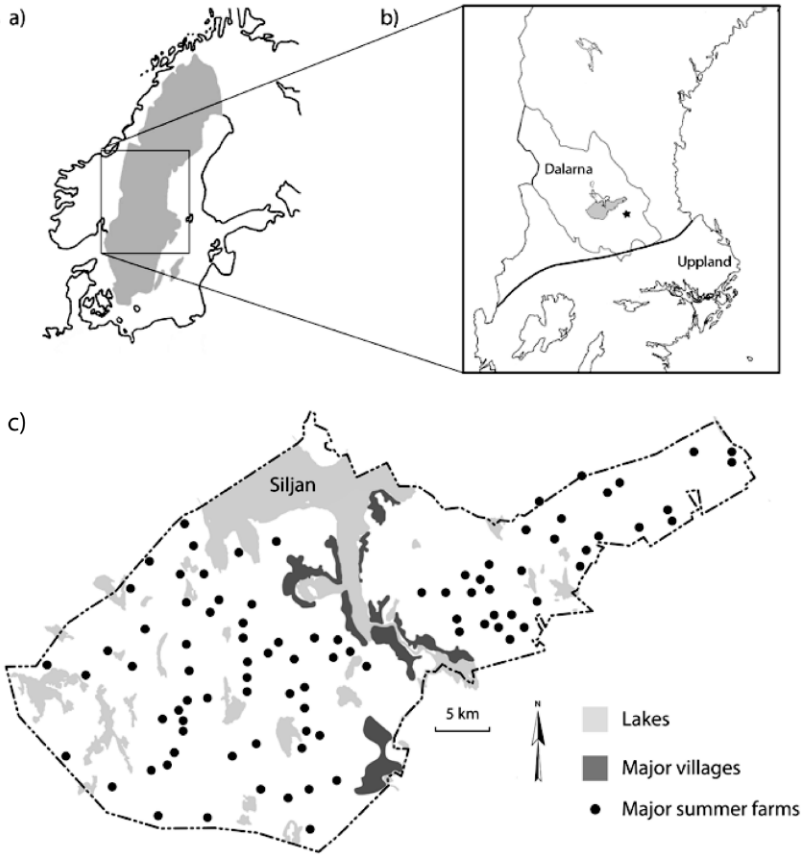


FIGURE 1. (a) Scandinavia with Sweden in grey. (b) The solid line indicates the southern boundary of the summer farms area of Sweden. The parish of Leksand, south of Lake Siljan, is highlighted in grey. The star indicates the location of Great Copper Mountain in Falun. (c) A detail showing the parish of Leksand around 1850.

(c) The Study Area, Leksand, Sweden

Leksand parish in Dalarna County in central Sweden encompasses the southern part of Lake Siljan and a stretch of Österdal River (Österdalälven) (Figure 1). From central Leksand, it is about 30 miles (48 km) to Falun, the main city in Dalarna County. During the sixteenth and seventeenth centuries, Falun's Great Copper Mountain, an important copper mine, exerted a huge influence over everyday life in Leksand. It was one of the biggest centres of employment in Europe in the late seventeenth century, and during this time, Falun was the second largest city in Sweden.

Leksand parish includes 274,196 acres (110,963 ha) of land. Population growth in Leksand was quite rapid, especially during four distinct periods: 1650–90, 1718–50 (after the Great Nordic War), the late eighteenth century, and 1830–65 (see Table 1).[30] Historians do not know the exact numbers of livestock nor how much they increased specifically between 1571 and 1830, but we know there was a rapid increase in the total number of animals in the region. During that period, cows, goats, and sheep increased 3.7, 5.5, and 10.1 times, respectively; after

[30] Lennart Palm, *Folkmängden i Sveriges socknar och kommuner 1571–1997, med särskild hänsyn till perioden 1571–1751* [The population of Sweden's parishes and communes, 1571–1997, with particular reference to the period 1571–1751] (2000), p. 272.

TABLE 1. Population in Leksand, 1571 to 1865

	1571	*1620*	*1699*	*1718*	*1735*	*1751*	*1805*	*1830*	*1865*
Population	2693	2626	5724	6852	7725	8394	9637	10,232	13,036

Source: Lennart Palm, *Folkmängden i Sveriges socknar och kommuner 1571–1997, med särskild hänsyn till perioden 1571–1751* [The population of Sweden's Parishes and Communes 1571–1997, with particular reference to the period 1571–1751] (2000), p. 272.

1850, the numbers of goats and sheep decreased sharply, while the number of cows remained the same.[31]

Leksand was not a typical early modern Swedish parish. Leksand and Upper Dalarna differed from other parishes and counties in Sweden during the eighteenth century with regard to inheritance rules, structure of agriculture, dependency on migration of labour, and in other important ways. However, as a community that developed a well-established common-property regime, it is well suited to an investigation of how its property regime evolved and how collective and private property rights affected agriculture.

In Leksand and the surrounding area, partible inheritance was practised and both sons and daughters inherited land. Until 1845, daughters inherited half of what sons inherited. After that, the rules changed so that sons and daughters inherited equal shares.[32] The reform in 1845 was one of many reforms in mid-nineteenth-century Sweden intended to solve broader social problems, improve women's situation in society, and promote economic development.[33] Until 1870, when industrialization started in Leksand, all households took part in agriculture. For this study, it is important to keep in mind that, before 1870, all households in Leksand kept animals.

During the eighteenth century, animal husbandry in Leksand was conducted as transhumance, where peasants brought their livestock from the village to summer farms (*fäbodar*) located in forest-covered common property. Thus, a summer farm was a periodic settlement for the use of common pastures for grazing. It had buildings for human accommodation, livestock, and the processing of milk into non-perishable products. Summer farms were specialized, feminine workplaces and functioned within a system of arable farming and animal husbandry.[34] Cows, goats and sheep were brought to the summer farms and grazed together. As in many other areas in the world, commons users had exclusive rights to their dwellings and small plots of land adjacent to the common land.[35] The number of users varied considerably for different

[31] Jesper Larsson, 'The expansion and decline of a transhumance system in Sweden, 1550–1920', *Historia Agraria* 56 (2012), pp. 21–5.

[32] Ulf Sporrong, 'Ägandets reproduktion – om arvsregler och landskapsutveckling i 1700-talets Dalarna' [The reproduction of ownership – on inheritance laws and the development of the landscape in eighteenth-century Dalarna. An Example from Leksand] in Widgren (ed.), *Äganderätten i lantbrukets historia*, p. 99.

[33] Maria Ågren, *Domestic secrets: women and property in Sweden, 1600–1857* (2009), pp. 168–9.

[34] Jesper Larsson, *Fäbodväsendets, 1550–1920: ett centralt element i Nordsveriges jordbrukssystem.* [Summer farms in Sweden, 1550 to 1920: an important element in north Sweden's agriculture system] (2009), p. 102; Larsson, 'Expansion', p. 20.

[35] Charles Geisler, 'Property Pluralism', in Charles Geisler and Gail Daneker (eds), *Property and values, alternatives to public or private ownership* (2000), p. 73.

summer farms during the eighteenth and nineteenth centuries. Small summer farms had only a few users while larger ones could consist of more than 40 users. Around 1830, approximately 112 summer farms existed in Leksand with a total of 1043 houses for people to live in. More than one household could have shares in a house.[36] This system collapsed in Leksand after 1890, with the rapid abandonment of summer farms.[37]

Agriculture was not the peasants' only means of making a living in the eighteenth and nineteenth centuries. Residents of Leksand developed specialized skills earlier than in most rural places, as men and women moved to other areas of Sweden, mostly during the summer. They worked as painters and decorators, in construction, as well as in agriculture and other occupations. This was a way to maintain the household income when the population increased and expansion in agriculture was limited.[38] However, agriculture was still the foundation of the local economy in Leksand up to the second half of the nineteenth century. Ownership of land gave people food and access to many other resources in the commons, and it gave them bargaining power and access to collective choice arenas.

Leksand was a homogeneous society with a shared understanding of many important aspects of life. The people belonged to the same church, it was a fairly egalitarian society in which most adults were landowners and all peasants were freeholders, almost all people were born and raised in the community, and all legal matters were handled by the local court.

(d) Source material

This article uses court records from Leksand and Gagnef, two adjacent parishes.[39] It is possible to begin the investigation as early as the mid-sixteenth century by using court records from Gagnef made between 1544 and the 1730s.[40] What justifies the use of court records from Gagnef is that the natural conditions, agriculture, and economy were almost identical to those at Leksand. When one compares court records from 1660 to 1730 from the two parishes, the similarities are clear. An additional argument for using court records from Gagnef is that animals from villages on both side of the parish border used the same pasture grounds in the first half of the eighteenth century.[41] Because 90 per cent of the court records are from Leksand, I refer to the whole set of material as 'court records from Leksand'.

Records from court sessions are the best sources for coming close to the ordinary people in early modern Sweden. They are also the only source material where one can follow the management of summer farms over a long period of time. In many court cases, we get detailed

[36] Some peasants from Leksand also participated in summer farms in neighbouring parishes, six in Bjursås and one in Rättvik, Sigvard Montelius, *Leksands fäbodar* [Summer farms in Leksand], Leksands sockenbeskrivning VII, (1975), pp. 124–7.

[37] Larsson, 'Expansion', p. 28.

[38] Göran Rosander, *Herrarbete: Dalfolkets säsongsvisa arbetsvandringar i jämförande belysning* [Herrarbete: migration of labour from Dalarna, a comparative study] (1967).

[39] Leksand was part of a court district that embraced three parishes (Leksand, Ål, and Bjursås), but the court records I have used include only Leksand. I have had access to unique excerpts from Leksand court records extending from 1660 to 1870 made by Dr Sigvard Montelius in the late 1960s (Sigvard Montelius archive, private collection, Falun, Sweden). His notes extend from 1660 to 1870. Dr Montelius made the extracts while doing research for his book *Leksands fäbodar* (*Summer Farms in Leksand*).

[40] Anders V. Andersson, *Om fäbodväsendet i Gagnefs socken* [About summer farms in Gagnef] (1984).

[41] Larsson, *Fäbodväsendet*, p. 285.

pictures of everyday life at summer farms.[42] However, it is probable that the cases brought to court were only a small part of the conflicts that were taking place. There were costs associated with using the court, and informal adjudications were common.

II

This investigation focuses on the twin questions of how physical boundaries were used and changed to exclude other users. We can see the process of change by examining the court records from Leksand. Out of 601 cases concerning summer farms in the Leksand court between 1660 and 1870, the largest category (180 cases) concern boundaries.[43] This is not surprising, since changes in boundaries within an area heavily utilized for agricultural purposes have an influence on the ability to develop agriculture and the output of agriculture. Encroachment on others' land could cause imbalances and unpredictable losses.[44] It is therefore likely that disputes over boundaries would end up in court. We find there were two kinds of boundary cases: first, those regarding the boundaries themselves and, second, those concerning the trespassing of animals. In the latter, it was not uncommon for the defendant to question a boundary and argue that no trespass had taken place either because the boundary was not where the plaintiff maintained, or that the court had not established it, or it did not exist at all.

In the sixteenth century, households began to establish summer farms on the outlying land around their villages (Figure 2). From the court records, it seems that the establishment of a summer farm was initially an individual enterprise.[45] Leksand was divided into quarters for the administration of many local issues, and one can argue that the commons in each quarter were *de facto* open pasture. No boundaries seem to have existed in the commons between different user groups for the purpose of grazing. The few boundaries mentioned before 1680 concerned quarters and parishes, but even the parish border was not always a boundary for grazing rights. Several villages located close to Leksand even established summer farms inside its boundaries. Later, the users of these summer farms came in conflict with peasants from Leksand who wanted to establish summer farms there. Both establishing a summer farm and herding animals in the vast forests surrounding it seem to have been open-access activities up to the mid-seventeenth century. However, it was not open access in a 'tragedy of the commons' sense.[46] It was open access because utilization of the commons for summer farms was still low (i.e. the resource was abundant relative to demand for it) and the costs of excluding others would have been high and served little purpose.[47] It is hard to argue, though, that the commons

[42] Ibid., p. 212.

[43] The second most common cases were about the right to have a share in a particular summer farm (71 cases), and the third most common cases were about moving livestock between the village and a summer farm and between summer farms (61 cases), ibid., pp. 215, 228–9.

[44] Ostrom, *Governing*, pp. 91–2.

[45] The village community might have organized the summer farms, but there is no evidence of that. It is more likely that the animals grazed on outlying land close to the village and were brought to the homestead every night before the establishment of summer farms. For the reasons behind the expansion of the summer farms, see Larsson, 'Expansion', pp. 15–17, 28–9.

[46] Garrett Hardin, 'The tragedy of the commons', *Science* 162 (1968), pp. 1243–8.

[47] Cole and Ostrom, 'Variety of property', p. 45.

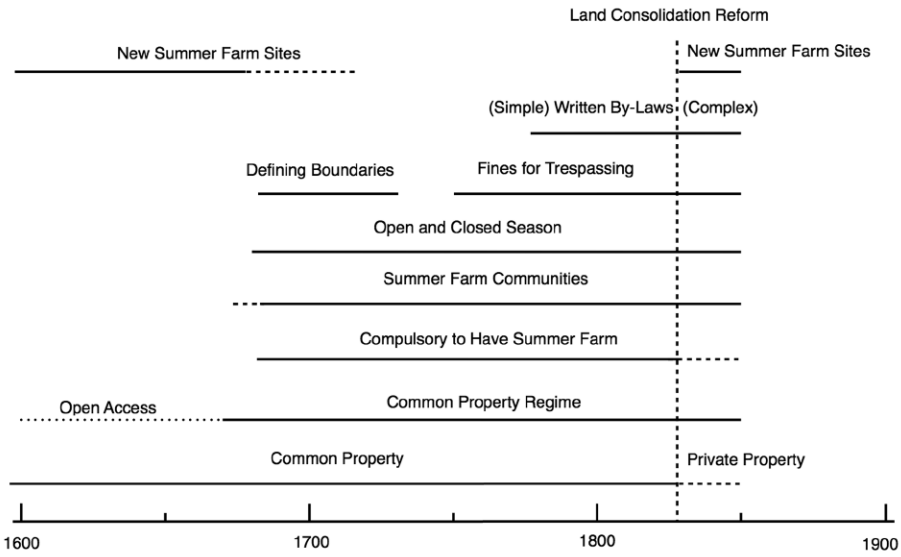


FIGURE 2. Schematic timeline for some of the more important parameters for the development of summer farms in the parish of Leksand between 1600 and 1850

were non-property (*res nullius*) since there might have been other restrictions in the use of the forest, and the commons, in a legal sense, belonged to landowners in Leksand.

When the population and the number of summer farms, as well as the number of users at each summer farm, increased, the peasants took action to protect their commons. One of the first steps, according to court records, was to establish a new institution: summer farm communities (*Fäbodlag*). A summer farm community encompassed all peasants who used the same summer farm. The first time a summer farm community is mentioned in Swedish historical records is in 1639 in Orsa parish, located about 40 miles north of Leksand.[48] The first Leksand references to summer farm communities are from 1677 and 1686 in the neighbouring parish of Gagnef.

A major step towards protecting the commons from overuse was to establish boundaries for the summer farms. Creating boundaries made it clear where one summer farm's resource area ended and the next one started. Thus, it was possible to manage questions about exclusion and subtractability in an efficient way.[49] The creation of resource areas for summer farms was an intense process during the late seventeenth and early eighteenth centuries. It is clear that this process was initiated by the users and was supported by the local court. The evidence for the creation of defined resource areas is provided by court records that contain disputes amongst the summer farm communities, and between villages and summer farm communities, up to the nineteenth century. In these disputes, many references were made to how boundaries for grazing rights had been established between 1680 and 1730. An example was a conflict about pasture rights in 1780: *Western Gansås and Faxberg v. Sörskog*. In the lawsuit, Sörskog presented

[48] Olle Veirulf, 'Fäbodväsendet' [Summer farms], in *Orsa: en sockenbeskrivning* II (1953), p. 394.

[49] Ostrom, *Understanding*, pp. 260–2.

a document from a 1699 inquiry about grazing rights that were eventually established by the local court in 1704.[50] Boundaries were often agreements between summer farm communities, and when their locations were disputed, the court often ruled that so-called 'trusted' men should walk along the boundaries and decide their correct positions. Afterward, the court confirmed the boundaries. It was not always possible to determine the boundaries between summer farms, because some were very close together. In such cases, the court ruled that the summer farms had to share the pastures.

The major change that took place in the late seventeenth century, and had an enormous effect on the use of the commons, was that it became compulsory for all peasants to have a summer farm. Until then, it had been up to the individual peasant to decide whether to have a summer farm (or a share in one) or not. From this time onward, it was no longer possible for a peasant to keep livestock in the village after the other villages had left for the summer farm. Since there were very few households without livestock, every household in the parish was forced to have a share in a summer farm during the eighteenth century and up to the mid-nineteenth century.[51] The only exceptions to this rule were poor people who either could not afford to move the livestock or who needed the milk from the livestock to feed their children during the summer months. Thus, an agricultural system in which summer farms were an essential part had been established in the region.[52]

When the utilization of the commons increased during the eighteenth century, the users took action to better protect their pasture grounds. It became more important to enforce rules, to monitor each summer farm better, to have more detailed regulations on issues connected to the use of the pastures, and to regulate what earlier had been minor issues concerning the utilization of the pastures. An example is the regulation over places where animals and people who tended the animals rested during the day. The livestock were herded out from the summer farm stables along different paths each day, stopping to graze as they went (Figure 3). At the end of each path was a place where the livestock could rest before they returned to be housed for the night. These places were often located along boundaries with other summer farm communities, resulting in arguments about use rights.[53]

It became more important to protect the boundaries of the summer farms in the second half of the eighteenth century. The boundaries between villages and summer farm pasturelands were the most crucial to protect, and it became common to build fences to mark them. Boundaries between summer farms could also be fenced, but since building fences was expensive and the outlying land was vast, it was something the summer farm communities tried to avoid doing. If they really needed a demarcation, it was possible to put up a simple fence or put debris from the forest along the boundary. However, the cheaper and more common way to protect one's pasture was to make the boundary more visible by cutting down trees and bushes along it or charging fines when people outside the summer farm community trespassed.

[50] Montelius archives, *1780 §54*, p. 695.

[51] This rule led to much tension in the parish and many court decisions, and it was an important issue during the land consolidation reform in Leksand between 1819 and 1830, Larsson, *Fäbodväsendet*, pp. 278–80.

[52] Ibid., pp. 385–8; Larsson, 'Expansion', p. 26.

[53] Larsson, *Fäbodväsendet,* p. 229.



FIGURE 3. Cattle stopping to graze and female herders practising two-end (twined) knitting at Björnbergets summer farm in the parish of Leksand in the opening year of the twentieth century

Source: Photo taken by Hans Per Persson, Djura, Leksand, Sweden. Permission to use granted by Lars Liss Photo Archive in Gagnef, Sweden.

From the second half of the eighteenth century, fining people who trespassed with animals became an especially effective way to protect pastureland. If a summer farm community wanted to levy fines, their right to do so had to be established by the local court. To acquire legal force, the trespassing rules had to be read out loud during church services so that all people in the parish were aware of them. If someone did not agree, he or she could register a caveat before the court. If no one complained, the right to charge fines for trespassing, for example, was given to the summer farm communities and the court stipulated the levels of the fines for certain violations. A way to prove that somebody had trespassed with livestock was to take the bells belonging to the animals as evidence.[54]

After summer farm boundaries had been clarified and were better marked, the number of cases brought to court declined. They peaked in the second half of the eighteenth century, with the highest number of cases occurring during the 1760s (Figure 4). This change does not indicate that the competition for pastures eased after this. The number of animals in the pastures increased well into the nineteenth century.[55] The court cases decreased because by then the boundaries were firmly established and peasants knew there was little chance of

[54] Ågren, *Jord och gäld,* pp. 171–4; Ehn, *Mötet mellan*, p. 94; Larsson, *Fäbodväsendet*, p. 236.

[55] Larsson, *Fäbodväsendet,* pp. 175–7.

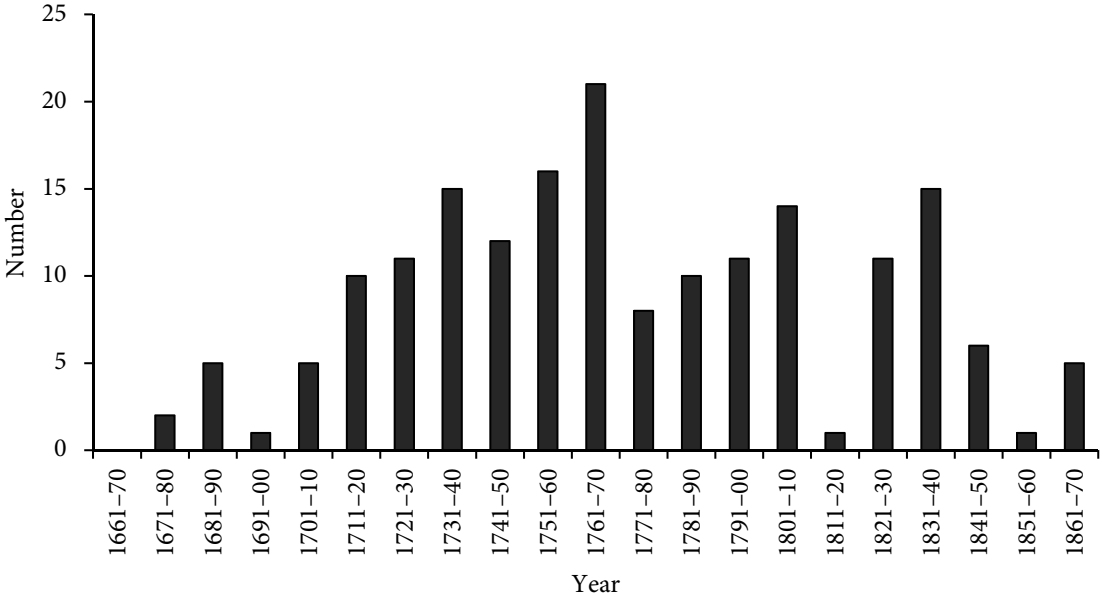


FIGURE 4. Number of local court cases concerning boundaries at summer farms in the parish of Leksand in ten-year increments, 1661–1870

Note: The high number of court cases after 1820 could be explained by enforcement drives. A few summer farms at the parish boundary were in dispute over several years, resulting in many court rulings. Between 1822 and 1827, one conflict had seven court sessions. After 1830, one summer farm accounted for more than one-third of all the cases.
Source: Sigvard Montelius unpublished archives, private collection, Falun, Sweden.

changing them. With boundaries well protected from intruders, the biggest threat of overuse of the pastures came from the user groups themselves. From the second half of the eighteenth century onward, the peasants had to focus more on their internal use of the pasture grounds to avoid overexploitation. As a result, each community put more effort into monitoring and regulating the use of its summer farm. Monitoring of the user group had always been an important task for the summer farm community, but it is clear that the effort to enforce rules increased in the second half of the nineteenth century, when written by-laws for the summer farms were introduced.

What the peasants did from the sixteenth century up to the nineteenth century was to establish clear rules on how the commons could be used. With help from the local court, they divided the commons into utilization areas for each summer farm and established a well-functioning common-pool regime.

III

A programme of land reform (*storskifte*) in Leksand began in 1819 and had been completed by the beginning of the 1830s. The purpose of the reform was to make land use more efficient. To achieve this goal, the number of infield plots that each peasant used was reduced and plots were merged into bigger fields. The outlying land, which was a common-pool resource, was

divided between the peasants with the aim of encouraging its cultivation. Another justification for including the outlying land in the reform was to turn commons into private land to enable better management of the woodlands to take place.[56] The end goal for the state was to make the country more prosperous and, in the long run, increase tax revenues. To achieve this, they needed to eliminate claims other users might have to the same land and allocate only one user and owner to each piece of land. This was the goal the courts explicitly expressed in cases regarding the grazing rights for summer farms in Leksand after the land reform.[57] Thus, the ideological background of the reform was part of a central trope in eighteenth-century public discourse: property should be under individual, absolute dominion in which the bundle of property rights is gathered under a single owner with the right to enjoy and exploit that property's resources without restriction.[58] It is clear that the architects behind the land consolidation reform did not recognize common property as an efficient property regime: they considered all common-property regimes to be inefficient by definition.[59] In that sense, they had the same view of commons as Hardin would have 200 years later and, like Hardin, they proposed conversion to private or public property.[60]

The land reform had to be initiated by one of the landowners making an application to the county governor. Leksand made the formal request in 1817. It is hard to argue that the peasants participated in the reallocation willingly. The land consolidation reform in Dalarna County took place between 1803 and 1894. In the earliest years of the reform the peasants in the parish of Floda refused to co-operate with the regional head of the land reform and his surveyors. At a meeting in 1806 chaired by the county governor, to which he brought soldiers to maintain order, he explained the consequences of not co-operating, and the consolidation started later that year. The next year, representatives from Floda travelled to Stockholm on behalf of all peasants in the parish to decline to participate in the reform. The answer from central government was that participation was mandatory for all parishes in Dalarna.[61] Finally, whether the peasants were for or against the reform is not important, because they could not avoid it. The peasants in Leksand were pragmatic and realized they would be better off by collaborating with the land surveyor to get the best possible result from the reform.

Land consolidation was not introduced as a result of changes in the agricultural system in Leksand. The peasants retained the same agricultural practices after the reform as they had had before.[62] However, the reform impacted upon their agriculture in many ways. The reform required that summer farms should be located on the peasants' own property. Most peasants had land where they had their summer farm dwellings and could continue within the same

[56] Pettersson, 'Äganderätten', pp. 130–1.

[57] Carl Schmidt (ed.), 'Om fäbodedelägares i Dalarne rätt att fortfarande begagna lötesmark inom annan sockens genom fastställdt storskifte bestämda rågång' [The right of summer farm owners to use pastures in another parish after the land consolidation reform], in *Juridiskt arkif* [*Legal archive*], 20 (1849), p. 511.

[58] Robert W. Gordon, 'Paradoxical property', in John Brewer and Susan Staves (eds), *Early modern conceptions of property* (1995), pp. 95–6.

[59] Staffan Helmfrid, 'The *storskifte*, *enskifte* and *laga skifte* in Sweden: general features', *Geografiska Annaler* 43 (1961), p. 115.

[60] Hardin, 'Tragedy', pp. 1243–8.

[61] Martin A. Bortas, *Storskiftet i Dalarna 1803–1894, med exempel från Leksand och Åls socknar* [Land consolidation in Dalarna 1803–1894, with examples from Leksand and Åhl parishes] (1992), pp. 21, 25.

[62] Larsson, *Fäbodväsendet*, p. 270; Montelius, *Leksands fäbodar*, p. 166.

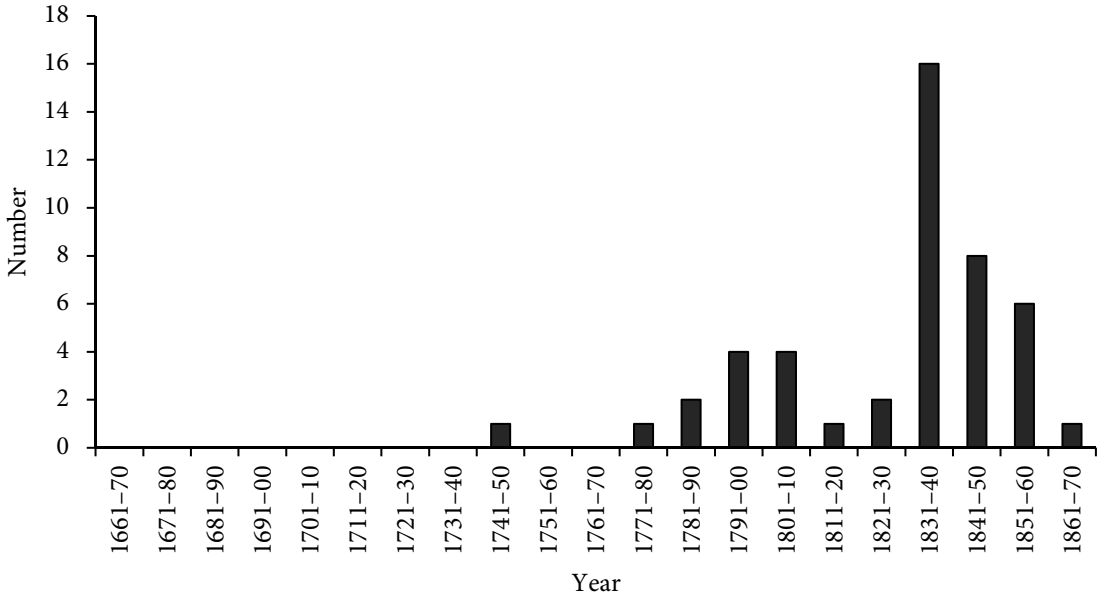


FIGURE 5. The number of court protocols regarding by-laws of summer farm communities in Leksand, 1661–1870, in ten-year increments

Source: Sigvard Montelius unpublished archives, private collection, Falun, Sweden.

summer farm community, but quite a few had to establish new ones. Following the reform, more than 40 new summer farms were established in the parish but each had very few users.[63] Most of the new summer farms (60 per cent) had only one cabin and were shared with no neighbours. Even though the new summer farms were located on the landowners' properties and closer to the home farm compared to many of the older summer farms, they tended to be abandoned earlier.[64]

Despite the forest now being divided into privately owned strips, peasants were still allowed to use the combined area for grazing. Thus, the peasants were given the right to use other people's private property for feeding their animals during the summer.[65] The summer farms remained a necessity, and without the rules that allowed livestock to graze on others' properties, the agrarian economy would have collapsed. Animal husbandry was very important and there were no alternatives for grazing. But by separating the right to use the land from ownership of the land, a tension was built into the system: privately owned land was used as a common-pool resource. There was a tension between private extraction of resources other than pasture from the land and collective use of the land for animal husbandry. So long as all peasants needed the forest for grazing, it had to work.

In many ways, animal husbandry remained unaltered after the land reform. It was still necessary for all users to move from the village to the summer farm on the same day in early

[63] Montelius, *Leksands fäbodar*, pp. 166–8.
[64] Ibid., pp. 252–7.
[65] Ibid., pp. 100–101.

summer and back to the village on the same day in the autumn (some users also returned for a short time to the village in mid-summer). It was still important to respect the boundaries of each summer farm, collectively maintain roads to the summer farms, work to clear the pastures, and other tasks. Since the woodlands went from being common lands to privately owned land while still being used as a common for grazing, it was necessary to formalize the rules for the summer farm. We know from court records that after the land reform, the number of by-laws concerning summer farms increased substantially in Leksand (Figure 5). Up to the time of the reform, written agreements about summer farm rules were quite simple and contained only two to six paragraphs.[66] Like village by-laws, these agreements had acted as laws once the local court had confirmed them, allowing a summer farm community to act like a court for such things as collecting fines from violators. The summer farm community by-laws could not be used against people who did not belong to the summer farm. As we saw, the summer farm communities could impose a fine on trespassers only if the right to do so had been confirmed by the local court.

After the land consolidation reform, a huge number of by-laws were brought to the court for confirmation. The number of paragraphs in each by-law increased and each paragraph became more detailed; the number of animals the peasants could take to the summer farm was clearly specified; the number of violations that the peasants had to pay fines for increased; and, for the first time, managers of the summer farm communities were mentioned. The local court specified the manager's authority to enforce the rules and collect fines. It is obvious that it had become important to make sure the by-laws could be enforced efficiently.

IV

The peasants in Leksand continuously changed the rules for using common-pool resources to adapt to changing conditions. Their key aim was to avoid overuse and ensure that the land could be used for grazing by the next generation of users. Property is a set of legal relations among persons (individual or collective), and each summer farm community in Leksand increased their 'rights' to their pasture grounds by denying other people's claims to the same land. For the summer farms, management was conducted as a common-property regime, even after the commons were divided into private plots, and 'membership' responsibilities continuously increased.

The cost to the peasant is connected to the question of power over property, or sovereignty.[67] Who was gaining power and who was losing power after the land reform? Before the reform, peasants frequently used the local court to resolve problems concerning summer farm boundaries. It was a low-cost arena for solving problems in which lay participation was high. Scholars have pointed out that the guiding principle of the local courts was to establish socially

[66] Most of the paragraphs were about summer duties, but one paragraph usually dealt with winter road work. All members of the summer farm were responsible for maintaining the winter roads to the summer farm so the hay stored there could be taken back to the village as needed, Larsson, *Fäbodväsendet*, pp. 267–71.

[67] Robert Brenner, 'Agrarian class structure and economic development in pre-industrial Europe', *Past & Present* 70 (1976), pp. 31–2, 71–2; Morris R. Cohen, 'Property and Sovereignty', *Cornell Law Q.* 13 (1927), pp. 8–30.

sustainable solutions to local problems rather than to press formal points of law, and Leksand's court followed that principle.[68] What made the court such a strong arena for conflict resolution was the interplay between *de jure* rights and *de facto* rights, i.e., rights given lawful recognition and rights that originated among users and produced operational rules closely matched to the physical and economic conditions of the common-pool resources.[69] One example is that the court recognized all landowners' rights to use the commons (*de jure*) as well as open and closed seasons for the pasture grounds (*de facto*). The court's stipulating fines in advance for violations of rules is another example of how rights that originated among users were recognized by the court.

In a society in which all children inherited land, there was always a risk of land fragmentation. To counteract this, strategic marriages were important and the role of kinship was significant in achieving successful collective arrangements. Another way to avoid further fragmentation was for each child to inherit undivided plots of arable land and meadows instead of receiving one strip of land within each plot.[70] It was possible to do this when the household had many small plots at its disposal. The peasants in Leksand had also developed a system for local exchange of land (arable land, meadows, meadows surrounding a private lot at the summer farm, and houses) and kept local records of who owned which strips.[71] With the land reform, the old practice of land exchange was no longer possible. From this time onward, the boundaries between landowners were defined by the central and regional governments, and they included the former commons. The exchange of land had to involve a land surveyor who acted as a representative of the regional government. Entitlements to land became clearer, at least for the government, but at the same time exchanging land became more costly for peasants. It was the first time in Leksand that a map was used as an instrument to show what property belonged to each landowner.[72] The power of the map belonged to the regional government. Morris Cohen recognized 'that a property right is a relation not between an owner and a thing, but between the owner and other individuals'.[73] The land reform in Leksand concentrated political rights at the state level, and the state destroyed rights previously held by local communities.[74] The reform increased the government's power over land transactions, and at the same time, the transaction costs for peasants increased. Increased government control was intended to secure better control over the country's assets and was part of a state-building effort. It was also an attempt to make the organization of agriculture less dependent on personal ties, to promote the rise of a more impersonal organization and to remove restrictions on individual enterprise.[75]

[68] Ågren, *Domestic secrets*, p. 23; Larsson, *Fäbodväsendet*, p. 292.

[69] Edella Schlager and Elinor Ostrom, 'Property-rights regimes and natural resources: a conceptual analysis', *Land Economics* 68 (1992), pp. 254–5.

[70] Ulf Sporrong and Elisabeth Wennersten, *Marken, gården, släkten och arvet: Om jordägande och dess konsekvenser för människor, landskap och bebyggelse i Tibble och Ullvi byar, Leksands socken, 1734–1820* [Land, farm, kinship and inheritance: landownership and its consequences for people, landscape and settlement in Tibble and Ullvi villages, Leksand, 1734–1820] (Leksands sockenbeskrivningar 10, 1995), pp. 207, 213.

[71] Sporrong, 'Ägandets reproduktion', pp. 101–06.

[72] Sporrong and Wennersten, *Marken, gården*, p. 334.

[73] Cohen, 'Property and sovereignty', p. 12.

[74] Charles Tilly, 'Reflections on the history of European state-making', in Charles Tilly (ed.), *The formation of national states in Western Europe* (1975), p. 37.

[75] Cohen, 'Property and sovereignty', p. 21.

Since the land reform did not arise out of changes in agricultural practice or social organization, the result did not turn out well for the peasants. The exchange of land between owners in Leksand decreased while all children continued to inherit land. The peasants continued to divide their land without formal recognition by the regional government, and without the possibility for local exchange. In the long run, this resulted in very narrow strips of land, arable as well as woodland, that were unmanageable and much more costly to farm and log.[76]

Since agricultural practice was almost the same before and after the reform, the big difference for animal husbandry was that peasants had to manage summer farms on privately owned land. The nature of the grazing made it impossible for peasants to feed animals on their own private lots, so they obtained easements to let their livestock graze on other peoples' land adjacent to their summer farm lots. Existing summer farms appear to have kept almost the same utilization area as before the reform. Thus, outlying land was still used as common pasture. In that sense, the land consolidation reform was not a complete privatization of land; it created hybrid ownership structures where common pasture rights remained intact. With the reform, more regulations were needed to maintain the use of summer farms, and by-laws became more complex. More by-laws and heavier regulations increased the transaction costs for the summer farms. It could be that more complex by-laws were a result of increased utilization of the summer farms, with more members in each. However, there are two reasons to believe that the introduction of the more complex by-laws was a result of the land reform. First, the number of by-laws increased tremendously right after the reform (Figure 5).[77] Second, a similar development occurred in other areas of Sweden after land reforms were enforced.[78] In Uppland, where agricultural practice was very different from that in Leksand, and its backbone, especially in the southern part, was grain production, many village by-laws were introduced at the same time as land reforms in the 1770s.[79]

The government had been promoting model village by-laws since 1742 as one of several means to increase grain production.[80] Initially, the peasants' response was hesitant and few by-laws were promulgated. It was not until the land reform that peasants adopted village by-laws. The reform caused some trouble, because it changed the boundaries, and with new boundaries, the peasants had to put up many new fences.[81] The old organization for maintenance of fences was no longer useful, and many villages had a shortage of woodland to provide material for the new fences. After the land reform, new rules were required to adjust to the new conditions, and village by-laws were a solution to the problem.[82] Despite the fact

[76] Dalautredningen, *Betänkande med förslag till lag med särskilda bestämmelser om delning av jord å landet inom vissa delar av Kopparbergs län* [Report with bill of special provisions of division of land in certain parts of Kopparberg county] (1931), p. 37; Erik Westholm, *Mark, människor och moderna skiftesreformer i Dalarna* [Modern land reforms in Dalarna, Sweden], *Geografiska regionstudier*, 25 (1992), pp. 67–79.

[77] Larsson, *Fäbodväsendet,* p. 268.

[78] Ehn, *Mötet mellan*, p. 103.

[79] The land consolidation reform (*storskifte*) in Uppland County occurred about a half century before the same reform in Leksand. Since it took place at different times in different parishes in Uppland, it was an extended process, but the peak occurred before 1772. In the nineteenth century, new land consolidation reforms (*enskifte* and *laga skifte*) took place in Uppland.

[80] Ehn, *Mötet mellan*, pp. 21–2, 90.

[81] One example was village boundary fences. Before the land consolidation reform, the boundaries between villages were often open fields. After the reform, fences had to be constructed along the new boundaries, Ibid., p. 103.

[82] Ibid., pp. 102–103.

that common land had been turned into private land, collective action was still a necessity for the peasants and required more formal regulation in both Leksand and Uppland. These findings contradict the view that the land reforms dissolved the older form of agrarian organization.[83]

For peasants in Leksand, land reform increased the transaction costs of having a summer farm for some more than others. One group consisted of peasants who had to move from their previous summer farm and establish a new one. Most of these peasants could not take advantage of one of the main benefits that larger and older summer farms had, i.e. many farmers being able to join forces and share the expenses of such things as building and maintaining roads and fences, clearing of pastures, and jointly hire workers. Another group of peasants, who lived in a village close to the parish border, found their summer farm in the adjacent parish. Before the land reform, some villages in neighbouring parishes had summer farms located inside the boundaries of Leksand. These summer farms were usually established in remote areas of Leksand in relation to where the major villages were situated. When the utilization of the outlying land increased during the eighteenth century and peasants from Leksand established new summer farms on the outskirts of the parish, conflicts emerged between user groups. However, the peasants from neighbouring parishes were still allowed to keep their summer farms. The land consolidation reform changed this arrangement. From then on, the boundaries of the parish were also the boundaries for grazing rights. Even if the land surveyor tried to compensate the peasants with land in the parish where they lived, many wanted to keep the same summer farm they had used before. For one such summer farm, a legal battle was waged from 1835 to 1849.[84] The government wanted to limit polycentric land use and favoured a monocentric hierarchy.

V

In the seventeenth century, the peasants in Leksand, with support from the local court, established a common-property regime for the purpose of using the outlying, common land for grazing. An important feature in this common-property regime was the creation of boundaries for the summer farms to establish utilization areas. Another important feature was open and closed grazing seasons, and it became mandatory for all peasants to have a summer farm. When the utilization of the outlying land increased, the common-property regime that the peasants had created was able to adapt to new conditions. The common-property regime they developed was able to cope with the important question of exclusion of users in an effective way. One of the features that made the common-property regime successful was the interplay between *de jure* and *de facto* property rights.

When the land reform split the commons into many small private strips without any preceding changes in animal husbandry, the peasants had to take action to continue their practice, i.e. introducing new, more complex by-laws and appointing managers. However, these changes increased the transaction costs of utilizing summer farms at the same time

[83] Sundberg, *Nordic common lands*, p. 178.
[84] Schmidt, 'Om fäbodedelägares i Dalarne', pp. 509–515. Larsson, *Fäbodväsendet*, p. 234.

as land exchange between peasants became more costly. For peasants who, to a large extent, practised subsistence farming and had no alternative to using the summer farms, the result was a gradual decrease in the value of animal husbandry. However, it is important to remember that there were also other factors at play in the nineteenth century that made it harder to manage summer farms.[85] Despite other factors, it is clear that the land reform certainly did not favour the use of forestland as pastures for the peasants in Leksand. The conclusion is that for the small farms with an established and well-developed common-property regime, the transition from a regime in which pastures were held as commons to a common-property regime on private land was costly and negative. It is difficult to interpret the introduction of private property in the outlying land as an evolutionary process from common to private. The peasantry were familiar with the concepts of both private property and common property before the reform and used a mixed property-rights regime.

If the development of property rights had gone toward more privatization during the seventeenth and eighteenth centuries, one would expect the peasants to have been better prepared for the land consolidation reform. Instead, the peasants' response to increasing demand for scarce natural resources, as the population grew and utilization increased, was to improve the common-property regime. The introduction of private property on the former commons increased the transaction costs for the users.

What we have seen is that more exclusive property rights were introduced by the peasants mainly by changing the common-property regime. At the same time, they used more collective action in agriculture. This could be seen as a conundrum: more exclusive property rights emerging with more collective action. A hypothesis is that during the early modern period a more complex agrarian economy evolved, including more complex social structures that required more co-operation among peasants. By creating more exclusive common-property rights and at the same time increasing co-operation among the users, it was possible to use larger areas, increase production, and create a more stable local society. Turning the commons into private property was supposed to end this co-operation, but it only served to make it more expensive.

[85] Larsson, 'Expansion', pp. 34–5.

Fuel supply and agriculture in post-medieval England

by Paul Warde and Tom Williamson

Abstract

Historians researching the character of fuel supplies in early modern England have largely focused on the relative contributions made by coal and the produce of managed woodland, especially with an eye to quantification. This has been to the neglect of the diversity of regional and local fuel economies, and their relationship with landscape, social structure, and infrastructural changes. This article highlights the wide range of other fuels employed, both domestically and industrially, in this period; examines the factors which shaped the character of local fuel economies, and the chronology with which these were altered and eroded by the spread of coal use; and looks briefly at the implications of this development for farming and land management.

A number of economic and environmental historians have, over the years, suggested that England made the transition from an organic to a fossil-fuel economy long before the conventional 'industrial revolution' of the eighteenth and nineteenth centuries. Nef argued in the 1930s that, by the sixteenth century, as a consequence of a serious shortage of wood caused by industrial expansion and population growth, coal was already becoming the main supplier of thermal energy in the country.[1] Nef's ideas were challenged by Coleman,[2] and somewhat nuanced by Hatcher,[3] but the importance of an 'early' transition to a coal economy – occurring before the end of the seventeenth century, and associated to varying extents with a shortage of alternative fuels – has been restated by a number of economic and environmental historians, including Richard Wilkinson, Tony Wrigley, Brinley Thomas and Paul Warde.[4] Others, such as George Hammersley, Robert Allen and Oliver Rackham, have disputed the specific scenario of fuel scarcity, pointing to the existence of untapped reserves of woodland where timber rotted where it fell, or the continuing capacity of consumers to supply themselves with wood

[1] J. U. Nef, *The rise of the British coal industry* (1932), pp. 158–76.

[2] D. C. Coleman, *The economy of England, 1450–1750* (1977), pp. 84–5.

[3] J. Hatcher, *The history of the British coal industry*, I, *Before 1700: Towards the age of coal* (1993), pp. 5–7.

[4] R. G. Wilkinson, 'The English industrial revolution', in D. Worcester (ed.), *The ends of the Earth: Perspectives on modern environmental history* (1988), pp. 80–99; B. Thomas, 'Was there an energy crisis in Great Britain in the seventeenth century?', *Explorations in economic history* 23 (1986), pp. 124–52; E. A. Wrigley, *Continuity, chance and change: the character of the industrial revolution in England* (1988); id., *Energy and the English industrial revolution* (2010); P. Warde, *Energy consumption in England and Wales, 1560–2000* (2006), pp. 32–9, 67.

and timber well into the nineteenth century.[5] Allen has also argued that, while the growth of London stimulated the provision of the cheaper fuel, coal, to the capital, energy in England was not expensive by European standards: the growth in the coal economy was more a consequence of expensive labour encouraging more energy-intense development, employing the cheapest fuel available, rather than a particular shortage of wood.[6] Nevertheless, while the precise mechanics and causes of the 'transition' are disputed, the position of coal as the dominant source of thermal energy in England by the late seventeenth century is now widely accepted.

Most contributions to this debate have, we would suggest, been characterized by a confusion of 'national' and 'regional' stories. Nef argued that scarcity was 'common to most parts … rather than limited to special areas':[7] and while evidence of readily available supplies of wood in particular areas can be used to refute this statement, this does not in itself tell us anything reliable about the overall 'national' picture. Allen has pointed out that the price trends for fuel in London and other parts of England diverge, although he only provides data on *charcoal* (a fuel involving more processing than firewood, and hence less representative of prices for wood itself) and talks loosely of comparing London data with a price series for charcoal and coal representing 'western Britain', 'the Midlands', and 'non-metropolitan England', somewhat varied designations, without providing any source.[8] His essential point is, however, unquestionably correct. Different regions of Britain, and of England, clearly had divergent fuel economies, and these underwent varied transitions between the sixteenth and the nineteenth centuries. For some purposes it is, indeed, important to know the date of 'national transition', defined as the point at which coal began to provide more than half of England's thermal energy.[9] But for many other enquiries, both economic and environmental in character, the date at which different *regions* and areas of the country became primarily coal using is probably more important: a rather different matter.

In this article we, first, emphasize the diversity of organic fuels in pre-industrial England, especially those other than wood, in part because these alternative energy sources have received little attention in debates and calculations concerning the date of a 'national transition'. This neglect is perhaps largely a consequence of the difficulty of assessing the importance of any of these on a *national* scale: historians have understandably been drawn to fuel sources that

[5] R. C. Allen, 'Was there a timber crisis in early modern Europe?', in S. Cavaciocchi (ed.), *Economia e energia secc. XIII–XVIII* (2003), pp. 469–82; id., *The British industrial revolution in global perspective* (2009), pp. 84–90; O. Rackham, *Trees and woodland in the British landscape* (1976), pp. 87–99; although see also id., *Woodlands* (2006), pp. 131–2; G. Hammersley, 'The charcoal iron industry and its fuel', *EcHR* 26 (1973), pp. 593–613.

[6] Allen, *British industrial revolution*, pp. 95–7.

[7] Nef, *Rise of the British coal industry*, p. 161; see the reply by Hatcher, *British coal industry*, p. 32.

[8] Allen, *British industrial revolution*, pp. 94–5.

[9] The most detailed, but still very preliminary, attempt at quantifying national fuel supplies is that by Warde, who estimated that coal became a more important provider of thermal energy than wood around, or a little earlier than, 1620: Warde, *Energy consumption*, p. 67. Hatcher speaks of such a transition definitely happening by around 1700 and perhaps before 1650, Rackham between the mid- and late seventeenth century, and Allen by 1700. Davidson rightly highlights the diversity of local fuel economies while asserting, on the basis of no clear quantitative evidence, that coal only became the main domestic fuel around 1840. Hatcher, *British coal industry*, I, pp. 47, 55; Rackham, *Woodlands*, p. 131; Allen, *British industrial revolution*, p. 96; C. Davidson, *A woman's work is never done: a history of housework in the British Isles, 1650–1950* (1982), pp. 74, 77.

are readily quantifiable, and that tend to relate to larger sources of supply and more extensive markets. Second, we look at some of the factors that shaped the character of local fuel economies, and the chronology with which these were altered and eroded by the spread of coal use throughout England. Last, we examine the agrarian implications of this latter development, suggesting that the use of the countryside for fuel production often placed limits on agricultural production, and that the widespread adoption of coal, especially as a domestic fuel, thus had important implications for the character of farming and the rural environment. The spread of coal use, that is, may help explain a number of significant but neglected changes in the countryside during the period of the classic 'agricultural revolution' of the later eighteenth and nineteenth centuries, and may cast additional light on some better known ones.

I

Past research into England's fuel supplies, and in particular into the chronology of coal adoption, has tended to focus almost entirely upon wood produced from managed, coppiced woodland.[10] Allen, for example, based an estimate of the availability of wood fuel in England largely on a suggestion made by Gregory King in the 1690s that the area of woodland used to supply firewood amounted to 1.5 million acres (rather lower than modern estimates by Collins and Warde).[11] Yet it is clear that a significant proportion of the fuel used in many districts did not come from coppiced woods, but comprised a range of materials dug or harvested from commons and other marginal land. William Harrison for example, writing at the end of the sixteenth century, argued that the shortage of wood in the vicinity of London would soon drive the inhabitants of the city to burn 'fenny bote, broom, turf, gall, heath, furze, brakes, whins, ling, dies, hassocks, flags, straw, sedge, reed, rush and also seascale'.[12] Harrison clearly implies that it would be sad indeed if Londoners were to become dependent on such things, but they are offered as realistic possibilities.

Harrison's 'fenny bote', or peat, was a fuel of considerable significance, especially in upland districts, where raised bogs supplied ample reserves of *sphagnum* peat.[13] It was extensively exploited from medieval times. In the South Pennines, for example, it has been suggested that all the peripheral blanket peats have been significantly affected by extraction, while on Dartmoor 'some areas seem to have had their altitude lowered by cutting'.[14] Indeed, the paucity of ancient woodland in upland districts has in part been explained by the fact that the availability of peat made the enclosure and protection of coppices unnecessary.[15] In the later

[10] One of the few exceptions is a passage discussing the variety of fuels in D. Woodward, 'Straw, bracken and the Wicklow whale: the exploitation of natural resources in England since 1500', *Past & Present* 159 (1998), pp. 48–56.

[11] Allen, *British industrial revolution*, p. 96; E. J. T. Collins, 'The wood-fuel economy of eighteenth-century England', in S. Cavaciocchi (ed.), *L'uomo e la Foresta Secc. XIII–XVIII* (1996), p. 1100; Warde, *Energy consumption*, p. 34.

[12] G. Edelen (ed.), *The description of England: the classic contemporary account of Tudor social life by William Harrison* (1994), p. 281.

[13] I. R. Rotherham, *Peat and peat cutting* (2011), *passim*.

[14] I. G. Simmons, *The moorlands of England and Wales: an environmental history, 8000 BC–AD 2000* (2003), p. 233; C. P. Rodgers, E. A. Straughton, A. J. L. Winchester, and M. Pieraccini, *Contested common land: environmental governance, past and present* (2011), p. 93.

[15] Rackham, *Trees and woodland*, p. 93.

eighteenth century peat was still being removed on such a scale from the upland commons in parts of the North West that it was causing serious damage to the grazing. At Bolton in Westmorland in the early nineteenth century, for example, it was argued that if the common were not enclosed, it would soon be completely ruined by peat extraction. [16] Peat was widely used as a fuel in the seventeenth century not only in remote rural areas but also in a number of northern towns, including York.[17] It was extracted on a commercial scale in the mosses of south-west Lancashire and supplied to Ormskirk and Liverpool in the seventeenth century, in a mixed economy alongside the output of the local coalfields.[18]

In the lowlands peat also continued to be a significant fuel source well into the post-medieval period. In 1797 Frederic Eden reported that it was 'the usual fuel consumed by labourers' in Lincolnshire, and was more generally used on the Isle of Axholme.[19] Although the drainage of the East Anglian Fens began in the seventeenth century, it was a protracted process, and peat was still being dug on an industrial scale in south Cambridgeshire in the late nineteenth century. The last extensive excavations, at Swaffham, were only closed at the start of the Second World War.[20] There were numerous other local sources. In the 'Broads' district of Norfolk and Suffolk, the kind of deep digging that created the lakes or 'broads', which gave the district its name, appears to have come to an end in the fourteenth century, but shallower peat excavation continued everywhere, and seems to have increased in scale in the decades around 1800, following enclosure of the valley fens.[21] Peat was employed industrially, as well as domestically, usually in the form of peat charcoal. It was used to fire lime kilns and, alongside wood charcoal, for smelting tin and other non-ferrous metals, only finally being replaced by coal in the first half of the eighteenth century, following the development of the reverberatory furnace.[22] It was, in short, even in the eighteenth century, a fuel of central importance in many areas of England and Wales.

Many other combustible materials were regularly cut from marginal land but have received little or no attention in calculations of aggregate fuel supplies.[23] Both heathlands, and to a lesser extent moors, grew significant quantities of gorse (or 'furze'), heather ('ling') and other vegetation which was burned as a domestic fuel.[24] Such material was especially useful for oven firing but was also employed on a more general basis. In the early seventeenth century, even though coal was becoming 'normalized' as a fuel in and around London, Thomas Blenerhasset could comment of Horsford Heath near England's second city that 'This heathe is to Norwich and the countrye heare as Newcastle coales are to London'.[25] Even where trees and woods were

[16] I. Whyte, *Transforming fell and valley: landscape and parliamentary enclosure in north-west England* (2003), p. 33.

[17] Rotherham, *Peat and peat cutting*, p. 25.

[18] J. Langton, *Geographical change and industrial revolution. Coalmining in south-west Lancashire, 1590–1799* (1979), pp. 56–7.

[19] F. M. Eden, *The state of the poor: or, an history of the labouring classes in England from the Conquest to the present period* (1797), p. 566.

[20] A. Day, *Fuel from the Fens* (1999), p. vi.

[21] T. Williamson, *The Norfolk Broads: a landscape history* (1997), pp. 98–103.

[22] M. Palmer and P. Neaverson, *Industry in the landscape, 1700–1900* (1994), pp. 48, 83; Simmons, *Moorlands*, p. 128.

[23] e.g. Warde, *Energy consumption*, p. 21. This is partly because there is currently no obvious way of quantifying their use.

[24] C. J. Humphries and E. Haughnessy, *Gorse* (1987).

[25] T. Barrett-Lennard, 'Two hundred years of estate management at Horsford during the 17th and 18th centuries', *Norfolk Arch.* 20 (1921), p. 120.

abundant, the importance of furze, in particular, is reflected in the strenuous efforts made by manorial courts to control its exploitation. At Bushey in well-wooded Hertfordshire, at no great distance from the capital, an order was passed in October 1600 forbidding the selling of furze cut from the waste to anyone living outside the manor, while in 1707 the Court Baron ruled that 'every person that cuts furze within the manor between May Day and Michaelmas [i.e., during the summer growing season]' would be fined 20*d*.[26] On the north Norfolk coast at Brancaster and Thornham furze was used as a fuel by both rich and poor, and manor courts attempted to protect supplies and promote re-growth in several by-laws passed during the sixteenth century.[27]

Gorse was grown not only on common land. There were many areas of private heath, moor and other rough ground where it was cultivated in special enclosures, protected from grazing. Even in 1801 it was said of Sithney in Cornwall that

> Here are, it is almost literally true, no trees; consequently a considerable part of every estate is under furze, which would frequently, with proper cultivation, produce whatever the cultivated lands now produce.[28]

Heather was perhaps even more widely used as a domestic fuel, cut in the form of turves dug to a depth of at least 2.5 cm, which thus included both the vegetation and, more importantly, a portion of matted root material. Crabbe, writing in the late eighteenth century about the east Suffolk heathlands in 'The Village', refers to the local heaths as a source of 'the light turf that warms the neighbouring poor'.[29] In the 1760s, Gilbert White, writing about the almost treeless Woolmer Forest near the south coast in Hampshire, noted how 'such forests and wastes … are of considerable service to neighbourhoods that verge on them, by furnishing them with peat and turf for their firing'. When the forest was enclosed in 1866, some 961 houses still claimed rights of turbary.[30] At times this material reached wider markets. The Dorset port of Swanage, for example, was one of the main destinations for the turves cut from the Purbeck heaths.[31] Broom, another characteristic plant of the heathlands, was also widely exploited for fuel and bracken was sometimes burnt on domestic fires, or used as kindling.[32] Where other sources of firing were scarce and expensive, even fern could be 'a very great help to the poore for firing'.[33]

Heather, broom and gorse were all used industrially, especially for firing brick kilns. When Blickling Hall in Norfolk was constructed in 1617–21, for example, more than a million bricks were fired in kilns entirely fuelled with gorse and broom faggots brought from the heaths at nearby Cawston and Saxthorpe (although Blickling also appears to have had its own 'Furze

[26] Hertfordshire Archives and Local Studies (hereafter HALS), 6398 and 6442, court rolls for the manor of Bushey.

[27] Rodgers *et al.*, *Contested commons*, p. 172.

[28] M. Turner (ed.), *Home Office Acreage Returns, HO 67. List and Analysis* (4 vols, List and Index Soc., 189–90, 195–6, 1982–3), I, pp. 33–4.

[29] G. Edwards (ed.), *George Crabbe: selected poems* (1991), p. 5.

[30] G. White, *The natural history of Selborne* (1789, 1993 edn), p. 29. We are indebted to information on the enclosure award to David Zylberberg.

[31] Parry, *Heathland*, p. 63.

[32] O. Rackham, *History of the countryside* (1986), p. 295.

[33] W. Blith, *The English improver improved* (third edn, 1652), p. 122.

Close', to judge from an estate map of 1729).[34] Well into the nineteenth century most of the kilns on the Bedfordshire brickfields were likewise fired using heathland vegetation.[35] It has been suggested that the vitrified bricks so common in seventeenth, eighteenth and even some nineteenth-century buildings throughout England, and often used in a decorative fashion, may have been the consequence of using such fuel: 'the high proportion of vitrified headers was probably a consequence of using firing materials, such as heather and gorse, which gave off fumes containing potash'.[36] Other industries might also be fuelled with gorse or heather turf, including lime burning, well into the eighteenth century. In short, the extensive common 'wastes' of seventeenth- and eighteenth-century England, and enclosed marginal land of similar character, produced a wide variety of fuels.

The continuing importance of peat, gorse, heather and the rest as fuel, at least for the poorer elements in society, even in the early nineteenth century is evident from the terms of numerous enclosure awards. Sarah Birtles has argued that many commons were, in the course of the eighteenth century, used less for grazing by the main farmers in a parish and more as a fuel source for the poor. In recognition of such customary uses (and presumably to reduce claims on poor relief), parliamentary enclosure commissioners often allotted an area for use as a fuel allotment, to be cut by the poor for gorse, turf or peat, although sometimes rented out from the start to provide coals for them.[37] In Norfolk alone no less than 250 parishes had such allotments, some relatively small but others – as at Bridgham or Feltwell – extending over more than 100 hectares.[38] In addition, a number of parishes in the same county – as many as 146 as late as 1845 – remained unenclosed, or were only partially enclosed, again mainly to leave sufficient firing for the poor.[39] In many other parts of England where extensive areas of heath, moor or fen survived enclosure, traditional fuels continued to be exploited. As late as 1858 a total of six million heather turves were still being cut each year in the New Forest.[40]

In Midland areas, where the pre-enclosure landscape contained fewer heaths and fens, allotments for fuel were less common, although still sporadically made. They were most frequent in forest districts, such as Rockingham, where most enclosure acts made such provision for the poor, a clear recognition of their previous rights to collect fuel from the forests. But a few were also made elsewhere, in the case of Northamptonshire in villages outside the forests at Clipston, Aldwincle, Harlestone, Wappenham, Wadenhoe, Wollaston, specifically in compensation for the loss to the poor of gorse, thorns and bushes.[41] In upland areas, however, the extent to which peat remained a major source of fuel is clear from the way that enclosures often allocated, to those receiving allotments, a 'moss dale' where they could cut peat: 'these usually show up on award maps as relatively small areas divided into large numbers of narrow rectangular strips'.[42] Such allotments continued to be made into the

[34] Norfolk RO, MC3/45. Blicking Hall, map of 1729, no catalogue number.

[35] A. Cox, *Brickmaking: a history and gazetteer* (1979), p.27.

[36] Ibid, pp. 28–9.

[37] S. Birtles, '"A green space beyond self interest": the evolution of common land in Norfolk, c.750–2003' (unpublished PhD thesis, University of East Anglia, 2003).

[38] Ibid., pp. 196, 307–9.

[39] Ibid., pp. 304–5.

[40] Parry, *Heathland*, p. 62.

[41] R. Liddiard, T. Partida and T. Williamson, *Champion: the making and unmaking of Midland landscapes* (2013), p. 152.

[42] Whyte, *Transforming fell and valley*, p. 76.

middle decades of the nineteenth century, as at Troutbeck in Westmorland in 1840. They were exploited by the farmers, as much as by smallholders and cottagers.[43]

II

In a world in which peat, gorse, heather and other materials cut or dug from heaths, moors, fens and other rough ground are seldom used as fuel, it is easy to forget the contribution that they made to energy supplies in the past. But other significant sources of fuel have also been largely ignored by historians, for it is clear that much of the fuel wood consumed in England did not in fact come from coppiced woodland at all. A major contribution was made by hedges and farmland trees.

Hedges were the main form of field boundary in lowland England. They needed to be rigorously managed, otherwise they would develop into a line of unconnected shrubs and trees, and this was achieved in two main ways, both of which would of necessity have produced significant quantities of wood, more likely to have been used as fuel than simply burnt *in situ*. The most familiar is perhaps *laying* or *plashing*, which took a number of regional forms but essentially involved hacking back the hedge with a billhook, removing lateral suckers, dead material, many of the main branches, unwanted species and much of the twiggy growth. Some of the principal stems were allowed to remain, cut roughly three quarters of the way through and bent at an angle of 60 degrees or more so that each overlapped its neighbour. In the spring, when growth resumed, a thick, impenetrable wall of vegetation was created.[44] But laying was never the only method of management, for in many districts hedges were *coppiced*: their constituent shrubs would simply be cut down, at intervals of between ten and twenty years, usually to within a few centimetres of the ground but sometimes at a height of around 0.6–1.0 metre.[45] Some local traditions recorded in the early nineteenth century, as in Middlesex, combined elements of both practices.[46]

Coppicing produced more fuel wood than laying, but even laying produced very significant quantities, although in both cases much would depend on the kinds of shrubs growing within the hedge, with hawthorn and blackthorn being less useful in this respect than species like ash, oak, elm, hazel, hornbeam and maple. By the end of the eighteenth century, hedges were usually planted solely with hawthorn or blackthorn, or with a combination of these species, and single-species thorn hedges were also recommended by some seventeenth-century agricultural writers, such as John Worlidge.[47] But as Wendy Johnson demonstrated many years ago, the evidence of numerous other early writers, including Fitzherbert and Norden, as well as the comments of foreign visitors and others, indicate that the planting of mixed hedges was common in the early modern period and continued into the eighteenth century.[48] Pehr Kalm,

[43] Ibid.

[44] R. and N. Muir, *Hedgerows: their history and wildlife* (1997), pp. 96–104.

[45] N. Kent, *General view of the agriculture of Norfolk* (1796), p. 182; W. Stevenson, *General view of the agriculture of Lancashire* (1815), p. 212.

[46] J. Middleton, *General view of the agriculture of the County of Middlesex* (1813), p. 150.

[47] J. Worlidge, *Systema Agriculturae; the mystery of husbandry discovered* (1681), p. 101.

[48] W. Johnson, 'Hedges: a review of some early literature', *Local Historian* 13 (1978), pp. 197–9; J. Fitzherbert, *The Boke of Husbandry* (1533), p. 53; John Norden, *The Surveyor's Dialogue* (1618), p. 201.

a Scandinavian traveller who came to England in 1748, typically noted how, in the Chilterns Hills in Hertfordshire, hedges were planted with a mixture of hawthorn and sloe but that in addition the farmers 'set here and there, either at a certain distance or length from each other, or just as they please, small shoots of willows, beeches, ash, maple, lime, elm, and other leaf-trees'.[49] A number of studies of the character of hedges surviving in the modern landscape have similarly concluded that mixed-species planting was normal before the eighteenth century.[50] Landowners planted a range of shrubs partly because it was often hard to source large quantities of hedging thorn but also because, while the latter made a good stock-proof barrier, it had few other practical uses, made indifferent firewood, and was awkward to handle. Useful species might also be added some time *after* hedges had been planted. Arthur Young described in the early nineteenth century how in Hertfordshire the need for firewood had 'induced the farmers to fill the old hedges everywhere with oak, ash, sallow and with all sorts of plants more generally calculated for fuel than fences'.[51]

The significance of hedges as a fuel source is frequently referred to in early modern sources. Thomas Tusser typically contrasted the open-field or 'champion' districts of England with the early-enclosed 'woodland' areas, in which 'in every hedge' there was 'plenty of fuel and fruit'.[52] Advocates of early enclosures often cited the improvements in fuel supply that would result from the planting of hedges; Walter Blith claimed that if more hedges were planted 'No man almost in the nation would be either at want of firing'.[53] Even in the late eighteenth and early nineteenth centuries, when single-species planting had become the norm, older hedges were still a major source of fuelwood. William Marshall noted in 1787 how, in north-east Norfolk, the 'old hedges, in general, abound with oak, ash and maple stubs, off which the wood is cut every time the hedge is felled; also with pollards, whose heads are another source of firewood'. The entire supply of wood in the district, he added, 'may be said, with little latitude, to be from hedge-rows'.[54] The great density of hedges in the sixteenth, seventeenth and eighteenth centuries in many old-enclosed districts in south-eastern England, the West Country, and southern East Anglia may, in part, be explained by their role as a fuel source. A 'Particular of Mr Rodwell's Farm' in the Norfolk parish of Diss, for example, made in 1771, describes 21 fields with an average size of less than three acres.[55] This was an extreme case: but maps and surveys nevertheless suggest that in all areas hedges formed a dense and intricate web across the landscape.

As the quotation from Marshall indicates, most hedgerows contained pollarded trees. Where farms were rented, especially in areas where there was a high demand for fuel, leases often

[49] Johnson, 'Hedges', p. 200; P. Kalm, *Kalm's Account of his visit to England on his way to America in 1748*, trans. J. Lucas (1892), p. 108.

[50] A. Willmott, 'The woody species of hedge with special reference to age in Church Broughton Parish, Derbyshire', *J. Ecology* 68 (1980), pp. 269–86; J. Hall, 'Hedgerows in West Yorkshire: the Hooper method examined', *Yorkshire Arch. J.*, 54 (1982), p. 105; G. Barnes and T. Williamson, *Hedgerow history: ecology, history and landscape character* (2005), pp. 73–96.

[51] A. Young, *General view of the agriculture of Hertfordshire* (1813), p.49.

[52] G. Grigson (ed.) *Thomas Tusser's five hundred points of good husbandry* (1984 edn), p. 281.

[53] Blith, *English improver improved*, p. 113; M. Reed, 'Pre-parliamentary enclosure in the East Midlands, 1550–1750, and its impact on the landscape', *Landscape Hist.* 3 (1981), pp. 60–8.

[54] W. Marshall, *The rural economy of Norfolk* (2 vols, 1787), I, p. 96.

[55] Norfolk RO, NRS 12793 3F F8.

laid down detailed stipulations regarding the management of both, normally reserving the 'bolling' or trunk of the pollards to the landlord, restricting the frequency with which hedges and pollards could be cropped and sometimes insisting that pollards should only be cropped when the hedges in which they stood were plashed or otherwise 'new made'. A lease drawn up in 1657 for a farm in Ridge in Hertfordshire thus allowed the tenant 'to lopp all the pollard hasells, maples, sallows, willows, hawthorns & hornebeame trees growing in the severall hedges, fields, dells & hedgrows', provided that he 'lopp and cutt but one tenth part of all the pollards hasells, maples, sallowes, willows, hawthorns & hornbeams every year for and during the last nyne yeres' of the term.[56] An agreement from 1693 concerning a farm in Aldenham in the same county stipulated that the tenant 'shall not lopp or cutt or cause to be lopped or cut any of the pollards growing upon the premises but when the hedges shall be new made and ditches scoured where the sayd pollards do grow'.[57]

Pollards also grew free-standing in pastures and meadows, while in many districts, including the Chilterns, the Home Counties north of London, and East Anglia, they were often grouped into 'rows', three or four deep, on the margins of pasture fields, or on 'hedge greens', unploughed strips of land on which the ploughteam could turn, and which was mown for hay or used for grazing tethered cattle.[58] The number of trees growing in fields and hedgerows shown on early maps, (and recorded in surveys), in old-enclosed districts is often astonishing. A farm survey made at Denham in Suffolk in 1651, for example, suggests that there was an average of 38 trees per hectare, while at Thorndon in the same county, another, made in 1742, implies as many as 72 per hectare.[59] These may have been extreme cases, for the tenant of the latter property complained to his landlord about the density of pollards on the farm, and data from nine surveys examined by Rackham, from farms in Essex, Suffolk and Norfolk made between 1650 and 1771, suggest an average of only *c.*25 trees per hectare.[60] On the other hand, a set of detailed maps drawn up as late as the mid-eighteenth century by Henry Keymer for farms in Norfolk, which record every hedgerow tree on the properties surveyed, suggest an average density of around 37 per hectare.[61] As late as 1784 a survey of West End Farm in Wormley in south-east Hertfordshire recorded an incredible 1496 trees scattered through 28 fields covering a mere 38 hectares.[62] What is even more striking is the proportion of farmland trees that were pollarded, rather than grown for timber. On a farm in Beeston near Mileham in Norfolk, surveyed by Keymer in 1761, there were 413 pollards, but only 104 timber trees: that is, 80 per cent of the trees were pollards.[63] Timber surveys from elsewhere suggest very similar ratios, in the 70–80 per cent range: on a farm at Stanfield in the same county in *c.*1798 there were 192 pollards to 66 timber trees (74 per cent pollards); on a farm at nearby Whissonset, at around the same

[56] HALS, D/ECd/E14.

[57] HALS, D/EAm/E3.

[58] D. Walker, *General view of the agriculture of Hertfordshire* (1795), p. 154; S. Wade Martins and T. Williamson, *Roots of change: farming and the landscape in East Anglia, c.1700–1870* (1999), p. 25; E. Martin and M. Satchell, *Wheare Most Inclosures Be: East Anglian fields, history, morphology and management* (2008), pp. 343–4.

[59] J. Theobald, 'Changing landscapes, changing economies: holdings in woodland High Suffolk, 1600–1840' (unpublished MA dissertation, University of East Anglia 1993); West Suffolk RO, T1/1/6.

[60] Rackham, *History of the countryside*, pp. 218–21.

[61] Norfolk RO, WIS 138, 166X3; PD 703/45–6. See also G. Barnes and T. Williamson, *Ancient trees in the landscape: Norfolk's arboreal heritage* (2011), pp. 64–82.

[62] Together with 569 'spars' or immature specimens: HALS, D/EBb/E27.

[63] Norfolk RO, WIS 138, 166X3

time, 131 pollards and 59 timber trees (70 per cent pollards) and, a few years earlier, 309 to 133 (again, 70 per cent); while at Thorndon in Suffolk in 1742, 80 per cent pollards.[64] Occasionally the proportion was even higher: 91 per cent at West End, Wormley, in Hertfordshire in 1784; and apparently reaching 100 per cent on a property at Ickburgh in Norfolk in 1651.[65]

Pollards were not only found on farmland. In many districts they were also a prominent feature of commons, including some heaths.[66] Sometimes they were present in only small numbers, often located towards the margins, but even in the later eighteenth century some commons still carried substantial quantities, in spite of the fact that wood pastures were, by their nature, inherently unstable environments. Their trees were vulnerable to damage from stock, through the stripping of bark for example, or the compaction of the ground above their root systems. More importantly, once trees died, were blown down or were felled, it was difficult to establish replacements in the face of sustained grazing pressure. It is usually assumed that such problems were more serious on commons than in parks and other private grounds because it was difficult to fence off portions of land to protect new trees (or indeed for any other purpose) as this came into conflict with the rights of commoners to access and exploit the common.[67] Recent research by Patsy Dallas, however, suggests that management systems existed that allowed or encouraged the replacement of lost trees on common land.[68] During a legal dispute in the late sixteenth century concerning the commons at Pulham in Norfolk, for example, it was stated that 'The tenantes of the said manor have used to make benefitt of the trees growing upon the common near their houses which were planted by themselves and their predecessors'.[69] A manorial survey of 1579, relating to the parish of Gressenhall in the same county, records that when tenants were admitted to holdings they received one or more 'plantings'.[70] A detailed map of the parish surveyed in 1624 shows that 'plantings' were areas of scattered trees growing on the various commons, in some cases so dense that the areas in question were effectively wooded. They are associated by name with the owners close to whose homes they were located.[71] Such customs certainly continued in many places into the eighteenth century. Francis Blomefield, in his *Topographic History of the County of Norfolk* of 1739, described how the tenants of his home parish of Fersfield had:

> Liberty to cut down timber on their copyholds, without licence and also to plant and cut down all manner of wood and timber on all the commons and wastes against their own lands, by the name of an outrun.[72]

These customs were not restricted to Norfolk, but have been noted in Hertfordshire and Essex and were probably common elsewhere.[73]

[64] Norfolk RO, PD 703/45–6; West Suffolk RO, T1/1/6.

[65] Norfolk RO, Walsingham XXVI/4, 414X6.

[66] G. Barnes, P. Dallas, H. Thompson, N. Whyte and T. Williamson, 'Heathland and wood pasture in Norfolk: ecology and landscape history', *British Wildlife* 18 (2007), pp. 395–403.

[67] Rackham, *History of the countryside*, pp. 121–2.

[68] P. Dallas, 'Sustainable environments: common wood pastures in Norfolk', *Landscape Hist.* 31 (2010), pp. 23–36.

[69] Norfolk RO, NAS II/17.

[70] Norfolk RO, MR61 241X1.

[71] Norfolk RO, Hayes and Storr 72.

[72] F. Blomefield, *Topographic history of the county of Norfolk* (11 vols, 1805), I, pp. 95, 739.

[73] See, for example, the papers relating to a dispute between Wheathampstead manor and Rothamsted manor over Harpenden Common, 1839–43: HALS, DE/Lw/E16.

Although the tenants usually had the right to crop pollards on commons, this was not always the case, and in south-east Hertfordshire the right to crop was sometimes in the hands of the lord of the manor and could only be enjoyed at a price. In this district the commons carried vast numbers of pollards. When in 1695 the commoners went to law in an abortive attempt to prevent their manorial lord, Sir Henry Monson, from felling the hornbeam pollards growing on Cheshunt Common, it was said that there were 24,000 on 1186 acres: that is, a density of around 50 per hectare.[74] Estate accounts show that Monson's descendants were still lopping the pollards on nearby Broxbourne Common as late as 1778 on a 12-year rotation. No less than 3809, again probably hornbeams, grew on 60 acres, a density of over 155 per hectare.[75] The large numbers of pollards on the commons of south-east Hertfordshire may be due to the proximity of London, and the market it provided for fuel, but commons in many other districts retained significant numbers of trees into the later eighteenth or nineteenth centuries, especially in the royal forests.

III

It is important to note the extent of regional variation in the availability of 'traditional' fuels, not least because this will have had an impact on the speed with which coal was adopted by local communities. The local abundance or otherwise of a particular resource was usually in sharp contrast to its national prominence. Some districts thus contained large numbers of hedgerow trees and hedges, others very few; woodland was abundant in some regions but not in others. In lowland England these particular variations to some extent followed the familiar distinction between 'champion' and 'woodland' areas. The former, mainly located in the Midlands and on the principal exposures of chalk in southern and eastern England, were characterized by nucleated villages, which, in the Middle Ages and often into the eighteenth and nineteenth centuries, cultivated extensive open fields. In contrast, in 'woodland' districts, which occupied the western counties of England and most of the South East, including southern East Anglia, open fields either never existed or had largely disappeared at an early date, so that, by the seventeenth century, the majority of farmland lay in hedged closes. The majority of coppiced woodland was also to be found in these kinds of landscape.[76]

However, the distinction between the 'two countrysides', at least by the seventeenth century, should not be too firmly drawn. Some extensive tracts of wood-pasture and woodland survived in the heart of the 'champion' Midlands, and especially in royal forests like Salcey, Rockingham or Bernwood.[77] Around the nucleated villages there had always been private crofts and other closes, all bounded by hedges, most of which contained pollards, and some trees and hedges also existed away from settlements, especially on parish boundaries: the boundary of East Farndon in Northamptonshire, a parish which was not enclosed until 1780,

[74] HALS, 10996 A/B.

[75] HALS, D/EBb/E26.

[76] B. K. Roberts and S. Wrathmell, *Region and place: a study of English rural settlement* (2002), p. 24.

[77] R. C. Thomas, 'Traditional woodland management in relation to nature conservation', in J. Broad and R. Hoyle (eds), *Bernwood: the life and afterlife of a fo*rest (1997), pp. 108–25; P. A. J. Pettit, *The royal forests of Northamptonshire: a study in their economy, 1558–1714* (1968).

was marked by a hedge in 1684, even though adjacent townships still remained open.[78] Hedges sometimes surrounded one or more of the open fields, as at Upper Boddington or Crick in the same county;[79] the meadows, as at Weston and Weedon;[80] and both consolidated and dispersed demesne land, as at Farthinghoe and Gretton.[81] Early maps often show short or discontinuous fragments of hedge within the open fields, of uncertain origins, but often in considerable numbers, as at Murcott or Wollaston.[82] They also indicate that the hedges within the fields contained trees, while trees could also be found free-standing on commons in some numbers.[83] Moreover, much early enclosure of the open fields took place in champion districts: even within the archetypical champion county of Northamptonshire, around half the townships had been fully enclosed before the first parliamentary enclosure act was passed in 1732, and most others had experienced some degree of partial, piecemeal enclosure.[84] Many of the hedges planted when such enclosures were made contained a mixture of woody shrubs as well as pollarded trees.

Other fuel sources in the seventeenth and early eighteenth centuries similarly exhibited distributions which were not only very uneven but also very complex, hard, if not impossible, to map on a national scale with any degree of confidence. Heaths for example, supplying gorse and heather, occupied poor, infertile soils overlying porous and acid sands and gravels. Charting their distribution is difficult, not least because late eighteenth-century county maps, while they frequently label such areas as 'heath', often describe them more neutrally as 'common'. In addition, vast areas of heathland were eradicated entirely during the period of the agricultural revolution, often before the earliest maps were surveyed. Many of these lost areas were associated with relatively small patches of sand and gravel, often unnoticed on modern geology maps or even destroyed entirely by the very process of 'improvement' itself, as in the case of the thin bands of sand, overlying chalk, which gave rise to the so-called 'chalk heaths'.[85]

The actual amount of fuel produced by the various kinds of 'waste' in any district is also difficult to calculate, even where their extent is known, because it depended not only on their extent but also on how they were managed. In some districts vegetation cut from marginal land had important alternative uses, as animal bedding or thatching, or as raw materials in the manufacture of potash, potentially reducing the quantity available for burning. More importantly, the amount of fuel produced by such rough land was determined by the intensity of agricultural exploitation – by the extent to which the ground in question was used for grazing – for where this was intense, gorse and broom could not grow into the large, woody plants suitable for firewood. John Norden, writing in 1618, described the gorse in the West Country, which grew 'very high, and the stalke great, whereof the people make faggots'. He continued:

[78] D. Hall, *The open fields of Northamptonshire* (1995), p. 264.

[79] Ibid, p. 234; Northamptonshire RO, Map 3133.

[80] BL, Add Ms 78141A; Northamptonshire RO, Map 4341.

[81] Hall, *Open Fields*, p. 264; Northamptonshire RO, Enclosure Plan 17.

[82] BL, Add, Ms 78141A; Northamptonshire RO, Map 4447.

[83] As at Weekley, Quinton, Easton on the Hill, Castor and Ailsworth, and Wollaston, Northamptonshire RO, maps 1349, 2895, 60p/504, and 4447.

[84] D. Hall, 'Enclosure in Northamptonshire', *Northamptonshire Past and Present* 9 (1988), pp. 351–68.

[85] Barnes *et al*., 'Heathland and wood pasture in Norfolk', pp. 395–7.

> And this kind of Furse groweth also upon the Sea coast of *Suffolke*: but that the people make not the use of them, as in *Devonshire* and *Cornwalle*, for they suffer their sheep and cattell to browse and crop them when they be young, and so they grow too scrubbed and lowe tufts, seldome to that perfection that they might be.[86]

In the case of lowland fens the amount of fuel extracted was similarly often limited by the conflicting demands of agriculture. Most such land was common land, and manorial courts evidently restricted, in some circumstances, the extent of peat extraction because it would of necessity reduce the amount of grazing available to commoners: it took decades for the ponds to 'terrestrialize', and even when they finally did so the grazing was usually dominated by reeds and other vegetation unpalatable to stock. At Martham in Norfolk, as early as 1404, two men were prosecuted for digging peat from part of the common which should have been left for hay; in 1509 an order was made forbidding the extraction of peat from all the commons in the parish, with the exception of Cess Heath and part of South Fen.[87]

Similar issues relate to the amount of fuel produced by hedges, for these varied significantly not only in number but also character. Most hedges for example were probably no more than two metres in width but in some districts they could be more like linear woods. James Parnell thus described in 1769 how in Hertfordshire

> the oak and elm hedgerows appear rather the work of nature than plantations generally extending 30 or 40 feet broad growing irregularly in these stripes and giving the fields the air of being reclaim'd from a general tract of woodland.[88]

Such variations presumably arose from the extent to which farmers put a premium on the production of fuel over that of food, for hedges of the kind described by Parnell not only took up large amounts of productive land but also cast shade over the adjoining fields. A further consideration may have been the character of the local farming economy, with livestock producers perhaps less bothered by such matters than arable farmers – tall hedges might inhibit grass growth to some extent, but would themselves have provided some sustenance (as well as shelter) for sheep and cattle. Similar calculations must have structured the density of pollarded trees on farmland, and perhaps on commons. We should also note that the amount of fuel produced by managed woodland, but also to some extent by pollards and hedges, must have depended to some extent on how far wood was needed for other purposes in the local economy.

The intensity with which the countryside in any district was exploited for fuel may to some extent have been dependent on population density: the kind of fuel sources with which we are concerned will presumably have been exploited to a lesser extent in areas where few people actually lived. This issue is rendered complex, however, by the fact that the more marginal sources of firing were disproportionately used by the poorer elements in society, and questions of local social structure, and of the character and extent of common rights, might thus affect the extent of their use. Comments by contemporaries need to be read in this light. Timothy Nourse, writing at the end of the seventeenth century, thought that the cutting of fuel from

[86] Norden, *Surveyor's Dialogue*, p. 235.
[87] Williamson, *Norfolk Broads*, p. 83.
[88] LSE, Misc 38/3, fo. 8.

hedgerows was no longer worth the cost of labour, and one was better off planting quicksets. But this is the view of the yeoman farmer, not the smaller husbandman or cottager.[89]

The most direct way to assess the scale and character of local fuel demand, and to discover how this changed during the course of the seventeenth and eighteenth centuries, should be through the direct records left behind by households and industry. Unfortunately, while much data of this kind exists, it is skewed towards particular groups (especially institutions, wealthier households with accounts, and recipients of poor relief). Secondary estimates of demand vary widely: Alberry has noted that in the eighteenth century it was believed that a cottager and his family would need between 25 and 50 tons of fuel wood per annum, equivalent to around 40 to 80 cubic metres, an improbably large amount to be consumed on any scale.[90] Rather more modestly, we can infer from Timothy Nourse's estimates on London's fuel supply that its half million inhabitants in 40,000 houses with some 360,000 chimneys, would consume 400,000 loads of firewood per annum, an amount equivalent to about a load per person, or a little less than 1.5 cubic metres of solid wood, although Nourse noted a nobleman's house might consume 40 loads.[91] Nourse's estimate falls more in the range of estimates for other European countries but is no more than a figure he found plausible, and in any case tells us little about the character of fuel mix and local consumption across broad swathes of the country.[92]

Longitudinal price series for fuels remain surprisingly rare and the literature has generally drawn on a limited number of institutional prices, often from diverse places. Given what we have noted about the localized nature of fuel markets, providing fuels of very diverse quality, these can tell us relatively little beyond the most general trends, although they do indicate huge regional diversity; especially in coal prices, which were ten times higher in Hitchin (Herts.) than in Derby in the 1690s, for example.[93] Despite the compilation of price series by authors such as Thorold-Rodgers or Beveridge, or the careful tracing of pithead coal prices in Lancashire by John Langton, we still await a systematic and comparative study of fuel price.[94]

Much about the nature of local fuel economies in the early modern period thus remains unclear, and would repay further research. But there is no doubt that, at a local and even regional level, traditional fuels must have made a considerable contribution to energy supplies in the seventeenth and eighteenth centuries. Turbaries and wood-pastures in particular must have produced very large quantities of fuel; and even where only bracken, scrub, gorse and heather were available, they were often present in significant quantities. There were probably around 33,000 square kilometres of moor, marsh, fen and other 'waste' in seventeenth-century England, out of a total land area of 130,000 square kilometres. It is, however, very uncertain

[89] T. Nourse, *Campania Foelix* (sec. edn, 1706), p. 28.

[90] A. Alberry, 'Woodland management in Hampshire, 900 to 1815', *Rural Hist.* 22 (2011), p. 164.

[91] This is based on a cart 'load' being just under a ton of wood. Nourse, *Campania Foelix*, pp. 351–2.

[92] The forthcoming PhD thesis of David Zylberberg on Hampshire and the West Riding of Yorkshire will be a very welcome step towards building up a more precise and thorough regional picture. For an exemplary study of medieval supply, although with little evidence on consumption levels, see J. Galloway, D. Keene and M. Murphy, 'Fuelling the city: production and distribution of firewood and fuel in London's region, 1290–1400', *EcHR* 49 (1996), pp. 447–72. On European comparisons, see P. Warde, 'Fear of wood shortage and the reality of the woodlands in Europe, c.1450–1850', *History Workshop J.* 62 (2006), pp. 28–57.

[93] Figures from Houghton, cited in Hatcher, *British coal industry*, I, p. 52.

[94] The authors hope to conduct such a study.

how much difference all this makes to current estimates about precisely when the nation as a whole made the transition to a coal-burning economy. In addition to the problems we have outlined above, much uncertainty surrounds the amount of thermal energy produced by these fuels. Pollarded trees for example were clearly a key resource; but even where we know their density, we have little real information about the volume of wood that pollards actually produced. Arthur Standish, in the 1610s, reckoned that after two decades a tree could produce at least 6*d*.-worth of lop every eighth year but, like other estimates, much must have depended on species, soil, drainage and proximity to other trees.[95] The contribution made by peat, gorse, heather, broom, bracken, sedge and other materials cut from commons and other rough ground is particularly hard to estimate, not least because the calorific value of such materials has been little researched. This said, if the thermal energy produced by this range of fuel sources could be effectively estimated, then the date of national 'transition' (usually calculated, as we have noted, on a comparison of recorded coal production with estimates of the amount of fuel produced by managed woods) might need to be adjusted, perhaps to a significant degree.[96] But far more important was the impact of the spread of coal use at a regional level, on localized fuel economies, and thus on the landscape and environment.

IV

In the absence of detailed studies of local fuel economies, it is difficult to chart this development except in the broadest terms. Coal was unquestionably in widespread use as a domestic as well as an industrial fuel across much of northern England and in parts of the Midlands by the middle of the seventeenth century, but assessing the rate of its wider adoption is made complex by the tendency – already noted – for fuel use to be not only geographically but also socially differentiated. In Herefordshire in 1805 it was believed that 'Coal is in general use as fuel as by as many of the inhabitants as can afford the purchase of it', at prices for Forest of Dean coal brought by ship and wagon that hint at a generally high cost of fuel in these parts.[97] In 1791, according to a government survey, coal was the most important fuel in Devon in the 'houses of creditable people, but the poor burn no coals, and very little wood, on account of the expense … most of their fuel is turf or peat.' But the same source makes it clear that most areas of the country were at least partly coal-using. Only in Durham, Yorkshire, Nottinghamshire, Staffordshire, Lancashire, Cheshire and the Welsh counties of Carmarthanshire and Flint was it reported that coal played little part in the local economy.[98]

That this general diffusion of coal use amongst the wealthier elements of rural society mainly occurred in the middle and later decades of the eighteenth century, rather than earlier,

[95] A. Standish, *The commons complaint* (1611), pp. 6–7; id., *New directions of experience* (1616), p. 14.

[96] Merely as an illustration of the parameters involved, if we estimate that the total energy provided by 'traditional' fuels was twice as high as current estimates, which are based on the supply of firewood alone, this would move the date of 'transition' from the 1620s to the late 1660s.

[97] J. M. Ducumb, *General view of the agriculture of the county of Hereford* (1805), p. 141.

[98] *Journals of the House of Commons*, 47, *1792*, 13 Feb. 1792, pp. 328–30. See also the reporting of turf and peat used extensively in Cumbria, mid-Wales and Barkham in Berkshire in D. Davies, *The case of labourers in husbandry stated and considered in three parts* (1795), *passim*.

is suggested by the character of vernacular buildings, the houses occupied by the 'middling sort'. In the middle of the sixteenth century open halls went out of fashion and open hearths were gradually replaced by large 'inglenook' fireplaces, set in massive stacks that occupied a significant proportion of a house's ground area.[99] Yet this change does not reflect the rapid expansion of coal use in Elizabethan England. A chimney-stack of this kind, in Smith's words, represented 'a very large cover placed over an open hearth, the heat from which was never intended to be so great as to affect the structure above it'.[100] Such stacks usually battered inwards markedly, in order to increase the draught. These characteristics, and in particular the width of the fireplaces themselves, indicate that vernacular houses in the sixteenth and seventeenth centuries were largely designed for burning wood and similar organic fuels: coal does not burn well in these circumstances, as anyone who has tried will appreciate. The shift to hearths and stacks more suited to burning coal, and the resulting changes in the design of houses, appear to have occurred at different rates in different areas. In Hertfordshire, near London, Smith has noted that in the late seventeenth century stacks began to be constructed that rose vertically on all four sides, quite possibly indicating a shift to the burning of coal although perhaps mixed with charcoal or other organic fuel, for fireplaces were still wide.[101] More significant was the decline of the large axial stack, which was under way in larger farmhouses in some areas by the end of the seventeenth century: smaller fireplaces, equipped with small vertical flues, facilitated the construction of the kind of 'double pile' farmhouse typical of the eighteenth century, often with internal stacks.[102] But the development was a gradual one. In North Yorkshire the 'rounded fireplace arch and timber hoods' characteristic of the area's vernacular architecture were only slowly replaced, in the course of the eighteenth century, by smaller stone-framed fireplaces. Even in the West Midlands it was only 'towards the end of the eighteenth century' that 'square, double-pile houses began to replace earlier elongated plans'.[103] The character of hearths and fireplaces certainly deserve more rigorous investigation, perhaps using the evidence of inventories, in which references to 'iron chimneys' and 'grates' may provide an indication of the spread of coal use.[104] But the evidence of surviving vernacular buildings certainly suggests that coal did not become a common domestic fuel in rural areas, away from coalfields, in the seventeenth century, still less in the sixteenth, but only from the middle decades of the eighteenth.

Thereafter the adoption of coal must have been rapid. As we have noted, when commons were enclosed, areas were often allocated to the poor as fuel allotments. But right from the start many, at least in the less remote rural districts, were being rented out by the committees that controlled them, and the proceeds used to buy coal for the indigent; and the proportion so managed increased rapidly with the passing decades. In Norfolk, for example, 55 per cent of

[99] E. Mercer, *English vernacular houses: a study of traditional farmhouses and cottages* (1975), pp. 50–71.

[100] J. T. Smith, *English houses, 1200–1800: the Hertfordshire evidence* (1992), p. 186.

[101] Ibid.

[102] Mercer, *English Vernacular Houses*, pp. 72–3.

[103] B. Harrison and B. Hutton, *Vernacular Houses in North Yorkshire and Cleveland* (1994), p. 186; D. Hooke, *England's Landscape: the West Midlands* (2006), p. 157.

[104] K. Wrightson, *Ralph Tailor's summer. A scrivener, his city, and the plague* (2011), pp. 117, 131, 186. For an example of a grate specifically for coal near Bury St. Edmund's in 1603, see Hatcher, *British coal industry*, I, p. 416. See also the discussion in M. Spufford, 'Chimneys, wood and coal', in P. S. Barnwell and M. Airs (eds), *Houses and the Hearth Tax* (2006), pp. 22–32.

allotment land was already, by 1833, used in this way; by 1845, 60 per cent; by 1883, 81 per cent; and by 1896, 92 per cent.[105] The cutting of peat on most surviving commons in the county also appears to have come to an end in the middle decades of the nineteenth century: extraction from Whitwell Low Common in the same county ceased in the 1870s because 'the houses and fireplaces of the commoners are unusable for the burning of turf'.[106]

The substitution of coal for local fuels in the course of the eighteenth and early nineteenth centuries was the consequence of two related developments. As population rose rapidly after 1750 it made more economic sense, in many circumstances, to use land formerly employed to produce fuel to grow food. Rising food prices may thus have served to increase the cost of local fuels, especially wood, relative to that of coal. This is because traditional fuels competed for space with cropped land: the rise in the value of crops would therefore raise the rental value of areas like managed woods, and thus the cost of the fuel cut from them. As Rock Church expressed it in his *Old Thrift Newly Revived* of 1612, the price of coppice wood in any region was determined by 'the value and vent for wheat is in that place where it groweth'. If the price of grain went up, so must the price of wood, even if demand for wood remained unchanged.[107] But substitution of local fuels by coal would not have been possible on any scale if the latter had not become more freely available, and the crucial factor here was unquestionably the progressive improvements in transport that occurred in the middle and later decades of the century. There would be little point in using any fuel if the expense of bringing it from its source came close to or exceeded the value that was derived from burning it (both of which might vary according to the season when it was supplied and consumed). Given the energy obtained from food and fodder was always more expensive from that provided by fuel, this reduced the marketable range of coal even further, although coal, with its higher energy density (i.e. joules per weight or volume), clearly could bear the costs of transportation better than any of its competitors.[108] Most places in England and Wales lie at some distance from ready supplies of coal, and so the nature of transport systems was clearly of crucial importance in deciding the distribution of its use. Even if, in national terms, coal was outstripping other sources of fuel by 1700, at this date some three-quarters came from mines in Shropshire, Staffordshire, Yorkshire and the North East of England.[109] Its use must have been highly concentrated, with only the north-eastern ports allowing for a large coastal trade.

Contemporaries agreed on the crucial importance of water transport in structuring the use of coal. William Harrison, writing in the 1570s, noted how coal use was just beginning

[105] Birtles, '"Green space beyond self interest"', p. 205.

[106] Ibid., p. 206. Bird, describing the use of East Ruston 'Common' (really a poors' allotment) in east Norfolk in 1909, similarly noted that the cutting of flags, peat and furze for firing had ceased 'since the old larger brick ovens and open chimneys have entirely disappeared', replaced, presumably, by grates and ranges designed for coal: M. C. H. Bird, 'The rural economy, sport, and natural history of East Ruston Common', *Trans. Norfolk and Norwich Naturalists Soc.* 8 (1909), p. 638.

[107] R. Church, *An old thrift revived* (1612), p. 29.

[108] Langton, *Geographical change*, *passim*; *Journals of the House of Commons*, 47, *1792*, p. 314. On transport costs see also Hatcher, *British coal industry*, I, pp. 13–14, 39.

[109] Calculated from Hatcher, *British coal industry*, I, p. 68. The proportion is much the same if we take instead the possible minima Hatcher provides for output. The North East produced up 1.3 m. tons, Shropshire 230,000, Staffordshire 150,000, and Yorkshire 150,000 out of a total of 2.3 m. tons.

to spread 'from the forge into the kitchen and hall, as may appear already in most cities and towns *that lie about the coast*, where they have little other fuel except it be turf or hassock' [our italics].[110] This importance of water transport was still being emphasized by Pehr Kalm in 1748, who observed that coal could be found in London, and was widely burned in villages within a 14-mile radius, but, 'in places to which they had not any flowing water to carry boats loaded with coals', the population continued to burn wood – mainly from 'trees they had cut down in repairing hedges' – or 'fuel of some other kind, as bracken, furze etc'. The effects of 'the improvement of roads, and the navigable canals' in Lancashire have been meticulously documented by Jack Langton, and indeed similar improvements elsewhere are widely recognized.[111] Of particular importance was the massive extension of the canal network following the completion of the Bridgewater canal (designed to serve the coal mines at Worsley) in 1761, 'the movement reaching a crescendo in the "mania" of 1789–93'.[112] The canal mania was directly paralleled by the expansion in the numbers of turnpike trusts, which was likewise most rapid in the period between 1750 and 1850. But in some districts, remote from navigable waterways, it was only the spread of railways that sounded the death knell for traditional kinds of fuel. Coal only began to be used on the Bedfordshire brickfields, for example, following the arrival of the local rail lines between 1838 and 1872: it was only from around 1845 that the Duke of Bedford's Crawley Kiln was fired with coal. The Duke's steward, Thomas Bennett, recalled in 1869 how 'Furze used to be grown for a demand for brickmaking, but this fell off some years ago'.[113]

V

The spread of coal use throughout England had many important ramifications, but one of these was that the countryside was now principally used for the production of crops and livestock, and was no longer also regarded as a major source of fuel. There was one obvious exception to this: fuel cut from woodland continued to be economically important well into the nineteenth century. It is true that in the eighteenth century landowners began to establish, on a significant scale, plantations which lacked a coppiced understorey, and which were composed only of timber trees;[114] and in some districts a decline in the economic importance of wood, as opposed to timber, is also indicated by the increasing density of standard trees in coppiced woods. It has been calculated that in Norfolk, for example, this rose from around 7 to around 20 per acre (*c*.17 to 50 per hectare) between the fifteenth century and the nineteenth, with most of the increase probably occurring in the latter part of this period.[115] By the 1830s, when the tithe files were produced, the density of timber was such that the growth of the understorey beneath was being suppressed, as for example at Fulmondeston in the same county, where the commissioners noted that the coppice would be 'much better if timber was thinned'.[116] But against this we should also note that the new forms of woodland were not intended to supply

[110] Edelen (ed.), *Description of England*, p. 281.

[111] Kalm, *Kalm's account of his visit to England*, pp. 137–8.

[112] N. Cossons, *The BP Book of Industrial Archaeology* (1987), p. 256.

[113] Cox, *Brickmaking*, p. 44.

[114] Rackham, *Woodlands*, pp. 430–57.

[115] G. Barnes, 'Woodland in Norfolk: a landscape history' (unpublished PhD thesis, University of East Anglia, 2003), pp. 214–5; 226–8; 294–307.

only timber. Plantations were usually very densely planted in order to suppress weed growth, and thus needed to be repeatedly thinned, the young extracted material being referred to in estate accounts, like that cut from traditional coppices, as 'poles'. William Marshall was able to describe how the great plantation belt around the park at Holkham in Norfolk comprised '480 acres of different kinds of plant, two thirds of which are meant to be thinned *and cut down for underwood*, so as to leave the oak, Spanish chestnut, and beech, only as timber' [our italics].[117] More importantly, in many districts not only were existing areas of coppice managed intensively into the nineteenth centuries but – as in parts of Hampshire – entirely new ones were established by major landowners at the expense of wood pastures.[118] Indeed, some historians have characterized the late eighteenth and early nineteenth century as the heyday of coppicing.[119] All this said, where coppicing remained buoyant, or even increased in local importance, much of the wood produced was often used for purposes other than fuel; and where it was employed as fuel this was often for specific, limited industrial uses. In east Hertfordshire, for example, hornbeam from the local woods was still being employed to fuel malting kilns as late as the 1960s, one observer describing the coppice poles in 'immense stacks like haystacks' beside the works.[120]

While coppicing thus remained economically important until the late nineteenth century – and still accounted for some 19 per cent of English woodland as late as 1949[121] – other forms of traditional fuel production went into sustained decline from the later eighteenth century, and the implications of this development deserve more attention than they have received in the past from agricultural and landscape historians. The steady decline in pollarding is particularly noteworthy. Opposition to pollarding had existed from the seventeenth century but this was in large measure because the practice was associated with common rights and with damage to timber trees on tenanted land. '[A]s late as the mid-eighteenth century, pollarding was being written about in a positive manner by one of the most influential agricultural writers', William Ellis. In the second half of the century, however, 'the critique of pollarding gained greater force', in large part because of the 'rise in the use of coal to replace firewood as a fuel in country districts'.[122] As William Marshall put it: 'We declare ourselves enemies to Pollards; they are unsightly; they encumber and destroy the Hedge they stand in … and occupy spaces which might, in general, be better filled by timber trees; and, at present, it seems to be the prevailing fashion to clear them away.'[123] By the middle of the nineteenth century most farmland trees were probably standards, rather than pollards, a dramatic reversal of the situation a century earlier.

More important, perhaps, is the way in which the middle and later decades of the eighteenth century saw a decisive shift, as already argued, towards the planting of single-

[116] TNA, IR 29/5937.

[117] Kent, *Norfolk*, p. 90.

[118] Alberry, 'Woodland management in Hampshire', *passim*.

[119] E. J. T. Collins, 'The coppice and underwood trade', in G. E. Mingay (ed.) *The agrarian history of England and Wales,* VI, *1750–1850* (1989), pp. 484–501.

[120] W. Branch Johnson, *The industrial archaeology of Hertfordshire* (1977), p. 33.

[121] Forestry Commission, *Thirtieth annual report of the Forestry Commissioners for the year ending September 30 1949* (1949), p. 45.

[122] S. Petit and C. Watkins, 'Pollarding trees; changing attitudes to a traditional land management practice in Britain, 1600–1900', *Rural Hist.* 14 (2003), pp.164, 168.

[123] William Marshall, *Planting and rural ornament* (1796), pp. 100–01.

species thorn hedges. The practice of multi-species planting seems to have declined to such an extent that the authors of the various *General Views*, produced in the decades around 1800, regularly contrasted 'recent' and 'old' hedges in terms of the types of shrubs they contained. The Rev. St John Priest, for example, in the *General view of the agriculture of the county of Buckinghamshire* of 1813 noted that the hedges of that county 'are of two sorts, old and new. The old fences consist chiefly of a mixture of ash, sallow, and hazel, with some whitethorn … The new fences consist of whitethorn'.[124] John Boys, writing about Kent, noted the difference between 'old hedges, such as nature has formed', and the newer 'quickset hedges raised from the berries of the white thorn';[125] while in Cheshire the contrast was between the new enclosures, of 'white, or haw-thorn', and the 'ancient fences', consisting of 'hasle, alder, white or black-thorn, witch-elm, holly, dogwood, birch &c &c'.[126] Max Hooper believed that the present distinction between species-poor hedges of eighteenth- and nineteenth-century date, and older species-rich ones, was simply due to the fact that diversity increased with age (so that hedges can be roughly 'dated' by counting the numbers of different woody species they contain).[127] The testimony of these writers, and others, suggests that it primarily reflects a change in planting practice, with an increasing tendency to plant with thorn alone because hedges were becoming valued simply as stock-proof barriers, rather than functioning also as sources of fuel and, perhaps, fruit. Arthur Young commented at the start of the nineteenth century that a neatly trimmed hawthorn hedge was 'a mere luxury and ornament, and has nothing profitable to recommend it'. He added, significantly: 'Hedges thus cease to be the collieries of a country'.[128]

Many agricultural historians continue to place the 'new rotations', featuring clover and turnips or other root crops, at the centre of the eighteenth- and early nineteenth-century 'agricultural revolution'.[129] The enhanced supplies of nitrogen and other chemicals necessary for crop growth which resulted from increased stocking levels raised yields and thus, together with the expansion of the cultivated acreage, provided sufficient grain to feed the rapidly expanding (and increasingly urbanized) population in the period after 1750. As all historians of the period are aware, however, other developments were also important in raising productivity, and it is arguable that many of these were directly or indirectly related to the onset of large-scale industrialization. Increases in soil fertility would have produced weeds as much as crops, and turnips were only beneficial if sufficient labour was available to weed them. Large inputs of labour were also required for the various schemes of reclamation, enclosure, marling and under-drainage adopted in the later eighteenth and early nineteenth centuries. It is therefore probably significant that the industrialization of the north and west of England led

[124] Rev. St John Priest, *General view of the agriculture of the county of Buckinghamshire* (1813), p. 123.

[125] J. Boys, *General view of the agriculture of the county of Kent* (1813), p. 61.

[126] H. Holland, *General view of the agriculture of Cheshire* (1813), p. 121.

[127] Pollard *et al*., *Hedges*, pp. 84–5.

[128] Young, *Hertfordshire,* p. 52.

[129] The central importance of the enhancement of soil nitrogen, emphasized in the 1980s by G. P. H. Chorley in 'The agricultural revolution in northern Europe, 1750–1880: Nitrogen, legumes and crop production', *EcHR* 34 (1981), pp. 71–93; and in the 1990s by J. Sheil, 'Soil fertility in the pre-fertiliser era', in B. Campbell and M. Overton (eds), *Land, labour and livestock* (1991), pp. 51–77 has recently been restated forcibly by Robert Allen, 'The Nitrogen hypothesis and the English agricultural revolution: a biological analysis', *JEcHist* 68 (2008), pp. 182–210.

to a measure of de-industrialization across large parts of the populous south and east, lowering real wages in some of the key areas of arable production.[130] The progressive improvements in transport outlined above may also have had an impact on levels of overall food production, for they allowed the cultivation of cereals to be concentrated in those areas best suited by climate and soils to arable farming: the period between 1750 and 1850 saw a significant reorganization of England's agrarian geography, with the emergence of the modern division between a largely pastoral west and largely arable east.[131]

The substitution of coal for local fuel supplies is arguably another part of this complex jigsaw of interdependence between industrialization and agrarian change, for many of the 'improvements' considered important by contemporaries were directly associated with the declining value of traditional fuels. The enclosure of commons and the reclamation of marginal land were thus frequently associated with the destruction, on a massive scale, of supplies of gorse, heather and broom on heaths and – through drainage – of peat on the remaining fens and mosses. Although, as we have noted, a proportion of such enclosed ground was sometimes set aside as a fuel allotment, the vast majority was converted to new uses, usually as arable or improved pasture. The enclosure of commons also led, in some districts, to the removal of untold thousands of pollards, as for example when the Midland forests like Rockingham were enclosed and largely turned over to farmland or plantations. The northern section of the 2000-acre Northaw Common in Hertfordshire still had thousands of pollards growing on it when enclosed by an Act of 1803: the work of division was continuing when the Ordnance Survey draft 2-inch map was made, the surveyor writing the words '?clearing for enclosure' across its area, indicating clearly enough its expected fate. Of course, historians have often concentrated on the supposed agrarian benefits arising from the enclosure of 'wastes'. But major increases in the arable area, and in yields per acre, also came from changes in the landscape of districts which had long been enclosed, especially the key cereal-growing areas in the Home Counties and southern East Anglia. These involved the wholesale removal of pollards from field boundaries, the widespread replacement of mixed-species hedges with ones composed solely with hawthorn, the destruction of innumerable copses and spinneys, and a significant degree of hedge removal and field amalgamation. Small, oddly-shaped fields were inconvenient for ploughing, tall hedges and hedgerow pollards shaded out crops and robbed the soil of nutrients, while wide outgrown hedges and groves harboured vermin and took up large areas of potentially productive land. Where successive maps of a farm or parish exist in such areas, significant amounts of 'rationalization' are usually apparent: the rector of Rayne in Essex typically observed in his tithe accounts of the 1780s how on one local farm 'the fields were over-run with wood', but 'since Mr Rolfe has purchased them, he has improved them by grubbing up the hedgerows and laying the fields together'.[132] A few landowners, such as George Hall at Weston Colville in Cambridgeshire in 1825, planned (and largely

[130] T. Williamson, *The transformation of rural England: Farming and the landscape, 1700–1870* (2003), pp. 168–70.

[131] Ibid., pp. 158–63: the change is clear when the maps of early modern farming regions prepared by E. Kerridge, *The agricultural revolution* (1967), or Joan Thirsk, *England's agricultural regions and agrarian history, 1500–1750* (1987), are compared with those of nineteenth-century farming regions presented by writers like James Caird, *English agriculture in 1851–2* (1850).

carried out) reorganizations of ancient field patterns, which were so extensive that the areas in question today resemble, with their ruler-straight hawthorn hedges, landscapes created by parliamentary enclosure.[133]

It is noteworthy that the 1791 government enquiry into the state of the nation's timber supplies included the question:

> Whether the growth of oak timber in hedge rows is generally encouraged, or whether the grubbing up of hedge rows for the enlarging of fields, and improving arable ground, is become common in those Counties?[134]

The answers received suggest that in arable districts hedge removal was 'frequent', 'becoming common', or the 'general practice'. One respondent from Suffolk commented that 'Underwood, particularly blackthorn bushes in hedge rows that spread two or three rods wide, is the true nursery of oak timber, but such rows are a dead loss and nuisance in a well cultivated country'.[135] Farming diaries from the period, where these exist, likewise indicate the extent of landscape 'tidying' which went on in many old-enclosed districts. That kept by Randall Burroughes of Wymondham on the Norfolk claylands in the 1790s makes frequent references to the removal, realignment or replanting of hedges, work usually carried out in the winter: 'the frost continued very severe so much so that … the men employed in throwing down old hedgerows found the greatest difficulty in penetrating the ground with pick axes'.[136] When not so employed they were, perhaps needless to say, usually busy taking down pollards. In 1801 one observer of the Essex countryside was able to declare: 'what immense quantities of timber have fallen before the axe and mattock to make way for corn'. The comment could have been of many old-enclosed areas of southern and eastern England.

VI

There is an understandable tendency amongst historians to discuss major economic and environmental developments and transitions in national rather than in regional or local terms. Whatever the pace of national transition, for many purposes a more critical matter was the regional and local character of the spread of coal use beyond coal fields and major urban centres, so that coal became the main provider of thermal energy in each *district* of England and Wales. This development, in association with other circumstances, allowed quite substantial areas of land to be freed up for food production, and permitted a significant intensification of agriculture on others, producing a number of significant changes in the fabric of the rural landscape. These were in one sense local and regional developments, but they had major national implications, in both environmental and economic terms, which remain to be explored.

[132] Essex RO, D/P 126/3/2.

[133] Cambridgeshire RO, 124/P83a.

[134] *Journals of the House of Commons*, 47, *1792*, pp. 318–9.

[135] Ibid, p. 343.

[136] S. Wade Martins and T. Williamson (eds), *The farming journal of Randall Burroughes, (1794–99)* (Norfolk Rec. Ser. 58, 1995), p. 29.

Warping and parliamentary enclosure: the example of north-west Lindsey, Lincolnshire*

by Thomas M. Smith

Abstract

Warping was the practice of letting turbid river water flood onto arable land, so that its suspended sediment could settle to form a fertile layer, before letting the water drain away. In this way poor soils were covered with fine silt, and their rentable value was increased. A necessary precursor to warping was enclosure by private or parliamentary means, as this would establish ownership of land, enable its demarcation into 'warpable' areas and provide the opportunity to make space for warping drains. Little has been written on warping and enclosure but this article suggests that in areas of poor low-lying land adjacent to the Trent in north-west Lindsey, the desire to use the technique was a principal driver to parliamentary enclosure.

The spur to parliamentary enclosure, while normally including an expectation of increased rents, usually embraced a combination of one or more additional reasons, which depended on local circumstances. The catalyst to action was sometimes a change in ownership and the arrival on the scene of a fresh personality who was more open to the idea of change. Perhaps a reason for an act was to make legally secure schemes involving the swapping of lands and the abolition of tithe. In some places enclosure may have been seen as a good way to mitigate the cost of the poor to the parish, by arranging allotments of land which would fund the poor rate; in others the requirement to preserve mineral rights, or have them confirmed, may have been a significant motive.

Because of its geographical rarity, however, the notion of warping being the reason for parliamentary enclosure has been overlooked by agricultural historians.[1] Warping, the technique of agricultural improvement where river water is allowed to flood onto land so that its suspended sediment might settle and form a layer of silt, before letting the water drain away, is only appropriate for certain terrains, but is particularly suitable for the area of low-lying land where the rivers Trent and Ouse fall into the Humber estuary.[2]

This article suggests that warping was a principal driver of parliamentary enclosure in

* I am grateful to Professor J. V. Beckett for his constructive comments on an early draft of this article.

[1] But see David Hey, 'Yorkshire and Lancashire', in J. Thirsk (ed.), *The Agrarian History of England and Wales,* V, *1640–1750* (2 vols, 1984), I, p. 79; B. A. Holderness, 'East Anglia and the Fenlands', in E. J. T. Collins (ed.), *The Agrarian History of England and Wales,* VII, *1850–1914* (2 vols, 2000), I, p. 387.

[2] Warping was also carried out in the Somerset Levels from about 1780. M. Williams, *The draining of the Somerset Levels* (1970), pp. 176–7.

some of the parishes bordering the Trent in north-west Lindsey and, in doing so, adds to the multiplicity of motives for enclosure in different areas of the country.

I

The canalization of the old river Ancholme, the draining of its valley and the consequent enclosure of some of the townships along its banks, can perhaps be attributed to lessons learned while watching, across the river Trent, the transformation of the Isle of Axholme by Vermuyden and the Dutch adventurers.[3] The influence of the Dutch on English farming had been long-lasting and extensive, from the design of windmills and barns to that of agricultural drainage systems. Arguably their most important innovation was the introduction of turnips and clover into the arable rotation, but there were other novelties as well; fodder carrots, cole and madder were introduced, with varying degrees of success.[4] It does *not* seem however that warping can be included in the list, and the technique does not appear to have been practised anywhere in the Low Countries. This is not too surprising since, because of the topography, Dutch engineers were constructing embankments and great sea-dikes and sluices and, in general, pumping water by one means or another from one level *to a higher level*. Warping would have seemed alien to them.

Thirsk stated that 'Dutch and Flemish settlers had improved much of the new land of the Levels [of Hatfield Chase in the 1620s] by warping'.[5] It is not certain however that the word is being used, at this early time, in its later sense, and it may simply mean that the settlers had discovered that the land was more fertile after a winter flood had deposited sediment. Lord Ernle asserted that 'warping was brought from Italy to the Isle of Axholme in the eighteenth century, and by its means the deposits at the estuary of the Humber were converted into "polders"', using the Dutch word for land reclaimed from the sea.[6] In 1831 J. C. Loudon described a similar process that had been seen in Tuscany:

> The Italian process called *colmata* is nothing more than a varietv of the British process called warping. In the Val di Chiana in Tuscany, fields which are too low are raised and fertilized by the process called *colmata* which is done in the following manner: The field is surrounded by an embankment to confine the water, the dike of the rivulet is broken down so as to admit the muddy water of the high floods … This water is allowed to settle and deposit its mud on the field. The water is then let out into the river at the lower end of the field by a discharging course called *scolo* and in French, *canal d'écoulement*.[7]

Rather than try to ascribe a foreign origin to the practice of warping, it seems more likely that it was founded on the repeated observations of a natural occurrence. The spring tides regularly

[3] For a recent study of Vermuyden's work in the Isle of Axholme, D. Byford, 'Agricultural change in the lowlands of south Yorkshire with special reference to the manor of Hatfield, 1600–*c.*1875' (Unpublished PhD thesis, University of Sheffield, 2005), I, ch. 3.

[4] G. E. Fussell, 'Low Countries' influence on English farming', *English Historical Rev.* 74 (1959), pp. 611–22; D. Neave, *The Dutch connection: The Anglo-Dutch heritage of Hull and Humberside* (1988), *passim*.

[5] Hey, 'Yorkshire and Lancashire', p. 79; For a chronology of warping around Hatfield, see Byford, 'Agricultural change', II, ch. 8

[6] Lord Ernle, *English farming: Past and present* (1912), p. 114.

[7] J. C. Loudon, *An encyclopædia of agriculture* (1831), p. 330.

overflowed the banks of the rivers, and deposited rich, fertile sediment or 'warp', and this led in time to warping being done in a controlled manner with embankments and sluice gates.

Some credit for this should be assigned to the Dutch. The inhabitants of the Ancholme and lower Trent wetlands will have seen the methods of Vermuyden's adventurers and learned how to make effective banks and sluices and generally manage the hydrology of the landscape in a much better way than their ancestors. There was no need to search for a name for the new technique; 'warp' was already used, in local dialect, to mean an accumulation of mud, or the silt that blocked ditches and drains, a sand bank in the river or even a portion of raised ground between two furrows.[8]

The first reliable report of warping, in its modern sense, seems to come in the 1730s from Rawcliffe, about four miles west of the confluence of the Ouse and Trent, where a small farmer called Barker used the technique. A few years later, in 1743, Richard Jennings, from the neighbouring village of Airmyn, was warping on a greater scale.[9] Further references to the practice cannot bo found until George Rennie's *General view of the agriculture of the West Riding of Yorkshire* in 1793, and other reports to the Board of Agriculture.[10] By 1799 Arthur Young was able to give a detailed description of warping in north Lincolnshire.[11] Most modern accounts of the process are based on a paper published by Ralph Creyke, as late as 1845, in the *Journal of the Royal Agricultural Society of England*.[12] This explained to a national audience a practice that was apparently little known outside the lower reaches of the Trent and the Yorkshire Ouse.

Warping was particularly suited to this part of the lower Trent basin, as the high tides of the river, when combined with the low-lying situation of the fields to be warped, made the practicalities of the process relatively simple. The warping process covered the unproductive peaty and acidic soils, the sandy soils and the heavy clay of the area with light, well-draining silt. The fertility of this deposited silt was in part due to the quantity of raw sewage that was discharged into the river from the many towns within the Trent's vast catchment area. Warping was expensive as specially made sluice gates had to be built, and embankments with sloping sides had to be constructed around the fields in order to contain the water. Water was allowed into the embanked fields during the spring tides through these gates, and when the tide was at its height, the gates were closed. As the tide ebbed, the water was allowed to escape slowly back into the Trent, having deposited most of its mud on the surface on the enclosure in which it had been penned. The result was a perfectly flat field, and if warping was carried out, during the several spring tides, for two or three years, a layer of fertile silt of perhaps a metre or more, would have been laid down.

[8] J. Wright (ed.), *English Dialect Dictionary* (6 vols, 1898–1905), VI, pp. 387–8; Warping should not be confused with the other form of artificial land reclamation, the deliberate accretion of estuarine alluvium. This involved the construction of embankments to enable the trapping of sediments carried naturally by the waters of the Humber. This type of reclamation was used, for example, from the seventeenth century onwards, to build up the area round Sunk Island Sand between Hull and Spurn Point. M. Dinnin, 'Introduction to the palaeoenvironmental survey', in R. Van de Noort and S. Ellis (eds), *Wetland heritage of Holderness: an archaeological survey* (1995), *passim*.

[9] Loudon, *Encyclopædia,* p. 332.

[10] G. Rennie, *et al*., *General View of the agriculture of the West Riding of Yorkshire* (1793), p. 166.

[11] A. Young, *General View of the agriculture of the County of Lincoln* (1799), pp. 276–7.

[12] R. Creyke, 'Some account of the process of warping', *JRASE* 5 (1845), pp. 398–405.

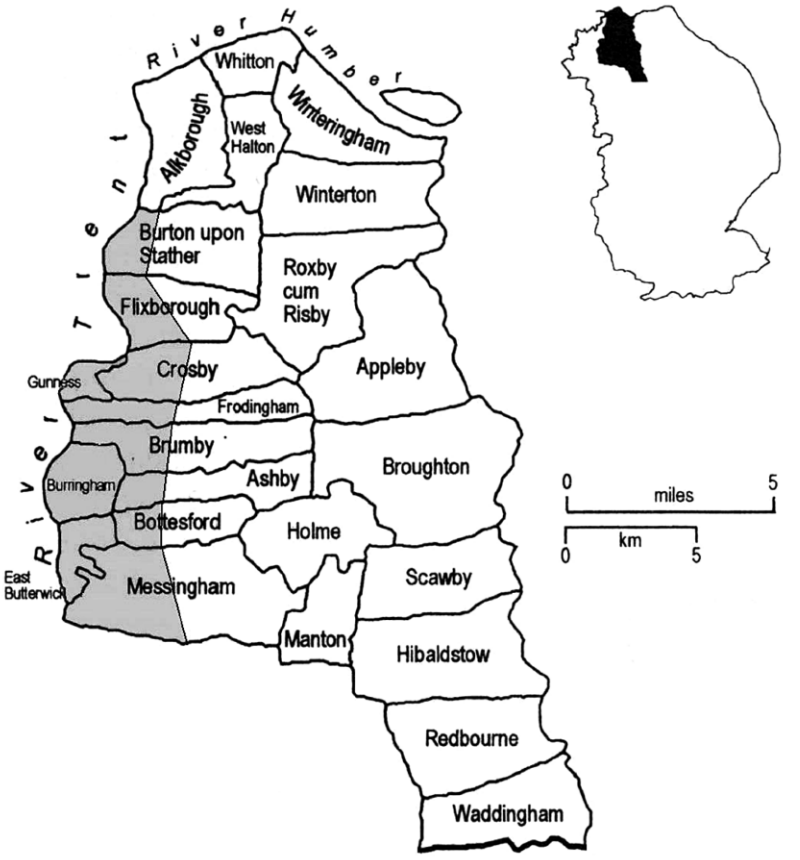


FIGURE 1. The townships east of the Trent in north-west Lindsey and, inset, shown within Lincolnshire – shading to show approximate extent of warping

Source: Based on Nottingham University Manuscripts Dept., BrY4, 'Map of the levels within Manley Wapentake' (printed); 1875

Warping and drainage could not usually be undertaken by a single farmer, unless that farmer had a field immediately adjacent to a river. In that case a drain could be made to outfall to the river, or a sluice gate could be built which would let muddy water into an embanked field. The farmer in this situation however would find himself faced with a considerable expense. If warping and drainage could be incorporated into the parliamentary enclosure process, with numbers of farmers agreeing to share the cost of construction, then the cost would be reduced, and this very important element in agricultural advancement could be implemented.

A number of Trent-side parishes – Messingham, Ashby, Burringham, Frodingham – where warping was associated with parliamentary enclosure, will now be discussed in turn. Finally two parishes – Flixborough and Burton upon Stather, which formed part of the Sheffield family estate, and where enclosure had preceded warping – will be considered.

II

(a) Messingham

In 1825 Archdeacon Bayley, vicar of Messingham commissioned a description of the changes that parliamentary enclosure had brought to the village from his curate, John Mackinnon. There is thus a nearly contemporaneous, before-and-after, portrayal of Messingham:

> The farmers' houses were of mean construction, built of dirt taken from the street and covered with straw or stubble. The habitations of the poorer people were composed of the same materials, but covered with ling, turf or star-thack … it contained many acres of land, yielded but little, and that principally rye, which was cultivated for home consumption. Much of the high land being of a sandy nature grew nothing but gorse and ling, which were plentifully stocked with rabbits; these prolific animals must ever be considered the bane of agriculture, and a great impediment to every kind of agricultural improvement. The low lands which were situated between the village and the Trent being of a boggy nature, for want of proper drains produced but little herbage, which gave support to a few sheep and large flocks of geese. Both above and below the town in various parts of the lordship, there were extensive pieces of water, some of them containing many acres; these abounded with various kinds of fish, but particularly in pike and eels, the former weighing from two to twelve pounds.[13]

Before parliamentary enclosure, Mackinnon notes, Messingham had 'three great divisions, the East Common, the Field and the West Common'.[14] It seems that the Field was, as might be expected, sub-divided and 'North', 'South', 'East' and 'West' fields are mentioned in glebe terriers from 1634 onwards.[15] From the lesser number of glebe strips in the East and West fields it is possible that these were smaller than the North and South fields, and were perhaps cultivated as one field on either side of the settlement of Messingham and that, in consequence, a three-field system of agriculture was in operation. As well as the enclosures of 1757 near to the eastern parish boundary, there were more by the river associated with the tofts of East Butterwick township, and a few closes on the northern parish boundary with others to the south of the settlement of Messingham.[16]

It was the autumn of 1796 when advertisements first appeared in the *Stamford Mercury* calling interested owners to a meeting at the Black Moor's Head Inn at Gainsborough. This announced the intended enclosure of East Butterwick, together with its neighbouring townships of Ashby and Burringham, and was 'to consider the expediency of the … inclosure and what terms shall be offered to the lord of the manor and tythe owners'.[17] Nothing more seems to have been heard of this plan for a joint enclosure of lands in the three townships, but in September 1797, again in the pages of the *Stamford Mercury,* a notice was placed that an application was to be made for an act for

[13] J. Mackinnon, *Account of Messingham in the County of Lincoln* (ed. E. Peacock) (repr. 1881), pp. 8–9.

[14] Ibid, p. 16.

[15] Lincolnshire Archives Office (hereafter LAO), Glebe terrier bundle, Messingham, 1634 and 1686.

[16] LAO, Messingham Inclosure Award and Plan, PAR CO. 1 (also listed as LAO, Acc. 2007/54).

[17] *Stamford Mercury,* 17 Oct. 1796.

> dividing, allotting, draining, embanking, improving and warping the several open and common fields, ings, meadows, pastures, moors, commons, wastes, and other uninclosed lands and grounds within … East Butterwick and Messingham … also for making a compensation for the several tythes arising within the said Townships, and for other purposes.[18]

A month later proprietors were invited to meet at the Sun Inn in Scotter 'to receive the answers of the tythe owners to the proposals offered to them … and to consult on other matters relative to the said inclosure'.[19] The notice was signed by Mr William Barnard, a substantial landowner in the parish.[20]

Negotiations amongst proprietors of land and tithe must have proceeded satisfactorily as in 1798 an act was passed for the enclosure of grounds within the township of Messingham and that part of the hamlet of East Butterwick which is in the parish of Messingham. The area to be enclosed was estimated at five thousand acres. Significantly, though, mention of warping had disappeared from the preamble to the act. This is probably because the proprietors were not willing to commit to the expense of the further improvement of the low-lying parts of the parish.[21]

The Act appointed the three Enclosure Commissioners and also named the Surveyor. All had local knowledge; two of the three, John Renshaw and Samuel Turner, had finished enclosing neighbouring Bottesford in 1797, while the third, Benjamin Codd of Glentworth was to be appointed to succeed John Renshaw and continue the enclosure of Ashby in 1802. The Surveyor, Anthony Bower, had just completed work on the award map of Bottesford and was to start on the Ashby enclosure in 1801, before finishing Messingham in 1804.

The Messingham Enclosure award was signed on 15 December 1804 and stated that the new owners had to ditch and fence their lands within three calendar months of the execution of the award. The 'payment of all tithes and the enjoyment of all rights of common' were deemed to have ended on 13 February 1800.[22] No costs are mentioned, but Mackinnon states that the expense of this enclosure amounted to £13,773 13*s.* 6½*d.* A document in Lincolnshire Archives, however, gives the higher figure of £15,078 14*s.* 10*d.*[23] The award plan shows that, in the former West Common, the Commissioners had laid out five public drains which were to be maintained by the owners of lands in the West Common together with those in the Trent Ings, Carr, and Side Ings. Banks had been built along the courses of the Bottesford Beck, which formed the northern parish boundary, and the tiny River Eau, which formed part of the southern boundary with Scotter, with the aim of preventing those water courses flooding the low-lying lands.[24] To the east of Messingham township, two additional public drains had been constructed, to be kept in good condition at the expense of owners who had lands in the former East Common. By the river Trent, the drains were only a part solution to the problem of low-lying unproductive land. While warping is not specifically mentioned in the award, its

[18] *Stamford Mercury,* 22 Sept. 1797.

[19] *Stamford Mercury,* 20 Oct. 1797.

[20] Barnard paid 21% of the parish land tax in 1800. LAO, Land Tax Assessments, Manley Wapentake, 1800.

[21] Lincoln Central Library (hereafter LCL), Messingham Inclosure Act, 1798.

[22] LAO, Messingham Inclosure Award and Plan, PAR CO. 1.

[23] Mackinnon, *Messingham*, p. 19; LAO, Misc. Dep. 22/27.

[24] LAO, Messingham PAR CO. 1.

undertaking at some time in the near future is perhaps foreshadowed by the appointment of a contractor – Joseph Thackray of Gainsborough – who was to maintain the drains for two years only.[25]

Six public roads, 40 feet wide, were laid out, together with 12 private roads, and the Surveyors of the Highways were awarded 13 plots of land totalling 13.5 acres, from which material to repair them could be dug. A total of almost 5546 acres had been allotted, nearly 11 per cent more than the 5000 acres estimated in the 1798 Act, and of this, 1131 were Special Allotments (allotments made in lieu of tithes, glebe or manorial rights, and land allotted to the Surveyor of Highways).[26]

John Mackinnon, curate of the parish, continued his account of the parish and mentioned warping as an operation separate from the enclosure process:[27]

> From this time the state of the Lordship underwent a material alteration, and the village … to improve. Draining only would have been instrumental in bettering the condition of the lands, but from their proximity to the river Trent, and the lowness of their situation, warping, conducted by Commissioners appointed for that purpose, has been adopted at the expense of about £10 an acre, by which process the lands readily let at 60*s*. an acre, and bring abundant crops of wheat, beans, and potatoes.

Edward Peacock, the editor of Mackinnon's account of Messingham, thought that his estimated cost of warping was too low, and the yearly rental too high, while Thirsk, in *English Peasant Farming,* commented that:

> At Messingham, where nothing is known of the circumstances of the warping agreement, except that it followed enclosure, the cost of the operation was £10 an acre. This was relatively cheap. On an average, the cost was £12–£20, including the cost of the sluice and main drain, but the value of the land was raised from next to nothing to between £60 and £100 an acre.[28]

The Rev. John Parkinson of East Ravendale, who wrote a diary, in three volumes, of happenings and tittle-tattle in local parishes, recorded the beginnings of warping in Messingham:

> 11 December 1811. Mr Roadley is warping 200 acres at Messingham; 50 he has warped already; 40 he hopes to complete next year & 90 afterwards. He lays on the warp, as I understood him, near a yard deep … the land, when made, lets for 50*s*. an acre. It takes three years to lay such a coat on.[29]

It seems likely that Mr Roadley, one of the parish's leading landowners, had deliberately caused the warping operation to be separated from the parliamentary enclosure of 1798–1804 so that he could complete the warping of his allotments in the low-lying areas of the parish, in his own time and according to the constraints of his budget. No documentation has been found as evidence for the exact timing of warping, but it seems from Parkinson's comments, as long

[25] Ibid.

[26] But Turner has 5560 awarded acres, in W. E. Tate, *Domesday of English Enclosure Acts and Awards* (ed. M. E. Turner) (1978), p. 166.

[27] Mackinnon, *Messingham*, pp. 19–20.

[28] Ibid., editor's note; Joan Thirsk, *English Peasant Farming: the agrarian history of Lincolnshire from Tudor to recent times* (1957), p. 291.

[29] LAO, 1 Dixon/16/3, 'Diary notes of the Revd John Parkinson of Ravendale, 1804–26', p. 206.

as five years must have passed, after the completion of the parliamentary enclosure process, before it started. This may be an indication that the fruits of enclosure were not immediate and that several profitable agricultural seasons had to go by, before the task of embanking fields and making sluice gates could begin.

The first edition of the Ordnance Survey map of 1824 shows that the western part of the parish was then in the process of being warped with the North and South West Common drains leading to allotments, some of which were still marked as containing scrub or marsh.

The warping was supervised by a Commissioner appointed by virtue of 'Articles of agreement for warping and improving lands within the parish of Messingham …'. This supervision evidently went on for many years, and the last mention of the agreement was in 1854, some 40 years after the business of warping began.[30] Warping continued for such a long time because, in some areas, especially where the original level was of peat, the land settled. It could settle from three feet above a datum, to one foot, because of this effect. If the original surface had been clay or sand, then the settling would be less. In any case if the settling was only slight, the landowner would be inclined to warp the land again, as the investment in outfall sluice and embankments had already been made. An annual layer of fresh fertile silt from the high equinoctial tide would be welcome after crops had been harvested and, following treatment, the land would be dry enough for ploughing early in the New Year. Warping would continue year by year until the cost of maintaining the sluice and drains exceeded the perceived agricultural advantage.[31]

The work of warping the low-lying land did however remain incomplete, as an angular piece of land known as Butterwick Hales, centred at SE 847062, in East Butterwick township and bordering Messingham township remains un-warped. It is noticeably lower than the surrounding land, has standing water in it throughout the year and is today used as pasture. White's *Directory* noted in 1856 that it was about 60 acres and had been 'purchased by the drainage commissioners … as a receptacle for water in time of floods'.[32]

(b) Ashby

At Ashby, three miles to the north of Messingham, the relationship between warping and parliamentary enclosure was different. The township's territory does not lie on the banks of the Trent but is separated from it by Burringham. Because of this, the act authorizing enclosure had to recite in detail the additional powers that were necessary to enable warping to be carried out. Essentially, provision was made by buying land in Burringham and by allotting space for a warping drain, with an outfall to the Trent, which could be dug when it was needed, or when the Ashby proprietors could afford it.

At the time of the Parliamentary Act of 1801, there were about 320 acres of old enclosures consisting of the tofts and croft of the township, together with the rectangular closes in the West field, which were associated with a 1784 private enclosure agreement.[33] There were therefore

[30] *Stamford Mercury*, 13 Oct. 1854.

[31] The practice of warping over long periods is discussed in BPP 1909 XIV [Cd. 4461] *Royal Commission on Coast Erosion and Afforestation*. II (ii), pp. 108–120, especially p. 118.

[32] W. White, *History, gazetteer and directory of Lincolnshire* (1856), p. 603.

[33] LAO, Misc. Dep. 77/16, 'Improvement of lands in the several open arable fields there by sowing of turnips and clover'.

1855 acres of land still to be enclosed.[34] Both the lord of the manor and the impropriator were absentees.[35] The preamble to the Act of 1801 contained all the usual motives for improvement *without* mentioning the word 'warping'. Perhaps the term was still little known at that time. Most of the 47 pages of the Act are given over to detailed instructions to the Commissioners; how farming was to be allowed to continue during the enclosure process, how they were to determine which of the land could be improved by drainage and warping, how new highways and footpaths were to be laid our and how some could be closed.

The Commissioners held their first meeting on 3 August 1801 at the Angel Inn, at Brigg. After many meetings, on 24 May 1804 they declared that the award was 'now ready to be ingrossed'. Work on the roads was ordered to be completed by the 11 July. On that date the Commissioners met at Ashby to view the roads, but work was still proceeding so they at once went to Brigg and met there from 11 to 13 July, where they made several small changes to the award. They were again at Ashby and Brigg from 1 to 4 October. At Ashby, the roads and various other building works were examined, while at Brigg further changes were made to the award, including, very significantly, the addition of a clause concerning warping, 'should this become possible'. The enclosure plan of Ashby clearly shows that embankments had been constructed at the low-lying west end of the township and they form its boundaries on three sides.[36] The zigzag course of an 'intended warping drain' was drawn on the map but, as noted, for warping to have been possible, the drain would have needed an inlet/outlet to the River Trent, across the fields of the neighbouring township of Burringham to the west.

The Commissioners clearly believed that the enclosure, at least, was approaching its conclusion but there is then an unexplained hiatus of four years before the minutes resume with a meeting at Brigg, on Friday 10 February 1809. At that meeting various bills were paid, a fourth rate of £257 was levied and the Commissioners finally signed the award.[37] Everything was ready for the low-lying lands of Ashby to be warped; the embankments had been constructed and room had been left for a warping drain to be dug to link with the Trent, by way of Burringham. The delay in the enclosure process from 1805–9 was almost certainly because the Ashby commissioners were waiting for the Burringham owners to begin their own enclosure, or at least to permit this linking section of the warping drain to be dug. By 1809 the Commissioners had evidently run out of patience with Burringham and they concluded the Ashby enclosure, with the warping for which the Act provided, yet to be started. It was not for some 20 years that the process of enclosure would begin in Burringham, and Ashby could be warped. When it came, it was done privately, by a landowner called Henry Healey, in a programme of improvement that included both drainage and warping.

[34] LAO, Brown, Hudson and Hudson, 7/1, Ashby Inclosure and Drainage Act, 1801.

[35] The lord was John Julius Angerstein (*c.*1732–1823), a marine insurance broker and an art connoisseur; the impropriator John Fardell (1744–1805), deputy registrar in the Archdeaconry of Lincoln and Stow. F. Martin, *The history of Lloyd's and of marine insurance in Great Britain* (1971), p. 145, et seq.; *The annual biography and obituary*, 13 (1824), p. 275; C. M. Lloyd, M. E. Finch (eds.), *Letters from John Wallace to Madam Whichcot, and some correspondence of John Fardell, Deputy Registrar, 1802–5* (Lincoln Rec. Soc., 66, 1973), pp. 45–9.

[36] LAO, KR/2/10. There was no need for a fourth embankment, on the eastern margin of the area to be warped, as the ground rises naturally on that side.

[37] LAO, BH 7/1, Public notices and Minutes of Commissioners' meetings with four rates levied for the enclosure.

(c) Burringham

Burringham is a township by the Trent, of 1450 acres, bounded on the north by Brumby, on the east by Ashby and on the south by East Butterwick. In 1856, William White described it as once being 'a low swampy moor which has been improved by warping upon it the silty deposits of the Trent'.[38]

As already noted, advertisements had appeared in the *Stamford Mercury* in the autumn of 1796 inviting owners to a meeting at the Black Moor's Head Inn at Gainsborough to discuss the intended enclosure of Burringham, together with its neighbouring townships of Ashby and East Butterwick.[39] Although, as already described, Ashby was enclosed in 1801–9, nothing more was heard of this plan for a joint enclosure of lands in the three townships, and it seems to have been abandoned.

Because warping was very costly, it was only practicable where the land to be improved was in a few hands, and where agreement could be reached to share the expense. In 1799 such an agreement was apparently made involving land in Burringham township in Bottesford parish, and in East Butterwick, the adjacent township to the south.[40] This proposed scheme must also have been abandoned, as nothing more was heard of it either. Achieving a consensus for agricultural improvement often proved difficult, but when the expense of warping and draining is also an issue, agreement will have been even harder and the arrangements may well have foundered on concerns about cost.

Henry Healey is the name particularly associated with the warping of land in the area. He was born Henry Holgate: when his uncle, George Healey died in 1824, he inherited property which was, at the time, said to be worth in excess of £100,000.[41] By the terms of his uncle's will, Henry Holgate was required to adopt the surname Healey.[42] He seems immediately to have begun a vigorous programme of enlargement and improvement of Healey's estate. He raised over £30,000 by mortgages to acquire additional property, including, in 1834, Ashby Duck decoy in Ashby township, and 350 acres of land which bordered his Burringham property. He was more celebrated however for the construction of the warping embankments and drains which were built in Burringham, a mile or so to the west of his new home. In the 20 years after 1828, he spent an estimated £31,000 on these works. In addition he paid several thousand pounds in compensation to his neighbours when the Healey drain broke on a number of occasions.[43] It may be that he overstretched his finances in improving his land in Burringham by warping, as he had sold off his properties in Frodingham and Crosby by 1842.[44] As he was by far the major landowner in the township, and he had expended such a great amount of money over the years, it seems very likely that it was Healey who finally carried out the warping of Ashby and largely created the drained and warped landscape of Burringham that is seen today.

[38] White, *History,* p. 596.

[39] *Stamford Mercury,* 17 Oct. 1796.

[40] John Rylands Library, Manchester, RYCH/3102, 'Articles of agreement between William Hall of Kingston upon Hull, and Thomas Peacock of Northorpe … under the superintendence of Anthony Bower', 1 Jan. 1799.

[41] Lincolnshire Archives Committee, *Archivists' report 22, 1 Apr. 1970 – 23 Mar. 1971* (1971), p. 53.

[42] LAO, 2 TGH 1/4/6, note concerning an entry in *London Gazette* re. change of name, 23 Aug. 1824; A. R. Maddison (ed.), *Lincolnshire Pedigrees* (4 vols, Harleian Soc. 50, 51, 52, 55, 1902–6), pp. 477–8.

[43] LAO, 2 TGH 1/31/4/3.

[44] This was to prove a costly error, as ironstone was discovered on these lands by the Winn family in the late 1850s.

(d) Frodingham

The experience in Frodingham, north of Burringham township, was different again. Although permission was given in the 1831 Enclosure Act to warp, it seems that the commissioners had learned their lessons and were no longer willing to wait on the whims and caprices of neighbouring landowners, before being able to undertake warping as part of their duties. Instead, the Act appointed the biggest owner to carry out the warping.

A petition came before the House of Commons in 1831 requesting the enclosure and drainage of the townships of Frodingham parish. The House committee, in approving the petition, seems to have added 'warping' to the wording. Before the bill could proceed, a counter petition from a local landowner, Mrs Sally Smith, was considered and approved, which effectively removed Brumby township from the enclosure.[45] The Act was passed on 23 August 1831 and allowed 'inclosing, draining and warping' in the rest of the parish of Frodingham.[46] The Act is conventional until paragraph 66, which states that after the lands capable of being warped had been identified by Commissioners, it would be lawful for Frodingham's leading landowner, Charles Winn, to undertake the warping himself.[47]

A series of subsequent paragraphs laid out in detail the rights and obligations of Winn in carrying out the work. Most importantly, Winn's estate was to be answerable for 'misconduct in the warping.'[48] Landowners were to be charged by Winn a total of £20 per acre for the work of warping. As soon as an acre of land was embanked and ready for the process to begin, the owners were to pay £10 per acre to Winn. When warping was 'well and effectually completed' as determined by 'engineers' appointed by the Act, the balance was to be paid. Those appointed were not engineers in any modern sense, but were local farmers and landowners who would have experienced warping in their own parishes and would have known what a successfully completed warp looked like.[49] They must also have been acceptable to all the affected landowners. After successful completion of warping, the Act provided for the appointment of a Warping Commissioner to be paid for by a warping rate, charged on the owners of warped lands.[50] The warping aspect of the enclosure was therefore taken out of the hands of the enclosure commissioners and placed under the control of the leading landowner, although the act included safeguards for the protection of the smaller landowners.[51] The warping cost is at the top end of Thirsk's estimate of £12 to £20 per acre.

The area encompassed by the act was about 1962 acres, and the award three years later enclosed a little over 1754 acres, so 208 acres had already been enclosed before that time.[52] The area of 'warpable' land identified in the 1834 award was a little over 504 acres of the low-lying land called the Carrs and Moors in Scunthorpe and Frodingham townships.

[45] *Journals of the House of Commons,* 86, *1830–1*, pp. 45–6, 351, 638, 664.

[46] 1 & 2 Wm IV, c. 57, An Act for inclosing, draining, and warping Lands within the townships or hamlets of Frodingham, Scunthorpe, and Gunhouse (otherwise Gunnas), all in the Parish of Frodingham in the County of Lincoln, 23 Aug. 1831.

[47] Ibid., para. 66.

[48] Ibid., para. 68.

[49] Ibid., para. 69.

[50] Ibid., para. 76.

[51] By 1847 an act had been passed (10 & 11 Vict., c. 38, English Drainage Act, 1847) which in effect authorized any person interested in draining and warping his lands, to clear a way through all obstructions, wherever it was worth the expense of the works and the compensation to his neighbours.

[52] LAO, Lindsey Award/125, Frodingham, Scunthorpe and Gunness Enclosure Award and Plan, 22 Aug 1834; White, *History,* pp. 598–9.

It would have seemed sensible, following the award, to drain and warp the whole of this area immediately, as part of the continuing programme of agricultural improvement, and as authorized by the Act. A notice had appeared in the *Stamford Mercury* just ten days after the Act was published, announcing the intention to drain and warp the lands that were being enclosed;[53] and there was an undated plan showing how the area of 235 acres might be warped and laid out, with ditches between owners' plots.[54] The progress of warping is not clear from the remaining records, but it was not finished until 1847, when the 'engineers' Peacock and Faviell signed a declaration that it had been completed 'as well … as the situation and level will admit'.[55]

The remaining 'warpable' part of the parish, Brumby West Common, was excluded at this time. It had not been possible to obtain agreement to enclose and warp from the Brumby landowner, Mrs Sally Smith, when the rest of Frodingham parish was enclosed. It was not until 1867 that the area was improved, by which time its owner had become the Earl of Beauchamp, of Madresfield Court, Worcestershire.[56]

III

In some parts of north-west Lincolnshire, the desire to warp the low-lying land was thus an important incentive to parliamentary enclosure, but in two parishes this could not be said to be true, as enclosure had already taken place *before* the new technique became fashionable.

North of Frodingham are Flixborough and Burton Stather parishes, home to the Sheffield family. The Sheffields seem to have been settled in Lincolnshire since the thirteenth century and, by the mid-eighteenth century, had an estate called Normanby, which consisted of the whole of Flixborough parish and the southern half of Burton. In 1778 Sir John Sheffield commissioned John Snape to make plans of the manor of Normanby, the manors of Burton and Thealby in the parish of Burton upon Stather, and a plan of the parish of Flixborough.[57] Snape's maps shows that nearly all the Sheffield family property had been enclosed by that time.

The Sheffield family had thus been early agricultural innovators and had led the way, in north-west Lindsey, with the enclosures on their Normanby estate. As has been shown, however, in the years that followed it had become the custom to drain and warp the low-lying lands in association with parliamentary enclosure, or as soon afterwards as practicable. This had not happened with the Sheffield's estates as warping had only begun to be a recognized technique in the 1790s.[58] The family must have looked at their low-lying tenanted land by the

[53] *Stamford Mercury,* 2 Sept. 1831, p. 2 col. 4: 'Notice for drainage of lands in hamlets of Frodingham under Act of Enclosure'.

[54] LAO, Sheff/E/52/2. The area is immediately north of the A18 between Gunness and Scunthorpe.

[55] LAO, Stubbs/1/249.

[56] G. E. Cokayne, V. Gibbs, *et al.,* (eds.), *The Complete Peerage of England, Scotland, Ireland, Great Britain and the United Kingdom, Extant, Extinct or Dormant* (2000), II, p. 41; LAO, Lindsey Award/125; LAO, Lindsey, Brumby award 119.

[57] North-east Lincolnshire Archives, 524/A/9/2 Flixborough; 524/A/9/3 Normanby; 524/A/9/4 Burton and Thealby. Sir John also commissioned, at the same time, plans of West Butterwick (524/A/9/5) and of the 'Manor of Crosby in the Parishes of West-Horton and Froddingham' (524/A/9/6).

[58] Plans to warp Morton Carr, north of Gainsborough with sketches of sluices etc, were being discussed in 1796. LAO, 1-Dixon/21/4/1/4.

river and wished that its productivity, and its rentable value, could be increased to equal that of other parishes that had been warped later. Any such talk of warping of the low-lying lands on the Sheffield estates would have been controversial at this stage, as this was tenanted land.

There were talks about the possibility of warping land below Burton Wood in 1827, but nothing seems to have come of them.[59] In 1835 there had been discussions based upon a paper that examined the possibility of warping 255 acres of land in Flixborough township and 334 acres below Burton Wood *without* the construction of a new warping sluice; instead an existing drainage sluice called Neap Clough would be used. The author of the paper (who was, almost certainly, the Normanby estate manager Robert Barker), thought that £600 could be saved in this way and he thought that '[should] the summer prove tolerably dry, it is possible that the land in question might be raised 18 inches and some of it 2 feet in *one* year, at any rate not more than two years would be required'.[60] He estimated how much extra rent would be produced by the land after improvement; at Flixborough he thought that rents could increase by 164 per cent and in the fields below Burton Wood by 134 per cent. It was not an easy calculation because as well as the considerable cost of the process itself, landowners would need to accept a much reduced rent from tenants for an indeterminate period.[61]

It seems that warping was underway in the years 1840–7, on some of the land at least, and in November 1843, Barker produced a further set of calculations to show its progress.[62] In 1846–7 a further 69 acres were warped, and the process was completed in 1848–9 when 73 acres were warped.[63]

A large drain together with a 'cleugh' into the Trent still exist just south of the landing stage at Burton, so it seems that that Barker's idea for saving money was not acted upon, and a new warping drain was in fact constructed.[64] A small amount of land near the 'cleugh' remains unwarped and it may be that one or two of the other smaller owners in Burton Stather were unwilling, or unable, to warp their land for reasons of cost.

The Sheffield family had paid the price for not warping at the same time as enclosure, but by 1850 all the riverside parts of their Normanby estate would have been as productive as those of neighbouring parishes.

IV

Before about 1800 no more than 1500 acres had been warped in Lincolnshire.[65] Fifty years later the total land improved in this way, alongside the east bank of the Trent from Messingham to Burton upon Stather, amounted to about 7000 acres.[66] The increase in the value of land

[59] LAO, Sheff/E/1/27.

[60] LAO, Sheff/E/5/50 (emphasis in original). In a dry year, the flood water at spring tides carries a higher proportion of solid matter.

[61] LAO, Sheff/E/5/50.

[62] LAO, Sheff/E/5/48.

[63] LAO, Sheff/E/5/55, Land below Flixborough Hill.

[64] 'Clough' is the outfall sluice of a drain communicating with a tidal river and provided with flood gates (*O.E.D.* III [1989], p. 364). The local word for it however is 'cleugh', which is pronounced as 'clue'.

[65] J. A. Clarke, 'On the farming of Lincolnshire', *JRASE* 12 (1851), p. 371.

[66] Thirsk, *English Peasant Farming,* p. 291; Lillie identified as much as 9933 hectares (24,545 acres) of warp in the lower Trent valley: M. Lillie, 'Alluvium and warping in the lower Trent valley', in Van de Noort and Ellis (eds), *Wetland Heritage,* p. 122.

was substantial, and had even persuaded the Sheffield family to warp *after* they had privately enclosed their lands earlier.[67] In most of the area by the river however, enclosure had been a precursor to warping, as it was much more practical to identify the area which could be improved, establish ownership and make space for warping drains and sluices by parliamentary enclosure, *before* the warping process was undertaken.

James Caird provided an account of Lincolnshire farming practice in the middle of the nineteenth century. He recognized the improvements that had been carried out beside the river by the technique of warping:

> Peat moss of the most sterile character has been by this process covered with soil of the greatest fertility, and swamps which in the memory of our informant were resorted to for leeches are now, by the effects of warping, converted into firm and fertile fields.[68]

He seems to have misinterpreted the hydrological action by which warping comes about, and believed that the fertile muddy soils which formed the warp came *up* the river from the sea, and were deposited in this manner, as far as thirty miles from the ocean. In reality, the mud came *down* the Trent from central England, and the warping technique was usefully limited to about 30 miles up-river, by the diminishing spring tidal range.[69]

A curious consequence of warping was the disappearance of Will-o'-the-wisp or *ignis fatuus,* the ghostly light sometimes seen at night or twilight over bogs, swamps, and marshes. A correspondent wrote in 1852 to *Notes and Queries:*

> Fifty years ago he might be seen nightly dancing over bog and brake; but since the process of warping has been discovered, which has made valuable property of what was before a morass, nearly the whole of the commons between Gainsborough and the Humber have been brought into cultivation, and the drainage consequent thereon has nearly banished poor Will. Any person wishing to make his acquaintance would probably succeed, if he were to pass a night next November, on Brumby or Scotton common.[70]

Brumby west common was not to be improved until 1867, while Scotton common had to wait until 1884–5, by which time, with the complete disappearance of the old marshy landscape and its replacement by a new fertile and productive terrain, 'poor Will' had danced his last.[71]

Schemes of water management are almost always associated with parliamentary enclosure, but in the area of north-west Lincolnshire, more advanced techniques were necessary to convert this landscape of tidal rivers and low-lying land to more productive use. In the east of the area, the river Ancholme was tamed by a sluice gate, and enclosure was afterwards

[67] See n. 30 above: at Messingham the value of warped land was raised to £60–100 per acre from practically nothing.

[68] J. Caird, *English Agriculture in 1850–51* (1852), pp. 191–2.

[69] Ibid.

[70] *Notes and Queries* 5 (1852), p. 574.

[71] *Stamford Mercury*, 12 July 1867, quoted in R. E. Armstrong (ed.), *An industrial island: A history of Scunthorpe* (1981), p. 20; LAO, Lindsey, Brumby award 119; LAO, Lindsey award 176, Scotton and East Ferry Enclosure Award and Plan, 18 Mar 1885; Byford thought that warping around Hatfield, on the west side of the Trent, may have continued until 1939: Byford, 'Agricultural change', I, p. 279.

worthwhile.[72] In the west, covering the poor peaty soils by fertile river silt had to be preceded by enclosure. Because of the constructional work involved, drainage and warping schemes were likely to be more expensive than other agricultural improvement. These costs were justified however by the prospects of the increased rents which would come from an end to inundation and greatly increased fertility.

As Beckett has observed, 'it is possible that in their fascination with the enclosure of open fields, historians have overlooked the fact that the general trend of enclosure may have been towards land reclamation rather than reorganization of the arable'.[73] Certainly in parishes bordering the lower reaches of the Trent, it does appear that a principal motive for parliamentary enclosure was improving unproductive peaty and acidic soils by replacing them with light, well-drained silt by warping.

[72] *Journals of the House of Commons*, 31, *1767*, p. 66; LAO, 2-RED/4/8/1.

[73] J. V. Beckett, *The Agricultural Revolution* (1990), p. 37.

The origins of timber plantations in India

by Brett M. Bennett

Abstract

This article assesses the origin and evolution of the Nilambur teak plantation in Malabar and the 'Australian' timber plantations on the Nilgiri plateau, two of the largest and most famous timber plantations in British India during the second half of the nineteenth century. The article argues that both timber plantations arose as part of the broader expansion of agricultural plantations and botanical gardens in southern India during the 1840s–1870s rather than developing from European forestry practices imported into India. By the end of the nineteenth century the difficulties and costs associated with establishing successful timber plantations outside of these two sites had led forestry officials to direct more resources towards regenerating India's indigenous forests. The success of the two pre-forestry plantations and the failure of plantations elsewhere in India suggests that forestry was less successful than has often been portrayed.

Government forestry policy in British India during the second half of the nineteenth century emphasized the conservation of indigenous forests and the establishment of timber plantations. Yet scholars writing about forestry have paid little attention to the history of timber plantations as opposed to forests in India. This lacuna reflects a more general historiographical oversight. Historical studies investigating 'Empire forestry', the term used to describe the rise and spread of state forestry in India and then throughout the British Empire, have tended to focus on the territorialization, management and regulation of indigenous forests rather than assessing plantations.[1] When historians of empire have commented on timber plantations, they usually refer to the success of the Nilambur teak plantation in Malabar, without indicating how its success was not replicated in other attempts to cultivate timber in both India and the Empire.[2] Some area studies specialists of India have drawn attention to the local social and ecological dimensions of timber plantations, but, again,

[1] For the question of the 'origins' of environmentalism, see Richard Grove, *Green imperialism: colonial expansion, tropical island Edens, and the origins of environmentalism, 1600–1860* (1995); Gregory Barton, *Empire forestry and the origins of environmentalism* (2002); Ravi Rajan, *Modernizing nature: forestry and imperial eco-development, 1800–1950* (2006).

[2] William Beinart and Lotte Hughes, *Environment and empire* (2007), p. 114; Barton, *Empire forestry*, p. 47; K. Sivaramakrishnan, *Modern forests: Statemaking and environmental change in colonial eastern India* (1999) p. 129; Rajan, *Modernising nature*, pp. 70, 85. Studies of forestry in southern Africa are one exception to this trend. Brett M. Bennett and Frederick J. Kruger, 'Ecology, forestry and the debate over exotic trees in South Africa', *J. Historical Geography* 42 (2013), pp. 100–09; Brett M. Bennett, 'Naturalising Australian trees in South Africa: climate, exotics, and experimentation', *J. Southern African Studies* 37 (2011), pp. 265–80; id., 'The rise and demise of South Africa's first school of forestry', *Environment and Hist.* 19 (2013), pp. 63–85.

they have tended not to situate them within the wider context of forest policy in India or the Empire.[3]

This article focuses on two timber plantations, those of teak (*Tectona grandis*) at Nilambur and of wattle (*Acacia*) and eucalyptus (*Eucalyptus spp.*) at Ootacamund, which were renowned in India and globally during the last three decades of the nineteenth century. Both plantations were established during a broader movement to create plantations of tea (1830s–1870s) and cinchona[4] (1860s–early 1870s) on the Nilgiri plateau and coffee (1830s–1870s) in the surrounding districts of Wayanad, Coimbatore, Coorg and Malabar.[5] These economic and environmental changes were part of an important global transformation that occurred between the 1840s and the 1870s, a period that John Darwin has identified as a seminal point in the formation of a Victorian British world-system of trade and empire.[6] Darwin notes that these transformations included the expansion of expatriate British trading networks, especially in tropical and sub-tropical plantation industries, both within and outside of the formal British Empire. Southern India was one of the most dynamic and important of these locations because the region produced commodities that were in high demand in Britain and the Empire.

In India, the expansion of plantation agriculture created a mutually reinforcing dynamic that encouraged botanical and agricultural experimentation, which in turn led to larger tree-planting campaigns. At one level, the deforestation undertaken to make way for agricultural plantations led to environmental anxieties, prompting government officials to plant trees to replace declining forest cover.[7] Newly acquired scientific knowledge transferred both across disciplines and between the different types of plantations.[8] The knowledge required to grow

[3] It should be pointed out that these are the exceptions, rather than the rule. See Kativa Phillip, *Civilizing natures: race, resources and modernity in colonial South India* (2003), pp. 71–131 and Deborah Sutton, *Other landscapes: colonialism and the predicament of authority in nineteenth-century south India* (2009), pp. 15–84. Most historians have rather focused on the ecological and social impacts of forestry. The main works on social impacts include Ramachandra Guha, *The unquiet woods: ecological change and peasant resistance in the Himalaya* (1989); Ramachandra Guha and Madhav Gadgil, 'State forestry and social conflict in British India', *Past & Present* 123 (1989); Marlene Buchy, *Teak and arecanut: colonial state, forest, and people in the Western Ghats* (1996); S. D. Gupta, 'Accessing nature: agrarian change, forest laws and their impact on an *Adivasi* economy in colonial India', *Conservation and Society* 7 (2009), pp. 227–38.

[4] Chinchona was a South American native tree valued for the medicinal qualities of its bark.

[5] Vera Antsey, *The economic development of India* (1977), pp. 284–6; Ranjit Gupta, 'Plantation labour in colonial India', in E. Valentine Daniel, Henry Bernstein and Tom Brass (eds), *Plantations, peasants and proletarians in colonial India* (1992); C. A. Bayly, *Indian society and the making of the British Empire* (1988), pp. 144–5; Richard Tucker, 'The depletion of India's forests under British imperialism: planters, foresters, and peasants in Assam and Kerala', in Donald Worster (ed.), *The ends of the earth: perspectives on modern environmental history* (1988); Dane Kennedy, *Magic mountains: hill stations and the British raj* (1996), pp. 94–6; Paul Erik Baak, *Plantation, production and political power: plantation development in south-west India in a long-term historical perspective, 1743–1963* (1997).

[6] See Richard Drayton, *Nature's government: science, British imperialism and the 'improvement' of the world* (2000), pp. 170–220; John Darwin, *The empire project: the rise and fall of the British world-system, 1830–1970* (2009), pp. 23–63.

[7] See Michael Williams, *Deforesting the earth: from pre-history to global crisis* (2003), pp. 346–57. For the concept of environmental anxiety see James Beattie, *Empire and environmental anxiety: health, science, art and conservation in South Asia and Australasia, 1800–1920* (2011).

[8] This was a more universal aspect of the history of plantations in India. See the recent study by Prakash Kumar, *Indigo plantations and colonial science in India* (2012).

various trees or shrubs – coffee, tea, and cinchona – often applied across species and was not confined to a single discipline or skill. Government officials and private individuals making and managing timber plantations did not see them narrowly through any single professional lens, such as 'horticulture', 'forestry' or 'agriculture'. Rather, they drew on a mixture of local experience and methods devised in India, and accessed a range of professional and amateur scientific opinion.[9]

By focusing on the history of the Nilambur teak plantation and Australian plantations on the Nilgiri plateau this article revise existing interpretations of forestry in India. First, it argues that Germanic forestry science had almost no influence on the origin and success of these two plantations. Instead of looking to Europe, naturalists in India purposefully looked for insights into the natural world in order to understand how to create timber plantations in the tropics. The view put forth in this article challenges Ravi Rajan's Euro-centric interpretation of the origins of forestry in India, which in turn draws from James Scott's well-known analysis of the origins and problems of Prussian timber plantations.[10]

In *Seeing like a state*, Scott argued that the human desire to make nature in the image of human conceptions of orderliness and efficiency led Prussian foresters to create pine plantations that became diseased in the nineteenth century owing to poor planning. His simplified view of plantations now informs many historians' understanding of the rise of timber plantations globally. Yet this Euro-centric view of the rise of timber plantations does not adequately take into account the messier history of tropical plantations, which rarely conformed to human desires, and where developments were conditioned by tropical conditions on the frontier of empires. Undoubtedly, the Enlightenment and German methods of forestry later played roles in determining the political economy of timber plantations, but I argue here that they had little impact on the methods used for creating and managing the first and second generation of many types of tropical plantations.[11] The article therefore agrees in principal with Richard Grove's argument that both a pre-existing South Asian and an imperial botanical tradition shaped the rise of forestry in India in years between about 1850 and 1870,[12] but it differs in regards to the weight it gives to the contribution of certain indigenous agents and the legacy of attempts to establish plantations before 1850.

Second, the article argues that the attempt to replicate the success of these two plantations elsewhere in India failed, and the wider project of making timber plantations was eventually abandoned in order to focus on the regeneration of natural woods. Ootacamund and Nilambur's unique climatic conditions, the integration of key botanical and economic networks, and the idiosyncratic methods developed locally in order to cultivate specific plantations could not be easily translated to other sites. The expense of creating plantations and the difficulty in establishing viable plantations led the Indian Forest Service to abandon the goal of replicating

[9] For a discussion of this in the tea plantations of Assam, see Jeyeeta Sharma, 'British science, Chinese skill, and Assam tea: making empire's garden', *Indian Economic and Social Hist. Rev.* 43 (2006), pp. 429–55.

[10] Rajan, *Modernising nature*; James C. Scott, *Seeing like a state*: *how certain schemes to improve the human condition have failed* (1998).

[11] For a discussion of the continuities from Indian to British colonial plantation agriculture, see Baak, *Plantation, production and political power*. For an intellectual and scientific history of 'improvement' in relation to botanical gardens, see Drayton, *Nature's government*, pp. 1–220.

[12] Grove, *Green imperialism*, pp. 309–473.

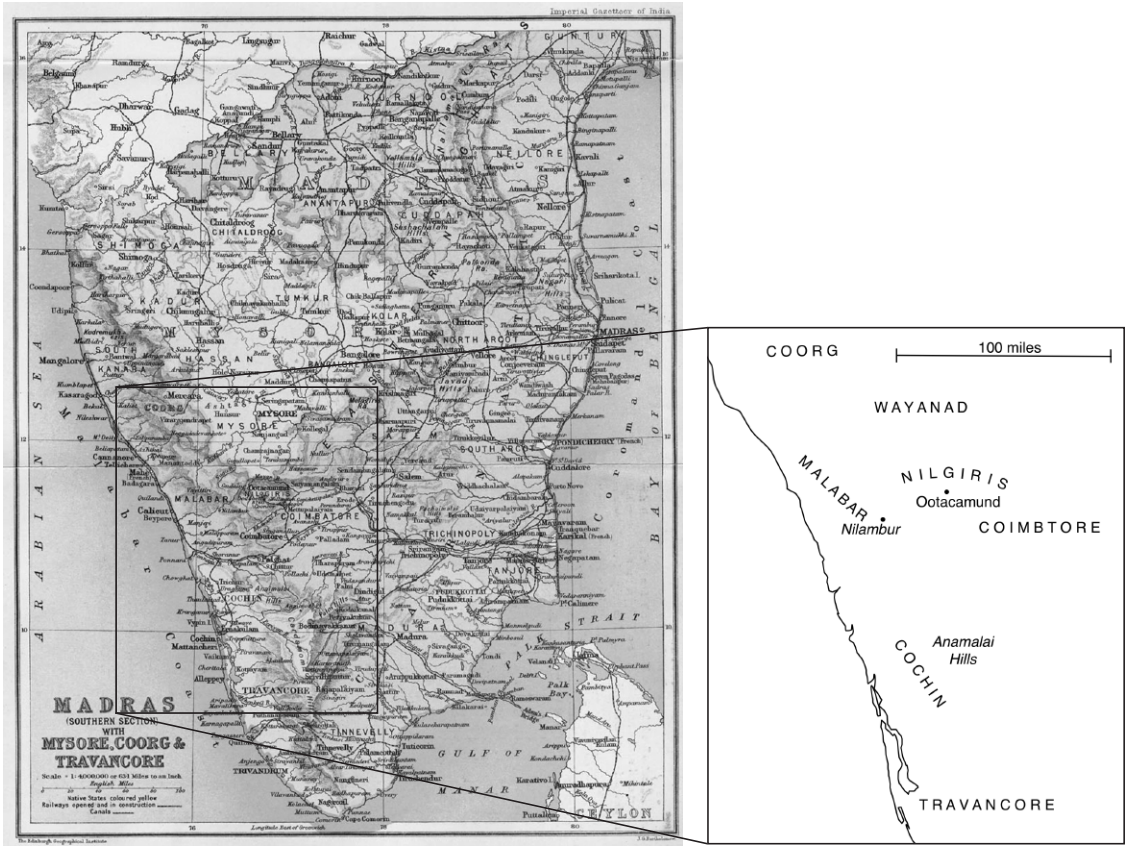


FIGURE 1. Madras (Southern section) with Mysore, Coorg, and Travancore, with sketch map showing places and districts mentioned in the text

Source: J. G. Bartholomew, *The imperial gazetteer of India*, XVIII (New edition, 1908), p. 250.

teak and eucalyptus in plantations throughout India and to focus its plantation efforts on a few key sites using techniques that were based on local experience rather than European theories or practices. European forestry practices and methods had an insignificant influence on India's timber plantations before 1900.

I

Teak (*Tectona grandis*) was the first species of tree that British East India Company officials sought to conserve in indigenous forests and grow in timber plantations. Its timber served numerous purposes. A fully-grown teak tree produces hard, resilient timber that resists the attack of ants and other pests and can be used to build structures that withstand long-term exposure to saltwater and humid, insect-prone tropical climates. Teak was prized around the Indian Ocean rim as a building material.

In southern India (Figure 1), teak grew sporadically amongst other trees in tropical forests along the western edge of the Western Ghats, primarily in the regions of Travancore, Cochin,

and Malabar (which today are part of Kerala).[13] Indian merchants cut and sold teak for local use and for sale in the Indian Ocean markets at Cochin and Bombay during the late eighteenth and early nineteenth centuries.[14] Arab and Indian buyers valued the teak grown in southern India more than teak from Burma; southern Indian teak commanded a healthy price, providing an economic incentive to harvest the finite supply of teak at an unsustainable rate.

The spoils of war during the last decade of the eighteenth century gave Britain access to many of southern India's large teak forests. The East India Company gained formal control of many of the teak forests of Malabar when it took possession of large swaths of the region in 1792 at the end of the Third Anglo-Mysore War.[15] In 1799, the Company also claimed Wayanad after the complete defeat of Tippu Sultan. Despite annexation, the Rajah of Nilambur retained large swaths of land including many of the forests as his private property. To the south of Malabar were located the teak-bearing princely states of Cochin and Travancore. Native landowners and princes maintained powerful control over access to teak, a constraint that eventually encouraged British government officials to attempt to grow teak in plantations.

Strategic demands for naval timber during the Napoleonic War led the East India Company to pass legislation that limited the cutting of teak in southern India. British Indian elites worried that progressive deforestation was leading towards a timber famine, a situation that would hurt Britain's naval efforts against the French navy. Reports in 1804 by Philip Dundas to Lord Wellesley, the Governor General of the East India Company (1798–1805), warned that the Malabar teak forests 'had been nearly exhausted'.[16] In 1806 the Madras Presidency appointed a conservator, Captain Watson, to establish government control over these forests. Watson established an unpopular government monopoly over the forests that permitted only government-approved merchants to cut down trees. His policy sought to limit the cutting of teak, but it did nothing to create new forests by replanting trees after they were harvested. But in 1823 the Governor of Madras, Thomas Munro, repealed these laws because they violated the principles of *laissez-faire*. By doing so, Munro ended the first state forestry programme in India.[17]

East India Company officials in the first half of the nineteenth century recognized that they needed to grow teak to maintain supply because the natural stock was dwindling. Officials did not view teak as being different from other non-timber tropical plants. In their mind it was just another marketable crop that could be harvested from wild stocks, but could also be cultivated in a plantation to make up shortfalls in supply. The plantation as a system evolved alongside European colonial expansion, and reflected an economic trend towards the intensification of land use that began well before the Enlightenment and continued after it.

Physicians, military officers, botanists, horticulturalists and arboriculturalists all experimented with growing teak. A succession of botanists at the botanical garden in Calcutta – Colonel Robert Kyd (1746–93), William Roxburgh (1751–1815) and Nathaniel Wallich (1786–1854)

[13] For an excellent history of teak in North Canara district, see Buchy, *Teak and arecanut*.

[14] Anne Bulley, *The Bombay country ships, 1790–1833* (2000), pp. 32–3.

[15] The British opted for direct control rather than indirect rule over the cinnamon trade. See Bayly, *Indian society*, pp. 62–3.

[16] Grove, *Green imperialism*, p. 394. Dundas later served as Governor of Prince of Wales Isle (now Penang) in 1805–7.

[17] Ibid., p. 397.

– trialled teak in Bengal, Orissa, and Bihar.[18] As Grove noted, 'the plantation methods he [Roxburgh] adopted were developed by him in India and were not derived from German or other European precedents'.[19] Whilst it is important not to overstate attempts to grow teak prior to the 1840s, we should also note that Roxburgh's methods, however innovative, failed.

Roxburgh's failure mirrored almost every attempt to grow teak in plantations in India in the first half of the nineteenth century. The Commissioner of Forests in Tenasserim, Thomas Latter, noted in 1848 that, '[i]t is well known that every attempt at artificial sowings [of teak] have proved a failure'.[20] Widespread failures led would-be growers to debate why the species was so difficult to regenerate and maintain. People had to learn what climate teak grew in, what soils suited it best, how to germinate its seeds, and how to space and thin teak trees. Over time it was recognized that teak did not grow well in cooler tropical climates, such as St Helena in the south Atlantic, and required warmer temperatures, such as existed in southern India and Burma.[21]

Rather than 'seeing like a state', experimenters tried to see like nature.[22] Latter, one of India's leading experts on teak, suggested simply that people follow nature: 'I would, therefore, recommend that in the case of artificial sowings, the process of nature be imitated as much as possible'.[23] Humans could only apply rationalistic models after they sufficiently understood and could control nature. Whereas pines in northern Europe were easily established in plantations, tropical trees were not so easy to plant and grow. Some suggested burning seeds before planting them whereas others called for boiling.[24] No one knew how far apart to space the trees or whether or not to thin them, and if so, at what age. Hugh Falconer, an amateur botanist and physician, believed teak required open spacing. An enquiry in the early 1850s by Falconer noted that 'the over-crowding of the trees, by close planting, was at the root of all the failures' of plantations in Bengal.[25] Others recommended inter-planting other tropical crops with teak.[26] No consensus existed on the methods by which teak could be grown because at this date no one had grown it successfully in a plantation.

A solution appeared in 1840s from the efforts of H. V. Conolly, Collector of Malabar and Chattu Menon, a Nair *Tahsildar* and Conolly's assistant.[27] Together they created India's first

[18] Grove, *Green Imperialism*, pp. 405–11.

[19] Ibid., p. 406.

[20] Thomas Latter, 'Extract of report on the teak forests in the Tenasserim Provinces', in *J. Agricultural and Horticultural Soc. of India* 6 (1848), p. 167.

[21] Francis Duncan called for the planting of teak in St. Helena in *A description of the island of St Helena; containing observations on its singular structure and formation and an account of its climate, natural history, and inhabitants* (1805), pp. 181–2. By 1815 attempts to grow teak from seed sent by Roxburgh had failed. See Alexander Beatson, *Tracts relative to the island of St. Helena; written during a residence of five years* (1815), p. 189.

[22] I refer here to the view of eighteenth- and nineteenth-century Prussian plantations as reflecting the idea that nature would reflect human ideas. This idea has been advocated most powerfully by James Scott's influential book on the failure of human efforts to restructure nature and human society using the ideals of the Enlightenment. See Scott, *Seeing like a state*, ch. 1.

[23] Latter, 'Extract of report on the teak forests', p. 168.

[24] I discuss this below, p. 104.

[25] Cited in Hugh Cleghorn, *The forests and gardens of south India* (1861), p. 323.

[26] 'Directions for cultivating teak', *Trans. Agricultural and Horticultural Soc. of India* 2 (1836), p. 46.

[27] A *Tahsildar* is a native name for a tax collector or sub-official who worked for the British government. In this case, Menon served as the Indian in charge of the day-to-day management of the plantation. *Nairs* are a Hindu cast that were especially prevelant in Malabar.

successful plantations of teak in Malabar in 1843. In 1852, Falconer, for the first time, could happily confirm to the Bengal government in report on teak: 'That the forests [of teak] can be renewed by planting, I consider to have been fully established … by the results attained on the Malabar coast'.[28] The Rajah of Nilambur, who owned most of the land in the region, would not sell any to the British, so the plantation site near the Nilambur River had been purchased from a temple in financial need.[29]

Like others before him, Conolly had a difficult time getting teak seed to germinate. At the recommendation of Menon, Conolly decided to lay hay over the seeds and burn them, so that the fire only singed the seeds.[30] Menon noted that teak seeds shed their tough coating by fires, and thus by burning the seed artificially, the seed might germinate. Some seeds germinated, but the fire only slightly singed most of the seeds, and they abandoned the attempt. Conolly and Menon then experimented with boiling the seeds. Marquis Tweeddale, then Governor of Madras (1842–8) and the first early supporter of Conolly, noted that this helped 'to produce the same effect by the heat so generated as the constant fires in the jungle do on the seeds which there germinate'.[31] Eventually the pair grew teak successfully by soaking seeds first in water before broad sowing them under leaves in plenty of light.[32] After transporting the successful saplings from a nursery, they planted them approximately six to nine feet apart in rows. These methods remained the standard nursery and planting practice into the twentieth century. British foresters continued to recognize the influence of Menon, crediting him with discovering how to germinate teak seeds. After Conolly was hacked to death in 1855 by three revolting Mappilas, Menon continued to direct planting at Nilambur until 1862.[33]

By 1860–61 the size of the plantations had expanded to 1100 acres, when the oldest plantations, then over 15 years old, were 'progressing favourably'.[34] In 1862 a Scottish forester, J. Ferguson, took over the operations of the Nilambur plantation.[35] A million and a half trees had been planted out before he arrived.[36] The plantations, he felt, required pruning and thinning. Nilambur faced a shortage of labour made worse by its location, the supposed caste prejudices of the local Hindu caste of Nairs 'who prefer their own caste to any other', and the opening of the Western Ghats to plantation agriculture, which 'drains a great amount of labour from the district'.[37] When possible, Ferguson employed Indians to thin the trees, and he began selling

[28] Ibid., p. 36.

[29] Brandis, *Indian forestry*, p. 24. Grove incorrectly states that the Rajah of Nilambur recommended that Conolly plant teak. In fact, Conolly followed the Revenue Board's orders and successive plantation superintendents complained about the Rajah's lack of support. Grove, *Green imperialism*, p. 457.

[30] Cleghorn, *Forests and gardens of south India*, p. 304.

[31] An extract from 'Minute by the Marquis of Tweeddale, 8 Dec. 1846', in Hugh Falconer, *Selections from the records of the Bengal Government no. 9. Report on the teak forests of the Tenasserim Provinces* (1852), pp. 244–5.

[32] Brandis, *Indian forestry*, p. 24.

[33] Cleghorn, *Forests and gardens of south India*, p. 11; R. McIntosh of the Indian Forest Service reflected on the important influence of Menon, 'Chattu Menon soon overcame the difficulty experienced in getting the seed to germinate, and the method adopted by him is, with a few minor modifications, retained to this day'. R. McIntosh, 'The Nilambur teak plantations', *Indian Forester* 16 (1905), p. 129.

[34] *Report of the conservator of forests for the official year 1860–1* (1861), p. 1.

[35] *Report of the conservator of forests for the official year 1861–62* (1862), pp. 39–40.

[36] Ibid., p. 54.

[37] *Report of the conservator of forests for the official year 1862–63* (1863), p. 47.



FIGURE 2. Teak plantation in Nilambur

Source: R. S. Troup, *The work of the forest department in India* (1917), p. 20.

thinnings at a government depot in Calicut. In 1863 the depot 'was not known at any distance' and 'no Arab traders were present', and so the revenue was lower than hoped.[38] A shortage of labour also hindered his ability to have teak cut and floated down the river to market.[39] In particular, Ferguson complained about the Rajah of Nilambur's lack of support. He noted that, '[t]he Rajah's word, too, is law, and neither the Rajah, nor any of his people, give the assistance that might be expected from them'.[40] Labour shortages continued throughout the 1860s.[41] But from the middle years of the 1860s, Arabs began to attend the auctions, providing revenue to pay for the running of Nilambur.[42]

Ferguson followed local planting precedents rather than drawing on European practice. In Scotland, where Ferguson grew up and worked, there was no consensus on thinning or spacing.[43] Most foresters in Scotland planted pine trees approximately three and a half to four feet apart and hardwoods approximately four to five feet apart.[44] But in the plantations at

[38] *Report of the conservator of forests for the official year 1863–64* (1864), p. 11.

[39] Ibid.

[40] Ibid.

[41] *Report of the conservator of forests for the official year 1866–67* (1867), p. 62.

[42] See *Madras revenue register* 2 (1868), p. 68.

[43] William Gilchrist, 'On the thinning of plantations', *Trans. Royal Arboricultural Soc.* 5 (1869), p. 43.

[44] Ibid., pp. 43–5.

Nilambur the trees were between six and nine feet apart and underwent a stringent thinning and pruning regime undertaken by Indian labourers. Ferguson also studied other experiments with teak, looking in particular to Burma, where foresters studied and debated many of the practices of the Karen, such as multiple cropping and slash and burn plantations. In 1867 the Madras government approved the experiment of planting food crops amongst the teak saplings during their first year based upon the Burmese Karen methods of *taungya* (slash and burn agriculture).[45] But this method was declared a failure in 1869, and Ferguson stopped it.[46] More mixed species experiments continued in the 1870s to 1890s, as foresters continued to experiment.

The success of the Nilambur plantation and the recurring government fears about a looming shortage of teak led Hugh Cleghorn, the first conservator of forests in Madras, to suggest in 1867 that the Forestry Department expand plantings at Nilambur and also ten miles away at Nellicottah. Cleghorn suggested that the Madras government create a subordinate training school at Nilambur for the whole of Madras. This would serve to educate both Indians and Europeans who 'might be always under the regular training of the Superintendent'.[47] Successive Secretaries of State for India, Stafford Northcote and the Duke of Argyll approved of Cleghorn's idea.[48] Yet the Madras government abandoned the idea in 1873, even after Argyll urged them to reconsider, when the government began discussing the establishment of a forestry school for Indians.[49] The failure to establish the school reflected the relative weakness of foresters in Madras, a province dominated by government officers who were concerned about the social ramifications of applying forestry laws in the communal land tenure regions of south India.[50]

Ferguson and his successor Gordon Hadfield (1883–1894) continued to experiment with mixed teak plantations inter-planted with Brazilian rubber (*Hevea brasiliensis*) and West Indian mahogany (*Swietenia mahagoni*). The desire to grow multiple crops stemmed from two factors. First, foresters and botanists began to recognize in the 1870s that monoculture teak plantations had higher rates of disease and pest infestation than natural forests. Conservator Captain Beddome noticed Nilambur's first pests in 1867, with various infestations of disease and bugs breaking out in the following years.[51] In his influential *A manual of Indian timbers* (1881), J. Sykes Gamble cautiously pointed to the destruction of monoculture teak plantations:

> No safe speculations can be formed regarding the future of a pure Teak forest like that of Nilambur. In its natural state Teak does not grow alone, but is associated with bamboos and a variety of other trees; and it is impossible to foresee the risk of damage by storms, insects, disease, or other causes to which pure Teak forests may be exposed.[52]

[45] See British Library, India Office Records (hereafter IOR), L/E/3/771, Conservator of Forests to the Secretary to Government, Revenue Department, 25 Oct. 1867.

[46] *Report of the conservator of forests for the official year 1868–1869* (1869), p. 25.

[47] Ibid.

[48] Ibid.; IOR, L/E/3/767, Duke of Argyle to Governor in Council, 25 Feb. 1869.

[49] IOR, L/E/3/767, Argyll to Governor of Madras, 30 Apr. 1873.

[50] See Madhav Gadgil and Ramachandra Guha, *This fissured land: an ecological history of India* (first edn, 1993), pp. 124–32.

[51] IOR, L/E/3/771, Plantation Progress Report, Conservator of Forests to the Secretary to Government, 25 Oct. 1867.

[52] J. Sykes Gamble, *A manual of Indian timbers: an account of the structure, growth, distribution, and qualities of Indian woods* (first edn, 1881), p. 289.

Second, Ferguson and Hadfield also sought to increase the revenue production of the plantations. New exotic species offered the opportunity to grow multiple species with a much quicker rotation than teak (the full teak cycle was assumed to be between 60 and 120 years). Ferguson introduced 28 rubber trees (*Hevea brasiliensis*) in the plantation in 1879 after receiving the seeds from the Royal Botanical Gardens in Peradeniya (Ceylon).[53] The plantation superintendents also introduced other rubber trees (*Castilloa elastica* and *Manihot Glaziovii*) into the plantations.[54] In 1872 Ferguson started planting Jamaican mahogany seeds amongst the teak.[55] These experiments, like the rubber, proved less than successful.[56]

The success at Nilambur spurred on the establishment of experimental Forestry Department plantations throughout the rest of Madras. District conservators started experimental plantations in Sigur, North Canara, South Canara, the Annamalai hills, and Cuddapah in the 1860s and 1870s.[57] As a general rule, these experiments did not provide promising results. Labour shortages, different soil types and climates, and the remoteness of many locations hindered the success of trials. One forester in the Annamalais reported, 'we labour under the following disadvantages, viz., a very feverish locality, scarcity of labour and 40 miles of land carriage'. Difficult social relations between British foresters and Indian sub-officials often made the protection of plantations against the encroachment of cattle or nearby residents difficult. In South Canara native subordinates ignored forestry regulations requiring the protection of trees.[58] When sites did succeed, the resulting plantations cost too much to be economically viable.

Attempts to establish plantations of teak failed across most of the Indian subcontinent. Except for some successes with the *taungya* (slash and burn) plantations in Burma, the vast majority of experimental teak plantations failed entirely or could not be financially justified by the projected income. The extent of government plantations actually declined in the early twentieth century when the Indian Forest Service abandoned many plantations. In 1907, the IFS recorded 134,785 acres of plantations – including taungya forests – a decline of over 10,000 acres from the previous year.[59] The decision was made to focus on improving existing natural forests because of concerns about the dangers of growing monocultures.[60]

Artificial methods of regeneration proved to be too costly to maintain, except at Nilambur. By the late nineteenth century foresters in India had decided to manage teak forests through natural reproduction rather than through the creation of plantations.[61] The failure of teak plantations, coupled with the high costs associated with buying or leasing land, clearing forests, and paying for labour, led forestry officials to discontinue most efforts. The plantations

[53] These did not thrive. See R. L. Proudlock, *Report on the rubber trees at Nilambur and at Calicut, South Malabar* (1908), p. 6.

[54] Ibid., pp. 49–50.

[55] The Jamaican tree was introduced to Madras in 1872. Most of the early plantings failed. See the discussion in 'Cultivation of mahogany tree', *Indian Gardner* 1 (1884), p. 319.

[56] Even after failures, some foresters wanted to continue to plant mahogany. See Berthold Ribbentrop, 'Note on the working plan for the Nilambur valley teak plantations', *Indian Forester* 24 (1899), pp. 165–6.

[57] See the government report on plantations in *Annual administration report of the forest department for the official year 1877–78* (1879), pp. 41–4.

[58] Ibid., p. 5.

[59] S. Eardley-Wilmont, *Report of forest administration in British India for the year 1906–1907* (1908), pp. 14–15.

[60] Ibid., p. 13. Also see Raymond Bryant, *The political ecology of forestry in Burma, 1824–1994* (1996), p. 111.

[61] Eardley-Wilmont, *Report*, pp. 14–16.

at Nilambur remained the exception to this rule. Responding to Sir William Henry Gladstone's question about the success of plantations in India at a parliamentary enquiry, William G. Peder, Secretary of the Revenue, Finance, and Commerce Department for the India Office from 1879–1888, explained to the House of Commons committee on forestry in 1884,

> [t]here have been some very successful instances of artificial plantation in India; the great teak forest at Nilambur in Madras is an instance. The experiment has generally been made under favourable conditions, but it costs a great deal of money.[62]

The example of Nilambur remained the great exception to the rule of the failure of teak plantings. In Gamble's revised *Manual of Indian timbers* (1922), he noted the general pessimism that Indian foresters felt about plantations but noted, with a hint of optimism, that Nilambur might still provide a path for future teak plantations: 'Teak plantations, however, have been largely, perhaps too largely, condemned in India, the large one at Nilambur being probably the only one of any importance which has been maintained and gradually increased'.[63]

For most of the nineteenth century the Nilambur plantation was managed according to Conolly, Menon, and Ferguson's methods. The introduction of identifiably 'continental' forestry methods in Nilambur can be dated to 1896 when the forester P. S. Lushington drafted and published the first working plan for the plantations.[64] He based his working plans upon German working plans.[65] The forests, he suggested, should be managed as a 'high forest' (a term to indicate a fully mature forest dominated by a single commercially valuable species) by clean felling the trees and then artificially regenerating the plantations anew.[66] Berthold Ribbentrop, the Inspector General of Forests in India, praised the working plan drawn up by Lushington, 'whose theoretical and practical knowledge is fully evidenced on every page of his excellent report'.[67] But the influence or importance of German working plans on the management of the plantation should not be overstated. The plan merely provided an analysis of the amount of timber within the plantation and suggested when the trees should be cut down. The first and one of the most crucial aspects of making teak plantations – the method of sowing seeds and transplanting saplings – remained unquestioned: Conolly and Menon's methods remained. No new study of planting need be done because as Ribbentrop noted, '[t]he art of planting teak successfully has, in the course of years, been thoroughly acquired'.[68]

Teak plantations in southern India in the nineteenth and early twentieth century, except for the success at Nilambur, were not successful. Theses failures led to changes in India-wide forestry policies. Instead of a policy oriented to both conserving forests and creating new plantations, the Indian Forest Service more narrowly focused on managing indigenous forests

[62] BPP, 1884–5, VIII, *Report from the select committee on forestry, together with the proceedings of the committee, minutes of evidence* (1884), p. 11.

[63] J. Sykes Gamble, *A manual of Indian timbers: an account of the structure, growth, distribution, and qualities of Indian woods* (sec. edn, 1922), p. 528.

[64] P. S. Lushington, *Report and working scheme of the Nilambúr teak plantations* (1896).

[65] The theoretical German working plan was based upon a quantified analysis of the growth rates of valuable trees, and it recommended the type of harvesting and silvicultural regime that should be implemented to harvest a sustainable amount of timber in perpetuity. A working plan provided for the past, present, and future of a forest.

[66] Lushington, *Report and working scheme*, pp. 66–7.

[67] Berthold Ribbentrop, 'Note on the working plan', p. 163.

[68] Ibid., p. 168.

through natural reproduction. The methods of planting, germination, transplanting, and thinning teak remained almost entirely unchanged from the 1840s when Conolly and Menon worked together to discover how to grow teak. The plantations' spacing and thinning regime was based upon local experimentation. Other experiments throughout Madras mirrored the methods used at Nilambur. But the less favourable environmental, social, and financial conditions elsewhere in the Madras Presidency made teak plantations other than the one at Nilambur unviable.

II

The Nilgiri plateau is a highland that bridges the Western Ghats and Eastern Ghats in southern India.[69] The mountains average approximately 6500 feet in elevation. The British city of Ootacamund, on the Nilgiri plateau, became a fashionable health resort from the 1830s, after the region's 'discovery' by the assistants of the collector of Coimbatore in 1818.[70] Ootacamund's elevation (approximately 7300 feet) made the site efficacious for Britons seeking respite from the heat of the sweltering, humid plains below. The location became so popular as a summer resort that the Madras government moved its summer capital there from 1861.[71] British settlers reshaped both the ecological and architectural aesthetics of Ootacamund and the surrounding environs, making neo-gothic Victorian churches, building Tudor-styled houses, and founding libraries and other public institutions frequented by the Britons who visited and retired in and around the city.[72] Prior to Ootacamund's 'discovery' by the British, the Toda and Badaga inhabited the area. The Toda, a group of probably less than 1000, tended to their buffalo and the Badaga, a larger tribal people, practiced shifting agriculture called *bhurty*.[73] During the mid- to late nineteenth century both groups lost many of their original lands owing to the rapid expansion of plantation agriculture, British settlement, and the reservation of forests in across the plateau.[74]

Beginning in the 1830s and '40s, British residents on the Nilgiri plateau began to plant exotic trees that they thought might grow in the cooler climate and higher altitude. The most successful trees came from some of the coolest regions of Australia, the mountainous parts of Victoria and Tasmania. Various species of *Acacia* and *Eucalyptus* became popular because they grew rapidly, created a new aesthetic landscape, and led many to hope that their hardwood could provide railway sleepers, building material, and an almost unlimited supply of firewood for the growing population. Ootacamund's residents began planting *Acacia melanoxylon* and *A. dealbata* first in the 1830s, the seeds probably coming from Tasmania.[75] Captain (later

[69] For a description of the region see W. Francis, *Madras district gazetteers: the Nilgiri* (1908), pp. 1–5.

[70] See Lucy Veale, 'Transforming the tropics: the creation of British space in India', presented at Negotiating Space Conference, Nottingham University, 16 June 2008, p. 1.

[71] For its early history see Kennedy, *Magic mountains*, pp. 20–22.

[72] For a post-Raj British reminiscence of the history of Ootacamund, affectionately referred to as 'Ooty', see Panter Downes, *Ooty preserved: a Victorian hill station in India* (1967).

[73] In 1871 the Badaga were reported to have 13,922 houses in the area. See W. Francis, *Madras district gazetteers: the Nilgiri* (1908), p. 131.

[74] This is an important part of the history of the region that is covered by other scholars. See Kennedy, *Magic mountains*, pp. 182–4; Phillip, *Civilizing natures*, pp. 95–6; Sutton, *Other landscapes*, pp. 134–5.

[75] Francis, *Niligiri*, p. 213.



FIGURE 3. View from above Sylk's Hotel, Ootacamund, *c.*1880

Source: Unidentified Artist, Untitled (Sylk's Hotel, Ootacamund, Mysore-Ooty, India), *c.*1880. Reproduced by permission of Harvard Art Museums/Fogg Museum, Gift of the Melvin R. Seiden Collection, P2000.96; *Photo Copyright*: Imaging Department © President and Fellows of Harvard College.

General) Frederick Cotton of the Madras Engineers planted the first known *Eucalyptus globulus* in Ootacamund in 1843.[76]

Residents began to comment on the rapid spread of Australian trees in the early 1850s. W. G. McIvor, a horticulturalist trained at Kew who headed the Ootacamund botanical garden from 1848 to 1876, noted in his 1852 report that 'the greatest variety of timber and ornamental trees are from Australia. Australian plants of all kinds thrive particularly well here, which is a mark of the similitude of this climate and soil to that of Australia'.[77] The botanical report described the rapid growth of *Eucalyptus* in glowing terms. One 'blue gum' supposedly grew to be 'upwards of 50 feet high, with a circumference at the best of four feet five inches'.[78] McIvor

[76] This date is well attested in numerous official gazettes, forestry publications, and personal memoirs.

[77] *Report on the horticultural gardens, Ootacamund, Neilgherry Hills* (n.d.). The published letter was dated 23 June 1852.

[78] *Report of the government botanical and horticultural gardens Ootacamund for the year 1854–55* (1856), p. 4.

believed that the blue gum 'had the advantages of being clean in its grain, and easily wrought into any shape' in addition to being both strong and resistant to the attack of insects.[79] *Acacia melanoxylon*, the 'Black Wattle', became the most popular of *Acacia* species because it grew so rapidly.[80] Government officials and private individuals alike planted Australian trees 'on these Hills for ornament and shelter'.[81]

The botanical garden at Ootacamund served as the first major centre for both the distribution of plants and knowledge about them in the Nilgiri plateau and across India generally. Kativa Philip notes that the establishment of botanical gardens laid the 'institutional and epistemological bases of colonial power' for expansion of agriculture and European settlement in the highlands.[82] In terms of forestry, the garden served to distribute Australian and other exotic trees throughout the region and India.[83] The Garden produced knowledge in the forms of governmental reports, pamphlets, and, through the public garden, grounds that highlighted exotic and native species.

Yet disseminating this knowledge proved difficult. McIvor was dissatisfied because he felt that the British residents and government officials in the region lacked an accurate knowledge of the experimental results of his garden. The garden's multiple experiments produced extensive results but 'as a knowledge of these [results] is not generally diffused, the public reap little or no advantage from them'. McIvor told the government that 'the want of a better knowledge of Horticulture' could have contributed to three-fourths of the failures in the region.[84] Matching species successfully to particular localities and conditions required extensive trials, and only rarely did an early introduction provide the basis for future success.

McIvor's efforts fitted within a mosaic of experimentation and acclimatization which occurred in India and throughout the British Empire. British officials and private capitalists experimented with valuable or potentially valuable species. The most suitable candidates at the time were tea, coffee, teak, and later cinchona, West Indian mahogany, and rubber. The size of exotic plantations grew rapidly in the middle decades of the century as a result of government-sponsored experiments and the activities of private planters financed by British and Indian capital. Experimental knowledge was relatively integrated. Questions about planting – how to germinate seeds, when and how to plant them, how to tend them – cut across then nascent professional scientific boundaries. For example, McIvor worked with tea and coffee planters, directed the government plantations of cinchona, provided the seeds and saplings for government plantations of Australian trees, and took part in larger Indian and imperial discussions about economic development. Foresters worked with botanists, botanists with private planters, and *vice versa*.

Between the 1850s and 1870s foresters often followed rather than led efforts to make timber plantations on the Nilgiri plateau. The professional and bureaucratic boundaries between the botanical garden, the Forestry Department, and other civil officers such as district collectors

[79] Ibid., p. 4.
[80] Ibid., p. 9.
[81] Ibid.
[82] Phillip, *Civilizing natures*, p. 254.
[83] See *Annual report on the Sind forests for the year 1858–59* (1859), p. 87; B. H. Baden-Powell, *Handbook of the economic products of the Punjab* (2 vols, 1868–72), I, p. 565.
[84] *Report of the government botanical and horticultural gardens Ootacamund for the year 1854–55*, p. 13.

remained vaguely defined. Botanists, civil officers, arboriculturalists, and foresters all officially worked for the government to create and manage plantations and conserve indigenous forests. They all reported to the Board of Revenue in Madras. Hugh Cleghorn, an eminent Scottish physician and botanist who previously worked in Madras, became the first conservator of forests in Madras when the Forestry Department was founded in 1856.[85] At its founding, none of the Forestry Department staff had previously studied German or French forestry, although Cleghorn had an expert knowledge of Scottish arboriculture. The Revenue Board also created a Jungle Conservancy Fund in 1859 to finance the creation of firewood plantations around villages in each district. This financed the foundation of many of the plantations created around the Nilgiri plateau in the 1860s. In 1872 a Jungle Conservancy Department was founded and staffed by the civil officers of the district. The Jungle Conservancy Department amalgamated with the Forestry Department in 1883.[86]

These overlapping divisions of power sometimes led to conflict over who had the authority to provide seeds, saplings, and knowledge. The botanical gardens (first at Ootacamund and then at Coonoor) staked their claim as the main supplier of nursery stock for government plantations. In 1858, the government of Madras asked that the head botanist of the Ootacamund garden supervise the plantations and woods for the Nilgiri plateau, including Kuhutty and Coonoor, approximately 12 and 8 miles away.[87] Cleghorn argued that another officer, appointed specifically to attend to government plantations, should take this job, leaving McIvor to focus on the garden.[88] McIvor, however, agreed with the suggestion of the council and began to prepare the required nursery in 1859. McIvor sought to maintain his control over the local plantations by controlling the supply of nursery plants. Whereas Cleghorn wanted specific nurseries located by the government plantations, McIvor noted, 'this would in great measure have removed the plants from my immediate superintendence when they required the greatest care'.[89] In the end, the government decided to in March 1859 to maintain McIvor's control over the supply of nursery trees.[90]

Forestry officers followed McIvor's method for producing and transplanting saplings throughout the second half of the nineteenth century. His ingenuity and thrift also ensured that the penurious Revenue Board maintained his privilege of supplying *Eucalyptus* and *Acacia* nursery trees for government plantings during his tenure. He first planted seeds in a seedling pot (with multiple seeds being grown in a single pot). He then transplanted the small saplings into a three-inch pot 'with good rich soil', which he then put into a growing house for a month to led the root structure grow.[91] After a month he took the saplings out of pots, 'wrapped them in moss', before then planting them in a four-inch bed of moss in a nursery bed. When planted closely together, he could grow upwards of 350 nursery saplings in a bed, whereas previously

[85] For a discussion of Cleghorn see Pallavi Das, 'Hugh Cleghorn and forest conservancy in India', *Environment and Hist.* 11 (2005), pp. 55–82.

[86] For a discussion of its early history see *Report on the administration of the Madras Presidency during the year 1875–6* (1877), p. 307; on its amalgamation see the *Annual administration reports of the forest department, Madras Presidency, for the official year 1883–3* (1884).

[87] *Report on the government botanical and horticultural gardens Ootacamund for the year 1857* (1859), p. 8.

[88] Ibid., p. 8.

[89] Ibid., p. 7.

[90] Ibid.

[91] Ibid.

the method of growing them in baskets allowed for only 30 plants to be grown and removed at a time. His technique made it cheaper and easier to supply seedlings for the whole region. This succeeded so well that he ordered 8000 pots, 4000 for the Forestry Department and 4000 for the garden. Both Cleghorn and the revenue council praised McIvor's astute methods for saving money and space.[92]

The Forestry Department and civil officers, drawing from the Jungle Conservancy Fund (after 1872 the Jungle Conservancy Department), created most of the plantations on Nilgiri plateau in the 1860s and after on lands claimed by the British as either private or government property. In 1869 the Forestry Department transferred its plantations to the Jungle Conservancy Department at the request of the Revenue Board.[93] This was part of a wider government effort to tax the use of indigenous forests in order to encourage local residents to conserve timber.[94] But in 1875 the Jungle Conservancy Department transferred them back to the Forestry Department. The land claimed by government for plantations usually fell under the category of 'wasteland', or lands supposedly unused by the local Toda or Badaga. After a lengthy debate over *bhurty*, the Madras government criminalized this form of shifting cultivation in 1862.[95] In 1863 the government implemented wasteland rules that strictly defined the settlement boundaries of the Badaga and Toda and opened up new land for purchase at auction.[96] Ninety-eight per cent of the land sales went to Europeans who actively sought the land for recreation and profit.[97] After the passing of the 1882 Madras Forestry Act the Forestry Department demarcated and protected certain areas of the indigenous forests as 'reserved', strictly defining them as state property and regulating the 'privileges' (rather than 'rights') of native users. By 1886 over a third of the land in the Nilgiri was reserved.[98]

The Governor of Madras, Sir William Denison, ordered the creation of the first government plantation of *Eucalyptus globulus* in 1862.[99] But the majority of plantings occurred after 1866–67 following a government decision to promote the creation of large government plantations. This reflected the rapid rise in demand for timber for railway fuel. The Revenue Department decided to establish Australian timber plantations to supply firewood for local usage and for the expanding network of railways. The expansion of railways in the 1850s and 1860s created a fear among officials that there would be a shortage of timber for fuel, both for villagers, cities, and the railway. The Revenue Department had a Presidency-wide debate in 1866–67 about whether or not private plantations could possibly produce enough timber to satiate the growing demand.[100] The reports submitted by civil officials painted a dour picture of the private plantation industry. They criticized Indians for not wanting to make plantations and suggested that the state would need to step in where private industry would not. The collector at Coimbatore argued that they should create a new Nilambur of Australian trees in the Nilgiri: 'A plantation of Australian trees on the same scale on the Neilgherries [*sic*] would, I believe,

[92] Ibid., p. 15.

[93] *Report of the conservator of forests for the official year 1868–1869* (1869), p. 18.

[94] Sutton, *Other Landscapes*, pp. 123–4.

[95] Ibid., p. 101.

[96] Ibid.

[97] Ibid., p. 102.

[98] Ibid., p. 105.

[99] David E. Hutchins, *Report on measurements of the growth of Australian trees on the Nilgiri* (1883), p. 1.

[100] See IOR, L/E/3/771, the larger correspondence and discussion in Madras Revenue Forests Collections to Despatches 1867–69.

eventually prove very remunerative to Government'.[101] The Revenue Board responded positively to the suggestion:

> The favourable conditions for extending planting on the Neilgherries, and the demand that exist and is likely to increase there for timber and fuel, induced the Board to support the Collector's recommendation that the Forest Department be directed to undertake planting operations there on a large scale.[102]

The Revenue Board instituted a policy of forming new plantations of Australian trees in the 1860s and 1870s. These included the plantations of Arambi (58 acres of *Eucalyptus* created in 1863–5 by the Jungle Conservancy Department), Marlimund (nine acres of *Acacia* and *Eucalyptus* created in 1860 by the collector), Norwood (26 acres of *Acacia* and *Eucalyptus* created in 1872–3 by the Jungle Conservancy Department), Bathri (an unknown acreage of shola was planted in the 1870s by the Jungle Conservancy Department), Ralia (*Acacia* and *Eucalyptus* plantations created in 1872 by the Forestry Department), Old Forest (200 acres of various species planted in 1872–3 by the Jungle Conservancy Department), and Newman (35 acres of *Acacia* and *Eucalyptus* plantations created in 1876 by the Forestry Department).[103] The government had created 1322 acres of Australian plantations by 1882.[104]

The practice of making plantations varied. As noted above, the Ootacamund botanical garden provided the seedlings and saplings for most of the plantations in the region. A review of plantations in 1882 by David Ernest Hutchins, an Indian forest service officer on special duty, discussed the various ways in which the plantations had been formed.[105] The spacing and thinning regimes differed greatly from plantation to plantation, with some plantations of *Eucalyptus* being grown at six feet apart and others at nine feet apart. Some of the plantations were managed as coppice. This method involved foresters cutting a tree at its stump to encourage the growth of multiple smaller shoots, which could be harvested for firewood and other minor timber uses in a shorter rotation. Other forests had been planted and managed as 'high forests', mature forests of a single species that would be replanted after being cut.

The rapid growth of the Australian trees in the Nilgiri plantations became internationally renowned among foresters in the 1880s. The Nilgiri plantations offered some of the world's only examples of blue gum (*Eucalyptus globulus*) outside its native home in Victoria and Tasmania. E. J. Brace reviewed the history of *Eucalyptus* plantations around the world for the international exhibition on forestry at Edinburgh in 1884 and discussed the Nilgiri plantations:

> Viewing the Eucalypti from the forester's stand point, it is to be noted that, save on the Nilgiri Hills, afforestation has only been carried out to any extent in the plantations belonging to the French Government in Algeria.[106]

Like the Nilambur teak plantation, the fame of the Australian plantations in the Nilgiri arose

[101] IOR, L/E/3/771, Collector at Coimbatore to the Acting Secretary, 21 July 1866, no. 188.
[102] Ibid.
[103] Hutchins, *Report on measurements*, pp. 4–10.
[104] Francis, *Nilgiri*, p. 216.
[105] Ibid.
[106] E. J. C. Brace, 'The formation and management of Eucalyptus plantations', in John Rattray and Hugh Mill (eds), *Forestry and forestry products: prize essays of the Edinburgh international forestry exhibition, 1884* (1884), p. 271.

primarily from the failure of other plantation attempts in India. Outside the cooler confines of Ootacamund, many Britons in India hoped that eucalypts would thrive in the hot climates and cure malaria and other deadly tropical diseases. But *Acacia* and *Eucalyptus* never became as economically valuable or ecologically viable as teak, during British rule. When eucalypts did grow in the hot regions of India (which was not often), they grew stunted and they did not stop deadly tropical diseases. Although many people still believed in the malaria-fighting qualities of eucalypts as late as the 1890s, professional foresters and botanists in India had been refuting the belief that eucalyptus oil helped cure malaria since the 1870s.[107]

Australian trees reshaped the ecology, social structure, and aesthetics of the landscape on the Nilgiri plateau. The landscape changed drastically. Blackwood, *Acacia melanoxylon*, used for its excellent timber, established itself quickly – perhaps too quickly – as one forester complained about their aggressive colonization in a report: 'If Ootacamund was deserted, the whole basin would probably at no lengthened period become a forest of these trees to the exclusion of almost all other vegetation'.[108] Australian trees altered the landscape because of their unique shape and leaves. Because of Australia's peculiarly nutrient-poor and dry conditions, Australian *Acacia* and *Eucalyptus* had evolved a specific adaptation called 'sclerophyll', in which leaves are small, tough, waxy, and have less nutrition. The leaves of Australian trees are rarely bright green like deciduous trees, and can be better described as a mix of grey, blue, and green. The colours proved depressing to many, and others criticized the rapid growth of *Acacia* and *Eucalyptus* because the 'tall Australian trees … shut out light, air and the view' of buildings around the city.[109] Towards the end of the nineteenth and early twentieth century many people complained about the destruction of the indigenous forests. The sportsman F. W. F. Fletcher later lamented, 'The grand indigenous sholas [the name for the native forests on the hills] have been cleared to make way for interminable forests of ugly eucalyptus and wattle'.[110]

Australian trees helped introduce capitalism, the distinction between state and private property, and a new social system in the region surrounding Ootacamund. Many British officials viewed the creation of plantations as a way of creating a wage labour force and a land revenue system for the indigenous people living on the Nilgiri plateau. Many of these plantations were often on or near 'wastelands' claimed near Badaga villages in the eastern half of the Nilgiri plateau.[111] Madras foresters and revenue officials sought to use revenue settlements and plantations to encourage the Badagas to become sedentary farmers and grazers.[112] The Badagas worked as labourers on plantations from the 1860s; sometimes they worked without payment because *monigars*, villagers chosen by the British to collect revenue and to find labour, forced them to work for free.[113] With a third of the forests on the Nilgiri

[107] Gamble, *Manual of Indian timbers* (1881 edn), p. 189.

[108] *Report of the conservator of forests for the official year 1868–69* (1870), p. 19.

[109] Francis, *Nilgiri*, pp. 215–6.

[110] F. W. F. Fletcher, *Sport in the Nilgiri and in Wynaad* (1911), p. 18.

[111] *Annual administration report of the forest department 1898* (1899), p. 33. Anthropologists tended to view the growth of eucalypts around the regions where hill tribes lived with approbation. J. Shortt, 'An account of the tribes on the Neilgherries', *Trans. Ethnological Soc. of London* 7 (1869), p. 234.

[112] Sutton, *Other landscapes*, pp. 134–5.

[113] Ibid., pp. 94–6.

plateau reserved, an expanding plantation frontier, and new laws in 1863 that required all unclaimed lands be auctioned, it became more difficult for the demographically expanding Badagas to acquire new lands.[114] They lost much of the land that they had formerly claimed and were hemmed in by plantations and state forest reservations.

Neither these scientific successes nor the ecological and social effects of Australian timber plantations can be attributed to the influence of German or French forestry methods. The report by Hutchins in 1882 – a full 30 years after the founding of the first government plantation – laid down for the first time a systematic working plan for the management of the plantations that estimated of the rates of growth, advocated a spacing and thinning regime, and calculated the future yield of the plantations. Hutchins maintained that the plantations should be managed as 'high forests', not as coppice on shorter rotations, as some, such as the previous conservator, Captain Beddome, had argued.[115] This required more thinning than had been previously done. Yet his theoretical analysis, based upon an individual-increment and acre-increment (i.e. figuring out the average yield per tree and acre), merely offered a guide for how to manage the plantations for the highest yield, and did not take into account the costs of labour or the exigencies of the market.

During the 1890s, the botanical garden and Indian forest service decided to stop making plantations of Australian trees and chose instead to replant the landscape with native trees. The Forestry Department ceased large scale planting of Australian trees in 1897.[116] The government gardens in Ootacamund and Coonoor began to grow more indigenous trees from the sholas in their nurseries for display at the garden, in the towns, and for planting in overcut sholas. Whereas the 1857 Botanical garden report noted that Australian trees were 'used in plantations for shelter and ornament, in preference to indigenous trees'[117] the botanical garden report for 1892–3 noted,

> As in the Government Gardens in Ootacamund, so here in Sim's Park [a botanical garden constructed in 1874 in Coonoor], the indigenous trees of the hills of Southern India are being grown in the place of the more common exotics.[118]

Complaints about the aesthetics of *Eucalyptus* forests by officials living at the government house in Ootacamund led to their replacement with indigenous trees in 1894:

> The whole of the blue gum forest, which has become very ugly and in some places dangerous … will be cut down, and the whole area planted up next year with indigenous shola trees.[119]

Foresters eventually rejected Hutchins's suggestion to manage the plantations as high-forest and chose instead to manage the plantations under a coppice system based upon a ten-year cycle.[120] By the 1890s and early 1900s it became apparent that the projected value of Australian

[114] Ibid., pp. 101–5.

[115] Hutchins, *Report on measurements*, p. 24.

[116] *Annual administration report of the forest department, Madras Presidency, for the twelve months ending 20 June 1897* (1898), p. 33.

[117] *Report on the government botanical and horticultural gardens Ootacamund for the year 1857*, p. 16.

[118] *Annual administration report of the government botanical gardens and parks, Nilgiri, for the year 1892–93* (1893), p. 2.

[119] *Annual administration report of the government botanical gardens and parks, Nilgiri, for the year Year 1893–94* (1894), p. 1.

[120] Francis, *Nilgiri*, pp. 215–6.

trees was overly generous. The timber of *Eucalyptus globulus*, imagined in the 1840s and 1850s to be as good as teak, proved much less durable and useful than imagined. The prediction of a forest famine never manifested itself for a variety of reasons. Railways in southern India used less wood than predicted, both for railway sleepers and fuel. From the 1860s onwards, the Madras Railway began to use iron instead of native timber sleepers.[121] Steam engines used more imported and domestic coal than originally expected.[122] The strict conservancy of reserved forests slowed and perhaps stopped the pace of deforestation in government forests in the late nineteenth and early twentieth centuries. Eventually the Forest Department had to quit working some plantations, such as the *Dharma* plantation of *E. globulus*, because of a 'lack of demand'.[123]

Plantations of Australian trees ultimately succeeded on the Nilgiri not because of any attempt to implement European forestry theory or practice. Like the teak growing at Nilambur, the climatic and environmental conditions of the Nilgiri plateau, especially the area surrounding Ootacamund, allowed for the rapid growth of cool weather Australian species of *Acacia* and *Eucalyptus*. Yet the success of Australian trees cannot be ascribed merely to environmental or geographic determinism, although these created conditions that allowed the trees to thrive. Human manipulation, especially through McIvor's methods of growing and transplanting, helped to officials to establish large government plantations in the region. Without the creation of a government town and growing agricultural plantations, it is unlikely that the need for firewood would have been as pressing. The success of Australian trees in the region resulted from the constant planting and support of a variety of people including missionaries, private landowners, foresters, district officers, revenue collectors, planters, and Badaga labourers. Indeed, the timing of planting and the supporters of Australian trees had strong connections with the expansion of coffee, tea, and cinchona plantations at the same period. The methods and planting regime of these trees over overlapped. It is this larger agricultural plantation economy and ecology in which historians should situate the rise of Australian timber plantations.

III

Widespread failures and partial successes occurred when Indian Forest Service officers tried to replicate the success of plantations at Ootacamund and Nilambur. Notably, the two most successful plantations were established prior to the formation of state forestry and the introduction of European forestry methods into India. They had strong linkages with the rise of a plantation agricultural and botanical garden complex in southern India. The failure to replicate the success of these two sites led forestry officials at the beginning of the twentieth century to turn away from plantations and to focus on regenerating existing indigenous forests. It was only in the middle of the twentieth century that timber

[121] See the discussion by Bryce McMaster, 'On the woods used for sleepers on the Madras railway', *Minutes of Proceedings of the Institution of Civil Engineers* 22 (1863), pp. 241–54.

[122] For some of the costs of coal versus wood and the various rates of usage by railway companies see *Trans. North of England Institute of Mining and Mechanical Engineers* 38 (1891), pp. 159–61.

[123] Francis, *Niligiri,* p. 215.

plantations proliferated across India, a result of continued experimentation with key genera, such as *Eucalyptus*.[124]

Successful plantation programmes during the late nineteenth century – in southern India, South Australia and the Cape Colony – resulted not from the introduction of European forestry methods, but rather from an experimental tradition that linked together botanical gardens with experiments in the field. Many of the key innovators in plantation techniques were not trained foresters, but came from a variety of backgrounds. The difficulties foresters faced when trying to replicate successful plantations show the ecological and economic limits of state forestry in India. Foresters could not easily replicate either European methods, or even local successes, elsewhere in India or throughout the British Empire. Historians focusing on forestry need to incorporate the general failure of plantations into their larger analysis, instead of implying that the successes of Nilambur and Ootacamund were characteristic of the fortunes of timber plantations as a whole.

[124] Brett Bennett, 'The El Dorado of Forestry: Eucalyptus in India, South Africa and Thailand, 1850–2000', *International Rev. of Social Hist.* 55 (2010), pp. 40–5.

‘Back to the land’: Lady Warwick and the movement for women’s collegiate agricultural education*

by Donald L. Opitz

Abstract

Within the late-Victorian and Edwardian movement to promote women’s advancement in farming and gardening, Frances Greville, countess of Warwick, founded the first women-only collegiate centre for agricultural education in 1898. Initially affiliated with the University Extension College, Reading, her scheme relocated to Studley, Warwickshire in 1903, where it flourished as an independent, private college. Historians have previously described the founding, development, and ultimate fate of Warwick’s project, but in this article I consider the question of its status within the broader movement for women’s collegiate agricultural education. As I show, Warwick’s advocacy for a ‘Back to the Land’ ideology and women’s scientific and practical instruction in the ‘lighter branches of agriculture’ added a decidedly rural, agrarian orientation to a movement otherwise dominated by an emphasis on urban horticulture; yet, despite her efforts, throughout its first decade, the scheme remained effectively trapped within the mould of horticultural education. The mismatch between Warwick’s ideals and practical achievements established her as a visionary whose contributions ironically reinforced the very tendencies she hoped to counteract.

In a 1903 issue of the *West Sussex Gazette*, the ‘gifted writer and scholar’, Miss Rachel Challice reported on the relocation of a British women’s agricultural school from its birthplace in urban Reading, Berkshire, to its new home in rural Studley, Warwickshire. Founded as a hostel five years earlier but now expanded into a college, this educational innovation of Frances Evelyn ‘Daisy’ Greville, countess of Warwick (1861–1938), recapitulated her strategy of returning educated women ‘back to the land’: ‘[T]he lasses … follow the course of training which, according to Lady Warwick’s scheme, leads energy and intellect “back to the land,” instead of

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allowing them to run to waste in the towns'.[1] This positioning of female 'energy and intellect' for the benefit of the land participated in a rich popular discourse linking women and science with national agricultural imperatives and, in so doing, strengthened a particular approach within a broader movement to advance women in the farming and gardening professions.

'Back to the land' thrived as a fairly common clarion call in the decades from the agricultural depression of the 1870s up to World War I. As Jan Marsh has shown, a confluence of factors elevated the status of the countryside within the British imagination: the poor conditions (and hence failed promise) of urban life, the declining status of (and hence need to rejuvenate) British agriculture, the resurgence of a moralistic nostalgia for the healthfulness of communing with nature, and the rise of suburbia.[2] For some social reformers, including aristocratic converts like Warwick, the call for a return to the land readily coupled with complaints over the wasting of women's talents. Applying trained female labour to '*la petite culture*' and, more specifically, the 'lighter branches of agriculture' (terms to be defined below) represented a single solution to the two-sided problem of distress among 'surplus' (unmarried and unemployed) middle- and upper-class women and struggling farming businesses. 'Careful pondering over these matters has convinced me that the solution of these two perplexing problems will be found in the juxtaposition of both', Warwick wrote in July 1899.[3]

As a leading advocate for this 'solution', Warwick recognized the critical value of scientific training in preparing women for agricultural careers and founded one of the first, independent collegiate programmes for women to study agriculture in 1898. Begining with the 'Lady Warwick Hostel' which she later extended into the 'Lady Warwick College', her efforts joined others within a broader movement to provide 'sound practical and scientific training for women', part of a tendency towards the professionalization of agriculture, as Nicola Verdon recently noted.[4] As I have described elsewhere, in the case of the Horticultural College, Swanley, the emphasis on scientific instruction was a strategic device to access the new county bursaries available to centres for technical instruction whilst asserting a new standard of qualification intended to create employment opportunities for women who otherwise lacked access to the male-dominated apprenticeships.[5]

Although traditionalists perceived this alignment of science and women to be a threat, Warwick shrewdly used science's potential to advance her cause. But, as I will show, her entrance into the larger movement to advance women's agricultural education notably shifted its emphasis from urban horticulture to rural agriculture, a nuance that has escaped previous historical analysis.[6] In the present article, then, I position Warwick's scheme within the larger

[1] University of Reading, Museum of English Rural Life [hereafter MERL], FR WAR 5/6/4, newspaper clipping, Rachel Challice, 'The Lady Warwick College at Studley Castle', *West Sussex Gazette*, n.d. For the 'gifted writer and scholar', id., 'Are the planets inhabited?' *Popular Astronomy* 11 (1903), p. 417 n.

[2] Jan Marsh, *Back to the land: the pastoral impulse in England, from 1880 to 1914* (1982), esp. pp. 1–7.

[3] Frances Evelyn Warwick, 'The new women and the old acres', *The Woman's Agricultural Times* (hereafter *WAT*) 1 (i) (1899), p. 2.

[4] Nicola Verdon, 'Business and pleasure: middle-class women's work and the professionalization of farming in England, 1890–1939', *J. British Studies* 51 (2012), p. 406.

[5] Donald L. Opitz, '"A triumph of brains over brute": Women and science at the Horticultural College, Swanley, 1890–1910', *Isis* 104 (2013), pp. 30–62.

[6] For historical accounts see D. M. Garstang, 'Studley College', *Agricultural Progress* 28 (1953), pp. 4–15; Pamela Horn, *Ladies of the manor: wives and daughters in country-house society, 1830–1918* (1992),

movement, and I explain how her 'back to the land' rationale underpinned a distinctive rural perspective, in which scientific training provided the means for improving rural industries. In a close analysis of the development and implementation of her scheme, I will assess the limited extent to which it developed the capacity to achieve her ideals. I conclude that, for all its rhetorical promise, Warwick's project failed to break from the earlier, more successful urban horticultural model that continued to dominate women's agricultural training in the early 1900s.

I

Lady Warwick explained what she meant by the 'lighter branches of agriculture' in her introduction to the sixth volume of the *Woman's Library* (1903), which was devoted to the topic: 'It implies all work on the land which requires skill rather than mere physical strength', and yet it 'requires something more than a light heart and nimble fingers'.[7] The branches included (as represented in the volume's contents) market gardening (especially of vegetables, fruits, and flowers), dairying, poultry-keeping, bee-keeping, and the commercial side of marketing produce. Warwick argued that young women were particularly suited to this range of work, and in order that they may develop the requisite competence, she prescribed 'sound training in some agricultural hostel or college'.[8] In formulating a women's sphere of agricultural occupations and prescribing college training, Warwick added her voice to a protracted, national debate concerning the state of agriculture, women's economic status, technical instruction, and the relationship between these issues. As we shall see, she built upon an established movement's *rural* foundations and its emphasis in women's country pursuits.

Warwick's promotion of 'the lighter branches of agriculture' as occupations for women co-opted a phrase already circulating in the agricultural vernacular and representing an area that proponents argued was of increasing economic importance. More generally these branches fell within '*la petit culture*', literally, 'small culture', or the smallholding system of land tenure that was more common in the United States and Continental Europe, especially France, than in Britain, where landlord/tenant farming on large estates predominated.[9] Commentators on the British 'land question' noted the desirability of expanding viable smallholdings in Britain within the context of the agricultural depression, and experiments in *la petit culture* and market gardening became beacons for a national political agenda.[10] In his public addresses, Gladstone often favoured what he termed 'spade cultivation' over the trends to consolidate smallholdings and mechanize farms, which he demonized as

Note 6 *continued*
pp. 185–91; Catherine Horwood, *Women and their gardens: a history from the Elizabethan era to today* (2010), pp. 288–95; Anne Meredith, 'Middle-class women and horticultural education, 1890–1939' (unpublished PhD thesis, University of Sussex, 2001), pp. 127–38; Kay N. Sanecki, *A short history of Studley College* (1990).

[7] Countess of Warwick, 'Introduction', in Edith Bradley and Bertha La Mothe, *The lighter branches of agriculture* (1903), pp. xv–xvi.

[8] Ibid.

[9] The Cobden Club, *Systems of land tenure in various countries* (1870).

[10] Joan Thirsk, *Alternative agriculture: a history from the Black Death to the present day* (1997), pp. 147–219.

the culprits behind the depression extending into the 1890s.[11] In his influential 1877 text, Frederick William Burbidge similarly underlined the commercial value of small culture and called for national education in this field:

> To enable our home growers to compete with those of other countries, it seems desirable that the State should make the subject of earth culture a necessary part of the instruction given in all board schools; or, better still, by the institution of an extensive and well managed national garden, in which the best fruits and vegetables of all kinds might be grown experimentally, and instructions given, not only to cultivators, but to others interested in the best methods of cultivating the soil.[12]

As these ideas percolated, advocates for women's employment seized upon the potential suitability of the work for women. Sympathizers argued that small culture entailed less physical exertion than large-scale commercial farming, making it an appropriate activity for women, who, according to popular gender norms, had more delicate constitutions than men. Nevertheless, to thwart women's involvement, traditionalists regularly cited the rigours of the male-dominated pursuits. In response, supporters consciously emphasized the healthfulness of *light* fieldwork for women. As such, they advanced an agricultural form of a standard separation of spheres for men's and women's roles, in which women were closely aligned with more private, domestic chores and men with more public, business enterprises.[13]

Despite an earlier historical view that a shift towards large-scale farming in the early nineteenth century gradually edged out the labour of farmers' wives and daughters, Verdon has argued that women continued to contribute to their families' farming businesses and retained a strong position in poultry-keeping and dairying work.[14] A well-documented, yet not atypical, case is that of Elizabeth Cotton, who performed a variety of (unpaid) work including the management of the dairy on her husband's 400-acre farm in Suffolk in the 1850s and 1860s.[15] Even with the lack of statistics, creating difficulties in charting the levels of women's – almost always unpaid – farming labour in the final decades of the nineteenth century, it is clear that women continued to perform work on large-scale farms throughout the century. A few were farmers: in the mid-1890s, Miss Katherine Courtauld of the prominent textile family was established in farming by her father. When she was 21, he bought for her the 243-acre Knight's Farm at Colne Engaine, Essex. Although still modest in size, Courtauld's farm included arable land, pastureland, dairies, gardens, and orchards.[16] One distinct area of food production that remained dominated by female labour was that of cheese-making, despite a growing

[11] W. E. Gladstone, 'The state of agriculture', in A. W. Hutton and H. J. Cohen (eds), *The speeches and public addresses of the Right Hon. W. E. Gladstone, M.P.* (1892), pp. 44–5.

[12] F. W. Burbidge, *Horticulture* (1877), p. 233.

[13] Karen Sayer, *Women of the fields: representations of rural women in the nineteenth century* (1995), pp. 33–48; Verdon, 'Business and pleasure', pp. 399–400, 404.

[14] Nicola Verdon '"… subjects deserving of the highest praise": farmers' wives and the farm economy in England, *c.*1700–1850', *AgHR* 51 (2003), pp. 23–39.

[15] Ibid, pp. 38–9; also Sheila M. Hardy, *The diary of a Suffolk farmer's wife, 1854–1869: a woman of her time*, ed. Jo Campling (1992).

[16] Peter King, *Women rule the plot: the story of the 100 year fight to establish women's place in farm and garden* (1999), pp. 106–8; Verdon, 'Business and pleasure', pp. 403–4.

contemporary advice literature that implied women's displacement with the introduction of new scientific methods.[17]

The question of farming and gardening as paid occupations for women became a subject of public debate in the 1870s, within the context of the broader movement for advancing women's employment. British general periodicals – especially labourers' and women's magazines – floated the idea of women as independent farmers, market-gardeners, and estate head-gardeners, and they disseminated international news about women's successes, making pioneering cases like Elise Pierson Buckingham's California ranch known to British organizers.[18] Correspondents to *The Woman's Gazette* between 1876 and 1877 also raised the question of gardening as an employment for *ladies* among the class of distressed gentlewomen, and the forceful Frances Power Cobbe elaborated how the success of one 'gardeness' could serve to build a movement:

> [W]hen her little establishment is in full working order, our lady market-gardener might invite one or more other ladies to board and share her work, who will thus study practical gardening as a profession, and fit themselves to take the posts of head-gardeners in country-seats where a few under-gardeners are employed.[19]

The suggestion proved premature by a dozen years, as the question of systematic training took priority. In reprinting Cobbe's letter in *The Garden*, William Robinson ridiculed, 'She does not know how much has to be learnt to make a good gardener now-a-days'.[20]

With the arrival of the agricultural depression, writer Jane Chesney O'Donnell also advanced the question but recognized the need for formalized training: 'One great bar to the increase in fruit-culture amongst us at present … is the want of technical knowledge'.[21] Within a social reform magazine column devoted to 'What Women Can Be and Do', she made one of the earliest detailed proposals for 'a Horticultural College, which should combine with its teachings something of the commercial element so as to become self-supporting' – precisely the model pursued in Swanley, Kent a decade later (to which I will return). But already in June 1878 she specified:

> Instruction should be theoretical and practical, wide and thorough. The pupil should study agricultural chemistry, botany, geology, entomology … A system of examinations, too, should be organised and certificates of proficiency be given.[22]

With the disastrous effects of the 1878 and 1879 farming seasons now in view, by August 1879 she re-emphasized the virtues of small culture both for its competitiveness and profitability, citing Burbidge as her authority: 'as much profit is obtainable from two acres under garden

[17] On cheese dairying, Sally McMurray, 'Women's work in agriculture: divergent trends in England and America, 1800 to 1930', *Comparative Studies in Society and Hist.* 34 (1992), pp. 248–70.

[18] 'Gardening as an employment for women', in Countess of Aberdeen (ed.), *Women in professions* (1900), p. 157; Bertha H. Smith, 'Women ranchers of the coast', *The Country Gentleman* 79 (1913), pp. 1628–9.

[19] Frances Power Cobbe, 'Correspondence', *The Woman's Gazette* 2 (vii) (1877), p. 109.

[20] William Robinson, 'Women as gardeners', *The Garden* 12 (1877), p. 293.

[21] Jane Chesney, 'A new vocation for women', *Macmillan's Magazine* 60 (1879), p. 344. Chesney also published under her married name of O'Donnell.

[22] Jane O'Donnell, 'What women can be and do', *Social Notes* (xvii) (1878), pp. 262–3.

culture as from five times the space farmed in the ordinary way.[23] Her views, reprinted on both sides of the Atlantic, reached a wide audience of readers.

On the heels of O'Donnell's proposal, in October 1879 Emily Faithfull showcased a specific example about 'A Woman Farmer' in her *Victoria Magazine*. This was the American, Marie Louise Thomas, who managed a farm of 20 acres in Tacony (near Philadelphia), Pennsylvania as a means for sustaining her family's livelihood amid the declining health of her aged husband, the well-known Unitarian minister Abel Charles Thomas. There she cultivated wheat, small fruits and pears; raised and kept cattle, poultry and bees; and produced butter and honey. Thomas explained her success to would-be women farmers in lectures and published testimonies.[24] But Faithfull publicized further examples of women proprietorships when she reported on her American travels, and like O'Donnell she raised the question of training. In her 1884 book, *Three Visits to America*, she highlighted Mrs Jennie Carr's 'industrial rural school to prepare girls for practical farming' in Pasadena, California.[25] Faithfull excerpted Carr's writing about 'Woman and Land', in which Carr put forth the idea of a 'Woman's Industrial University … the model for hundreds of practical training-schools throughout the country'.[26]

Spurred on by the publicity of such exceptional American cases and the mounting discussions within the women's periodical press, organizing efforts got underway. A London campaign in autumn 1879 led to the founding of a Ladies' Association 'for the Promotion of Horticulture and *Minor* Food Production' – the name satirized in *Punch* (and afterwards shortened with the dropping of 'Horticulture').[27] Leading this effort was the medically trained Isabel Jane Thorne, who explained its objective as 'providing interesting and profitable employment for educated women, and giving them a scientific and practical training in the branches of food production included in the French term "*la petite culture*"'. The intended subjects of instruction included 'poultry and pig rearing, dairy work, fruit, flower, and vegetable culture, and beekeeping'.[28] Within weeks, after receiving 'numerous letters' showing 'that there is a widespread interest throughout Great Britain', Thorne reported the association's hope for organizing 'an institution where complete training can be given to women'. Citing statistics from the success of poultry breeding in France, she argued that this 'intelligent practice of one of the branches of the work …, which can easily be carried on by women, may become an important factor in the national wealth'.[29] As Anne Meredith has described, *The Englishwoman's Review* followed the developments closely, reporting that the association organized lodgings for ladies to attend lectures in South Kensington for several years and thereby produced at least a couple

[23] Chesney, 'Vocation', p. 345. This was reprinted in American magazines like the *Living Age* [Boston] 143 (1879), pp. 728–32 and *Library Magazine* [New York] 2 (1880), pp. 252–8. *The Spectator* [London] 52 (1879), p. 1018, endorsed her ideas, urging that the 'admirable suggestions may be acted upon, and an efficient school of horticulture, open to persons of both sexes, established'.

[24] Emily Faithfull, 'A woman farmer', *Victoria Magazine* 33 (1879), pp. 534–6. Thomas spoke, for example, to a women's club over which she presided in New York City: 'Sorosis hears about bees', *The New York Times*, 19 Feb. 1895, p. 16.

[25] Emily Faithfull, *Three visits to America* (Edinburgh, 1884), pp. 248–9.

[26] Ibid., p. 249.

[27] 'New work for woman', *Punch* 77 (1879), p. 297; Isabel Thorne, 'Food production', *The Times*, 6 Jan. 1880, p. 8, emphasis added.

[28] Thorne, 'Food Production', p. 8.

[29] Ibid.: *The Times*, 17 Feb. 1880, p. 11.

of noteworthy, successful women-led flower market gardens.[30] Although the 'movement' (as Thorne repeatedly referred to it) seemed to fizzle within a decade, in some measure it energized the next wave leading to independent residential schemes, with greater longevity and influence.[31]

The early years of the movement thus showed a progression from rural theory to urban practice. Beginning with a general concern over British agriculture's failure to compete with foreign imports, advocates argued for the appropriateness of rural occupations for unmarried daughters of country gentlemen who faced the problem of earning their own livelihoods. In tandem with the idea that women could be farmers and estate gardeners, proponents recognized the need for systematic training and floated proposals for formalized agricultural and horticultural education. The London origins of the first successful scheme, directed by Thorpe, grounded those proposals in a decidedly urban context, precipitating the next significant development – the urban orientation of the first college that provided women with comprehensive, scientific training in horticulture. This urban dimension to the movement foreshadowed Warwick's imminent assertion of a need to return women 'back to the land'.

II

Although the activists clearly envisioned rural farms and market gardens of various types as destinations for women with the requisite training, they increasingly discovered more strategic niches within the up-and-coming realms of cities, suburbs, and colonial settlements. As opposed to agricultural occupations connected with rural farming estates, then, the movement emphasized those activities – small-scale food productions and decorative gardening – closely associated with homes and gardens of more modest means and typically situated in villages and towns. The educational schemes that took hold continued to address small culture in its full extent – dairying, poultry-keeping, bee-keeping, cultivation of fruits, vegetables, and flowers, and all of the associated food productions – but the job prospects tended to lie more often within private gardens and nurseries than farms. Two main catalysts propelled organizers' energies specifically in the direction of town gardening as distinct from commercial agriculture.

First, whereas women's field labour in the British Isles remained contentious, its potential for helping settle the colonies proved less objectionable, involving as it did another sphere constructed as domestic and feminine. Directed towards an imperial civilizing mission, women's rural skills were attuned more strictly to domestic management on colonial ranches, i.e., supervision of the household economy and associated outdoor tasks, particularly cultivation of kitchen and decorative gardens and the keeping of livestock. Organizations co-ordinating the emigration of women in service of colonial homesteads worked to establish formalized training under distinctly colonial conditions, leading to the establishment of the Colonial

[30] Meredith, 'Middle-class women', pp. 47–8.

[31] Grace Thompson identified Thorne's association as 'the beginning of the movement which led to the foundation of Swanley Horticultural College [*sic*] and other horticultural schools and poultry-farms for women'; Otto Fischel and Max Von Boehn, *Modes and manners of the nineteenth century,* trans. Grace Thompson (4 vols, 1927), IV, p. 76.

Training Home at Leaton, Shropshire, and its dedicated curriculum in home economics and horticultural subjects in 1890.[32] As we shall see, colonial departments in the horticultural and agricultural colleges also joined this trend.

Second, the same logic underpinning women's usefulness to improving the national status of agriculture also propelled one enterprising London businessman to recognize the value of scientific instruction in the training of *male* middle-class students for careers in small culture. From the ambitions of Arthur Harper Bond and his supportive urban network emerged the Horticultural College, Swanley, in Kent, the first residential college devoted to horticultural training, and although beginning as a men-only institution in 1889, it became co-educational in 1891 and women-only in 1903. As I have shown elsewhere, Swanley (to shorten the college's name) was singular in advancing the cause for women's scientific education in horticulture and allied subjects in the 1890s.[33] Although its evolution proceeded quite independently of Warwick's scheme, it provided *the* focus for the women's agricultural education movement in the ensuing years.

Swanley's founders and feminizing agents approached the problem from an unmistakably urban perspective that shaped both the form and function of their contributions to the movement. Although bearing a similar arrangement as traditional models for residential, agrarian education and apprenticeships, and ultimately situated on a country estate some 20 miles outside of London, the college was formed by the entrepreneurial Bond in January 1889 as a joint-stock company, with one objective being explicitly:

> To carry on business as horticulturalists, market gardeners, fruit growers, seed merchants, farmers and graziers, and to buy, sell, manufacture, and deal in implements, machinery and apparatus of all kinds required by customers of the Company, and to buy, sell, grow, improve, preserve and deal in plants, vegetables, shrubs, trees, fruit, and other products of all kinds.[34]

The college's market emphasis aligned well with national imperatives promulgated by the likes of Gladstone; when welcoming the attendees of the Hawarden and Buckley Floral and Horticultural Society's annual show, which he hosted at his Hawarden Castle in August 1890, he cited a lecture by pomologist Cecil Henry Hooper, 'a Kentish man occupying an important position in Kent, in the Horticultural College', as 'a rather important sign of the progress the subject is making'.[35] One mark of the college's departure from its rural precedents was the class origins of the students; whereas long-established private colleges like the Royal Agricultural College, Cirencester strove to prepare sons of gentlemen for managing their estates, Swanley

[32] On the alignment of imperialists' agendas, female emigration, and domestic ideals, see Lisa Chilton, 'A new class of women for the colonies: *The Imperial Colonist* and the construction of empire', in Carl Bridge and Kent Fedorowich (eds), *The British world: diaspora, culture and identity* (2003), pp. 36–56. Further on women's colonial training and occupations, see James A. Hammerton, *Emigrant gentlewomen: genteel poverty and female emigration, 1830–1914* (1979). On the influential masculine precedent, the Colonial College, Hollesley Bay, see Opitz, 'A triumph of brains', pp. 48–9.

[33] Opitz, 'A triumph of brains'.

[34] The National Archives, Kew (hereafter TNA), BT 31/4333/28142, 'Memorandum of association of the Horticultural College and Produce Company, Limited, 30 Jan. 1889'.

[35] 'Mr Gladstone on cottage gardening and fruit farming', *The Times*, 22 Aug. 1890, p. 5.

joined a groundswell of new institutions devoted to 'the masses', primarily sons of professional and middle-class men.[36]

Although an alumnus retrospectively claimed that 'Bond had in mind, from the beginning, the possibility of admitting women students', it took a well-known advocate for women's professional advancement to convince the college directors to accept its first female students in 1891.[37] Precipitating this historic victory were the experiment and organizing efforts of Miss Emma Cons, founder of the so-called 'penny lectures' by eminent men of science, held at her Royal Victoria Coffee and Music Hall ('the Old Vic'), and of the Morley Memorial College for Working Men and Women that developed from those lectures.[38] Having sat as a pioneering councilwoman on the London County Council, Cons's interest in Swanley developed when fellow councillor John McDougall, an original shareholder of the college's limited company and uncle to a 'Swanleyite', invited Cons to visit the campus in 1890. She was joined by her friend Miss Ethel Gertrude Everest, a lady of some means, and the 'autumn two energetic spirits [*sic*]' remained at the college for a few weeks to work alongside the students and thereby 'prove' that women had the physical capacity to withstand the rigors of the training.[39] Their investments of sweat and, perhaps more critically, capital (in Everest's case, £250) swayed Swanley's directors to accept their proposal, supported by the noted London landscape gardener of the Metropolitan Public Gardens Association, Miss Fanny Rollo Wilkinson, to open a 'Ladies' Branch' in June 1891.[40]

The locus of support for Swanley's Ladies' Branch lay in urban quarters. Through Wilkinson, Cons called upon London's network of women gardeners, significantly including Mrs Edith Laxon Chamberlain, founder of the Women's London Gardening Association. Chamberlain's business hired women gardeners on a contract basis to care for private gardens, conservatories, window boxes, and interior plants in London, and she took in apprentices for instruction in floral arrangement and nursery work.[41] In addition to lending her business's premises for the meeting of Cons's group, during which they drew up the first prospectus of the Ladies' Branch, Chamberlain agreed to serve as the branch's first honorary secretary. Chamberlain, who lectured on 'town gardening' at the Portman Rooms in central London, drew notice to Swanley's new branch when she repeated her lectures at the International Horticultural Exhibition at Earl's Court in the summer of 1892. Her lectures were afterwards collected in

[36] For the class distinctions, see R. Hedger Wallace, 'On agricultural education', *Trans. Royal Scottish Soc. of Arts* 12 (1891), p. 150.

[37] R. J. Tabor, 'Arthur Harper Bond', *Horticultural College Magazine* (hereafter *HCM*) (lxxxvii) (1941), p. 5. On Tabor, see A. B. Beakbane, 'A brief historical account of some members of the governing body of Swanley Horticultural College', *The Swanley Magazine* 6 (xcvii) (1946), pp. 7–8.

[38] *ODNB*, 'Cons, Emma (1838–1912)'.

[39] Emmeline Eason Wilkinson, 'The history of the college, part III: recollections of the early days', *HCM* (Nov. 1916), p. 20; Elsa Morrow, 'A history of Swanley Horticultural College', *Wye: The J. of the Agricola Club and Swanley Guild* 21 (iii) (1985), p. 80; TNA, BT 31/4333/28142/item 5, 'Summary of Capital and Shares', 26 Jun. 1889.

[40] Elisabeth Crawford, *Enterprising women: the Garretts and their circle* (2009), p. 231; Morrow, 'Swanley', p. 80. For the prospectus, Hextable Heritage Centre, Swanley Town Council (hereafter HHC), W00011/1, 'The Ladies' Branch of the Horticultural College, South Bank, Hextable, Swanley', in 'Women's Branch of the Horticultural College, Swanley, minute-book (May 1891 to Nov. 1893)'.

[41] Frances Wolseley, *Gardening for women* (1908), pp. 257–8.

the volume, *Town and Home Gardening*.[42] As Sarah Bilston has pointed out, in Chamberlain's advocacy for women gardeners she made 'the relationship between traditional domestic and modern professional roles particularly clear'.[43] Thus in her handbook for gentlewomen, featuring a chapter on 'Gardening as a Profession' that highlighted Swanley's Ladies' Branch, she underlined the value of a scientific curriculum: 'To some minds much of this appears unnecessary, but it should be remembered that in this artificial age the gardener is always trying to forestall Nature, and only science can help him (or her) to achieve this'.[44] In her view, Chamberlain wedded science and modernity, horticulture and urbanity.

Although, as we have seen, the broader movement envisioned a range of rural, agrarian pursuits for women possessing the requisite training, in line with the new urban emphasis the leadership of Swanley's Women's Branch (as it was quickly renamed) focused primarily on equipping its students for situations in private gardens, market gardens, and nurseries. One gentlewoman visitor to Swanley, herself an accomplished horticulturalist 'brought up for the most part in the country', recognized the Women's Branch's potential for promoting 'a new employment … for women of small means'. She suggested how within 'many of the suburban districts the dulness [*sic*] of the small plots of ground in front of the houses is entirely owing to the want of education in the neighbouring nurserymen', and '[a] lady gardener might easily undertake to lay out these plots in endless variety'. She identified 'larger villas, where single ladies might prefer a woman head-gardener with a man under her to do the rougher and heavier work', and greenhouses as further suitable situations for women with both the training and maturity.[45] The potential envisaged here lay within suburbia as opposed to rural arcadia. As Crawford illustrated in some detail, a good number of the graduates went to the cottage gardens of prominent middle-class women, for example a 'series of ex-Swanley gardeners' to Elizabeth Garrett Anderson's Alde House in the Suffolk village of Aldeburgh.[46] As one of Britain's pioneering women doctors, Anderson was quick to proclaim horticulture to be 'a healthy and suitable employment for women' and sat on the Women's Branch's council from 1893.[47] The honorary secretary of the Women's Branch, Miss Ada Goodrich Freer (afterwards Mrs Spoer), later confirmed the apparent trend, writing in 1899: 'Nine-tenths, at least, of would-be employers who have applied to me for women-gardeners are themselves women, and in very many cases they have offered as a reason that they thought it right to promote a new opening for women's work'.[48]

A peak in Swanley's publicity coincided with a significant reopening of the question of rural women's potential, however. Among the events commemorating Queen Victoria's

[42] Crawford, *Enterprising women*, p. 231. See also Karen Sayer, *Country cottages: a cultural history* (2000), pp. 92–102.

[43] Sarah Bilston, 'Queens of the gardens: Victorian women gardeners and the rise of the gardening advice text', *Victorian Literature and Culture* 36 (2008), p. 13; Edith L. Chamberlain, *Town and home gardening* (1893).

[44] Edith L. Chamberlain and Fanny Douglas, *The Gentlewoman's Book of Gardening* (1892), pp. 213–4.

[45] C. W. Earle, *Pot-pourri from a Surrey garden* (1897), pp. 4, 39–40; see *ODNB*, 'Earle, (Maria) Theresa (1836–1925)'.

[46] Crawford, *Enterprising women*, p. 234.

[47] HHC, SWAN00015, 'Women's Branch of The Horticultural College, Swanley, Kent, second annual report, December 1893', in 'Reports, 1892–1912', p. 7.

[48] Ada Goodrich Freer, 'Horticulture as a profession for the educated', *The Nineteenth Century* 46 (Nov. 1899), p. 776.

Diamond Jubilee, a congress devoted to 'Agricultural Education for Women in Great Britain, Ireland, and the Colonies' was held in early July 1897, at the Empress Theatre in Earl's Court, London. As part of the 'Victoria Era Exhibition', the topic was 'so keenly discussed, that the session was prolonged far beyond the allotted time'.[49] The congress addressed women's capacity for agricultural pursuits in the widest sense, and the presentation by Lady Georgina Vernon, who kept an apiary in the country at Hanbury Hall, Worcestershire, proposed 'activities connected with agriculture' as an answer to 'the problem of how to obtain the most profitable and suitable employment for women of the upper classes'.[50] Given her own rural and upper-class orientation to the subject, Vernon emphasized the potential inherent in small culture as well as estate gardening. With respect to dairying for example, she advised against 'embarking in a large business which would entail a number of men for the care of the cows', emphasizing instead the profitability awaiting 'one or two girls joined together in a small dairy farm', i.e., 'a small house and land for one or two cows'.[51] She also affirmed the opportunities in gardening, 'a branch of work which could so easily be carried on by ladies in their own homes and their own gardens'. But she cautioned that '[a] garden, to be profitable, demands knowledge of horticulture', and she advocated 'a course of instruction at the Horticultural College at Swanley in Kent, if this occupation is to be taken up seriously'.[52] In sum, this country gentlewoman's statements provoked a shift in the movement back towards rural concerns.

Ironically one of the male detractors of women's pursuit of horticulture contributed to this shift. In his presentation at the congress, the Oxford chemist, Hugh O'Donoghue Macan, argued, 'I am bound to say, and I will always say, that I cannot recommend women to take up the work of professional gardeners', citing as evidence Swanley's low job placement of women graduates into professional positions apart from 'doing valuable work in their own homes'.[53] And here, alternatively, Macan stated his position that women should be trained in rural, agricultural pursuits to 'enable them to supplement the work of men in the country and not to supplant them', achieving '[t]he harmonious working of all members of the family together'.[54] By invoking the rhetoric of separate spheres and speaking only a few years after the opening of the Women's Branch, Macan cast an unfair shadow over the gradual but certain success that the Swanley women enjoyed in obtaining a broad range of positions – especially in market gardening – over the ensuing decade.[55]

Whether sympathetic or adversarial, the discussion at the 1897 Victoria Era Exhibition uniformly underscored the ascendancy of horticulture in the movement whilst noting the unrealized potential in agriculture as a whole. Swanley emerged as the beacon for women's scientific training but for outcomes more closely aligned with what Chamberlain popularized

[49] C. W. Kimmins, 'Introduction', in Countess of Warwick (ed.), *Progress in women's education in the British Empire* (1898), p. xviii. The congress was part of the Education subsection of the Women's Work section of the Victoria Era Exhibition.

[50] Lady Georgina Vernon, 'The training of women in dairy work and other outdoor industries', in Warwick (ed.), *Progress in women's education*, pp. 127–8.

[51] Ibid., p. 133.

[52] Ibid., pp. 135–6.

[53] H. Macan, 'Education suitable for women in rural districts', in Warwick (ed.), *Progress in women's education*, pp. 144–5.

[54] Ibid., p. 149.

[55] On the job placement statistics, see Opitz, 'A triumph of brains' , pp. 55–7.

as 'town and home gardening', thereby associating women's potential with the modernity of scientific training and urban living. It was against this backdrop – and indeed, in reaction to it – that Warwick advanced her own ideas for promoting women's education and careers in agriculture. She picked up on Vernon's main proposal that agriculture offered a key solution for retaining women on the land. Warwick soon afterwards elaborated a full rationale for an 'Agricultural Training College for Women', which, although including 'practical work' in 'Horticulture', among other subjects, positioned 'Agriculture' as the overarching frame and leading subject for the college and its curriculum.[56]

III

While the Horticultural College at Swanley worked to accommodate the increasing women's enrolments (which overtook the men's in 1896), Warwick pursued an initiative of her own that gave rise to a competitor institution. Renowned as an aristocratic beauty, before and after her marriage to Francis Greville, Lord Brooke (and earl of Warwick from 1893), Daisy (as she was generally known) notoriously received the attention of various suitors and lovers, including the Prince of Wales (who addressed her as 'My darling little Daisy wife').[57] After several years of 'dalliance' (as the *Oxford Dictionary of National Biography* aptly put it), Daisy focused more on fulfilling a 'Lady Bountiful' role with considerable seriousness.[58] She first became interested in the plight of unemployed labourers' daughters in the neighbourhood of her inherited estates centred on Easton Lodge, near Dunmow, Essex. There she launched, in 1891, the Easton School of Needlework to provide village girls with a form of technical training. In connection with this endeavour, and to provide the girls with prospects for work, she set up a shop on Bond Street in London. After meeting the journalist and 'professional moralizer' W. T. Stead in 1892, she received his encouragement for expanding her interests in this form of structural social reform.[59] Macan pointed to one artifact of her next project – in many ways more closely associated with her developing interest in women's higher agricultural training – at the Victoria Era Exhibition congress: 'that little leaflet … laid upon [attendees'] chairs, giving an account of the technical school at Dunmow which has been started by the Countess of Warwick'.[60] This was her 'Secondary and Technical School' (afterwards 'Secondary and Agricultural School') established in early 1897 at Bigods Hall, near Dunmow, Essex.

Her home county having been hard-hit by the agricultural depression, Warwick came to believe that technical education held the key to a sustainable solution, an idea nurtured through her friendship with Joseph Arch, a radical, working-class agriculturalist, later MP, living in the village adjacent to her husband's Warwick Castle estate. During periodic visits to Arch's cottage 'just outside the gates of the Castle' in the mid-1890s, Warwick learned of his 'struggles and victories' for working-class labourers' rights, especially his founding of the

[56] Countess of Warwick, 'Woman and the future of agriculture', *The Land Magazine* (i) (1897), pp. 723–9.

[57] Kate Caffrey, *The 1900s lady* (1976), p. 115.

[58] ODNB, 'Greville, Frances Evelyn, Countess of Warwick (1861–1938)'; 'Lady Bountiful' was a term Warwick applied to herself; see, for example, Frances Countess of Warwick, *Life's ebb & flow* (1929), p. 100. On this role, see Horn, *Ladies of the manor*.

[59] Margaret Blunden, *The Countess of Warwick* (1967), pp. 79–81.

[60] Macan, 'Education', p. 146.

first Agricultural Labourer's Union in England (in 1872) and its advocacy for enfranchising labourers (achieved with the Third Reform Bill of 1884). During this time she suggested that he write, and she edit, his autobiography for publication, a project that impressed upon her that '[a]dequate education, elementary and technical, is what the agricultural labourer now needs most of all'.[61] As she prepared to undertake this project, in November 1896 at a meeting of the Barking Technical Instruction Committee, during which she presented prizes, she heard chemist Raphael Meldola deliver a speech in which he expressed concern over the 'absence of technical day schools teaching the basic scientific principles underlying production' within the context of Britain's lagging competition behind foreign markets.[62] Spurred by such ideas and dissatisfied with the poor secondary schools in her district, she sought to remedy the situation by founding a secondary school specializing in the technical preparation of local pupils for work in agricultural and allied rural industries, including ones she deemed especially suitable for young, working-class women.[63]

Officially opened in February 1897 in buildings adjoining Bigods Hall on an estate of some 17 acres acquired for the purpose, the school accepted day students between the ages of 12 and 16. By 1898, to align the school with the Essex County Council's requirements for recognition as a science school eligible for technical instruction funds, Meldola advised Warwick to establish a separate 'Science School' section providing a three-year (afterwards two-year) course of study 'prescribed by the Science and Art Department'. She also opened Bigods Hall as a dormitory to mitigate the school's remoteness for many of the students.[64] In receipt of technical instruction funding, Warwick had chemical and physical laboratories built to accommodate practical demonstrations alongside theoretical instruction, and she provided 'all Senior Scholars' with experimental garden plots. In due course, she added a biology laboratory, a one-acre experimental farm, a dairy, an apiary, an orchard, glasshouses, a poultry run, a meteorological station, and an agricultural museum. Meldola drew up the scientific curriculum and selected the first principal, Eugene Edwin Hennesey, a science demonstrator from the Royal College of Science, London.[65] Despite offering co-educational instruction in most subjects, for the first couple of years the girls' training departed from the boys' in its substitution of botany and home economics, for physics, and flower cultivation, for vegetable cultivation. These gendered divisions shifted after the turn of the century, physics being added to the girls' subjects and the only remaining sex differentiation lying within the manual work. As Hennesey explained,

[61] Warwick, *Life's ebb*, p. 145; ead., 'Preface', in Countess of Warwick (ed.) *Joseph Arch: the story of his life, told by himself* (1898), p. xiv.

[62] Blunden, *Warwick*, p. 117. See also Ralphael Meldola, 'The education of the farmer's son and (?) daughter', *WAT* 1 (x) (1900), p. 3.

[63] On the pedagogical connections between Warwick's schools, see James A. Kettle, 'Preparation for Life: the Countess of Warwick and British education' (unpublished ts, Forth Worth, TX, 1984), pp. 2–3.

[64] Meldola, 'Education', p. 4; Essex Record Office, T/P 229/23, *The Countess of Warwick's Secondary and Technical Schools, Bigods, Dunmow, Essex* (n.d.). On the date of the school's original opening, Countess of Warwick, 'Technical education in rural districts', in Henry Treuman Wood (ed.), *International Congress on Technical Education: report of the proceedings of the fourth meeting* (1897), p. 231. For curricular changes, *The Countess of Warwick's Secondary and Agricultural Schools, Bigods Hall, Dunmow, Essex* (1903), a copy of which is held by the National Agricultural Library, Beltsville, MD, USA).

[65] Hannah Gay, 'Chemist, entomologist, Darwinian, and man of affairs: Raphael Meldola and the making of a scientific career,' *Annals of Science* 67 (2010), pp. 106–7.

'I do not think it is possible to have separate courses for boys and girls in rural schools, and for this reason that rural science schools are, as a rule, not big enough to allow of two courses running side by side'.[66] Private philanthropists funded a number of scholarships and prizes, including one given annually by Meldola 'for the best natural history collection'.[67]

According to Hennesey, the 'elementary course' at Bigods included science subjects in which 'we do *not* give an agricultural bias', but beginning in the third year 'the course must undoubtedly have rural science for its foundation', and this meant both classroom and practical agricultural instruction. 'The course', Hennesey explained at a London conference of science teachers in January 1902, 'is really an elementary investigation into the properties – chemical, physical and biological – of the soil and of the plant, and the interdependence of these two'.[68] Meldola, speaking at the same conference about his role in adapting the curriculum of the Science and Art Department 'to the requirements of our case', noted the lack of precedents for developing 'a scheme with an agricultural bias'. He underlined, 'public attention had not been awakened to the different requirements of town and country education'.[69]

This emphasis on Bigods Hall as a centre for *country* science education presaged Warwick's application of a similar logic to women's collegiate agricultural education. In a paper she delivered at the International Congress on Technical Education in London in June 1897, just weeks before the Victoria Era Exhibition, Warwick explained the fundamental tenets underlying her Bigods experiment as they related to women's technical education, foreshadowing her intervention in the women's agricultural movement.[70] Here she succinctly rationalized agricultural instruction steeped in natural science, with reference to back-to-the-land principles:

> [S]o much of my interest is centred on rural subjects …, with special reference to the Technical Education of girls and women, as its careful development may help – not a little – to stay the de-population of our villages … First then and all important to the country child should come the study of Nature … . An intelligent appreciation of natural phenomena and natural laws when applied to agriculture might go a long way to relieve the depression from which our rural districts are suffering so keenly.[71]

At this point in the development of her ideas – on the brink of expanding greatly – Warwick thought of the beneficiaries and their potential occupations in quite conservative, even condescending terms. The instruction she envisioned 'will be for the wives and daughters of farmers, artisans, and agricultural labourers', a class for whom 'the only industry especially applicable is that of dairying, which is more or less women's work'.[72]

Her 'interesting educational experiment' at Bigods Hall faced education scholar Michael Ernest Sadler's mixed approbation when he reviewed it for the Essex Education Committee in

[66] E. E. Hennesey, 'Technical education in English rural secondary schools', *The London Technical Education Gazette* 8 (1902), p. 46.

[67] *Warwick's Secondary and Technical Schools*; Michael E. Sadler, *Report on secondary and higher education in Essex* (1906), pp. 295–6.

[68] Hennesey, 'Technical education', pp. 46–7.

[69] R. Meldola, 'Pioneer work in secondary and technical education in rural districts', *The London Technical Education Gazette* 8 (1902), p. 50.

[70] On the congress, see Henry Treuman Wood, 'International Congress on Technical Education', in Wood, *International Congress*, p. vi.

[71] Warwick, 'Technical education', p. 223.

[72] Ibid., p. 225.

1905. Underlining the 'great value' of Warwick's founding premise that 'the future life-needs of the pupils should colour the course of training which a secondary school should give', he found the technical side of the school's curriculum efficacious, being 'sound in scientific principle and practical in its execution'.[73] Nevertheless, this focus, believed to give short shrift to 'a general education efficient in all respects, and especially thorough as regards English subjects', also jeopardized, and ultimately cost, the school's recognition by the Board of Education 'as a secondary school in receipt of grants'. Sadler's investigation prompted a special inspection of the school by the Essex Education Committee in 1906, leading to the discontinuance of its annual subsidy of £100 and leaving the school to rely upon private means alone, most especially Warwick's own annual contributions of up to £1000. Within 10 years of its foundation, Warwick found 'I could not afford to continue the school until it paid its way' and thus felt forced to close Bigods Hall by 1908.[74] Despite Sadler's finding that between 1900 and 1905 nearly half of the boys who attended 'have subsequently become farmers', Warwick afterwards reached a different conclusion based upon old students' anecdotal letters: 'With the exception of three prosperous farmers, not one of them went on the land'.[75] Based on the lacklustre state support the school received, Warwick later concluded, 'My efforts were a little before their day'.[76]

IV

The eventual failure of Bigods lay most of a decade in the future. For the moment, the Bigods experiment positioned Warwick as an influential female voice in the technical education movement, and it was in this capacity that she joined the discussion on women's agricultural education at the Victoria Era Exhibition in 1897. Attended by ladies like Vernon, 'drawn from polite Society [but] having special associations with country life', the congress turned Warwick's attention to the potential of technical education *beyond* the secondary level for preparing women of the middle and upper classes for work in a range of agricultural branches.[77] She thus set herself on a new project and publicly announced her educational scheme in the December issue of *The Land Magazine*; there she elaborated upon the congress's idea that women could usefully contribute to the improvement of agriculture within a specified sphere: '[M]en have not hitherto given the necessary time and thought to the *lighter branches of agriculture*, such as poultry- and bee-keeping, flower and fruit growing, jam and soft cheese making, and such like; and it may be added that many women are gifted with more of the commercial instinct'.[78] Acutely aware of the criticisms of dissenters like Macan, who questioned the fitness of women for heavy farm labour, Warwick rephrased the dissent into justification for a separate sphere for 'women possessed of systematic training … in *supplementing*, not *supplanting*, the work of their husbands and brothers on the farm'.[79] In publicizing her nascent scheme, she and her collaborators singularly popularized this feminized sphere consisting of the 'lighter branches of agriculture'. Warwick's intervention made a decisive departure from the women's

[73] Sadler, *Report*, pp. 295, 301.

[74] Ibid., p. 301; Blunden, *Warwick*, p. 197; Warwick, *Life's ebb*, p. 290.

[75] Ibid.

[76] Ibid., p. 286.

[77] Blunden, *Warwick*, pp. 119–20.

[78] Warwick, 'Woman', p. 724, emphasis added.

[79] Ibid., p. 725, emphasis in original.

agricultural education movement's trend towards 'town and home gardening', crystallized in the focus on horticulture at Swanley's Women's Branch, and she renewed instead the emphasis on agriculture as a means to effect women's return to the land.

As nominal chair of the sub-section concerned with women's education at the Victoria Era Exhibition, Warwick shepherded the publication of its proceedings shortly following the conference.[80] She relied upon the sub-section's secretary, Miss Edith Bradley, to carry out the editorial work (for which Bradley was acknowledged as 'sub-editor'). More importantly, Warwick looked to Bradley to help her make a reality of her grand ideas to return women to the land (see Figure 1). Bradley was well positioned for this work. Since 1892 she had directed the Women Lecturers' Association, her supplement to the male-dominated University Extension Movement, to promote women's continuing education, especially in the natural sciences.[81] At Warwick's request, in the months following the conference Bradley investigated a number of established agricultural departments at universities – University College London, Nottingham, and Cambridge among them – to find a suitable host for a women's hostel, and the University Extension College, Reading (popularly referred to as 'Reading College') was settled upon.[82]

The Agricultural Department at Reading was founded in 1893, only a year after the establishment of the college itself.[83] A joint standing committee of members from the Oxford University Extension Delegacy and the Reading College council supervised the design and delivery of curriculum, examinations, certificates, and degrees. The curriculum spanned both theoretical and practical subjects, and the certificates and degrees required the students to undergo periods of practical work while in residence on farms. The relocation, in 1895, of the British Dairy Institute from Aylesbury to Reading and its placement under the management of the joint committee established the college as a main centre for dairy teaching and research. From the outset, all of the department's classes were open to both men and women students who were at least 16 years old.[84] A month-long 'special course' in 'poultry farming, horticulture, and bee-keeping' in November 1894 piloted the inclusion of small culture. On the eve of Warwick's involvement, the department's director, Douglas Alston Gilchrist, hoped for an expansion of this part of the curriculum.[85]

With Reading already accepting women students and offering a range of subjects aligning with Warwick's 'lighter branches of agriculture', the site proved expedient for launching her scheme. She now needed to overcome two hurdles to put her ideas into practice: setting up a hall of residence for the students, and acquiring an official affiliation with the college. To

[80] Warwick (ed.), *Progress in women's education*.

[81] Bradley founded the organization as the Association of Women Pioneer Lecturers. On Bradley, see Blunden, *Warwick*, p. 119, and *The British year-book of agriculture and agricultural who's who, 1908–9* (1908), p. 480.

[82] Blunden, *Warwick*, p. 122.

[83] Reading College originated within the University Extension Movement; see W. M. Childs, *The Making of a University* (1933), and Ian Macrae, 'The making of a university, the breakdown of a movement: Reading University Extension College to the University of Reading, 1892–1925', *International J. of Lifelong Education* 13 (1994), pp. 3–18.

[84] Paul Brassley, 'Agricultural science and education', in E. J. T. Collins (ed.), *The Agrarian History of England and Wales*, VII, *1850–1914* (2 vols, 2000), I, pp. 641–42; Douglas A. Gilchrist, 'The Agricultural Department of the University Extension College, Reading', *The Record of Technical and Secondary Education* 3 (1894), pp. 514–25.

[85] Gilchrist, 'Agricultural Department', p. 525; 'Preface', in *Reading College calendar: seventh session, 1898–99* (1898), p. 7.

achieve the first, Bradley set out in July 1898 'dressed in green cycling suit and brown hat' and 'pedalled round Reading house-hunting'.[86] Meanwhile, Warwick struck an agreement with the college's principal, the geographer H. J. Mackinder - an original founder of the University Extension College - to officially 'recognize the Countess of Warwick's Hostel as a place of residence for Women Students' and affirm the college's undertaking 'to provide the necessary courses of instruction'.[87] With Bradley's success in identifying a suitable house with three acres of ground 'about twenty minutes' walk from the College' in Bath Road, the agreement specified the hostel's grounds would 'afford room for practical work'.[88] The scheme's expressed purpose was to enable 'women over the age of sixteen, to obtain a thorough training (theoretical and practical) in the lighter branches of Agriculture, viz., Flower and fruit growing, and packing for market, especially bush fruit, tomatoes, mushrooms, etc., Bee and poultry keeping, dairy work'.[89] With the agreement settled, and advertising for the hostel already underway, 12 students moved into 'Lady Warwick Hostel' in October 1898. By the following June, with 'applications continuing to pour in', Bradley rented a further house, named 'Maynard Hostel' (after Daisy's maiden name), and again by September a further house, Brooke House, 'had to be acquired'. By the time of the Hostel's third annual report in December 1900, Bradley recorded the entrance of 117 students since the opening, with 52 then enrolled.[90]

The agreement with Reading established a governing body for Lady Warwick Hostel (which encompassed all of the facilities) to be filled with four appointees by Warwick and three by the college council. The appointments came later in the year, after the college's 'experimental stage' during which Warwick and Bradley managed the hostel's affairs, with Warwick as 'President' and Bradley as 'Warden'. Three of Warwick's appointees to the committee – her husband, Lady Vernon, and John Marshall Dugdale – ensured representation of the landed interest. Dugdale, a Welsh country squire, barrister, and chairman of the Dairy Teachers' Association, actively promoted the advancement of technical, agricultural education.[91] The college council selected Mackinder, William Berkeley Monck, chair of the British Dairy Institute, and Martin John Sutton, senior partner of the prominent Reading seed firm of Messrs. Sutton and Sons, which 'kindly placed their nurseries and trial grounds at the disposal of the College for demonstration purposes'.[92]

[86] Blunden, *Warwick*, p. 136.

[87] MERL, FR WAR/1/19, 'Countess of Warwick's agricultural scheme for women, hostel for students at Reading College, President: The Countess of Warwick' (ts, 1898). On Mackinder, Brian W. Blouet, *Halford Mackinder: a biography* (1987).

[88] 'Warwick's agricultural scheme for women'; *Reading College calendar, eighth session, 1899–1900* (1899), p. 54. Warwick looked over the house, Coleyhurst, in the summer of 1898; MERL, FR WAR 5/5/1, H. J. Mackinder to E. Bradley, 16 Aug. 1898.

[89] 'Warwick's agricultural scheme for women'.

[90] For advertising, Blunden, *Warwick*, p. 136. For the roll of the first 12 students, MERL, FR WAR 5/13/1, 'Lady Warwick Hostel Visitor Book' (n.d.). For the addition of further houses and their capacities, Frances Evelyn Warwick, 'Agricultural education for women', *The Times*, 13 May 1901. On the enrolments, MERL, FR WAR 5/1/19, *Lady Warwick Hostel, Reading, third annual report, December 8th, 1900* (1900), p. 3.

[91] The Dairy Teachers' Association was formed in 1895 'to promote the interests of dairy instruction'; see 'Technical education', *J. of Education*, new ser., 17 (1895), p. 258. On Dugdale, see *Brasenose College register, 1509–1909* (2 vols, 1909), II, pp. 620–1. In 1895 Dugdale's cousin Colonel Frank Dugdale had married Eva Sarah Greville, the fifth earl of Warwick's sister; Greville, *Life's ebb*, pp. 30–3.

[92] *Calendar, eighth session*, p. 116. On Sutton, see *ODNB*, 'Sutton, Martin John (1850–1913)'.

Alongside these arrangements, Warwick proceeded to found the Lady Warwick Agricultural Association for Women (abbreviated as LWAA) in February 1899 'for the definite purpose of helping to organise and direct the extensive amount of work now being carried out by women in agriculture, horticulture, dairy and poultry work, bee-keeping, and other out-door occupations as well as all rural industries'.[93] At its heart, the association kept a registry as 'a means of bringing together employer and employed'; as such, it served as the job placement arm of Warwick's overall scheme. The range of situations were classified under headings including 'lecturers, organisers, teachers, commercial agents, gardeners (general, special and market), dairy and poultry women, bee-keepers, teachers of handicrafts, and … out-door occupation[s]' (the last including the marketing of eggs, flowers, honey, and jam).[94] Members could subscribe annually to the LWAA as Patrons (at one guinea) or Associates (at five shillings), providing them with free access to the registry and a subscription to the association's monthly newsletter, *The Woman's Agricultural Times*. A non-subscriber who desired to use the registry – i.e., a student seeking work – could do so at half the price of an associate's subscription.[95] The indefatigable Bradley served as LWAA's organizing secretary and, effectively, editor (albeit Warwick nominally so). At its formation, the LWAA incorporated Dugdale's Dairy Teachers' Association and named him chairman of an executive committee of some ten members who included Mackinder, Vernon, and Gilchrist; a general committee of nearly 60 further members included an array of titled personages, educators, and noted agricultural scientists like A. D. Hall, principal of South-Eastern Agricultural College, Wye, and J. A. Voelker, director of the Woburn Farm experimental station.[96] A few were also drawn from the early supporters of Swanley's Women's Branch: Mrs Garrett Anderson, MD; the Hon. Mrs Evelyn Cecil, the garden historian afterwards better known by her maiden name, Alicia Amherst; and Miss Henrietta Margaret White, principal of Alexandra College, Dublin, a women's college which introduced courses in horticulture early in the movement.[97]

Although the scheme's rural bent steered Warwick to Reading and its established agricultural department, a tension existed between her theoretical ideas and the hostels' practical outcomes. She envisioned a return of her students back to the land, 'having put their hands to the plough … content *not* to look back'.[98] In line with this vision, she hoped for students' placement on small 'Agricultural settlements for women', a plan consonant with both Gladstone's endorsement of smallholdings and Vernon's similar suggestion aired at the Victoria Era Exhibition. Warwick forecast:

[93] MERL, FR WAR 5/1/19, printed circular, 'Lady Warwick Agricultural Association for Women' [1899].

[94] Ibid.

[95] Ibid.; Edith Bradley, 'Lady Warwick Agricultural Association for Women', *WAT* 1 (i) (1899), p. 13.

[96] On Hall's role at Wye, see Stewart Richards, 'The South-Eastern Agricultural College and public support for technical education, 1894–1914', *AgHR* 36 (1988), pp. 172–87. In 1902, Hall assumed the directorship of the Rothamsted Experimental Station; on this aspect of his career, see Sir E. John Russell, 'Rothamsted and its experiment station', *Agricultural Hist.* 16 (1942), pp. 229–50. On Voelcker, see B. Dyer, 'Obituary: John Augustus Voelcker', *The Analyst* 63 (1938), pp. 79–84.

[97] Sue Minter, *The well-connected gardener: a biography of Alicia Amherst, founder of garden history* (2010); *ODNB*, 'White, Henrietta Margaret (1856–1936)'. White persuaded Sir Frederick Moore, keeper of the Royal Botanic Gardens, Glasnevin, to offer a training course for lady gardeners in 1898; see M. Forrest, 'Women's horticultural colleges in Dublin in the early twentieth century', *Dublin Historical Record* 58 (2005), pp. 31–8.

[98] Warwick, 'New women', p. 2.

> [T]he agricultural settlements, where for those who have small incomes cottages will be built with land attached which the trained women will cultivate. It is proposed that the cottages should be built in pairs, and that in each two women should live as partners; six or eight of these cottages will form a settlement presided over by a superintendent, who will advise about the crops and also market the produce of the settlement. Co-operative principles must prevail.[99]

But despite these lofty ideals and Reading's robust agricultural curriculum, practically none of the hostels' students completed courses of study in agriculture proper; some earned certificates in dairying and poultry-keeping, and most followed pathways in horticulture. For students to earn an agricultural diploma the requirements included two years of coursework plus an additional two years of residence on a farm; the agricultural certificate required only one year of each type of instruction. Although the required lengths of instruction were apparently shortened for hostel students by 1900, the college's annual *Accounts and Reports* recorded only one woman student completing an agricultural course of study; this was Gertrude Codrington, who received a certificate in agriculture in 1901, but it is likely she was not a hostel resident.[100] Consistent with this outcome, Bradley reported in December 1900 that no hostel students had followed the agricultural tracks during the scheme's first three years. At that time, the 52 students then enrolled were distributed as follows: 29 full-course students of horticulture (56 per cent), ten full-course students of dairying (19 per cent), two full-course students of poultry-keeping (4 per cent), and 11 short-course students of specialized subjects (21 per cent). Given these trends, Bradley underlined the efforts to expand the facilities to provide 'sound practical training' in horticultural work.[101]

As per the agreement with the college, Warwick relied upon Reading's agricultural department to provide the theoretically informed curriculum, but she supplemented this with practical instruction in the hostels' grounds and demonstrations at off-site gardens, farms, and nurseries. Local sites included the Rev. George Wharton Robinson's nurseries at Calcot, the experimental seed grounds of Messrs Sutton and Sons, and the poultry runs at Edward Brown's farm at Theale. Further afield, the hostel students visited farms in Ascot, Berkshire; Cocum (near Barton Stacey), Hampshire; and Lockinge, the estate of Robert James Lloyd-Lindsay, Baron Wantage, in Ardington, Oxfordshire.[102] Recognizing the criticalness of practical work

[99] Ibid.

[100] 'Report of the Council for the Year ended September 30th, 1901', *UCR Accounts and Reports, 1892–3 to 1900–1* (1901), pp. 17–20. Although, at the commencement of the Lady Warwick Hostel in 1898, the terms for the Diploma of Agriculture specified two years of theoretical plus two years of practical instruction, and for the Certificate only one year of each type of instruction, by 1900 the curriculum advertised in conjunction with the hostel seemed to relax these standards to two years of theoretical and *one* year of practical instruction for the Diploma, and only six months of theoretical instruction – with no mention of practical instruction – for the Certificate; compare *Calendar, Seventh Session,* with *Reading College Calendar, Ninth Session, 1900–1901* (1900), p. 88.

[101] *Third annual report*, p. 3.

[102] Warwick, 'New women', p. 2. *Calendar, Eighth Session*, p. 116; MERL, FR WAR 5/1/19, 'Lady Warwick Hostel for Students at Reading College' (printed prospectus, 1 Jan. 1899), Edith Bradley, '"Our Daughers of Ceres"; or, matters concerning the Hostel students', *WAT* 1 (i) (1899), p. 9; M. Sharples, 'An ideal demonstration', *WAT* 1 (i) (1899), p. 10. On Robinson at Calcot, see Claire Tomalin, *The invisible woman: the story of Nelly Ternan and Charles Dickens* (1991), pp. 214–45. On Brown, see James E. Rice and F. C. Elford, 'A tribute to a great leader', *International Rev. of Poultry Science*

in the training of the horticultural students, in October 1899 Bradley rented six acres of land in Berkeley Avenue (near the Maynard Hostel) for the students to cultivate as a market garden, though she later recorded the challenge of achieving successful yields, given 'that for several years this piece of land had been out of cultivation, that it was choked with weeds, and that there was no depth of soil over a topsoil of gravel'.[103] Nevertheless, with 'double-ploughing' and 'very heavy manuring', within a year she reported, 'It certainly responds to cultivation splendidly'.[104] Named and advertised as the 'Warden's Farm', a variety of soft fruits, vegetables, and flowers were planted and harvested for sale in markets. So, in addition to gaining practical skills in small culture, the students also learned the business side of market gardening. Two large greenhouses were added in May 1900.[105] In this respect the arrangement in Reading, though more modest in scale, approached that of its older competitor, the Horticultural College, Swanley.

For horticulture, a certificate modelled after that of agriculture and granted by the Oxford and Reading Joint Committee required passing examinations after one year of classroom study and another year of practical work. The Reading College calendar for 1900 specified a range of examination subjects taught by well-credentialed instructors. The Rev. Robinson, an Oxford-trained, retired schoolmaster, taught horticulture and (as already mentioned) hosted demonstrations at his market garden. He was later joined by William Iggulden, head gardener to the earl of Cork and Orrery and an authority on tomatoes, who gave on-site horticultural lessons and supervised Marion ('May') Crooke – one of the original 12 students – in her appointment as hostel head-gardener. Percy Groom lectured on botany while chairing a department devoted to the subject at the Royal Indian Engineering College at nearby Cooper's Hill, Surrey. Charles Mann Luxmoore lectured on elementary chemistry and on soils and manures, subjects in which he also conducted extensive research. The Cambridge-trained Theodore Thomas Groom, who held a lectureship in zoology and geology (the latter being his primary field of research), taught agricultural entomology. The curriculum's other examination subjects included apiculture, bookkeeping and, optionally, meteorology.[106]

For dairying, Frank P. Walker (a graduate of Edinburgh) provided lessons under the auspices of the British Dairy Institute, and after the first year further practical work was added on-site at the hostel under the direction of Bertha Marguerite La Mothe, another of the original 12 who had received the National Diploma in Dairying (NDD) from the Royal Agricultural Society

Note 102 *continued*
13 (1940), pp. 5–6; for the farm at Theale, 'Excursion to the College Poultry Farm, Theale, July 12th', in Edward Brown and Francis H. Wright (eds), *National Poultry Conference held at Reading: official report* (1899), pp. 77–9.

[103] Bradley and La Mothe, *Lighter branches*, p. 53. To help with the garden, Bradley hired 'An old gardener, whose best days had ended ten or twenty years ago, and a young boy' (pp. 55–6).

[104] *Third annual report*, p. 4.

[105] Warwick, 'Agricultural education', p. 10.

[106] On the examination subjects, see *Calendar, ninth session*, p. 89. On the named lecturers' credentials, see W. R. Dunstan and B. A. Keen, 'Charles Mann Luxmoore', *J. Chemical Soc., Trans.* 123 (1923), pp. 3431–5; John Bretland Farmer, 'Percy Groom – 1865–1931', *Obituary Notices of Fellows of the Royal Society* 1 (1932), pp. 63–4; William Iggulden, *The tomato, with cultural directions for maintaining a continuous supply of fruit* (London, 1881); P. Lake, 'Theodore Thomas Groom', *Quarterly J. Geological Soc. of London* 99 (1943), pp. lxxxii–iv. On Crooke's appointment, *Third annual report*, p. 4. See also Edith Bradley and May Crooke, *The book of fruit bottling* (1907).

of England (RASE) in 1901. By May 1900, a turbine steam separator was acquired and placed in Maynard Hostel, enabling the production of butter and cream cheeses. One drawback was the lack of a dairy farm, requiring the purchase of outside milk and, as Bradley complained, resulting in losses of up to five shillings per pound of butter sold. In aviculture, Frances Home supplemented Brown's poultry lessons with further on-site poultry-keeping demonstrations. The continuing expansion of the facilities enabled appointments like La Mothe's and Home's, thus utilizing the talents of the hostels' own students.[107]

To summarize, from a curricular point of view, despite the provisions for 'sound scientific and practical training' in an array of agricultural subjects, the dominant study lay nonetheless in horticulture – a reality confirmed by Bradley's enrolment reports and efforts to expand the hostels' facilities for practical gardening instruction. Within a couple of years, the mismatch between Warwick's idealistic 'back to the land' rhetoric and her scheme's practical outcomes became glaringly apparent.

V

The hostels' physical growth, increasing enrolments, and scattered sites provided justification for Warwick to mobilize a campaign to found an independent college, really her ulterior motive from the beginning. Speaking at the third celebration of 'Founder's Day' in December, 1900, Warwick broached the subject: 'We have *three* Hostels – we want to roof our students beneath *one*. We are overflowing on our garden ground, our poultry ground, our farm'. She called upon 'the press in the room' to bring attention to her 'lament' so that 'it may fall under the eye of some sainted millionaire, who will become the pious founder of a woman's agricultural and horticultural college'.[108] Press accounts indeed appeared in places ranging from the *Graphic* to the *Morning Post*, but Warwick penned her own public appeal in a letter to the editor of *The Times*.

> What we require is an endowment of £30,000 or £50,000. This would enable us to purchase 200 acres of land and to build a proper agricultural college for women, equipped with lecture-halls and laboratories for practical and theoretical work, and supplied with all the other fittings of a well-managed garden and farm, besides providing accommodation for 200 students.

With Edward VII now on the throne (as of 22 January 1901), she noted 'His Majesty the King has graciously signified his approval of the scheme and given it his patronage.[109] Unfortunately the appeal failed to attract a 'sainted millionaire' or yield a significant endowment.

Apparently, tensions within Lady Warwick Hostel's joint committee of management precipitated a decisive step towards complete independence from Reading in the following autumn. When the *Reading College Calendar* was printed for the 1901–02 academic year, it listed two

[107] Warwick, 'New women', pp. 1–2; *Third annual report*. Other student appointments included Elizabeth Constance Hoare (afterwards Mrs Miles Benson) as Assistant Instructress at the British Dairy Institute (see ibid., p. 4), and Annie Quelch as Foreman Gardener at the hostel; see 'Lady Warwick Agricultural Association for Women', *WAT* 2 (viii) (1901), p. 14.

[108] *Third annual report*, pp. 7–8.

[109] Warwick, 'Agricultural education', p. 10; Blunden, *Warwick*, p. 186.

new residences for women students – St George's Hostel and St Andrew's Hostel – but made no mention of Warwick's hostels.[110] At the joint committee's meeting on 7 November 1901, the omission was discussed at length. Walter Palmer, a college governor and academic board member, attended the meeting to give 'his view of the relationship between the College and the Hostel'. He 'expressed the opinion that inadequate courses of instruction were given at the Hostel', referring to the growing trend of courses based at the hostels' premises serving as poor substitutes for the regular agricultural department courses at Reading's campus. This appears to have been the primary driver behind the 'action on the part of the College Council' taken 'in eliminating all mention of the Hostel from its Calendar'. Based on the meeting's minutes, a clear divide existed between the college's representatives – Mackinder and Palmer – and Warwick's representatives – Vernon and Kimmins. Although the minutes mention a 'particular incident' for which Lady Warwick 'expressed her regret', they are otherwise vague about the details of the controversy. In the end, 'After a long discussion, and frank expression on both sides', Mackinder agreed to reinstate 'the usual mention of the Hostel' 'in subsequent reprints of the Calendar'.[111] Nevertheless, by the end of the month Warwick decided to break off her agreement with Reading College and, following Bradley's recovery from 'a break-down in health' that spring, they began 'drafting a scheme of work & instruction for the future'.[112] Warwick's association with Reading officially terminated on 31 July 1902.[113]

The break from Reading promised Warwick greater freedom to tailor the curriculum and, hopefully soon, situate the students on a centralized campus in truly *rural* surroundings so as to align her scheme more closely with her original back-to-the-land agenda. But until such a site could be acquired, she and Bradley made do with the 'present scattered quarters' and fashioned a stand-alone curriculum. The hostel hired its own teaching staff to provide theoretical instruction on site. The new arrangement resulted in certain limitations, including an inability to offer certificates and diplomas bearing Oxford's imprimatur. Owing to the cramped facilities and incapacity to fund student scholarships, Bradley explained, 'it has seemed desirable from every point of view to arrange the necessary theoretical side of the training with the least possible expenditure of time, and also to teach only what is definitely required for the scientific side of the work'.[114] In Bradley's outline for the new curriculum, horticulture appeared as the principal subject and agriculture, in its own right, did not make an appearance. Dairying, aviculture, apiculture, and marketing were all retained, but these were really subsidiary to horticulture. Warwick managed to retain agreements with many of the lecturers affiliated with Reading's agriculture department. Also listed was 'Colonial Training', already in progress at Brooke House as a one-year training course that included

[110] *Reading College calendar, tenth session, 1901–02* (1901), p. 61; *Official gazette* [University College, Reading], 1 (xvii) (1902), p. 132. The new hostels were not restricted to agricultural students. St Andrew's Hall now houses MERL (a connection for which I thank the Editor).

[111] MERL, FR WAR 5/7/1, 'Minutes of the Fifth Meeting of the Lady Warwick Hostel Joint Committee of Managers held at Lady Warwick Hostel', (ts, 7 Nov. 1901). On Palmer, see 'Sir Walter Palmer', *The Times*, 18 Apr. 1910, p. 13.

[112] MERL, FR WAR 5/1/9, 'Letter book of LWH, Feb. 1902 to Dec. 1902', E. Bradley to C. W. Kimmins, 14 Jun. 1902.

[113] 'Report of the Council to the Governors for the year ended 30th September, 1902', *Official Gazette* [University College, Reading], 1 (xvii) (1902), p. 136.

[114] Edith Bradley, 'Lady Warwick Hostel: a new development', *WAT* 4 (i) (1902), p. 2.



FIGURE 1. Miss Edith Bradley, seated, and Frances, Countess of Warwick, standing, at the Lady Warwick College, Studley Castle, on Founder's Day, 1903. Museum of English Rural Life, University of Reading, FR WAR 5/10/4/1.

subjects in domestic science like cooking, laundry, and 'housewifery'. The new configuration of teaching staff included further appointments from among the hostel students.[115] In short, the severance from Reading College retained certain continuities, but it made more apparent the reality that the Lady Warwick Hostel served as a centre for women's training in *horticulture* as opposed to agriculture in its broadest extent – an obvious compromise in a scheme intended to direct women back to the land.

By late 1902, Warwick had located a new site for her scheme closer to Warwick Castle and in a more rural context than Reading could supply. The 340-acre estate – which included a castle of its own – came on the market for £25,000, and, according to Warwick, 'I consulted with my husband and he agreed to our acquiring Studley Castle'.[116] On 22 March 1903, while on a holiday in Palermo, she penned 'An open letter to my "Daughters of Ceres"', announcing that a 'most suitable place has been found' and that 'our College becomes an accomplished fact

[115] Ibid., pp. 2–3. On the Department for Colonial Training, see 'Notes from cookery schools', *The Epicure* 8 (1901), p. 333.

[116] Warwick, *Life's ebb*, p. 300. On the cost, see 'Studley College, Warwickshire', *Quarterly Rev.* [Royal Agricultural Society of England], (Nov. 1954), p. 13. The property previously belonged to Thomas Eades Walker, a solicitor, and after the purchase it came under the supervision of the Warwick Estates' agent, Mr Payton; see Garstang, 'Studley', p. 10, and Blunden, *Warwick*, p. 186.

this year!'[117] Lord Warwick's estate staff worked to fix up the castle and grounds in time for receiving the students and college staff in the autumn, but Bradley recalled 'the discomfort and difficulties of settling into a new place' and gave as an illustration how 'a household of between 50 and 60 people with unfinished baths and a necessarily inadequate hot water supply, was – to put it mildly – trying to the temper'.[118] In addition to about 40 students, as many resources as possible were transported from Reading, including the two 100-foot glasshouses that were taken down and re-erected on the castle grounds. Lecturing and other practical lessons quickly resumed at what was now Lady Warwick College, Studley, resulting in no apparent break in the students' education. During the first couple of years Bradley's energies were expended in managing new complexities in the college's affairs, attempting to make do with a shoestring budget, recruiting and retaining new students, and building up an endowment to enhance facilities and fund student scholarships.[119] In the process, a rift was created in her relationship with Lady Warwick, and she and other members of the staff resigned in August 1903. To fill the warden vacancy, Warwick appointed Miss Mabel C. Faithfull, private secretary to Miss Alice Balfour, the Prime Minister's sister and chatelaine.[120]

Before her departure, Bradley succeeded in launching the new curriculum and a structure of certificates and diplomas clearly modelled on the precedents in Reading. In horticulture, the students attended lectures and engaged in practical lessons to prepare for two sets of spring examinations, those of the Royal Horticultural Society, which issued prizes, and then those of Lady Warwick College, which issued the diplomas and certificates.[121] The subjects were distributed amongst the two broad categories of 'Elementary Principles' (including soils, plant physiology, botany, and 'variation and selection') and 'Horticultural Operations and Practice' (including surveying and landscape gardening, propagation, cultures of various types, manures, hybridization, and pests) (see Figure 2). In 'Dairying', students prepared for examinations given by RASE for the NDD, the British Dairy Farmers' Association for a diploma and range of more specialized certificates, and the Lady Warwick College for its diploma and certificate. The college also offered diplomas and certificates in poultry-keeping, for which examinations were held each summer and included practical tests in 'plucking, trussing, and cramming'. Examinations in the theory and practice of apiculture

[117] MERL, FR WAR 5/1/19, A description of the new Lady Warwick College, Studley Castle, Warwickshire (1903).

[118] MERL, FR WAR 5/1/25, Lady Warwick College, Studley Castle, Warwickshire: warden's report (1904).

[119] 'The Lady Warwick College, Studley Castle, Warwickshire', *The Ladies' Field*, 9 Jan. 1904, pp. 174–5; Blunden, *Warwick*, p. 186; Garstang, 'Studley', p. 11. See also newspaper clippings in MERL, FR WAR 5/8/4 and 5/8/5, for reports of Bradley's speeches, made from early to mid-1905 in public lecture halls, girls high schools, and ladies' drawing rooms.

[120] Blunden, *Warwick*, pp. 186–7; Horwood, *Women and their gardens*, pp. 290–1; Sanecki, *Short history*, p. 10. Faithfull was Emily Faithfull's cousin; Eric Ratcliffe, *The Caxton of her age: the career and family background of Emily Faithfull (1835–1895)* (1993). Bradley and Crooke set up a gardening school in Bredon's Norton, and later Bradley founded a 21-acre women's farming commune and training centre with Miss Baillie-Hamilton at Greenway Court in Hollingbourne, Kent; see Anne Meredith, 'Horticultural education in England, 1900–40: middle-class women and private gardening schools', *Garden Hist.* 31 (2003), pp. 67–79; Owen Stinchcombe, *American lady of the manor, Bredon's Norton; the later life of Victoria Woodhull Martin, 1901–1927* (2000), pp. 36–45.

[121] On the RHS examination results by sex from 1893 through 1939, see Meredith, 'Middle-class women', pp. 95–7.



FIGURE 2. Entomology lecture at the Lady Warwick College, Studley, 1903.
Museum of English Rural Life, University of Reading, FR WAR 5/10/2/24.

were administered by the British Beekeepers' Association.[122] Again, agriculture *per se* was conspicuously absent from the curriculum until 1912 when a herd of 15 shorthorn cattle was acquired. But, as Doris M. Garstang noted, a long sought-after recognition by the Ministry of Agriculture and Fisheries in 1926 signified only then that the 'courses of training had come into line with courses at other Agriculture Colleges'.[123] During the early years at Studley, despite its being situated on a vast farming estate, the educational emphasis still lay in horticulture. Although the college's relocation succeeded in bringing students back to the country in 1903, its curriculum did not yet fully do so.

VI

Studley's early emphasis in horticulture, aviculture, and apiculture, however, did not rule out trainees' placement in a variety of rural situations, but it did reinforce a tenacious gendering of agricultural work, aligning women with its 'lighter branches'. Feminine iconography reinforced this gendering. Steeped in the classical imagery associated with the Roman goddess

[122] Challice, 'Lady Warwick College'.
[123] Garstang, 'Studley', p. 12. Garstang was principal of Studley College from 1949 to 1956; Sanecki, *Short history*, p. 33.

of agriculture, Ceres, Bradley dubbed the students of Lady Warwick's schemes at Reading and Studley the 'Daughters of Ceres' – a label connoting a heritage of agrarian plenitude but also birth from a fertile matron. In this respect, Warwick's habit of addressing her students as 'My Daughters of Ceres' created a close association between her matronly aristocratic identity and feminine divinity.[124] Bradley consistently titled her monthly warden reports in *The Woman's Agricultural Times*, 'Our Daughters of Ceres', and when she and six students formed the alumni guild in September 1900, they again utilized the same terms for its name.[125] The irony, however, is that despite the strong rhetoric and allusions to things *agricultural*, in reality the students were primarily trained and working in situations *horticultural*.

Warwick's and Bradley's reports about graduates' successes conveyed the notion that their hope for returning women back to the land was nevertheless coming to fruition. Their evidence included the robust numbers of students passing through the college since its inception as well as the high proportion of graduates who were applying their education in paid work on farms and in gardens as well as unpaid work at their country homes. So, in her annual report issued in October 1904, Bradley summarized that 250 students had 'passed through' the college since its foundation in 1898, 146 of which were 'Full Course students'; 50 per cent *of those* students were 'earning a livelihood or working at home'.[126] In breaking down the placement statistics, she indicated that 24 students 'possess small holdings of their own, either as farms or market gardens', with a further four ready to start after completing the current term. To this might be added the hazy figure of 12 'working their home gardens and farms'. Although it can be concluded that the bottom-line 'return' of Warwick's educational investment can be said to be fairly low, with only 40 of the total 250 students (16 per cent) reported to be farming or gardening in some capacity, paid or unpaid, at the same time those returns represented the largest segment of the full range of situations tracked. In raw numbers, returning even a few dozen women back to the land offered hope for opening the profession to women amid the apparent shrinkage of women's farming labour revealed by the census reports.[127]

On her part, Warwick claimed success. At about the time of Faithfull's appointment in 1905, she told a journalist: 'I am now in a position to prove that, with sufficient training, a woman can make as good a competence on the land as in the crowded city, with the inestimable advantage of living in fresh air and enjoying the simple pleasures and pursuits of the country that make for health and happiness'.[128] Her privileging of country pursuits over city life continued a persistent tension in the movement, providing justification for her scheme amid a period in which further schools materialized and horticulture became an established university subject, particularly at Reading where the College Council agreed to create a Department of Horticulture in the wake of Warwick's withdrawal.[129] Rural, scientific instruction was a mainstay both in the curriculum

[124] On Ceres, see B. S. Spaeth, *The Roman goddess Ceres* (1996). The iconography at Swanley also included Ceres: the lecture-room was 'beautifully decorated with frescoes representing Ceres at play'; see J. E. T., 'A visit to the lady gardeners at Swanley', *Shafts: A magazine of progressive thought* (Jun. 1893), p. 82.

[125] 'Guild of the Daughters of Ceres', *WAT* 2 (vii) (1901), p. 13.

[126] Warden's report, p. 4.

[127] Verdon, 'Business and pleasure', pp. 395–7 (a point for which I thank Susie Steinbach).

[128] Warwick, *Life's ebb*, p. 304.

[129] On the schools, see Meredith, 'Horticultural education', pp. 67–79. On the formation of Reading's Department of Horticulture, see 'Report of the Council … 30th September, 1902', p. 136.

and in advertisements of Warwick's scheme, thereby aligning with a touted national priority. As affirmed by Meldola, 'from the very beginning Lady Warwick had recognised the true position of science in the scheme of agricultural education'.[130]

But, as with the Horticultural College, Swanley, the science and practice of horticulture, and a few lighter branches of agriculture, dominated Studley's curriculum. The effect reduced the full scope of Warwick's vision – '[t]he reform of rural England' through the realization of women's agricultural settlements – to a rather limited, gendered sphere of activity.[131] Even so, the vibrancy of her scheme, thriving and growing in the decades since its launch, constituted a major component in the women's agricultural education movement. Adding a decidedly rural and agrarian orientation to a predominantly urban movement, ironically Warwick's scheme ended up strengthening a horticultural emphasis. Through her Daughters of Ceres, Warwick indeed pioneered a return of women back to the land, but outcomes beyond rhetoric required serious expansion of women's agricultural training and the launching of women's smallholdings. These developments were not achieved for at least another decade, stimulated in part by the emergence of the Women's Land Army in the context of World War I. Ultimately Studley achieved repute on par with other national agricultural colleges until its closure in 1969. Until these later developments, however, the 'town and home gardening' emphasis, championed at Swanley, dominated the early collegiate movement.[132]

[130] Meldola, 'Education', p. 4.

[131] Warwick, 'New women', p. 2.

[132] On the rise of women's smallholdings in the ensuing decades see Erin Gill, 'Lady Eve Balfour and the British organic food and farming movement' (unpublished PhD thesis, University of Wales, 2011); Anne Meredith, 'From ideals to reality: the women's smallholding colony at Lingfield, 1920–39', *AgHR* 54 (2006), pp. 105–21; Stinchcombe, *American lady*; Verdon, 'Business and pleasure'. On the Women's Land Army, see Carol Twinch, *Women on the land: Their story during two world wars* (Cambridge, 1990); Bonnie White, *The Women's Land Army in First World War Britain* (forthcoming, 2014); and, in connection with wartime 'return to the land' rhetoric, Susan R. Grazel, 'Nostalgia, gender, and the countryside: Placing the 'Land Girl' in First World War Britain', *Rural Hist.* 10 (1999), pp. 155–70. On Studley's later history, see Sanecki, *Short history*.

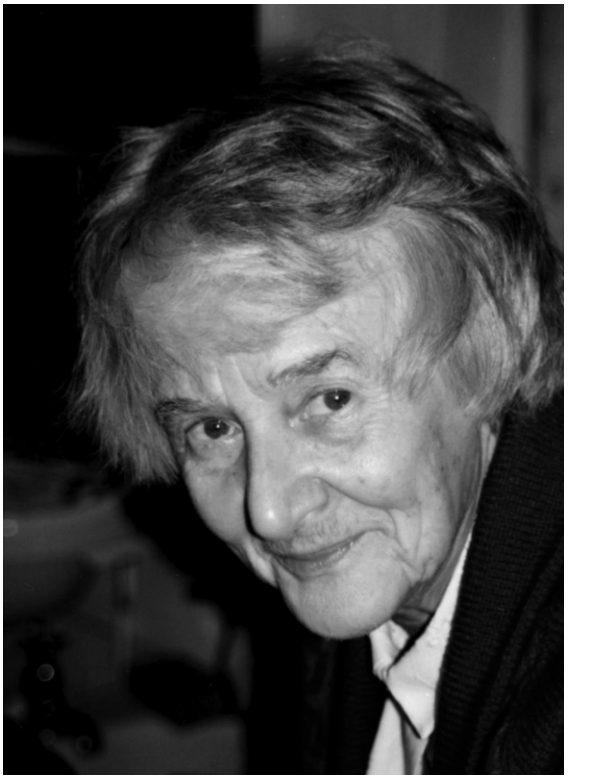
Joan Thirsk, FBA, 1922–2013

Joan Thirsk, FBA, died on 3 October as a result of a fall at home. She was 91, and is survived by husband, Jimmy, a sprightly 99, and her children, Martin and Jane. For more than 50 years she was the single most significant figure in the British Agricultural History Society, and was recognized internationally as Britain's principal rural historian.

Like so many of her generation, Joan's career was profoundly influenced by the Second World War. She was in Berne at the outbreak of war, living with a family on a London County Council language scholarship, and struggled to return through France. She rejoined her schoolfellows from Camden School to complete her studies, in its evacuation successively to Uppingham, Grantham and Stamford, perhaps the first links with the county that would assume such significance in her later career. She went on to study French and German at Westfield College, London, which was then, in turn, evacuated to St Peter's Hall (later College), Oxford. After completing her first year, she was given the choice between completing the course to become a teacher, or signing up for national service. Choosing the latter, she was selected for the Intelligence Corps, and served from 1942 in the Fusion Room, later linked with Huts 3 and 6 in Sixta, at Bletchley Park, where she met her future husband. Also serving at Bletchley was John Habakkuk, a future Oxford colleague, but neither was aware of the other's presence there until revealed by a lunchtime conversation at a conference in the mid-1980s. She married Jimmy in September 1945, and returned to Westfield. She changed course to History directly as a result of the war: she felt impelled to study causation, but also felt that languages would be more difficult to study as a newly married woman beause she thought it necessary to go and live abroad to achieve a near-native mastery.

On graduation she studied for a Ph.D. under R. H. Tawney, on sales of royalist lands during the Interregnum, which established the challenges of specificity of place and landownership to grander narratives. A lectureship in Sociology at LSE was followed in 1951 by the first of her major posts, as research fellow at Leicester, where many of her characteristic approaches to the past were developed. She remained at Leicester until 1965, when she succeeded W. G. Hoskins as Reader in Economic History at the University of Oxford, with a professorial fellowship at St Hilda's.

There Joan taught undergraduates (of whom I was one of the first) giving a memorable source-based class on Defoe's *Tour*, and introducing very different perspectives on the past. In collaboration with J. P. Cooper, she edited a wonderful new collection of *Seventeenth-century economic documents* (1972), to replace the old collection by Bland, Brown and Tawney, used as the set text in the single course in economic history then offered among 'further subjects' at second-year level. This was a collection of immense value, and still represents an extraordinary foundation for study in the period. Her principal contributions in Oxford were, however at



Joan Thirsk, *c.* 1992
Photo courtesy of Jane Robinson.

postgraduate level, as doctoral supervisor, and as the convenor of a memorable early modern seminar. She was a meticulous and enthusiastic supervisor of a large number of doctoral students, to the extent that one of her St Hilda's colleagues advised her not to see them too often. Disenchanted by the first major wave of cuts in university funding in 1981–2, she took early retirement in 1983.

Despite this critical contribution to advanced teaching and supervision, Joan's real strengths lay in original and wide-ranging research. Two papers published in 1953 demonstrated the rationale of traditional farming systems and were developed in contributions to the *VCH Leicestershire*. Deep analysis of unpublished primary sources, notably probate inventories and the records of the courts of Equity, was applied to demonstrate the complex patterns of past agrarian landscapes, seen in her monograph *English Peasant Farming* (1957). This direct approach was married to her reading of comparable evidence from elsewhere in Western Europe, and lead her to question the conventional historiography of open fields, and to argue that these were not necessarily farmed in common, and that neither cultural nor technological factors were sufficient explanations of communalism.

Springing directly from these observations of practice from the bottom up was her conviction of the place of the whole family in farm enterprises, the central place of women in mixed farm economies and the complex associations of agriculture and industry. Together these generated important publications on women and the family, and the fundamental study, 'Industries in the Countryside', in the Tawney *festschrift* in 1961, which did so much to lay the analytical

foundations of protoindustrialization. These themes recurred in her survey of plurality and peasant innovation in farming, *Alternative agriculture: a history* (1997), and in the deepening interest in textiles, seen in her chapter on the 'Fantastical folly of fashion' in the Julia Mann *festschrift* (1973). Typically of Joan's curiosity about the practicalities of her subjects, she had spun and knitted mixed fibre yarns in exploring knitting more widely.

Many of these themes, and the links of early modern governments with industrial change and patterns of consumption were revisited and extended in her Ford lectures of 1975, published as *Economic Policy and Projects* in 1978. Here Joan explored patents, ideas for change, new tastes and processes, dualism in occupation, and the work-creating impact of 'projects', to revise our views of occupational structures and the development of consumer demand before the 1750s. Expanding the models for change she had expounded in studies of tobacco-growing and stocking-knitting, this work inspired a large number of followers, and was, in the words of one, 'a subtle critique and clarion call to explore the everyday lives of women and men for patterns of historic material practices'. As in all her work, people, often from humble stations in society, were central to her analysis of innovation and change.

In retirement from 1983 onwards she took great pleasure in her arrangements for boxes of books to be despatched to Hadlow Castle from the London Library to feed her continuing researches, and two main areas of work emerged. Food, again marrying her practical and scholarly interests, formed the subject of her last main book, *Food in Early Modern England* (2007). For Joan, food history gave a fresh dimension to her thoughts whilst cooking in her kitchen, reflecting the research and hospitality that characterized her 30 years in her Kentish home. Many of her essays on crops had explored the process of transmission of innovations, through the study of the libraries of gentlemen to more direct contagious spread from farmer to farmer, and time spent in Spain sparked ideas about the ultimate sources of horticultural progress. Reading widely, Joan became aware of the extent to which Islamic horticulture had developed crops and techniques that diffused later to the Low Countries, one of the principal sources of gardening innovation in England, potentially a very large research project, and not one to begin, as did Joan in her eighties, even when so powerfully supported by husband Jimmy in his great role as bibliographer.

Early in her career, Joan had been part of the institutional beginnings of agrarian history, both in the formation of the British Agricultural History Society in 1952 and the establishment of the Cambridge Agrarian History of England & Wales project from 1956.

Joan succeeded Herbert Finberg to become the second editor of the *Agricultural History Review* (1965–72), maintaining its very high typographical standards, having contributed from its first edition in 1953 with articles, reviews, and annual lists of publication in the field. As editor, she promoted the wider subject of British agrarian history, applying many insights drawn from comparative European studies, and often made less visible contributions in her improving of authors' drafts to produce better-published results. As in her role as general editor of the History of Lincolnshire series, many authors were unwitting beneficiaries of these improvements. She served two terms as President of BAHS (1983–86 and 1995–98), a distinctive mark of the esteem in which she was held by her colleagues, and a measure of her significance to the Society. Her distinction led to her election as Fellow of the British Academy in 1974, and the award of CBE in 1994.



Joan Thirsk, *c.* 1993
Photo courtesy of Jane Robinson.

She was also a long-standing member of the Council of the Economic History Society, and a central figure in the editorial board of *Past & Present* (1957–92), and appears in the portrait of the seven founders of the journal in the National Portrait Gallery, a picture she did not personally admire. She was very active in wider local and regional history, producing several articles in the *Amateur Historian*, guides to sources and approaches, two later reprinted as pamphlets.

She was a member of the committee called together by Finberg to launch the Cambridge Agrarian History project, and was the first designated volume editor, directing its small Acton research office from 1957, where two distinguished research officers Alan Everitt and Margaret Midgley worked on the materials for volume IV, 1500–1640, published in 1967. From the outset, strongly influenced by Joan, the project was committed to undertaking a vast amount of new research, intended to preclude a synthesis of existing knowledge that would lead only to the revelation of equally large tracts of ignorance. Her own chapters in volume IV, published in 1967, fully vindicated this approach, even in Chapter III, 'Farming Techniques', which she undertook late in the project when the original contributor withdrew. It was in this volume that her considered thoughts on local and regional patterns of farming were first presented, and regions featured strongly as chapters in the two volumes of the *Agrarian History* that she edited. Her perspectives on regions had been presented as pencil-outlined maps to her first undergraduate classes in Oxford, clearly linking teaching with research in the mid-1960s.

Puritanical in her views of the use of scarce resources, she had been disapproving of the planning lunch held under Finberg's direction at Simpson's.

Finberg saw volume I part II into print in 1972, but at his death in 1974, Joan succeeded as General Editor of the series, contributing the editing and writing of much of volume V, parts I and II, 1984–5, and directing the project to completion with volume VII, 1850–1914, in 2000. As volume editor, she was a strong director, but was intimately involved also with every draft text as General Editor, and most contributors received her comments, queries and suggestions as well as those of their formal volume editor. The achievement has been immense: eight volumes, published between 1967 and 2000, in eleven bound books; 103 authors and editors; and over 9100 pages of published text. Unusually, in comparison with other agrarian history projects in Western Europe, the approach of the *Agrarian History* was strongly oriented to primary research. A decade or more on, much of that content has yet to be fully incorporated into wider scholarship, and, sadly, the reprinting of selected thematic volumes, as with some chapters of volumes IV and V, which might well have diffused this scholarship more widely, proved a less attractive project than Joan anticipated. She was also disappointed that the series was not extended in its chronological coverage into the later twentieth century.

Joan supervised a large number of research students, and freely offered support and advice to many others, making the group once described as 'the friends of Joan' very numerous and international. There were two *festschrifts*, in 1990 and 2004, and on her ninetieth birthday 40 or more wrote letters of tribute as individuals or on behalf of learned societies. She received many honorary degrees, the Fellowship of the British Academy in 1974, and a CBE in 1994 for her contributions to local and regional history. Her work, her welcoming personality, and her forceful if not strident feminism made her a major role model for younger women, but also a friend and support to all younger scholars, and a major British figure in the wider world of history. All this was attained with a keen sense of fun, and an open house to visitors. Hers was a life of major achievements, and she will be widely missed.

John Chartres

Here we publish, with the generous permission of their authors, two memoirs of Joan, the first by her husband, Jimmy Thirsk, the second by her daughter, Jane Robinson, both read at the memorial meeting for Joan held on 11 January 2014.

I

Thank you, Richard, for organising this tribute to my wife Joan. And thank you also to all those who have come today – her old students, many of them now retired professors, family, colleagues, friends and neighbours. Joan would have been astonished, just as she was overwhelmed on her ninetieth birthday in 2012 when she received a leather-bound dossier of letters from old colleagues and students.

In the videoed interview we have just seen,[1] Joan spoke of her gratitude to Professor Tawney

[1] The meeting began with the interview of Joan by Anna Kussmann made *c.* 1990 as part of the Institute of Historical Research's *Interviews with Historians* series.

for the help he gave her when he supervised her PhD thesis. I remember the day that, several years after the end of World War II, Joan came back from Westfield College, London, with the news that she had been awarded a grant for further studies to enable her to take a higher degree. Mrs Mary Bennett, Principal of Westfield College (a daughter of H. A. L. Fisher the historian) and herself an economic historian, advised Joan to go to the Institute of Historical Research and consult Alexander Taylor Milne, the Secretary and Librarian. 'I know him!' I said. For in 1941, serving in the Royal Artillery Maritime Regiment, I had met a fellow librarian, Gunner Milne, who was awaiting transfer to the Education Corps. So, as Joan did not know him, I went along with her. The last time I had seen him, about five years earlier, he was in the cookhouse at Southport, awaiting transfer to the Education Corps. He was the one who added gravy to your plate after you had collected the meat and veg. It was a great joy to see him again. He was kind and helpful to Joan, suggesting subjects for her thesis and raising the possibility that Professor Tawney might agree to be her supervisor.

Tawney had a tremendous influence on Joan. She had read his *Religion and the Rise of Capitalism* in her spare time at Bletchley Park in the Penguin edition and was now to be supervised by the great man himself. For Tawney was one of the greatest historians of the first half of the twentieth century, and, in my opinion, one of the greatest men of that century. We were once invited to a party at his flat in London but I never saw his study, which, according to Joan, was in a state of chaos. As the years went by Joan's study began to resemble Tawney's and though Joan claimed that she knew where every book was, I found her system of classification unlike anything I had ever come across in the seven different libraries in which I had worked.

Not many would associate Joan with Shakespearian studies. Yet three times she found time to write long essays on Shakespearian themes. The first was a 10,000-word chapter entitled 'Forest, field and garden, landscapes and economies in Shakespeare's England', which appeared in Volume 1 of an enormous three-volume work of nearly 1000 pages, edited by J. F. Andrews and published by Scribners in America in 1985.

After Joan retired from her post as Reader in Economic History at Oxford, she was invited to conduct a month-long series of seminars at the Folger Shakespeare Library in Washington DC. A flat near the Library was provided and I went with her. We were met at the airport and transported to our flat by Jon Bush (no relation!), an American student who had been supervised by Joan many years earlier. He is here with us today. At the same time as the seminars, the Folger Library had put on an exhibition with the strange title *Fooles and Fricassees.* The sub-title *Food in Shakespeare's England* was the title of a 10,000-word essay by Joan, which appears in the exhibition catalogue (Folger Library, 1999). During our stay in Washington DC I was allowed to use the library. You can imagine what a paradise it was for me, a retired librarian with a lifelong interest in Shakespeare, to roam around the shelves. One day, one of the Folger librarians took me down to the holy of holies in the basement, where they kept, safe from flood and fire, their collection of First Folios and many other rare books of the period.

Joan's third contribution to Shakespearian studies appears in *Shakespeare, an Oxford guide*, published in 2003 by Oxford University Press and edited by Stanley Wells and Lena Orlin. Joan's chapter in this book is entitled 'Daily life in town and country'.

My time is up, but I would like to end by quoting lines from Shakespeare's play *The Tempest*, which Joan knew by heart. She had probably learned them at Camden School in London in the 1930s, where she enjoyed acting in plays, and once appeared as Marie Antoinette. The lines are spoken by Caliban to two drunken sailors who have just heard strange music.

Be not afeard; the isle is full of noises,
Sounds and sweet airs, that give delight, and hurt not.
Sometimes a thousand twangling instruments
Will hum about mine ears; and sometimes voices,
That, if I then had wak'd after long sleep,
Will make me sleep again: and then, in dreaming,
The clouds methought would open, and show riches
Ready to drop upon me; that when I wak'd,
I cried to dream again.

Jimmy Thirsk

II

This article will give you a glimpse into the domesticated world of my mother, Joan Thirsk. I will tell you something about Mum as a wife, mother and housekeeper.

Mum always seemed to be there even when she wasn't. I'm not sure quite how she managed that. Although she commuted by train to Leicester, and then later to Oxford, and stayed over for a night or two during each week of term, she always left behind a casserole and jacket potatoes in the oven for us all, so her presence was felt even in her absence. My brother Martin and I have discussed it and both recall that she seemed to be at home more often than she wasn't.

She was a guardian of the English language. There were no split infinitives in our house, nor use of the word 'hopefully' at the beginning of a sentence. She was a stickler for etiquette and manners. I recall sitting at the lunch table ages after the others had gone to play till I said thank you for something our guests had brought. She took a dim view of poor manners, or as she would call it, 'boorish' behaviour.

She was certainly a feminist, probably right in so many ways, yet she could sometimes make inappropriate anti-men comments, for instance, an awkward-to-clean cooker top 'must have been designed by a man'. I knew my eventual husband would have to cut the mustard with her. Fortunately, his interest in such things as weaving, bread making and designing knitted jumpers wooed her over!

She was interested in everyone and everything, large and small. A new rose on the bush, a new recipe, a sour-dough culture for baking bread, a piece of knitting or a trip to a new place, a chance encounter with an interesting person, all these things were as interesting to her as the much bigger things in life. She had a keen interest in wanting to do things, hands on. It wasn't enough for her just to learn about them or research them. I have lost count of how many times, since October when she died, I have thought to myself 'oh I must tell Mum about that, she would be interested …'.

She was always busy, only ever at rest for a short spell in the evening perhaps, when she might read *The Times*. She would be constantly cooking, baking, cleaning, shopping for food, sewing, gardening, working in her study. She was multitasking years before the phrase was even though of! She made virtually all our clothes when we were children, and all her own too. She took up machine knitting in her retirement for all her children, their spouses and her four grandchildren and I recall how crestfallen she was when, at 38 knitted jumpers each, we all said we had enough, and she was left with no one to knit for!

The only time I remember her really relaxing and doing nothing was occasionally a short sunbathe on the roof top of our maisonette in Swiss Cottage. Bikini on, she would climb up the ladder through the skylight and soak up the rays for half an hour or so. But thinking back, I don't suppose she was doing nothing – she was probably writing the next chapter of her book, in her head. As a historical note aside, we could see the Royal Free Hospital being built from that roof top, it must have been between 1965 and 1974.

She occasionally lost her temper, for example when she found Martin and me as children sliding down steep stairs towards a hard, tiled floor in cardboard boxes. I wouldn't recommend you do this at home – it was such great fun but I do recall her anger at the time! On another occasion, we were aged about 8 and 10 yrs and had left the hot tap running in the bathroom, Martin on the basis that I was the last to use it, and I on the basis that Martin had turned it on in the first place. Annoyed with us, Mum ran up from her study to turn it off, saying as she went 'Children, why do you *vex* me so?' I don't think either of us had any idea what that meant, but her body language said it all. This was a prime example of how beautiful her use of the English language was, even in a state of high emotion!

When doing her academic work at home, my recollections of her are always in a rather cluttered study (she hated to throw anything out), pencil in hand, marking work, usually with the pressure cooker sizzling in the kitchen, or some bread baking in the oven. If interrupted at her desk in the study, she would put her pencil down and listen, give us time, not be cross for the interruption. I'm sorry if it was *your* thesis she was marking at the time!

We were awash with so many words and names from her academic life, which we accepted as normal, even if we didn't know what they meant! Words and phrases like 'I'm just popping to the PRO or the BM or the Bodley'. It wasn't till I was much older that I understood what or where these places were. 'Subfusc' – that was another mystery – we had no idea it was linked to the black witch's cloak we saw hanging in her bedroom wardrobe or in her room at the History faculty. People's names – Billy Hoskins, Alan Everett, Herbert Finberg, Professor Habakkuk, Trevor Roper – we were so familiar with these people even though we may not have met them all. We also grew up so used to parents who had literally thousands of books lining their walls, and couldn't understand why no one else did, when we visited our friends' houses.

She was a very attentive mum, always there at school parents' evenings, always supportive regarding school-work, exams, revision, everything really. She was always interested in things we were doing and gave wise counsel if we were in difficulty. I recall what I used to call 'Ghostly talks' at bedtime. She would come and lie on my bed in the dark, me inside the bed, and she on top of the blankets, and we would mull over the day together. Those chats were really important to me. We talked about all sorts. She was always happy to come out for a bike ride, or play tennis in the garden, if that's what we wanted to do. She was inexhaustible really.

Although she showed definite cognitive decline over the last few years, she was still translating a German book into English, for Dad, three months before she died, and helping correct the punctuation and grammar of my son Tim's university essays during early 2013. She may not have known much about the subject – Global Health – but her editing skills were unhindered by this, and the red ink ran freely across his pages! She was still baking her own bread a year ago, and not in a bread-maker as you or I might. She would regard that as cheating! She did it in the traditional way with two risings, three loaves at a time, one to eat and two for the freezer. She was still able to enjoy life into her last year, even though she was physically and mentally slowing. She and Dad enjoyed ten days of glorious hot summer staying with us in North Yorkshire in July of last year, basking in the sun in the garden, and many trips out, to an outdoor Shakespeare play and to Beverley for the day, with a picnic in sunshine on Beverley Westwood. We also had a trip to see a working limestone quarry, a new experience for us all.

Only four days before she died, she was out with seven of us family for lunch at Hever Castle in Kent, albeit having to resort to a wheelchair to be pushed around the grounds. That is the first and last time I am aware of her needing a wheelchair for a trip out. There is no doubt that she would not have welcomed a slow and long decline, or to be kept alive by too much doctoring. She would have hated to have not been able to live in her own home. So when she collapsed and died suddenly on 3 October, after 2 months of deteriorating health, it is I am sure the death she would have chosen.

We family will all miss her more than words can say. She was a truly incredible woman and I am very proud to have been her daughter.

Jane Robinson

Annual list of publications on agrarian history, 2012*

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Book Reviews

PHILIP SLAVIN, *Bread and ale for the Brethren: the provisioning of Norwich Cathedral Priory, 1260–1536* (Studies in Regional and Local History 11, University of Hertfordshire Press, 2012). xvii + 220 pp., 18 figs., 45 illus. £35.

There is nothing that demonstrates the forces that shaped the late medieval economy quite so clearly as the provision of food. *En route* from production to market and consumption, the persistent pressures – labour supply, wages, prices, and repeated troughs in climatic and disease cycles – are sharply exposed; yet it is often here that we also have first sight of the sources of constructive change, such as shifting patterns of land use, developing transport infrastructure, the rise of lively extra-urban markets, and seigniorial and – increasingly – civic measures to manage their communities' needs. The records of England's monasteries are simply unrivalled for the completeness of the data they offer. No other domestic setting matched the scale or scope of their consumption, nor their remarkable resilience; indeed, given the peculiarities of England's Reformation, uniquely, the cathedral monasteries – and Westminster Abbey, a cathedral for a time – can provide perspectives on production and consumption that reach across the conventional medieval and early modern divide.

For the Canadian author, Philip Slavin, they – naturally – represent a 'Klondike' (p. 191) crying out to be panned. Of course, he is by no means the first to open a claim in this territory: the pioneers – R. A. L. Smith, F. R. H. Du Boulay, Barbara Harvey – were followed into the archives (particularly the cathedral archives) by their own generation and the following one, and the interdependence of tenantry, demesne and *domus* has now been drawn out across southern and south-eastern England (Bath, Winchester and especially Canterbury), the east and west midlands (Peterborough, Worcester) as well as through the very different territory of the Durham palatinate. Slavin's mining of the Norwich Cathedral Priory estate records benefits from these now well-defined points of comparison and, to a degree, the enduring value of his researches lies in its complement to the existing corpus. Yet the distinctive character of this conventual *domus*, and the agricultural and commercial environment mapped in its *compotus* rolls should not be overlooked. Above all, perhaps, the breadth and depth of the surviving accounts allow us to follow the response of whole enterprise from before the Famine to long after the Plague and from the sloping desk of the cellarer's clerk to the common table of the brethren, which, by the turn of the fifteenth century, could support fewer than half the intended number with limited quantities of the unusually weak ale.

The early orthodoxy held that in the later Middle Ages the great estates were commercialized both in the management of their estates and in meeting their subsistence needs. Recent studies – notably Miranda Threlfall-Holmes's reading of the Durham records – have enhanced their reputation for market nous, but also counselled against any simple polarity, still less a sustained trend that led every estate all the way from the Black Death to the break with Rome. In the same way, Slavin discovers at Norwich an approach to estate management that was notably undogmatic, marked by the determination to respond to the challenges, and, when they arose, the opportunities, of the prevailing conditions. If there was a principle maintained in such an unpredictable climate, it was the pragmatic benefits of self-sufficiency. When conditions dictated the letting of estates, they were locked into the provisioning of the convent with grain rents. In the 250 years of Slavin's survey, Norwich achieved 80 per cent self-sufficiency, treating the increasingly vigorous food markets of the immediate environs only as a supplement; even as the house entered its final half-century their typical rents were still in cash and kind. Such determined avoidance of market-dependency might be seen as self-defeating, given the recurrence of catastrophic harvests and conditions close to famine, but Slavin finds the responsive recasting of tenurial terms during the deepest troughs in arable production in the last quarter of the fourteenth century, when the usual grain rents were turned to cash.

Not only did the priory managers evince a nuanced understanding of the market but also, Slavin suggests,

they also demonstrated a profound knowledge of the productive capacity and topography of the diverse portfolio of estates. More than two thirds were assigned to spring crops, a choice which Slavin considers shows an awareness both of local climate and commercial limitations of the Norfolk market, whose cash-poor consumers were more likely to be secured for the long term with cheaper barley bread. Meanwhile, wheat, for the convent, certainly, but, it would seem, with little market scope, was confined to the far distant estates.

Slavin presents the priory as equally proactive in the development of transport and storage, again not as a marker of a growing commercial ambition but as a determination to assure a food supply sufficient to always meet the needs of the *domus*. Early investment in barns bequeathed only maintenance costs (which were remarkably stable) to the convent in the century before 1540. By contrast, transport placed rising demands on their annual expenditure. Such is the scope of the *compotus* rolls that Slavin can conjure for us the 'great boat' (*magna batella*), comprising 219 planks, constructed in 1320–21. While still tied to rents in kind, the tenantry sought commercial opportunity in the carriage of their produce, and the rolls record rising expenditure for the priory, which was compelled to engage carters across its domain.

For Slavin, the profits of the policy of self-sufficiency were to be found not in agricultural innovations, annual yields or any demonstrable commercial advantage, but in the riches of the priory's common table. Here, apparently, there was not just sufficiency but abundance: 'the brethren ate and drank in truly heroic quantities' (p. 190), he suggests, with 50 per cent of their daily diet being bread, and 2 per cent, ale (which was notably weak), generated from the sustained, and sometimes hoarded, supply of demesne grains. A significant fall in the size of the professed community (from 60 to 38) between the thirteenth and the fifteenth centuries gives some credence to Slavin's claims for prodigality and the impression he draws from the rolls is not out of step with dietary trends documented at houses of varying size, wealth and market position, such as Durham, Ely and Westminster. However, his calculations of numbers of consumers within the purview of the convent at times appear hasty, if not unsafe, and he does seem to accept the fallacy that qualitative judgments can be drawn from quantitative data. There is a taste for raw totals and rough means that are not nearly as meaningful as Slavin believes.

Perhaps of greater interest to those currently working in this field are the fresh insights offered into the convent's provision of food for those subsisting outside the gilded world of its own enclosure, some 6000 or so annually, including as much as 20 per cent of the inhabitants of the city. The quantity and variety of relief available in the precinct of the priory – including what Slavin archly calls the almoner's 'soup kitchen' – is especially striking; old obligations in the city itself, such as a donation of grain to the prisoners of the castle also continued to be observed.

Given the significance of such social commitments to representations of pre-Reformation monasticism, it is disappointing that Slavin, despite his stated chronological boundaries, devotes such scant attention to the last decades before the Dissolution. In fact there is a general detachment from recent discussions of later monasticism, which may explain, if not excuse some of his lazier assertions, such as 'monks … led a passive and contemplative life' (p. 172). The primary interest is the patterns of economic management in the years either side of the Black Death. Still, his ready enthusiasm should remind students in this field of the empirical riches of the rolls.

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DOMINIC JOHNSON, KENNETH HILLIER and LESLEY BOATWRIGHT (eds), *Grace Dieu Priory, Leicestershire: the draft account book of the treasuresses, 1414–1418* (Grace Dieu Priory Trust, 2013). xxxv + 279 pp. £35 + £4 p. & p. from Mrs Ann Petty, 174 Leicester Road, Whitwick, Coalville, Leicestershire LE67 5GJ.

Records for small nunneries are not thick on the ground, and so this volume represents a valuable addition to the canon of printed original sources. The volume is especially valuable as it is a parallel Latin transcription/English translation. The erudite notes on editorial conventions and the Latin by Lesley Boatwright (to whose memory the volume is dedicated) are a testament to the care that has gone into the production of this book. The seven-page glossary of both English and Latin terms is very useful and will save readers the trouble of searching through their own reference works! The list of dates for saints' days and festivals is also a handy quick guide to the dates that appear in the text. The indices of persons and places appear to be comprehensive, but the subject index is a little simple in its composition.

The introduction (by Kenneth Hillier) to the volume provides a short history of the priory up to the period of the account book and a description of the priory and its buildings. Given the depth of material about the buildings, a plan of the site might have been of benefit to this section. Although the volume has a photograph and historic drawing of the priory on its front and back

covers, a site plan would have provided further context for the reader.

The introductory section about the nuns of Grace Dieu Priory brings the personalities of these religious women to life and is an excellent illustration of the way in which financial records can paint a picture of the lives of those who are recorded in them. Excellent use is made of supplementary sources to further fill in the details of the nuns and their (not always harmonious) relationships. The contributions to priory life of the chaplains, boarders and secular personnel of the priory are also examined in the introduction – a reminder of the diversity of people, both internal and external, who made up the day-to-day life of a religious house. The final section of the introduction provides an overview of the priory's economy that emerges from the account book. As Chris Dyer writes in his preface, 'The account book is of course about money', and the discussion of the priory's economy offers many pointers to the interesting and detailed information contained in the text.

Much of the material in the text is spatial in nature. The text describes the work done on the nunnery's estate, and again it would have been helpful for those without a detailed knowledge of the local area to have had a map of the estate and its surrounding area. Even if it is not possible to identify the field names mentioned in the text, a map would have helped to put the priory, its activities and economy into a geographical context.

The wealth of information contained in the account book is indeed impressive and includes details of rent receipts, nuns' salaries and clothing allowances, and the cost of building works and repairs. The costs of gathering in the harvest are listed in detail along with the names of those employed; long lists of female and male workers employed in weeding, reaping, threshing of crops and mowing of hay testify to the frantic activity of harvest-time. The payments to the men and women are also interesting. In the third week of harvest in 1314, Adam Baxter and the (unnamed) wife of John Standwych were paid the same amount (1*s*. 8*d*.) for 5 days work. Helen Herthyll and the villein (unnamed) of Henry Foster were also paid the same rate for their work on the harvest that year. Also of interest are the debts owed by the nuns to various people. Great efforts have been taken by the editors to identify the wide range of materials bought for the nunnery; these include a variety of building supplies and the minute but necessary bits of iron, leather and wood required to keep a cart or plough in good repair. The range of foodstuffs bought for the house is also impressive; such foodstuffs are dominated by pork and, unsurprisingly, fish (from herring to mussels). The cost of entertaining visitors is evident on 16 January 1415 when cheeses for visitors are purchased especially. All in all there is plenty of information both for those interested in the local area of the nunnery and for those interested in the economic and social circumstances of such religious houses. The editors have provided not only a useful resource for historians to mine, but the quality of the transcription and the parallel translation will be helpful as a guide for those who want to use similar sources. As the editor says, the account book is a 'valuable snapshot of the economic standing of a small nunnery'.

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MICHAEL HICKS (ed.), *The fifteenth-century inquisitions* post mortem*: a companion* (The Boydell Press, 2012). xviii + 253 pp., 3 figs., 25 tabs., 1 map. £50.

Covering the period 1235–1660, the inquisitions *post mortem* constitute a series of returns (numbering in their thousands) made by royal escheators based on the investigations carried out by local juries at the instigation of the English Crown on the death of one of its feudal tenants. These provide details of who held the land and what it comprised, together with an assessment of its value. Often ignored or taken for granted and much maligned by generations of historians as inaccurate, incomplete or erroneous, the IPMs represent a fascinating and detailed archive of property holding and offer an almost unparalleled resource for examining the landed society of medieval England.

This book, sub-titled 'A companion', is more than a friendly introduction to these documents: it is intended both to complement study of the IPM Calendars and spark off fresh avenues of research. The guide, Michael Hicks, adopts a reassuring tone as he glides through the legal technicalities and administrative process that underlay the Inquisitions. He also contributes an erudite examination of property transmission across generations, concluding that dower, jointure and courtesy are far more complex than historians have hitherto acknowledged and that there is much more research needed into provision for widows and widowers. Other contributors make similar claims for exploring the potential of the sources. Indeed, Lawrence Poos, James Oeppen and Richard Smith, examining the use of the IPMs for measuring life expectancy and seasonal mortality, make an urgent plea for the remaining years of the fifteenth century to be completed. Christine Carpenter, who extols the virtue of the new calendars of IPMs for assessing lesser landowners' estates and enabling comparisons

to be drawn between gentry and nobility, outlines the opportunities for longitudinal studies of individual families and the structure and exploitation of estates in particular locations as well as the strategies and legal procedures favoured for land settlements.

Analysis of landholding patterns and estate values on a broad scale using statistical methods also emerges as a distinct possibility with the new digitized resource. Although the reliability of the data across the centuries still has to be borne in mind, Margaret Yates, on the strength of her Berkshire case study, is confident about the validity of employing quantitative techniques to land use and developments in agriculture. Similarly, Matthew Holford in his reassessment of the reliability of valuations and extents adopts a positive tone since the results so far have been shown to be 'credible and illuminating'. And, as Holford demonstrates in a second chapter in the volume, it is not just the landholders themselves who can be studied. Since the IPMs contain the names of local jurors, their status, method of selection and deliberations can now be evaluated, revealing the importance of locality in the choice of jurors and the fact that while they were respectable members of their communities, the burden of informing the Crown generally fell upon relatively humble, minor local officeholders. Kate Parkin's chapter, 'Tales of idiots', is equally revealing in its examination of the priorities and strategies for the protection of families and individuals involved in the concealment of idiocy, contrasting the theoretical rigidity of procedure with the flexibility of process that is observable from the 'lived historical experience'.

For those interested in what goes on behind the scenes, a series of papers highlight the problems entailed in calendaring the IPMs. Sean Cunningham assesses the 'Great Historical Enterprise' that the calendaring process represents, examining the different approaches adopted, from the largely antiquarian concerns followed from its beginnings in the early nineteenth century, through differences of opinion on indexing during the post-war period, to the scholarly, more research-informed AHRC calendaring projects of the early twenty-first century. This is matched by Claire Noble's lucid explanation of the development of the various writs used by the Crown which were encountered in the editing/calendaring process and their idiosyncracies; and Oliver Padel's consideration of the pros and cons of the late Roy Hunnisett's longstanding guidelines on calendaring and indexing place-names, at the conclusion of which he offers recommendations of his own to overcome difficulties in the identification of places and uncertainties in manorial affiliations fit for both printed versions and the new age of electronic calendars. The value of the IPMs for economic and social history is rightly brought out by Christopher Dyer's informative essay, though it would have perhaps been more effective to have this at the close of the book, providing a sense that it was more than just a collection of interesting essays. The volume has a useful glossary and a good index, though predominantly of persons and places. If publishing costs had permitted, it could have done with a few plates of the original manuscripts, illustrating the sheer size of some of the returns and the damaged and dilapidated state of some of them, if only to show the immense dedication and enthusiasm of those who have compiled the calendars which this volume celebrates.

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JANE WHITTLE (ed.), *Landlords and Tenants in Britain, 1440–1660. Tawney's* Agrarian Problem *Revisited* (People, Markets, Goods: Economies and Societies in History, 1, Boydell Press, 2013). xv + 240 pp., 7 figs., 4 tabs., £17.99.

Like Shakespeare leaving his second-best bed to his wife, the great R. H. Tawney left to his closest academic companions, agrarian historians, his second-most famous book. But his *Agrarian Problem in the Sixteenth Century* (1912), whose centenary this volume marks, has probably aged rather better than the more well-known *Religion and the Rise of Capitalism* (1926). The issues it raised: the relationship between landlords and tenants, the impact of inflation, the importance of enclosure, and the rise of the market economy, are ones which rural and agrarian historians are still picking over, and despite over a century of scholarship since, we still have more questions than answers, hence the success of this volume.

Centenaries do not always make for good scholarly publications since the issues they cover have often become rather stale. Not here, however, for there is still so much we do not know about the changes that swept over the countryside in the period we still sometimes call 'Tawney's Century'. As a result, the studies here manage to be uniformly interesting, and in some cases present some genuinely important findings.

There are, broadly, two types of chapter. Firstly, there is the overarching survey of knowledge in a particular area of Tawney's interest. In this mould, Whittle's interesting opening chapter looks at the preparation and reception of the book, from its initial plaudits to the stinging rebukes by Geoffrey Elton and Eric Kerridge after Tawney's death, and to the rekindling of interest in the wake of arguments by Robert Brenner. Christopher Dyer follows by summarizing research

into the rural history of the later fifteenth century, reminding us of the economic dynamism of the period, and pointing out how much Tawney got right about it. Julian Goodare then searches for a Scottish 'agrarian problem' and suggests that similar issues were at play north of the Border. Landlords were becoming more assertive, customary inheritances being attacked, and small tenant farmers were suffering. David Ormrod, meanwhile, in the book's final chapter, describes theoretical models of economic change and the development of capitalism from Tawney through to the twenty-first century.

Two of the most useful broad contributions deal with legal aspects of land tenure, a subject not always especially accessible to agrarian historians. Harold Garrett-Goodyear's article is particularly interesting, looking at it does to the process by which common-law courts started to regulate copyhold in the early sixteenth century. He makes the point that, however advantageous the protection of common law might have turned out to copyholders, the initial suits were launched by manorial lords. Christopher Brooks, meanwhile, highlights the considerable security enjoyed by copyholders by the time of the Civil War.

The other type of chapter comes in the form of the detailed local study, a genre of agrarian history that has developed immeasurably since Tawney's day. These cover issues – essentially enclosure and tenurial change – that were dear to Tawney's heart, but through the microscopic approach of scientific local history. Taking those which deal with commons and enclosure first, Briony McDonagh describes an enclosure dispute from Henrician south Yorkshire which pitted a manorial lessor against his tenants, and which was fought out in the common-law, equity, and prerogative courts as well as on the ground. The level of organization and skill deployed by the tenantry was impressive: they managed to bring 18 or 19 ploughs to an organized mass-ploughing, and were careful in the legal complaints to use the language of depopulation – smart politics indeed. Heather Falvey's chapter then dissects an intriguing dispute over a piece of herbage in Derbyshire, showing that those farmers involved in disorder were not necessarily the 'rude multitude', as the government insinuated, but came from many levels of society, and included some of high status. Andy Wood, meanwhile, dips into an intriguing dispute over common rights in Malmesbury, arguing that the possession of common rights was not merely an economic convenience, but represented 'shared entitlements' and 'a kind of social contract'. Grazing a cow, as such, 'combined material need, common interest, memory, community, meaning and agency'. William Shannon, finally, discusses wasteland enclosure in lowland Lancashire, showing that the benefits to landlords from larger schemes were significant and risk-free; those to the tenants could be considerable, but they were not quite as certain. The surprisingly slow pace of wasteland enclosure in the region – given the benefits to lords in particular – is put down to a lack of willing tenants.

As with the chapters on law, the local studies of land tenure place emphasis on the strength of customary tenures, in almost total contrast to Tawney's view. Jean Morrin's study of the estates of the Dean and Chapter of Durham, however, does show tenant-right holdings gradually being converted to leaseholds, though it also tracks the eventual emergence of mutually beneficial relationships between estate and tenantry. Jennifer Holt's chapter on the Hornby Castle estate in the North West, meanwhile, shows clearly that rising land values from the sixteenth to the late eighteenth centuries benefited customary tenants vastly more than the estate itself. Tenants held by tenant-right, which gave the lord the opportunity to exploit two irregular fines: one on the death or alienation of the tenant (like copyhold) and one on any change of lord. But even given this advantage they were only able to retain about 11 per cent of the market value of the land in rents: the rest was accrued to the tenants. Indeed, says Elizabeth Griffiths, it is in the context of these difficult economic circumstances – not the 'anti-landlordism' of Tawney's day – that we should understand the position of his 'villains', the landlords themselves. And her study of estate improvement in Norfolk has them as behaving in a manner we should see as 'reasonably fair' and 'perfectly sensible'.

This, then, is an impressive collection: it is learned, detailed, and based on deep archival research. It will be useful to students, and essential reading for rural historians. Perhaps the most salient conclusion is that, though we still find ourselves interested in many of the same things Tawney was, our view of the politics of the period, of the winners and losers, and of the social roots of entrepreneurialism, has shifted down the social scale. We no longer accept that this was necessarily the great age of the capitalist landlord. Instead, we emphasize the political, legal, and economic strength of the yeomanry: largely, of course, the self-same copyholders that Tawney saw being squeezed and exploited. Many landlords themselves were suffering an 'agrarian problem', in that – where their tenants held the lands on secure copyholds – they struggled to keep their income up with inflation. Importantly, the question that is starting to be asked is whether the real victims of exploitation were not, rather, the *subtenants*

on copyhold land, holding by insecure, annual leases at market rates. Should we, then, be looking for political strife not so much between landlords and copyholders, but between copyholders and their own poor, exploited tenants?

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JOHN LOUIS CRUICKSHANK, *Headlingley-cum-Burley, c.1540–c.1784* (Thoresby Society, sec. ser. 22, 2012). xiv+ 323 pp., 3 figs., 7 maps. £15 available from Publications, The Thoresby Society, Claremont, 23 Clarendon Road, Leeds, LS2 9NZ.

There have been relatively few studies of the interface between towns and their adjacent townships, whether in terms of identifying networks of supply and demand as modelled by Von Thünen, or through examining spheres of urban political influence. This book therefore provides an important new case study, charting the changing pattern of landownership and landholding, improvements in transport and communications, and developments in agriculture and industry within Headingley-cum-Burley, one of 11 townships wholly within the ancient parish of Leeds. Tracing developments from the dissolution of the Cistercian abbey of Kirkstall to the end of the eighteenth century, Cruickshank finds a 'progressively greater involvement of the town in the township'.

The book begins with a detailed examination of the property structure of the township from the ministers' accounts produced at the dissolution of Kirkstall Abbey. Many of the abbey's demesne lands had already been transferred to men from adjacent townships within the abbey's estates, prior to the dissolution. Following the dissolution, the Kirkstall monks, while living separately, maintained a network of links, retained much of the abbey's demesne, kept possession of goods from the abbey, and bequeathed the abbey's property from one to another for a generation. In the 1560s, when the original Crown leases of the abbey demesne expired, the security of the remaining manorial tenures was destroyed. During the course of the seventeenth century, power in the township shifted from its manorial lord, a member of the county gentry, to a small group of minor gentry landowners who were also influential in Leeds.

Although the area of enclosed agricultural land grew substantially between 1540 and the end of the eighteenth century, mainly at the expense of woodland, the number of farmsteads and houses in Headingley and Burley increased only slowly. Throughout the period, the author considers the township to have been similar to a nineteenth-century 'close parish' in which landholding and residence were tightly restricted and very stable. Family members and resident farm servants, rather than landless labourers, provided the labour for tenant farmers, supported when necessary by casual labour from Leeds. Arable farming predominated, and livestock holdings were relatively small, but some farmers seem to have supplied liquid milk to Leeds from the 1680s. The township provided grazing land for butchers' stock and animals in transit to the town, and formed a link in the trade that supplied cattle, which were driven from Scotland, fattened in Craven, and brought to the urban market. While not forming part of the well-known cloth manufacturing area around Leeds, the township accommodated some industry, including iron-making, tanning, milling and fulling.

The conclusion notes that those townships adjoining Leeds which lay to the north of the River Aire, including Headingley-cum-Burley, enjoyed good arable land, while those to the south and west, which were steeply sloping and poorly suited to grain production, became cloth manufacturing areas. The town of Leeds, at the river crossing, acted as the principal interface between these two zones. For those unfamiliar with the area, it would have helped to set out this wider geographical context in the introduction to the book, which is rather brief. A little more detail on the physical and economic development of Leeds in this period would also have assisted the reader. Nonetheless, this book, based on the author's Ph.D. thesis, provides a valuable case study for those with agricultural, urban, or industrial interests in the early modern period.

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L. JESSOP, M. WHITFIELD and A. DAVISON, *Alston Moor, Cumbria. Buildings in a North Pennines landscape* (English Heritage, 2013). 140 pp., 140 figs. £14.95.

Although the research behind this book was undertaken for one purpose, the results have been reworked for a different audience and the outcome is something of a *tour de force*. English Heritage's remit includes giving advice and, in order to be able to do that, a considerable amount of research may be required to underpin a consistent approach to the varied environments to be found across England. *Alston Moor* is one in a series of booklets published under the general heading of 'Informed Conservation', which examine the 'impact from climate change and new social and economic trends'. As the owner of two earlier publications in the series I think *Alston Moor* raises its game to a

remarkable extent, for this is an outstanding book especially when its size and price are taken into account.

For those unfamiliar with the extreme North West of England, it must be explained that, for a number of reasons, Alston has iconic status. Firstly, it has a geology which (amongst other things) was to generate huge wealth. Secondly, that wealth (and its subsequent rapid decline) resulted in an unusual demographic profile. Thirdly, Alston's situation high up in the Pennines results in a dramatic location with stunning views and skyscapes of breath-taking beauty. Each of these elements is discussed and thoroughly illustrated here.

Alston Moor is part of a relatively isolated upland area lying in the far north of England between Penrith and Durham and forms part of the North Pennines Area of Outstanding Natural Beauty. It is well known in geological circles for giving its name to the 'Alston Block' and for its silver-rich lead deposits, which have been exploited for at least the last 3000 years. (Those who would like to know more about Alston's geology should go to www.bgs.ac.uk and enter 'Alston Block' in the search engine). The modern town has many idiosyncratic features, not least the way its main street appears to climb vertically when approached along the A686 from the direction of Hartside Fell. But this ancient market town is only one component of the wider area under discussion here. This is primarily a landscape and buildings book and the authors do a fine job in both the quality and depths of those discussions and in the wealth of maps and illustrations that serve to complement them. Not least is the very effective use of LIDAR images so that the reader can truly follow the features across the landscape.

The text draws useful comparisons with surrounding areas and puts Alston in its context in a number of remarkable ways. In particular, by using the history of the built-environment and the industrial archaeology they deliver a narrative of Alston's population, its dramatic rise and fall and the activities of the varied social groups who lived there at different times.

Although it may seem overly critical (given the value for money represented by this booklet) there are nits to pick. In a text of this quality and depth, an index and glossary would have been appropriate. Furthermore, although there is a 'reference and further reading' list, it appears to only give the former, with little of the latter to take an interested reader onward. But, enough carping: this is a first-rate book and could well be a model of how to use thorough research to generate a readable and illuminating text.

JENNIFER S. HOLT
Rossendale

STEVE HINDLE, ALEXANDRA SHEPARD and JOHN WALTER (eds), *Remaking English society. Social relations and social change in early modern England* (The Boydell Press, 2013). xviii + 374 pp., 9 figs., 1 illus., 10 tabs., 6 maps. £60.

Keith Wrightson has been a formative influence in the development of early modern social history over the last forty years, and this *festschrift* provides both a fitting tribute and interesting insights into the current state of the discipline. It begins with a long and weighty introduction in which the three editors contextualize Wrightson's achievement and trace changes in social history over the course of his career. It highlights the enduring themes, and the subtly nuanced shades of understanding deployed at the interface of the traditional social order and the forces of social and economic change. Wrightson's initial achievement was to focus on people and community politics in social and economic history. How this has fared as history was submerged by the linguistic turn in the humanities is a second and important theme of the chapter.

In the remainder of the book the contributors demonstrate the wide range of themes Wrightson's students have addressed. Many made use of the micro-study technique, a case study, often from a single community looked at from several positions. Alexandra Shepard examines how communities treated the fathers of illegitimate children. They were often expected to take responsibility, physically as well as financially once the child had survived the first few years, but by the later seventeenth century the parish was more frequently directly involved with the placing of the child. Helen Berry uses the intriguing case of Italian *castrati* opera stars in London to explore perceptions of their gender (and sexuality) during the eighteenth century. Naomi Tadmor deploys a gendered approach to the eighteenth-century Sussex diaries of Thomas Turner, showing how Turner's wife was excluded from parish affairs while her husband often did parish business over a hearty meal on the rates. Paul Griffiths looks at written record keeping by townships and cities, and the new information culture partly spawned central government's enactments. It created information networks between towns, as well as providing London with data and turning oral custom into written record, but may also perversely have made local government more secretive. Phil Withington's chapter on intoxicants in early modern York looks at the ale house and the 'moralists and magistrates' who regulated it, central Wrightsonian territory. The early seventeenth century surge in wine and tobacco consumption in inns and taverns changed

the focus of York's intoxication, but it was the small alehouse keepers who were most scrutinized and purged. Food and drink are the focus of Adam Fox's contribution, considered as badges of social status. Using a combination of contemporary writings, and a rather uncritical take on Gregory King's calculations on food expenditure by social group, he considers variation in diet as an indicator of social status. Tim Stretton considers early modern neighbourliness and indebtedness, pointing to the wider use of written bonds, and contrasts England's readiness to imprison debtors, with Massachusetts' ban. England's increasing litigiousness went with an un-neighbourly willingness to enforce the letter of the instrument, and a growing culture of vexatious litigation. Malcolm Gaskell considers neighbourliness in the context of witchcraft accusations, demonstrating the 'capricious and contested' range of neighbourly situations which engendered court cases – the political, the isolated old woman accusing her neighbours of trying to bewitch her, but above all pointing up the gulf between richer and poorer sorts in much more nuanced ways than in Macfarlane's classic scenario. Andy Wood's chapter on deference and paternalism successfully deploys sociological ideas to clarify this contested area and argues that deferential pleas for a return to past harmonious social relations in early modern England gave way in the nineteenth century to a sense that the golden age was irrecoverable. Steve Hindle's fertile research on the Newdigate papers and Chilvers Coton here considers the estate workforce and their patterns of recruitment and work. Servants in husbandry came from outside the parish, and changed frequently, while local day labourers were vital for peak season, and 25 per cent of their work was at piece rates. Wage rates appear low, but whether this was the result of paternalist relationships is unclear, and complicated by the burgeoning local coal industry which has left few records. Henry French's chapter on the old poor law in Terling illustrates a well-documented topic only lightly explored by Wrightson and Levine in their study. His massive database of poor law payments up to 1800 used in combination with a very full 1801 census return shows the dominance of short-term help to a wide range of families, the scale of the crisis of the 1790s and enriches rural historians' understanding of the reality of poor law provision. In the final chapter Craig Muldrew charts the relationship between economic and political governance from Sir Thomas to Adam Smith, looking at the change in vocabulary from Commonwealth to Nation and Society. He stresses how labour and labour discipline have long been seen as the key to public opulence, and the importance to Adam Smith's thought of government's role in controlling vested interests of every kind.

These varied essays match the breadth of Wrightson's interests and the high research standards he engendered. Wrightson's approach ensured that social and economic history broke out from the structures and categories of its initial phase to ensure that individuals and communities could be given full voice. It is no criticism to reflect that his territory (and that of the contributors) is almost exclusively England. Wrightson's contemporaries in early modern political history widened perspectives to stress Scotland and Ireland and the British question. Economic and social historians have increasingly made global comparisons, while the COST and CORN initiatives have triggered transnational rural approaches. Will Wrightson's successors subtly shift his very English focus without losing the rigorous and nuanced approach he instilled?

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IAN MITCHELL, *Tradition and innovation in English retailing, 1700 to 1850. Narratives of consumption* (Ashgate, 2014). xiv + 223., 11 figs, 2 tabs. £70.

Retailing and especially consumption have attracted an enormous amount of interest in recent years, with the long eighteenth century being accorded particular emphasis in narratives of transformation. This book promises a reassessment of the standard view, firstly by focusing on aspects of retailing too often overlooked (markets and itinerants, for instance) and secondly by placing these alongside both more familiar retail formats (fixed shops and polite shopping) and key motivations for consumption. Mitchell is wary of grand narratives; indeed, he seeks to debunk them. He does this by grounding his book in a rich and detailed picture of the everyday practices and experiences of retailing. The analysis is structured into three broad sections.

The first centres on continuity and change in traditional retail formats. Central to this is a familiar story of the rise of fixed shops, although there is welcome detail that adds granularity and coherence to a picture too often left patchy and impressionistic. More importantly, the picture is broadened to include the operation and experience of markets, and the attempts to improve these whilst retaining ideals of morality and fairness, especially for the poor. Alongside this, Mitchell explores the margins of retailing: itinerants, back street shops and second-hand dealers. Importantly, these are presented as part of the same retail system: practices and customers being shared with more formal types of retailing. It is here that village shops make their

only appearance, which is unfortunate as they too were growing in number and sophistication during this period, and deserve greater attention.

The second section focuses on consumption; what Mitchell sees as 'disturbing influences'. He begins by revisiting the familiar debate over luxury, but adds a fresh touch by including an explicitly religious dimension to these 'moral' debates. The discussion is then extended into ideas of dissatisfaction and contentment, although the latter is rather brushed over as attention centres on the so-called Diderot effect. Next, we move to fashion, conceived here largely in terms of novelty and leisurely sociability, although comfort is also discussed, mostly as a counterpoint to the apparent strictures of gentility and elegance. In many ways, this chapter lies at the heart of the book. It is here that Mitchell really gets to grips with shopping as an activity that brings together retailing and consumption. In doing so, he seeks to address the thorny issue of the role of shopkeepers in constructing and communicating taste. Despite excellent primary material and a nuanced discussion of shopping practices (which emphasizes the importance of fashion to consumers) we never really get an answer to this question. Instead, attention moves on to collecting (and obsession) as another motivation to consume. These are explored largely in terms of books and again we are treated to some wonderful insights into the varied practices of bibliophiles, each carefully gleaned from the archives and meticulously presented. It is perhaps a little surprising, then, that the analysis leaves largely unexplored the ways in which these passions were fed by or shaped the provincial book trade.

In the final section, Mitchell turns to 'modern' forms of retailing, which emerged in the early nineteenth century. Following a canter through some figures on the growing number of shops, attention focuses more firmly on proto-department stores and bazaars. The former are reasonably familiar and a series of well-known businesses are discussed, mostly to ascertain commonalities in their success. Perhaps some 'failed' initiatives would have added to our understanding of this important retail innovation, but we nonetheless get a much clearer picture of the contingent nature of retail development: there was nothing automatic about the success of shops such as Browns or Kendals. Less familiar is the rise (and fall) of bazaars – an essentially London phenomenon that briefly flourished in a number of provincial towns before being subsumed or overtaken by department stores. In the end, we return to our starting point: the retail market, discussed here in terms of the emergence of market halls. Rather than dwell on their physical form, Mitchell focuses on their construction as a contested process with uncertain outcomes – one that depended on the firm guiding hand of a wealthy landowner or determined local government.

Overall, this is an impressive book; the product of considerable scholarly effort. Does it succeed in offering the promised reassessment? To an extent, it does. Mitchell argues convincingly that modernity was a fragmented and fractured process, and successfully anchors grand narratives in the complexity of everyday experience. He focuses at least some of our attention onto traditional and humble forms of retailing and invites us – quite rightly – to think closely about the link between retailer and consumer. However, his wariness of large explanatory frameworks means that he ultimately shies away offering an alternative framework for analysis that might reform how we approach retailing and consumption in this vital period of change. Nonetheless, this is an impressive and very readable book; one that provides rich insights into a dynamic and diverse set of economic and social practices.

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JOHN M. VIRGOE, *Thomas Eccleston (1752–1809): A progressive Lancashire agriculturalist* (Chetham Society third ser. 49, 2012). xiv + 242 pp., 1 tab., 1 illus., 2 maps. £20.

A full assessment of the contribution made by the gentry to the economic performance of Lancashire in the late eighteenth century is long overdue. This volume provides a contribution towards such an evaluation, from which future historians will derive considerable benefit.

Thomas Eccleston was an ambitious agricultural improver, based in Scarisbrick, Lancashire, who gained widespread fame during his own lifetime, not least because of his work draining Martin Mere. Eccleston was an extremely able self-publicist, from which much of his fame derives, and he was a correspondent of many of the leading lights of late eighteenth-century agricultural improvement, both at home and overseas. Virgoe rightly selects Eccleston for close scrutiny, and highlights south-west Lancashire as a place of significant agricultural developments during the industrial revolution. Eccleston stands out as an individual who enjoyed a prominent local reputation with active membership of agricultural societies, large-scale success with drainage, a champion of Elkington's method of drainage, and sponsor of Lancastrian William Moorcroft, the first Englishman to obtain a formal veterinary qualification, and an

experimenter with crops, rotations and implements. He is an important figure in English agricultural history, hitherto neglected by agricultural historians, much like his native south-west Lancashire.

Eccleston was a member of the ancient Scarisbrick family and his descendants were to become possessed of one of the largest, and richest, non-aristocratic estates in England in the nineteenth century. The Scarisbrick archive held at Lancashire Archives is substantial and significant, with the estate being particularly well documented for the century after 1750. This book is based on an impressive array of letters, diaries, accounts, surveys and memoranda of various types, as well as a range of contemporary published sources. The scale and diversity of the archive is made very apparent by this book, and Virgoe has clearly developed an unrivalled knowledge of the manuscript collection.

However, I do have some concerns with the book. The context is, for the most part, very poor with barely any acknowledgement of a great deal of academic work on agricultural history in recent years. As an example, only six articles and one review from the *Review* are cited, with only two of these being published in the last 20 years. Of the 150 or so items in the bibliography of secondary sources, only 11 were published in the last ten years. This failure to contextualize mars the whole book, significantly undermining Virgoe's argument. That the book is written in praise of the gentry contribution is established early on in a phrase that could easily have come from the text of an eighteenth-century critic of Lancashire farming: 'Farms were small and the farmers were conservative' (p. 21). He goes on to argue that '[f]ew ordinary farmers could be pioneers since they did not have the financial resources to offset the risks of failure, particularly on the small farms of south-west Lancashire, and it was up to the landlords to be the innovators' (pp. 152–3). But Virgoe simply does not address any of the literature that has challenged the role of the landlord-improver nor those works that have argued a case for the role of the small farmer in the agricultural revolution.

Readers of this journal may fill in some of these omissions for themselves, and those able to do so will find this book rewarding. Virgoe has established a case for Eccleston as an active writer, host, agricultural tourist, experimenter, adopter and promoter of innovations, and has thus achieved his first aim: 'to put the case for Thomas Eccleston as an important agricultural improver' (p. 1), although lack of reference to the full body of work on south-west Lancashire and a general lack of analysis prevent him from achieving his second, 'to reappraise the position of Lancashire from that of an agriculturally backward part of England' to one that could be regarded as 'progressive' (pp. 1–2). Parts of this book will be very familiar to those who are aware of Virgoe's previous work, and those familiar with the historiography will be aware of numerous significant omissions. However, much of the text itself reads like an extended annotated catalogue with extremely long summaries of letters that ought to have been edited down. This archival coverage is impressive, with sometimes forensic accuracy regarding personnel, but with sometimes excessive detail that detracts from the two stated aims. There is a distinct lack of analysis, and, ultimately, contradiction and confusion in the argument.

Virgoe cannot really maintain his argument. In the concluding pages he confesses that 'Eccleston was less of a true innovator' (p. 192) and, in contrast to other contemporary practical 'improving' farmers, he was not motivated by profit – but by 'personal ambition' (p. 199). Eccleston had produced agricultural goods for urban markets, although his experiments with Galloway cattle, for instance, did not go down well with Liverpool butchers. Yet, in Virgoe's eyes, such experiments remained valuable as 'many ordinary farmers were illiterate' (p. 192) and therefore unable to benefit directly from the activities of organizations such as Agricultural Societies. However, Virgoe does not demonstrate how much of an impact Eccleston had on the farmers of south-west Lancashire; undoubtedly he had some influence, but how is this to be measured and set against the innovations of 'ordinary' farmers, many of whom were literate, and were in a better financial position than Virgoe and many eighteenth-century commentators assumed? Ultimately Virgoe characterizes south-west Lancashire as a place which 'made the best use of its own resources and farming traditions by producing mainly dairy products, potatoes and vegetables based on small family farms and small, ancient enclosures' (p. 195). I remain perplexed, in such an environment, about the role of an 'improving agriculturalist'.

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HANNAH VELTEN, *Beastly London. A history of animals in the city* (Reaktion Books, 2013). 288 pp., 121 illus. £29.

Hannah Velten's book is a beautifully illustrated, well researched, accessible and evocative history of animals in London. This is a narrative account, and Velten draws on a wonderfully wide range of sources – literature and popular commentary, prints, illustrations and photographs, the work of diarists and satirists, as well as official material – which, along with a sensitive yet direct written style, bring the story to life. By

addressing the history of animal-human relations in one place, she is also able to capture and extraordinarily wide range of animals and the ways that our treatment of them has changed dramatically over time. In part this has been about animal welfare, but it has also been about changing notions of 'civilization', and about technology: by 1947, when the Ministry of Transport banned horse-drawn vehicles from major London thoroughfares at peak times, there was less need for them. *Beastly London* captures the complexity of the ways in which humanity has historically shared its urban space – be that space roads, homes, circuses, railway stations, markets, slaughterhouses, dairies or parks – and by doing so makes us pause.

This is not a book written solely from a human point of view, however. As an experienced journalist who has worked for *Farmers Weekly* and someone who has worked with dairy cattle, Velten has managed to take on board the 'animal turn' and put it to very good and steady use. For example, we see the animal 'voice' in the form of vignettes, or moments of animal biography. Through these, the animal characters come alive, so that we can know them better. But, demonstrating a very subtle understanding of recent academic discussions about animal welfare in its various guises, Velten never writes of the animals sentimentally. In fact, many stories are very likely to disturb, and she underlines the awful conditions in which many thousands of animals were housed and slaughtered, or under which they were handled and worked daily. These vignettes engage the reader, while Velten moves the narrative forward on the larger scale and traces each element of animal history to its close. At the same time, and strikingly for a popular history, Velten manages to avoid what could be a simple story of progress. Her writing is superbly nuanced.

The book covers pets of all kinds; the vermin that Londoners housed accidentally; animals in the Royal Menagerie, the Tower of London and, later, London Zoo; animals used for entertainment – including dancing bears and fighting cocks – in circuses, theatres and other venues; animals used for draft and power; animals farmed, marketed, driven and slaughtered; animals vivisected; and animals celebrated. It demonstrates that humanity, as environmental historians as well as animal ecologists have argued, has lived within an enormously rich set of networks with other animals for a very long time. Though the book ends a little too soon, it also serves to remind us that we still live in those networks, if in altered form. We accommodate other animals in more ways than we might at first think.

KAREN SAYER
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PHILIP CONFORD, *The development of the Organic Network. Linking people and themes, 1945–95* (Floris Books, 2011). 477 pp. £25.

Slavoj Žižek, in his analysis of the structure of contemporary ideology, famously draws upon the example of the organic apple. It is not, he argues, simply that we purchase organic apples for the positive qualities they embody of being 'pure' or 'healthy', we also choose to buy organic because we desire the 'excess' that the term organic signifies. When we buy organic, we also buy our own absolution from the negative qualities of the capitalist market: pollution, degradation of the soil, the use of pesticides, and so on. In the organic movement one sees the operation of modern ideology; the way in which modern consumerism allows us to simultaneously inhabit capitalist society and purchase an indulgence against it.

Philip Conford's book does not take Žižek's critique of the organic movement as its starting-point, but it might. The book is a detailed study of the overlapping influences upon the organic movement since the Second World War. It is in some respects a difficult work; there is no over-arching thesis or argument and the book does not have a neat concluding chapter or summary. There is a great deal of detail about the characters and publications of the movement, which is largely descriptive in character.

However, in other respects Conford's book shares much with Žižek's remark on apples, in that it is both flawed and brilliantly suggestive. Most remarkable is the way in which Conford demonstrates the rich interactions between the organic movement and wide range of other tendencies in intellectual endeavour, social and economic change, and political struggle. As such, the book implicitly raises a number of important questions and possible routes for further research.

For example, the transformation of the organic movement in the 1970s and 1980s, with the emergence of a greater consumer orientation (embodied in 'wholefoods', and the popularization of the Soil Association Standard as a propaganda tool in promoting organic eating) marks what is clearly an important moment in the generalization of organic culture. The full implications of this social and economic shift are rather underplayed, and it is clear that there is a great deal more to be said. Nonetheless Conford's narrative is a starting point for further work.

Similarly, there are wonderful impressionistic chapters on the organic movement's relationship to ecology, environmentalism, and wider political life. The complex, and sometimes strained, relationship between the organic movement and environmentalism is apparent. Nor was there a straight translation of the

organic movement into the political terms of socialism or conservatism; although Conford demonstrates significant and important connections to the tradition of radical land reform and British utopian socialism.

Conford is, however, far from certain about how to address these ambiguities. It is worth considering why the 'politics' of something like the organic movement do not simply map onto existing political formations. Arguably, this has less to do with the concrete content of the organic idea than with the attraction of the 'excessive' attributes that Žižek has identified. An essential quality of any ideological object is precisely that it is able to convey more than its own particular content. Diverse political movements may seek to capture it precisely to determine how this excess is deployed. If anything, Conford's account of the politics of the organic movement reflects the interpretive potential of viewing the movement as an ideological formation.

This, however, also marks an unfortunate limit of a book that is driven by an explicit empiricism, which Conford adopts in the introduction with somewhat perverse pride. This empiricist positioning is adopted in antipathy towards Social Movement Theory, though we never discover precisely what it is that Conford objects to in this theoretical orientation except that it is posited 'a priori'. Yet, the author is quite happy to accept the a priori theoretical parameters of his own self-proclaimed 'inductive process'. Ultimately, the absence of theoretical discussion limits the capacity of this work to draw wider conclusions about the nature of environmental movements or the historical significance of the organic movement itself.

Yet, one thing is clear from the detailed research that Conford had undertaken, and the rich intellectual and social world that his empirical word has uncovered: there are all sorts of possibilities for further analysis in the world of the organic movement. From the role of emerging consumption, to the influence of esotericism, or questions of class, gender and race, the application of the analytical categories, which historians have elsewhere successfully deployed, will doubtless reveal a great deal. The organic movement has much to thank Conford for in making available an accessible starting-point for this endeavour.

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Europe and Elsewhere

ERIK THOEN, GUUS J. BORGER, ADRIAAN M. J. DE KRAKER, TIM SOENS, DRIES TYS, LIES VERVAET and HENK J. T. WEERTS (eds), *Landscapes or seascapes? The history of the coastal environment in the North Sea area reconsidered* (CORN Publication Series 13, Brepols, 2013). 428 pp., 114 figs., 7 tabs. €70.

The 18 papers collected here were presented at the third conference examining the historical evolution of the coastal lands of regions bordering the North Sea. Each of these conferences has redefined our understanding of the changes which have taken place in the continental coast of the North Sea and has sought to integrate insights from geomorphology on the one hand, and history and archaeology on the other. The reality is that there are considerable problems in combining the two approaches, and this volume is divided into separate sections for those papers that deal with the 'natural context' and those that address the 'social organization'. The first generally looks at change on a grand scale of thousands of years, while many of the papers dealing with the history consider the later middle ages alone. The tension between natural and anthropogenic factors runs throughout the volume. The historical papers in particular are deeply ambivalent about the cause of changes and whether the 'aggressive' reclamation of wetlands precipitated the subsequent crises.

The term 'aggressive', employed in a number of papers by the Continental contributors, implies a certain type of relationship between human intervention and the environment. It seems to be used here to mean reclamation activities which created unstable environmental conditions. Stability in a dynamic coastal environment is, however, a relative concept. The conditions in these regions were unpredictable and the pursuit of long-term stability was generally illusory. Increasing storminess from the later thirteenth century and strong winds at any period, which could reactivate coastal dune systems, were important factors in changing the environment. But equally as important was the decline in land values in the fifteenth century, which reduced investment in drainage and maintenance of the flood defences. It remains difficult even with the benefit of hindsight to understand the contribution of the various factors. The introduction of rabbits into the coastal dunes of the south-west Netherlands is identified in one chapter as an important part of a stable eco-system lasting until the eighteenth century, but in the nearby Scheldt estuary rabbits are said to have been the cause of the destruction of the coastal dune barrier. Equally, coastal flooding could be regarded as a disaster,

or the means by which fertile alluvium was deposited, raising land levels and providing opportunities for new, profitable reclamation.

The particular value for English-speaking readers is that this book brings together an enormous volume of scholarship, particularly from continental Europe. Much of that work is otherwise available only in Dutch or Flemish, and the individual papers here provide a guide to the current state of knowledge on the coastal environment of the North Sea coast. These are set alongside a small number of papers from Britain and, rather oddly, a study of water management in the Po valley in Italy. What emerges more strongly than anything else is that most of the papers are local case studies. No grand synthesis emerges and even common factors are difficult to identify. As a result the concluding chapter by Eric Thoen lays stress upon regional 'social-agro systems' as the critical factor in the history of these coastal lands. Diversity rather than uniformity along the coast seems to the main conclusion to draw from this volume.

MARK GARDINER
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JORDI PLANAS, *Viticultura i cooperativisme. La comarca d'Igualada, 1890–1939* (Publicacions de d'Abadia de Montserrat, 2013). 411 pp., 12 figs. €21.

Agricultural cooperation has been an important subject for European agricultural history. Cooperatives arose principally in response to the challenges posed by agricultural modernization and the difficulties farmers had in facing them individually. Numerous books and academic articles have been published in Spain on this topic, many of them concentrating on explaining the relative failure or scanty development of this model prior to the Civil War (1936–39).

Against this background, the principal objective of this book is to analyse the development of agricultural cooperation in the field of grape and wine production in the first third of the twentieth century in Catalonia, the Spanish region where cooperation was most highly developed. To this end the district of Igualada, in the province of Barcelona – which clearly specialized in wine production – has been chosen as a case study; at the end of the nineteenth century over two thirds of the agricultural land area was dedicated to vines. It was a district in which the replanting of vines, following the arrival of the *phylloxera* blight, was of great importance, with the area under vines eventually reaching almost the same land area as before the coming of the disease.

The study is principally based on documentary sources that in many cases were generated by the cooperatives studied, which on occasion have even maintained a historical archive to conserve them. The methodology of the research is, therefore, to analyse local cases, using them in an attempt to extract conclusions that can be of more general application. On the other hand, the author, who has published a wide body of work in the field of agricultural history, has conducted this research with a deep knowledge of the Spanish literature on agricultural cooperation. This makes it far easier for the study of local cases to be correctly inserted into more general debates.

The historical context in which the subject is studied has two principal features. First, following the golden age of the last quarter of the nineteenth century, as a consequence of problems of overproduction, there were successive crises for grape and wine producers, which generated sharp price fluctuations and fairly low price levels that had a tendency to decrease. Second, social conflict was also intense in the agricultural areas that specialized in vines, as the result of the opposition between landowners and the farmers who cultivated the land under long-term contracts (*rabassaires*).

Although the book analyses all the agricultural experiences of association, and most particularly those of cooperation, which took place in the district of Igualada, attention is focused on the two of greatest importance and impact: the Cambra Agrícola d'Igualada (Igualada Chamber of Agriculture), founded in 1908 and having over 2,000 members, and the Sindicat de Vinyaters d'Igualada (Igualada Wine Producers' Trade Union); the latter, founded in 1921, only reached a membership of 200 members, yet possessed greater assets than the former and displayed greater continuity in the post-war period.

The two experiences represent two completely different models of agricultural cooperation that coexisted in harmony in Catalonian. The Cambra Agrícola d'Igualada is a perfect example of cooperatives created by well-off proprietors, in many cases encouraged by the Church within the framework of Catholic agricultural associations. Its objectives were dual. On the one hand, it sought to diffuse new agricultural technologies and facilitate farmers' access to them. Thus, it supplied chemical fertilizers, fungicides and other inputs to farmers, and distilled surplus wine to obtain alcohol and spirits. On the other hand, it also attempted to reduce social conflict by avoiding the need for tenant farmers to have their own organizations: the important owners occupied a social position that would permit them to channel tensions and maintain their hegemony. The affiliation of small owners or tenants to this cooperative can be understood by the advantages they obtained from having access to new inputs, techniques or means of

transforming production. By contrast, the Sindicat de Vinyaters d'Igualada was an initiative of small farmers and tenants which, thanks to the financial support of the municipal savings bank, controlled by left-wing republican politicians, was successful where the Cambra Agrícola was not, since it created a cooperative winery.

This is a valuable book, one that performs a meticulous analysis of the actors participating in these experiences, the methods of organization and working of the cooperatives, their principal results and their links to the social conflicts that existed in the rural environment in those years. It is an important study in local history, undertaken by a researcher well versed in the principal debates of agricultural history in that period, but who should perhaps have used his excellent knowledge of the contexts outside the district analysed to explain the problems tackled. This would have given non-specialist readers a better understanding of the importance of these experiences. Similarly, somewhat broader conclusions, explaining the contribution of this study to wider knowledge of cooperation in European agricultural history would have been interesting.

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Conference Report: Winter Conference 2013 'Augmented Agriculture: Tools, Fuel and Traction in Farming'

On 7 December 2013, London's Senate House hosted the annual Winter Conference of the BAHS. John Chartres opened the proceedings with some well-chosen words in memory of 'the single most important individual in BAHS history', Joan Thirsk, who had died suddenly in October. We observed a minute's silence in memory of Dr Thirsk's extraordinarily productive life.

This year the theme of the conference was chosen in honour of another stalwart of the Society and of economic and agricultural history, Ted Collins, with the focus of the day reflecting his long-term influence on and interest in technology and power in agriculture.

The first paper, presented by Jordan Claridge (University of East Anglia), was entitled 'The Price of Progress? Skill Premiums and the Trade of Agricultural Horses in Medieval England' and focused on the role of the demesne in the medieval horse trade. Claridge explained how, by studying manorial accounts for a sample era spanning the years 1290 to 1310, he had established that this trade was not only highly segmented, but also subject to regional variation. Work horses of the time were commonly referred to as 'affers' and 'stotts', and although 'affers' were most frequently mentioned in demesne records, 'stotts' were dominant in East Anglia. This, Claridge suggested, indicated less a difference in nomenclature but more a variation in the type of horse preferred.

There were also regional variations in the ways demesnes acquired new horses. Although animals were generally purchased at market, demesnes would also breed or rear a proportion themselves. Horses were also acquired as seigniorial perquisites (taken from tenants in payment of death duties, or confiscated if judged to be 'strays or waifs'). Demesnes in the Midlands were most likely to breed their own horses, whilst those in the Thames basin and East Anglia preferred to purchase them. These latter areas used more horses in general, which Claridge attributed in part to the economic dominance of London and the need for horsepower to transport goods to the city's markets. Horses, he said, contributed directly to commercialization. There was some evidence that 'cart horses' were traded over a wider distance than 'plough horses', perhaps because they would be sold at the end of a journey.

In the next paper, 'The history of the plantation hoe and why it never got written' Chris Evans (University of South Wales) declared he had deliberately sought out the 'dullest item possible' to study. The session proved to be anything but dull, and revealed that this ostensibly unremarkable implement possessed a rich historic hinterland. Hoes were such an important tool on colonial plantations that, by the eighteenth century, manufacturers in Britain were producing a range of designs, adapted for different environments and tasks. This lucrative trade was dominated by the Crowley family of Tyne and Wear, who produced three main types of hoe designed for use in Virginia, the Carolinas and the Caribbean respectively. Their branded tools were so sought after that at one time they were producing over 11,600 a week. Yet despite this the plantation hoe, unlike the plough, has been almost erased from the historical record.

Evans explained that the reasons for this varied. In Virginia, for instance, tobacco farming necessitated the use of hoes. However, by the 1770s, growing this luxury crop for the British was perceived as degrading. In a desire for self-reliance, agriculture shifted to wheat production – which required the plough. The hoe, now imbued with negative connotations, was consigned to memory. In the Carolinas, rice cultivation gradually shifted from inland swamps to tidal plantations, which planters created by building dykes and embankments. The colonists celebrated their own engineering expertise, and in consequence their slaves' labour with the hoe was forgotten. In the West Indies, planters began to advocate the use of the plough rather than the

hoe in the late eighteenth century, as it was considered less arduous to use and made them appear 'progressive' and more concerned for the welfare of their slaves – thus improving their increasingly unsavoury image back in Britain. Hoes could be made to order, and Evans ended the session by raising the intriguing possibility that the opinions of slaves might have influenced design.

Lunch provided an opportunity to admire the oxen depicted on the lavishly painted ceiling of room 349, the conference venue, as well to wonder at an imposing, if mysterious, sisal wall-hanging (depicting a bird of prey, it turned out, by the late Tadek Beutlich, a Polish artist). Proceedings then resumed, with Richard Hoyle reminding us of some of the achievements of the day's special guest, Ted Collins. Ted, a treasurer of the BAHS for over 15 years and a long-time Director of the Rural History Centre, had not only secured the future (and ultimately a new building) for the study of rural history at Reading, but also edited volume VII of the *Agrarian History of England and Wales,* amongst his many publications. Ted said a few words of thanks and recalled attending the first winter conference back in 1966. He mentioned how delighted he was to be a dedicatee of the recently published book, *The Farmer in England* (ed. Richard Hoyle, Ashgate, 2013), not least because several contributors had been his postgraduate students.

Tom Williamson (University of East Anglia) delivered the third paper of the day. Entitled 'Fuel Supply and Agriculture in Post-Medieval England', it had emerged, he said, from a disagreement he'd had with Paul Warde (the paper's co-author) about the timing of the transition from organic to fossil fuels. The paper, which argued for a regional approach, outlined the variety of organic fuels used in that period – not just wood, but also peat, gorse and furze. Peat, used on a large scale in the seventeenth century, was still providing fuel in the lowlands in the eighteenth century. On the Norfolk Broads, its extraction increased after enclosure and many parishes had 'fuel allotments' of peat. In Cornwall, by contrast, furze from the heath was commonly used as fuel.

Much fuel came from hedges and coppices and, as William Marshall noted in his surveys, mixed hedges and pollarded trees were still an important source of firewood in the late eighteenth century. The nature of hedges varied regionally, not only in the mixture of species grown, but also in appearance: in some areas hedges were like small woodlands, and could be 30–40 feet wide. By the mid-seventeenth century, coal was being used in many parts of the North and Midlands, though use was restricted to those able to afford its relatively high price. After 1750, when the costs of organic and fossil fuels levelled out across the country, coal was used more widely. It was generally transported by boat, so its use was particularly observed in areas which were accessible by water. As the use of coal spread, organic fuels diminished in importance, hedges ceased to be the 'collieries of the countryside' and more land was given over to food production. Williamson ended by explaining how fireplace design provided a useful indicator of coal adoption, since coal burned better in small hearths than in large inglenook fireplaces. He suggested that a close reading of domestic architecture could provide valuable information in this field.

Karen Sayer (Leeds Trinity University) delivered the final paper, which was a suitably illuminating study of 'Electrification and the farm'. This, we learned, was a complex story. Until World War I, electricity was mainly supplied to cities and expansion into the countryside was slow: even by 1944 only 50 per cent of farms had electric lighting, much of which was produced by the farmers' own generators. A planned programme of rural electrification in 1953 meant that by 1960 around 80 per cent of farms were being served by public companies. However, although the arrival of electricity was to change the spaces of the farm and affect the design of new buildings, it was in the domestic sphere that it was first adopted. Lighting in cottages and farmhouses was the first priority, followed by the acquisition of labour-saving devices such as vacuum cleaners. One reason for this was a concern that, without modern amenities in their homes, agricultural workers would leave the land and seek alternative employment.

Adoption of the use of electricity in farming practice was slow and, as supply was often unreliable, farmers were reluctant to get rid of their own generators. Although electricity meant poultry could be kept indoors and cows could be milked by machine, farmers often continued to use generators, paraffin lamps and Calor gas to provide light and power. There were also concerns about the social cost of such devices, which were seen to be putting British labourers out of work. There were competing views of the value of electricity. Although it was promoted as 'modern' and progressive, many saw the march of pylons across the land as a threat to the countryside and a traditional way of life. Although electrification facilitated and allowed for mechanization, its adoption in agriculture was neither rapid nor linear, and until the 1970s it was in competition with other technologies. Questions on this paper, as all the others, could have continued for much longer than time allowed. Unfortunately illness had prevented the organizer, Paul Warde, from attending the conference, but all were grateful to him for arranging such an engaging programme.

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Forthcoming conferences

British Agricultural History Society 2015 Spring Conference
University of Bangor
Monday 30 March to Wednesday 1 April

The conference will feature papers by Dr Matthew Tompkins (University of Winchester) on 'The online fifteenth-century inquisitions *post mortem* database: a new tool for rural history', Dr Carin Martiin (Swedish University of Agricultural Sciences) on 'Swedish dairy farming: the parallel existence of two different systems of production, 1890s to 1960s', and Executive Committee member, Ruth Tittensor on 'Twenty Shades of Green: the Changing Roles of Woodland in Upland Britain and Ireland since 1800'. We will also be joined by Lowri Rees and Nia Powell of Bangor's History department and Institute for the Study of Welsh Estates. There will be a New Researchers session which will include papers on science and seed improvement in the sixteenth and seventeenth centuries, the place of women in watercress production between 1860 and 1945, and Lower Wharfedale's farming community, 1914 to 1950. Back by popular demand will be the conference field trip on the Tuesday afternoon: we will be visiting Hafod y Llan farm. For more details, see the BAHS Web site, www.bahs.org.uk

The second conference of the European Rural History Organisation (EurHO), Rural History 2015
Girona, Spain
Monday 7 to Thursday 10 September

The preliminary programme will be announced and registration will open at the end of February. For more details, see the conference Web site, k.udg.edu/ruralhistory2015

The imperial abbey of Ellwangen and its tenants: a study of the polyptych of 1337*

by Shami Ghosh

Abstract

This article presents an analysis of Ellwangen Abbey's polyptych of 1337, with a view to understanding better the nature of the south German rural economy in this period. It is generally accepted that in England by this time, rural society was highly commercialized, despite (or because of) the survival, at least formally, of the manorial system. In contrast, there was little direct management of demesne lands in much of Germany at this date, but the evidence suggests that rural society was, here as well, highly commercialized. Although this article is an analysis of only one source for one micro-region, its results suggest that the situation in England might have been less exceptional than is often supposed, and in the final section of the article some further suggestions are advanced regarding the implications of this point.

The later Middle Ages have been understood as a crucial phase in the agrarian and economic history of England: an 'age of transition', a period characterized by changing forms of land tenure, increasing commercialization and social stratification, and, according to one influential thesis, the origins of capitalism.[1] Scholarship on England – like scholarship on most other regions – tends to follow a 'national' trajectory, and generally avoids comparative analysis as a means of understanding the causes of socio-economic change in the long term. This is a particular misfortune in the case of England because, as a result of its industrialization earlier than other parts of Europe, and because of apparent peculiarities in its agrarian socio-economic system in earlier periods, England tends to be seen very much as an island to itself, unique and following a different path from the rest of the world. Whether deliberately, as

* I would like to express my thanks to Richard Hoyle and the two referees for the *Review* (one of whom subsequently revealed himself to be Chris Dyer) for their extremely useful suggestions. I am also grateful to Tom Scott for his encouragement and comments, and to the Interlibrary Loan staff at the John P. Robarts Library in the University of Toronto for their prompt and efficient assistence in supplying me with material.

[1] The period between *c.*1300 and *c.*1550 was most recently characterized as an 'age of transition' by Christopher Dyer, *An age of transition? Economy and society in the later Middle Ages* (2005). On processes of commercialization, see the seminal work of Richard Britnell, *The commercialisation of English society* (sec. edn, 1996). For the arguments regarding the origins of 'agrarian' capitalism in the period following 1350, see Robert Brenner, 'Agrarian class structure and economic development in pre-industrial Europe', *Past and Present* 70 (1976), pp. 30–75; Brenner, 'The agrarian roots of European capitalism', *Past and Present* 97 (1982), pp. 16–113. Both papers are also reprinted in T. H. Aston and C. H. E. Philpin (eds), *The Brenner debate: agrarian class structure and economic development in pre-industrial Europe* (1985).

in the case of Robert Brenner (who did indeed adopt a comparative framework, but only in order to prove that England was unique), or unwittingly in the case of most other more recent historians (whose narratives about England normally betray no hint that similar developments might be found elsewhere), England tends to be presented as exceptional with respect to agrarian commercialization, and as a region that appeared to have some sort of drive towards capitalistic development earlier and to a greater extent than can be found elsewhere.

The only way one might genuinely establish just how exceptional England was, however, is by means of detailed comparison with other regions. The basis of any comparative work must necessarily be rigorous empirical analysis, and the purpose of this article is to provide a comparandum from a region – southern Germany – that tends not to loom large in discussions of agrarian commercialization and transitions to capitalism, while also providing some stimulus for the more theoretical debate regarding these issues and the question of how unique England's situation on the eve of the Black Death actually was.[2] Agrarian historians in the English-speaking world seeking comparative empirical material from the German lands are relatively well-served by scholarship on the sixteenth century and later periods.[3] For the Middle Ages, however, most work in English on Germany concerns political history.[4] Although Werner Rösener's survey of the medieval peasantry focuses on Germany and is available in English translation, with the exception of some articles by Michael Toch, there is a lack of detailed studies of single estates or landlords that could stimulate further comparative research.[5]

This article intends to take a first step towards filling this gap, providing an examination of the economic relations in the 1330s and 1340s between the principal landowner of one south German micro-region, the abbey of Ellwangen, and its tenants; this will be the first study in any language of Ellwangen's agrarian history in this period. The first part of this article introduces Ellwangen and its surroundings, and the primary source on which this study is based. Part II provides an analysis of the economic organization of the abbey's holdings. Part III discusses briefly some of the theoretical implications arising from the foregoing empirical analysis, with reference to scholarship on both southern Germany and England in the same period.

[2] A more lengthy theoretical discussion is forthcoming elsewhere: see my 'Rural economies and transitions to capitalism: Germany and England compared (*c.*1200–*c.*1800)', *J. Agrarian Change* (forthcoming).

[3] Exemplary studies in English are provided by Thomas Robisheaux, *Rural society and the search for order in early modern Germany* (1989), and Govind P. Sreenivasan, *The peasants of Ottobeuren, 1487–1726: a rural society in early modern Europe* (2004). See also most recently Katherine M. Brun, *The abbot and his peasants: territorial formation in Salem from the later Middle Ages to the Thirty Years' War* (Quellen und Forschungen zur Agrargeschichte, 56, 2013). For the seventeenth and eighteenth centuries, see William W. Hagen, *Ordinary Prussians: Brandenburg Junkers and villagers, 1500–1840* (2002), and David Warren Sabean, *Property, production, and family in Neckarhausen, 1700–1870* (1990). For the period 1300–1600, the sections on rural society in Tom Scott's survey are very useful: *Society and economy in Germany, 1300–1600* (2001), pp. 76–90, 153–99.

[4] This scholarship tends to ignore economic history altogether; however, a useful, brief survey on peasant life can be found in Benjamin Arnold, *Power and property in medieval Germany: economic and social change c.900–1300* (2004), pp. 35–74.

[5] Werner Rösener, *Peasants in the Middle Ages* (1992; originally published as *Bauern im Mittelalter*, 1985). Toch's work on this subject is collected in his *Peasants and Jews in medieval Germany: studies in cultural, social and economic history* (Variorum Collected Studies Series, 757, 2003). See further Ludolf Kuchenbuch, 'Links within the village: evidence from fourteenth-century Eastphalia', in Del Sweeney (ed.), *Agriculture in the Middle Ages: technology, practice, and representation* (1995), pp. 138–62, for a study of rural social structures.

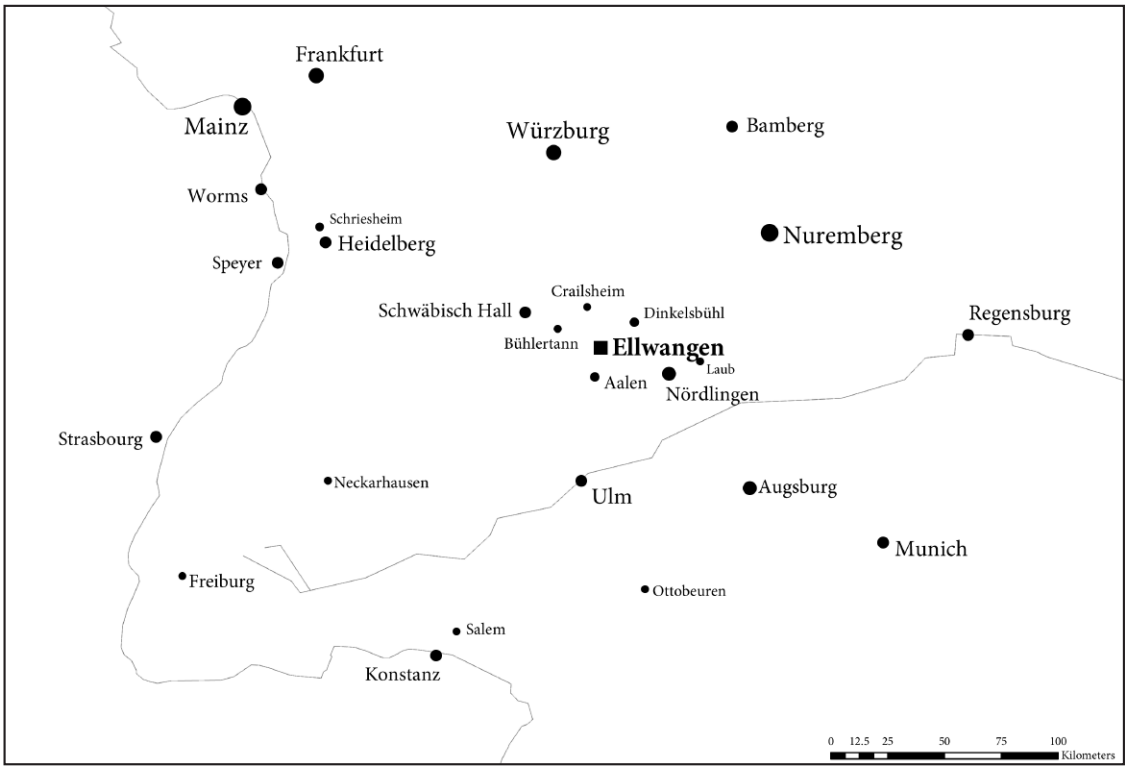


FIGURE 1. Ellwangen within southern Germany

I

The town of Ellwangen is situated in the north-eastern corner of what is now Baden-Württemberg, roughly in between two geological areas: to the south and south-east are rolling hilly landscapes of rich clay and marl soils, well-suited to arable cultivation, while the north and west are characterized by more wooded areas with rocky soils. A number of rivers flow through the region, including the Jagst, on the banks of which the town of Ellwangen came into being. A Benedictine monastery was founded here by Hariolf, Bishop of Langres, in 764.[6] From 814, Ellwangen was an imperial abbey, with no regional overlord.[7] An Ellwangen penny is mentioned in a charter of 1147, and although it does not occur in any other document, its existence suggests that there was by this point a market at Ellwangen; by the middle of the fourteenth century there is evidence for four regular markets held in the town.[8] The town

[6] There is no original foundation charter. A narrative of the abbey's foundation is in the ninth-century biography of Hariolf by Ermenrich, a monk of Ellwangen who later became bishop of Passau, and the date of foundation is given in a charter of 1124 recording the rebuilding of the abbey after its destruction by fire in 1100. See Viktor Burr, 'Vita Hariolfi', in Viktor Burr (ed.), *Ellwangen 764–1964: Beiträge und Untersuchungen zur Zwölfhundertjahrfeier* (1964), pp. 14–18, where the founding of the abbey is described; *Württembergisches Urkundenbuch* (hereafter *WUB*), I, no. 281, pp. 357–8. On Ermenrich, see *Lexikon des Mittelalters*, III, col. 2157.

[7] *WUB* I, no. 71, pp. 79–80.

[8] *WUB* II, no. 325, p. 41. On the history of markets in Ellwangen, see Immo Eberl, 'Der kalte Markt und

itself makes its first documentary appearance in 1229 when Ellwangen is mentioned as a *civitas*.[9] From entries in the polyptych (*Urbar*) of 1337 it is clear that the abbey remained the overlord of the town.[10] There was another market about 20 kilometres away to the north west at Bühlertann, where the abbey had a number of holdings, and a further market within a day's journey of Ellwangen was located in Aalen, roughly 15 kilometres to the south; the abbey was a major landowner here as well. Other market towns between 20 and 40 kilometres distant from Ellwangen were Crailsheim to the north and Dinkelsbühl to the north east, and the major regional markets of Nördlingen to the southeast and Schwäbisch Hall in the north west. The abbey's peasants thus lived within a day's journey of one of the local market towns, and were but two days away from major centres of regional and inter-regional exchange.

By the 1330s, Ellwangen was a reasonably well-endowed monastery: the polyptych of 1337 records properties at over a hundred locations, mostly within a 12-kilometre radius around the abbey (although a fair number are further away), as well as rents from citizens of the town of Ellwangen itself.[11] The source used in this article is a record of renders of all kinds due to the abbey from its tenants. It also lists a number of tithes owing from properties that did not

Note 8 continued
die Ellwanger Jahrmärkte: Pferde, Vieh und Handel in der Geschichte von Kloster, Stift und Stadt Ellwangen', *Ellwanger Jahrbuch* 38 (1999–2000), pp. 11–118, pp. 18–21 for the period up to *c.*1400. There are no sources to inform us as to how or why these markets originally came into being, but it is plausible that the growth of other towns in the region and associated commerce, coupled with, perhaps, the abbey's own increasing demand for cash payments, were factors involved in bringing these markets into existence.

[9] *WUB* III, no. 769, p. 258. The town appears to have grown out of an informal settlement of lay people, attested in the early twelfth century, and was located immediately without the abbey walls; in the fourteenth century, part of the northern wall of the abbey also functioned as one of the city walls: Eberl, 'Der kalte Markt', p. 18; Eugen Weis, 'Bürger zu Ellwangen unter Abt und Propst', in Burr (ed.), *Ellwangen 764–1974*, pp. 168–78, at p. 168.

[10] This polyptych, the basis of the present study, is cited from Hubert Häfele (ed.), *Das älteste Urbar der Abtei des gotzhuses zu Ellwangen von 1337* (Veröffentlichungen der Kommission für geschichtliche Landeskunde in Baden-Württemberg, Reihe A: Quellen, 52, 2008), hereafter *Ellwanger Urbar*, followed by entry number; page numbers are given only for references to the editor's introduction. The text states clearly that the abbot is the legal lord of the city, which is defined explicitly as his possession: *Ellwanger Urbar*, 206. The abbey was owed an annual communal fee of £100 from the town, along with rents from the communal herd of cattle, tithes, a monopoly on milling rights, and the right to appoint and approve most officials of the town, from the shepherd to the court officers: *Ellwanger Urbar*, 2–5, 8–9, 11–13, 206. For a discussion of the abbey's relations with the burghers of Ellwangen, focusing mainly on the period after 1400, see Weis, 'Bürger zu Ellwangen'.

[11] Note, however, that in many of the places mentioned the abbey was not the only landlord; a number of lay landlords in the region have a shadowy existence in this source as the other parties in the purchase and sale of the abbey's lands. A useful overview of the history of the abbey's landholding is provided by Häfele in his edition of the polyptych: *Ellwanger Urbar*, pp. xxii–xxxvii. For the period up to *c.*1300, a number of charters recording land transfers to the abbey are printed in the *Württembergisches Urkundenbuch*; these provide little information about how the land and the people cultivating it were managed. Some other relevant sources for the period before the compilation of the 1337 polyptych have been published, including a twelfth-century lectionary that contains information about rents due from various properties (*WUB* VI, no. N8, pp. 435–6); a list of holdings compiled *c.*1136 (Karl Otto Müller, 'Ein Ellwanger Güterverzeichnis über die Schädigung des Klosterguts durch Abt Helmerich', *Württembergische Vierteljahreshefte für Landesgeschichte*, neue Folge, 39 (1929), pp. 36–58); and a necrology commenced in the later twelfth century (Karl-Heinz Mistele, 'Necrologium Elvacense', in *Ellwangen, 764–1964*, pp. 160–7); Häfele's edition provides references to additional material, both published and unpublished. The source used in the present study is the earliest polyptych, and the earliest text to provide

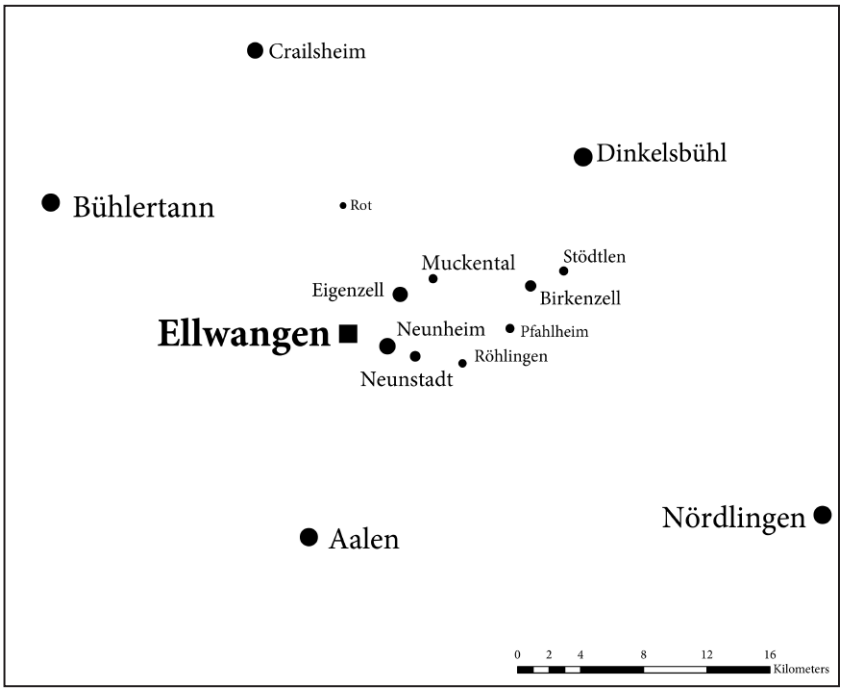


FIGURE 2. Ellwangen and its immediate surroundings

have the abbey as their landlord.[12] The compilation of this text began after the election of Kuno of Gundelfingen to the abbacy in 1335, and an initial draft of the document was completed in 1337, whence the (modern editorial) title derives.[13] Between 1337 and 1344 further entries and marginal notes were added to the manuscript. In addition, two paper inserts (which one of the scribes calls the 'zwai quatern', and the editor refers to as the *Jüngerer* and *Älterer Quatern*) of eight pages each, were added into the parchment codex; these contain modifications of rents already recorded as well as information about other holdings not contained in the main codex. Five pages of have been lost from the two *Quatern*.[14] The manuscript – including the *Quatern* – was revised a number of times from 1356 onwards until 1381; most of these revisions were made in the 1360s and 1370s.[15] The earlier scribes had already periodically compiled *summae* of

Note 11 continued
any level of detail regarding land management; the earlier documents almost invariably do little more than record transfers of property to and from the abbey.

[12] Since almost all properties of Ellwangen also owed tithes (though in some cases these, like the recognition fees, were to be paid to the abbey's advocate), these are not discussed below.

[13] *Ellwanger Urbar*, pp. xxxix, xlix, li–lii. On Kuno, see further Karl Fik, 'Geschichte der Leitung der Abtei Ellwangen', in Burr (ed.), *Ellwangen, 764–1964*, pp. 107–52, at pp. 145–6; Sigrid Pfeiffer, 'Abt Kuno von Gundelfingen, 1332–1367: Mönch – Politiker – Manager', *Ellwanger Jahrbuch*, 39 (2001/3), pp. 109–18.

[14] *Ellwanger Urbar*, pp. li–lix.

[15] The sources for Ellwangen's history expand considerably from the later fourteenth century, as the individual offices of the abbey now compiled their own discrete lists of properties and pertinences (Hauptstaastarchiv Stuttgart, H 222, Bd. 263; Staatsarchiv Ludwigsburg, B 389: Bü 230 and Bü 804); the abbey also produced a polyptych in 1379 (Hauptstaatsarchiv Stuttgart, H 222, Bd. 171), and a register of rents in 1381 (Hauptstaatsarchiv Stuttgart, H 222, Bd. 172), both pertaining to the properties within and in the immediate vicinity of the town. These texts have yet to be edited; there are, however, editions of a brief polyptych from 1360 and a rent register from the parish of Ellwangen

rents of all holdings from individual settlements; these too are sometimes revised by the later hands. Most of the document is in Middle High German, but there are also many entries and annotations (particularly in the *Quatern*) in Latin. For the purposes of this study, I use only the entries from earlier period (1337–44) and provide a description of the rural economy based on the abbey's relations with its tenants during these years.[16]

II

The abbey's holdings fall into a number of categories (Table 1), ranging from the large estates that were probably the descendents of former manors (the *Meierhof* or *curia villicalis*), to cottage plots (*Selden*), as well as a number of urban properties in the towns of Ellwangen, Bühlertann, and Aalen.[17] For the purposes of this article, most of the latter are excluded. The only urban holdings included in my sample are the 77 Ellwangen burghers who were also obliged to provide labour services on the abbey's lands, and citizens of Bühlertann and Aalen whose plots are explicitly described as fields or meadows.[18] Also excluded from my sample are communally owed rents for common lands, fees paid by persons that appear unrelated to landholding of any sort, mills, three bathhouses, a hospital, and a brickworks; when the

Note 15 continued
from 1353: Hubert Häfele, 'Das Bucher Urbar um 1360', *Ellwanger Jahrbuch* 27 (1977–8), pp. 260–5; Häfele, 'Das Zinsregister der Pfarrei Ellwangen von 1353', *Ellwanger Jahrbuch* 29 (1981–2), pp. 142–5. These sources, like the polyptych of 1337, provide information primarily about properties relatively close to the abbey and from which the abbey drew considerable income; the abbey also produced a series of lists of properties (*Lehenbücher*) between 1367 and 1450 (Staatsarchiv Ludwigsburg, B 424), which include details about a large number of stray holdings further afield. These, along with numerous charters recording land transfers, are held in the Hauptstaatsarchiv in Stuttgart and the Staatsarchiv in Ludwigsburg, in some cases along with transcriptions by Häfele; brief descriptions of and references to the broader source base for the later period are provided in the introduction to his edition and notes to the text: *Ellwanger Urbar*, pp. xi–xii, xxi, *et passim*.

[16] I include material that has been crossed out by later hands. However, entries and information deleted by the contemporary hands are excluded. Where there appears to be contradictory information in a contemporary hand – as when material is contained both in the parchment codex and one or both of the *Quatern* – I include the data from the *Jüngerer Quatern* only. Note further that for the years concerned, while some stray charters recording transactions with other landowners do survive, there are no other sources relevant to the questions posed here.

[17] Where a recognisable modern equivalent of a Middle High German term occurs in the source that is in current (at least academic) use, I use the modern equivalent throughout, with modern capitalization and plural forms; thus the source's *mayerhof* is rendered as *Meierhof*, pl. *-höfe*, *selde* as *Selde*, pl. Selden, *hub* as *Hufe*, pl. *Hufen*. In other cases (e.g. *zins* and *stiur ekker*, *hartzheller*, *morgen*), I retain the form given in the source.

[18] While it is possible – even likely – that holdings listed under the rubric of a particular town, and described as a house, or a house and garden, were engaged in the agrarian economy, it is impossible to be certain about this, and it is also probable that these tenants were more involved in non-agrarian occupations. Since in a number of cases urban tenants are indeed listed as paying rents for fields or meadows, it is reasonable to assume that when no such details are given, and when urban tenants are said only to pay rents on a home (and sometimes garden) but not on fields or meadows, these tenants had relatively little involvement in the agrarian economy. It is likely, however, that they did engage in intensive market-gardening for the towns, and probably also in raising poultry; in addition, there are entries relating to urban shepherds, suggesting that the towns had access to communal pasture. On the communal financial obligations of the city, see *Ellwanger Urbar,* 1–14, 206, and 254 for the tithes; see further Weis, 'Bürger', pp. 168–71.

TABLE 1. Holdings by type

	Hof	*Hufe*	*Selde*	*Lehen*	*Zins* and *stiur ekker*	Other	Total
N	66	69	71	202	94	262	764
(%)	8.5	9.0	9.0	27.0	12.5	34.0	100.0

miller also holds a field or a meadow, however, the latter have been included.[19] With these properties and dues excluded, we are left with a total of 764 holdings, which form the basis of the following analysis.[20]

Table 2 shows that just under nine per cent (66) of the properties in this sample are categorized as *Höfe*. A *Hof* (*curia*) was a large holding, most likely descended from an earlier demesne, though not necessarily the full land area of that demesne; eight of these are *Meierhöfe*, which would have been held by the *Meier* (reeve).[21] Of the *Höfe*, 18 are a fraction:

[19] One field-watchman is recorded as owing oil, but either he had no land, or this fee is related to the office: *Ellwanger Urbar,* 1480. The open fields (*Flur*) at Aalen collectively owed one *malter* of spelt: *Ellwanger Urbar,* 1508. On two occasions, a rent is recorded as owing from the cows of a settlement collectively, in one case of cheese, in the other of money, called 'der kuewe heller': *Ellwanger Urbar,* 653 (cheese, with a monetary value specified); 1557 (money). Apart from the herdsmen at Ellwangen itself, two further herdsmen are mentioned who appear not to have had any landholdings; one of them owed a *malter* of oats and a quarter of oil, the other owed 100 eggs; the collective fee for the Ellwangen herdsmen is 5*s*. and 200 eggs: *Ellwanger Urbar,* 11, 1481, 1556. Haintze Volrat's son of Muckental paid 5*s*. for the abbey's protection: *Ellwanger Urbar,* 322 (this entry has been deleted, but it is unclear whether by a contemporary or later hand). In what might be a similar case, Walther Schatzman is described as 'dez gotzhus aygen' ('belonging to the abbey') and paid 10 schillings 'vom lib' (for his person): *Ellwanger Urbar,* 787. Mills are recorded at *Ellwanger Urbar,* 12, 295, 332, 370, 388, 407, 658, 745, 1158, 1380, 1412, 1484, 1485–8, 1509. Apart from the first, which is an entry concerning all the mills of the town of Ellwangen, these are for individual mills, mostly in villages; in most cases, the miller also had some additional land, which is listed separately. Apart from the Ellwangen mills, two others also paid grain rents and no cash; the rest owed money alone. Three bathhouses are listed: *Ellwanger Urbar,* 1157, 1476, 1489. All owed cash rents only. One hospital (*selhus*) pertaining to the parish of Stödtlen is also listed, and was surprisingly not exempt from rents, paying 3*s*. and a chicken: *Ellwanger Urbar,* 691. The brickworks owed 8000 bricks every year: *Ellwanger Urbar,* 381. The currency used here is £1 = 20*s*. = 240 *heller* (*d*.); the *heller* was a local penny, widely circulated in southern Germany by this point.

[20] Where one tenant demonstrably has more than one holding, these are counted separately in my sample, though where I attempt to distinguish between smallholders and fullholders, I exclude from the former category individual smallholdings held by single tenants that together could be equal in size to a full holding (see further below on the criteria for differentiating between these categories). Where one entry lists one tenant as paying a single rent, but explicitly from two properties (e.g. X pays a certain sum from two *Lehen*), these are accounted for as a single holding for my purposes since in such cases the abbey appears to have counted the multiple holdings as one in terms of the rent due. However, where one entry explicitly lists multiple properties held by multiple tenants, these have been counted separately, even if the entry does not separately enumerate the rents for each holding. Although it is not always clear that the 17 tenants owing only cash rents from collecting resin (*hartzheller*) actually also possessed landholdings, I have included them as individual entries in my sample.

[21] Note that the title of *Meier* or reeve would have earlier implied a hereditary tenant who also functioned as the manager of the demesne; by this point, however, the term did not necessarily any such connotations, and simply indicated the tenant of the *Meierhof*, a term attaching to the property by virtue of its earlier associations. The *Meier* could, however, often function

TABLE 2. Holdings by size

	Höfe[a]	Full *Hufen*	Other full holdings[b]	*Selden*[c]	*Zins* and *stiur ekker*[d]	Other small-holdings[d]	Fragmentary *Lehen*	Tenants owing *hartzheller* alone	No size information	Total
	65	66	14	69	82	42	8	17	401	764
(%)	8.5	8.5	2.0	9.0	11.0	5.5	1.0	2.0	52.5	100.0

Notes:
[a] This figure includes fractions of a quarter-*Hof* or larger.
[b] Full holdings include all holdings larger than 10 *morgen* apart from those explicitly called *Höfe* and *Hufen*.
[c] This excludes *Selden* that are known to be part of an accumulation of holdings of a single individual.
[d] This includes only individual holdings of less than 10 *morgen*, and excludes such individual holdings that are known to be held by tenants who also held other lands, with their properties cumulatively comprising more than 10 *morgen*.

ten are half, three each a quarter and a third, one is three eighths, and the last is an eighth of a *Hof*. A total of 48 are full *Höfe*. At the next level are those holdings called *Hufe*: full holdings, most likely descended from the holdings (*mansi*) of dependent peasants of former demesnes; there are as many *Hufen* as there are *Höfe* (66), with a further two being half a *Hufe* each, and one described as a small *Hufe*.[22] If all but the fragments of *Hufen* and the *Hof*-fragment less than a quarter in size are counted as full holdings, these comprise 131 holdings, 17 per cent of the whole; to this we may add a further 14 holdings that are neither *Hufe* nor *Hof*, but of which the size is specified and, at 10 *morgen* or more, may be counted as full holdings.[23] Thus 145, or 19 per cent, of the 764 properties are full holdings.[24]

Note 21 continued
as rent-collector on behalf of the landlord, and as we shall see below, it appears that the *Meier* at Neunheim retained some of his earlier role. For a thorough study of the end of the manorial system and the descent of the *Meierhöfe* from demesne lands in southern Germany (mostly further to the south than the region discussed in the present article), see Werner Rösener, *Grundherrschaft im Wandel: Untersuchungen zur Entwicklung geistlicher Grundherrschaften im südwestdeutschen Raum vom 9. bis 14. Jahrhundert* (Veröffentlichungen des Max-Planck-Instituts für Geschichte, 102, 1991), pp. 373–566.

[22] Fragments of *Höfe* and *Hufen*: *Ellwanger Urbar*, 329–31 (one *Hof* divided into one half-*Hof* and two quarters); 373–4 (a *Hof* divided into two halves); 411 (a half-*Hof*); 648–9 (two half *Hufen*, together paying £1 of rent); 1007 (a quarter-*Hof*); 1369 (two half-*Höfe*); 1370–2 (one *Hof* split into a half-*Hof*, and two fragments of an eighth and three eighths); 1375–8 (one *Hof* divided into one half-*Hof* and three sixths); 1385–6 (two half-*Höfe*). In addition, at *Ellwanger Urbar,* 144, 158, 162, 202–3, we have records of holdings in the town of Ellwangen, each of which was half a *hofstat*, and all of which owed labour services only (the labour services are discussed below).

[23] German measures are notoriously unstandard, far more so than their English equivalents for this period. The *morgen* was a standard measure of both agricultural land and meadow, though what it meant could differ depending on what sort of land was being measured; there were also vast differences depending on region. One *morgen* in this region in this period would have been somewhere between 0.75 and 0.85 acres, or roughly a third of a hectare. Ten *morgen* would have been between 7.5 and 8.5 acres.

[24] By smallholding I mean land that would have been too little to support the subsistence of a family; by full holding I do not mean a large plot, but simply one that would have been enough to support a family (even if at a bare minimum level of existence and not in years with bad harvests). I know of no detailed study of how large a plot had to be for subsistence in this region in the fourteenth century; the source does not allow us

At the other end of the spectrum, we have a number of holdings that can be clearly categorized as smallholdings. There are 71 holdings called *Selde*, a term that implies a cottage plot and can safely be understood as a smallholding. Two of these can be excluded from this category since they were held by persons also occupying other properties, leaving 69 (9 per cent). In addition, 94 holdings (12 per cent) are called either *zins akker* or *stiur akker* (pl. *ekker*; literally 'rent-paying fields', though sometimes some meadowland is also included under these headings); these rendered only chickens, and the size of all of them is specified. If we exclude those that are 10 *morgen* and above, and exclude also multiple individual holdings held by one tenant that together make up more than 10 *morgen*, we are left with 82 (11 per cent) that are smallholdings. A large number of the abbey's holdings are difficult to categorize by size or type: 202 are described only as *Lehen* or *feudum*, and of a number of others we are told only that X owes a certain sum of money or a natural rent from field (*Acker*), meadow (*Wiese* or *pratum*), or woodland (*holtz*). Some indication of size is often given in the latter cases, but this is not true of all of them; the *Lehen* almost never receive any further description. Seven of the *Lehen*, however, are fragments – half, thirds, or quarters – of *Lehen*, and can probably be counted as smallholdings; this also probably applies to the one property explicitly called a small *Lehen*.[25] Of the holdings called *Acker* or *Wiese* for which an indication of size is given, once the larger plots and conglomerations of properties are excluded, we are left with 38 holdings of field or meadow that are less than 10 *morgen* altogether. For the remainder – about half the listed properties – we have no indication whatsoever regarding size. It is nevertheless perhaps suggestive that no *Selde* paid more than 25*s*. 6*d*. in rent and only one paid that much (most owe 10*s*. or less), and the rents from the *Lehen* range from 3*s*. to £3 and 70 of them paid £1 or more; in contrast, both the full *Höfe* and the *Hufen* rarely gave less than £1.[26]

Note 24 continued
to make accurate estimates of productivity. For the sixteenth century (by which time there might have been some increase in productivity, but it is unlikely to have been really significant), for a neighbouring region, Sreenivasan suggests that 6.5 acres was the minimum amount of land required for subsistence: *Ottobeuren*, p. 148. In contrast, Dyer states that while 15 acres would have been sufficient for subsistence, rents, and a small surplus, 7.5 acres would have been too little to feed a family in medieval England: *Making a living in the Middle Ages: the people of Britain, 850–1520* (2002), p. 163. At 7.5–8.5 acres, 10 *morgen* seems a reasonable, conservative cut-off point for smallholdings. In any case, only eight holdings whose size is specified are larger than 10 *morgen*, and never more than 16 *morgen*, so the relative numbers of full holdings and smallholdings would change by only 2% even if we were to follow Dyer's estimates rather than Sreenivasan's. No sizes are available for *Höfe* and *Hufen*, but it is reasonable to assume that a full *Hufe* was a full holding; other studies suggest that demesne lands in southern Germany, when leased, were normally let out in parcels of about 40 acres, so a quarter *Hof*, if exactly 10 acres, would still have been over 10 *morgen*. These figures are all admittedly speculative. On the size of leased demesne lands, see Philippe Dollinger, *Der bayerische Bauernstand vom 9. bis zum 13. Jahrhundert*, trans. Ursula Irsigler (1982), pp. 127–30; Friedrich-Wilhem Henning, *Deutsche Agrargeschichte des Mittelalters, 9. bis 15. Jahrhundert* (1994), p. 174; Rösener, *Grundherrschaft*, 469–71, 521–30.

[25] Fragmentary *Lehen*: *Ellwanger Urbar,* 1349–51 (a *Lehen* divided into one half-*Lehen* and two quarters; the rents for these holdings added up comes to £1 6*s*., suggesting at least a *Hufe*-sized property originally); 1388–90 (a *Lehen* divided into three, cumulatively paying a rent of £1 13*s*.); 1433 (a *Lehen* explicitly called small, paying 31*d*. of rent only).

[26] The *Selde* that paid over £1 of rent occurs at *Ellwanger Urbar,* 699, and was located at Röhlingen; it was also one of only two *Selden* owing renders of grain (a number of *Lehen* with rather low money rents also owed grain). Only six of the 48 full *Höfe*, four of the fragmentary *Höfe* a quarter or more in size, and four of the 67 full *Hufen* did not pay at least £1 in rent (two of the *Höfe* paying less than £1 owed no cash

Although it would be unwise to make judgements regarding holding size solely on the basis for rents, it nevertheless appears fair to state that while the term *Lehen* could be applied to holdings of any size, ranging from *Selde* to *Hof*, most are unlikely to have been large holdings of any kind, and many were probably too small to support a family.[27]

Adding all these figures (the *Selden*, the *stiur* and *zins ekker* less than 10 *morgen*, the eighth-*Hof* and the three fragmentary or small *Hufen*, and all other holdings of less than 10 *morgen*) leaves us with a sum of 201 holdings that were less than 10 *morgen* and were not held by persons also holding other land giving them a total of more than 10 *morgen*. To this we may add the 17 individuals who paid only *hartzheller* or *hallenses resinales*, cash rents from collecting resin in the woods.[28] In most cases, it is not clear that these persons held any land at all, and most likely simply had the rights to exploit the forest resources of the area. (Surprisingly, none of them was expected to provide any pigs or pork; this suggests that whatever land they possessed would only have provided space for very little livestock of any kind, whether pigs, cattle, or poultry.) They are said to pay their rents from *holtze* or *wicmarch* (woodlands); if we assume that they had no other significant landholdings (none are recorded in the source), they can also be counted among those who had insufficient land to provide directly for the subsistence of their families. (They must, however, have had at least a small cottage to live in, and possibly also a small garden plot and perhaps access to commons, though this is pure speculation.) Thus a very significant proportion of the abbey's tenants – 218, or 29 per cent – were certainly smallholders (or possibly, in the case of those owing *hartzheller* alone, absolutely landless), who would have been dependent on some source of income to sustain themselves, beyond what they could produce on their own lands. As we have seen, of the remaining holdings for which no size indication is given, it seems most likely that most were smallholdings.

While the majority of Ellwangen's tenants thus appear to have been smallholders, there is also some evidence of accumulation: I count 20 instances of a single tenant (or, in one case, a tenant and his brother) possessing two or more *Lehen* that are assessed as one holding (and counted thus in my sample); or a *Hufe* or *Hof* as well as *Lehen* or fields or a *Selde*; or multiple holdings of *Acker*; in all these cases either the cumulative land area is recorded as 10 *morgen*

Note 26 continued
whatsoever, but one of them owed a half share of the crop). The three holdings owing as much as £3 10*s*. or more were *Höfe*, and one of them was the *Meierhof* at Aalen: *Ellwanger Urbar,* 595, 1493, 1496 (*Meierhof*). One *Hufe* and five *Lehen* had rents as high as £3: *Ellwanger Urbar,* 298–300 (*Lehen*), 371 (a holding consolidated out of three *Lehen*), 402 (*Hufe*). In addition, use rights to one plot of woodland (*holtz*) at Laub (this is one of the abbey's holdings furthest away from Ellwangen, located to the north east of Nördlingen) were also worth £3: *Ellwanger Urbar,* 654. See the Appendix for a discussion of the value of the monetary sums paid in rents.

[27] Even if we count the 70 *Lehen* owing £1 or more as full holdings on the basis of their rents, this would take the total number of full holdings only up to 30%. And if we count properties paying £1 or more as full holdings, we must count the others as smallholdings, which leads to the inevitable conclusion that roughly two thirds of the abbey's tenants were smallholders. Of course, this is speculation, however well-founded, since the level of the rent is not necessarily a good basis for judging the size of a holding. Nevertheless, there seems to be no doubt that smallholdings significantly outnumber the full holdings, and most likely comprised more, possibly significantly more, than half of all the holdings.

[28] What was done with this resin is unclear from the source; it is apparent, though, that it must have been sold in order for the collectors to be able to pay cash rents.

or more, or the rent paid was £1 or more.[29] This is a statistically insignificant number, given the size of the sample; but from the perspective of the social history of the region it is not inconsequential that we can find the beginnings of some amount of accumulation among the upper strata of the peasants. Furthermore, it is likely that other tenants holding large *Lehen* or a large acreage of fields also represent such accumulation that had occurred at an earlier date: the result of consolidating as one holding fragments of *Höfe* or *Hufen*, or cottage plots, or individual fields and meadows. (The number of *Hufen* and *Höfe* is relatively small, and an individual *Hof* or *Hufe* is unlikely to have been built up by accumulation.) The evidence thus suggests that processes of both fragmentation and accumulation had led to a fairly high level of social and economic differentiation among the local population.

Table 3 shows that 465 of the properties (61 per cent) paid rents in cash (many also, as we shall see, owed other renders as well); a further 17 (2 per cent) owed only *hartzheller*.[30] Apart from rents, 83 holdings (11 per cent) also paid a *wisat* (a recognition fee) in cash; all but three of these also owed a money rent.[31] In contrast to money, the abbey expected

[29] Evidence of accumulation (I do not here include instances of tenants with multiple holdings of less than 10 *morgen* altogether, or paying less than £1 of rent): *Ellwanger Urbar,* 79, 571, 631 ('diu Suterin' holds a house and fields in Ellwangen, and two plots of 3 *morgen* each of *zins ekker*); 234 and 786 ('der Gerhuser' holds a *Hof* and a single *morgen* of fields elsewhere); 304 and 304a (Sitze Egelolf holds two *Lehen*, owing 10*s*. for each); 319 (Dentzelin holds what were 'wilunt triu kleiniu lehen, diu sint nu geaht uf ain lehen': 'three small *Lehen* now counted as one'; he pays 30*s*. rent); 371 (the brickmaker holds a *Lehen* said to have earlier been three, paying £3 of rent); 430–2 (Haintze Smit holds three *Lehen*, cumulatively paying over £1 of rent; one of these holdings is itself comprised of three *Lehen*); 435 ('des Spilmans sun' holds two *Lehen* counted together, paying £1 of rent); 539, 548, 555 (Butzan hols a *Hufe* and a *Lehen* together paying £1 10*s*. rent; he also holds 5.5 *morgen* of fields); 573, 621 (Utze der Wegener and his brother hold two plots of *zins ekker* totalling 15 *morgen*); 586, 604, 610, 626 (Sitze Zimmermann holds a *Hufe*, a *Lehen*, a field of 1.5 *morgen*, and *zins ekker* of 4 *morgen* and a small meadow); 627 (a *Hof* holding a *zins akker*; the *Hof* is not elsewhere recorded); 141 and 638, 173 and 635, 179 and 644a (Wernher Maister, Haintze von Kotzpuhel, and Walther Russe each have both a *hofstat* in the town of Ellwangen and *zins ekker*); 537, 547, 572 (Setzelin der Gesser holds a *Hufe* and a *Lehen*, together paying £1 10*s*. rent as well as grain and commuted labour services; he also has 12 *morgen* of *zins ekker*); 182, 210, 641 (Cuntze Smit holds a *hofstat*, a field, and *zins ekker*); 1133 and 1275 (Cunrat der Genanne holds a *Hufe* and 3 *morgen* of *stiur ekker*); 1134 and 1281 (Sitze Hertuelder holds a *Hufe* and 11 *morgen* of *stiur ekker*); 1149 and 1277 (Hainrich Wolfganch holds a *Lehen* owing 12*s*. and a grain render, and 8 *morgen* of *stiur ekker*); 1280, 1400, 1407 (Lutze Herinch holds 4 *morgen* of *stiur ekker* as well as a *Lehen* paying £1 of rent and a *Selde*; he may the same as the Herinch recorded at 1392, who holds a *Hof* with his son).

[30] A similar proportion of tithe-paying properties that owe no rents (recorded in the source but not included in my sample) paid their tithes in cash: of a total of 103 tithes, 67 (65 per cent) were in cash. Tithes are recorded as greater (grain) and lesser (vegetables and animals) tithes, with hay tithes a category by themselves; greater and lesser tithes are almost invariably to be paid in kind, whereas hay tithes are almost all recorded as commuted; all but two of the cash tithes are expressly recorded as commuted hay tithes. See *Ellwanger Urbar,* 268: the tenant 'git 3 schillinge heller fuer den huwe zehenden' ('gives 3*s*. for the hay tithe'); the following entries list only the cash fee, but all come under a heading 'Von den heuwe zehenden, die zu Elwangen gehoerent' ('regarding the hay tithes that pertain to Ellwangen'). The commutation of the tithes is made more explicit at *Ellwanger Urbar,* 1047: 'Vnd wanne die kircherre vormals lange daz heuwe von den lueten nit nament noch samentent, do sluog man daz heuwe an heller vnd namen heller fuer daz heuwe. Vnd so wil ich beschriben die heller, die man fuer daz heuwe git' ('and because the possessors of the church from a long time ago neither took nor collected the hay from the people, the hay was commuted to pennies and pennies were taken instead of hay. And thus I will list the pennies that people give for the hay').

[31] On the *wisat* or *Weisat* and its origins, see Josef Hopfenzitz, 'Die Weisatgabe – ein grundherrschaftliches

TABLE 3. Holdings by rent type[a]

	Cash rents	*Hartzheller* alone	Labour services[b]	Grain renders[bc]	Share of the crop[b]	*Zins* and *stiur ekker* owing only chickens	*Selden* paying no cash rents	Natural rents alone[d]	Total
N	465	17	78	6	37	94	33	22	752
(%)	61.0	2.0	10.0	1.0	5.0	13.0	4.0	3.0	99.0

Notes:
[a] These figures add up to just under 99 per cent of the total of 764 holdings, since the four holdings owing no rents at all and the eight holdings for which no information is available are not included.
[b] These refer to holdings that do not also owe cash rents.
[c] These holdings owe a specified amount of grain, rather than a share of the total harvest.
[d] This figure refers to holdings owing only natural rents not including chickens; it also does not include the *Selden* of the previous column.

labour services from just 132 (17 per cent) of its tenants. Of these, 12 could either perform labour or commute this service for a cash rent; all of these 12 also owed a cash rent anyway. If we exclude all those holdings with money obligations, we are left with only 78 holdings owing labour services and not also paying cash in some form. That is to say: 59 per cent of those properties that were obliged to provide labour services neither paid cash rents nor had the option of commuting their labour for money; this amounts to just 10 per cent of the total sample. All but one of these were homesteads (*hofstete*; sg. *hofstat*) in the town of Ellwangen, which suggests that close proximity to the abbey has something to do with the importance of labour services. These tenants were supposed to provide *sniter* (reapers for the corn harvest) and *recher* (people to rake mowed hay). None of the labour to be provided for the grain harvest – the *sniter* – was performed on demesne land at Ellwangen: these tenants are explicitly said to owe their labour services on the lands of the *Meier* of Neunheim, about two kilometres to the east, to assist with the reaping of rye and oats.[32] Nothing is said about where the *recher* go, though some entries mention a number of meadows around Ellwangen that belong to the abbey and appear not to have been cultivated by anyone else, and it is

Note 31 continued
Reichnis (Nach oberdeutschen Quellen)', *Zeitschrift für bayerische Landesgeschichte*, 40 (1977), pp. 23–38. Hopfenzitz argues that this was originally always paid in kind (and mainly by full holdings), but by the fourteenth century was (in southern Germany) commonly commuted.

[32] *Ellwanger Urbar*, 580: 'Vnd der apt sol dem selben mayer lihen die sniter der hofstet ze Elwangen … vnd sol im da mit helfen sniden in dem roggen snit vnd in dem haber snit'. The fact that labour services are owed at this *Meierhof* is not necessarily an indication that the abbey directly managed any lands here, and the fact that, as the same entry tells us, the *Meier* owed half of the crop of this property as well as a substantial cash rent of £2 suggests in fact that it did not. However, we should note that the abbot was supposed to provide not just labour, but also half the seed corn for this property; the *Meier* himself had the rights to collect the lesser tithes in the whole of the hamlet of Neunheim; and the *Meier* also claimed further rents from *Lehen* pertaining to this holding. It is apparent from this entry, therefore, both that the *Meier* had himself taken on some of the characteristics of a landlord, and that while the abbey may not have managed the lands there directly, it did retain some direct interest in terms of providing labour and seed corn.

possible that the hay was made there.[33] It is equally possible that all of these labour services were due at the *Meierhof* in Neunheim: if so, this is a further indication that this property descended from former demesne land, most likely one of the more important and older manors of the abbey.[34] Almost every other instance of an obligation for labour service is for mowing hay (*mader*). Thus all those tenants who performed labour services but paid no cash rents did at least part, probably all, of their labour not on directly farmed demesne land, but on a *Meierhof* (albeit one that owed a half-share of its crop to the abbey); almost all the others performed labour service related not to cultivating grain, but to the pastoral economy. Remarkable for its absence is any mention of labour services not related to the harvest, except for transport services owed only by the *Meier*.[35]

The obligations of the tenants are in all cases recorded as their owing a person – a *sniter* or *mader* or *recher* – rather than any specific number of days of service. But since all of the labour services relate to the harvest, whether of grain or hay, it seems likely that this information can be taken at face value: tenants had to provide one or more labourers to perform specific services for the duration of the harvest. In most cases, each holding owed only one labourer; the burghers of Ellwangen, however, who had no other obligations whatsoever beyond labour services (and, of course, tithes), all owed at least two labourers and in many cases more: each homestead (*hofstat*) had to provide one *recher* and two *sniter*, and tenants with more than one *hofstat* provided more labourers accordingly. A family, depending on the age and number of its children, would possibly have been able to provide three persons for the harvest without needing to hire wage labourers, but those tenants who had to send more people than this would almost certainly have had to find others to perform these labour services, and it seems plausible to suggest that even many of the single homesteads would have had to pay for at least some non-family labour to fulfil their obligations.

The only lands that would appear to have been under the abbey's direct control are a few meadows; labour services owed relate overwhelmingly to mowing or raking hay, and the labour that is related to grain crops was performed exclusively at the *Meierhof* in Neunheim. It is obvious therefore that labour services were not a major component of the relationship between landowner and tenant for most people on Ellwangen lands. Furthermore, insofar as labour services did exist on the abbey's lands, they were related more to the pastoral economy than to grain production; the abbey's grain consumption was clearly not predicated on forced labour on its own lands.[36]

[33] See *Ellwanger Urbar,* 1027–8, 1031–6, for 'prata ad castrum pertinentes' (this description is placed in a later hand at the head of these entries).

[34] Unfortunately, there appears to be no earlier charter evidence regarding Neunheim, which in itself might suggest that it belonged, if not to the abbey's original endowment, then to a very early stage in its history, making it more likely originally to have been a directly managed demesne.

[35] These are recorded for four *Meierhöfe*, at Birkenzell, Pfahlheim, Neunstadt, and Neunheim: *Ellwanger Urbar,* 445, 505, 530, 580. In no case did the *Meier* owe any other labour, but the transport service is not an insignificant one: these *Meier* had to travel to Schriesheim – over 100 kilometres to the north west, in the vicinity of Heidelberg – and bring back half or one wagon-load of wine.

[36] It is worth noting that 48 holdings paid cash dues that are explicitly recorded as commuted labour services: *madheller*, *madschillinch*, or *snitheller* (all of these also owed other money rents); mostly, these dues were for commuted mowing (*madheller* or *madschillinch*, which derives from *mader*, mower, and *schillinch* or *heller*), rather than reaping (*snitheller*, which derives

TABLE 4. Number of holdings owing each type of rent or service

	Money rents[a]	*Hartzheller*	Labour services	Commuted labour services	Grain renders	Share of the crop	Chickens	Other rents in kind
N	465	18	132	48	142	40	523	117

Note:
[a] This figure excludes those owing *hartzheller* alone.

The abbey was not, however, dependent on the market, or not primarily so at any rate. Close to a quarter of its holdings owed rents in grain. This is recorded either as a specified amount (142, or 19 per cent of the holdings), or as a share, normally a fifth but occasionally more (40; 5 per cent).[37] However, almost all holdings owing grain renders (136) also owed rents in money, though almost all of the sharecroppers (37) did not (one of these did, however, have to pay a cash recognition fee, the *wisat*); thus a total of 43 holdings that owed grain did not also pay cash rents. The most common natural render recorded is of poultry: 523, or 68 per cent of the abbey's tenants owed one or more chickens.[38] Most of these holdings, however, also had other forms of rent due, and it is not clear in most cases whether these chickens are to be counted as a rent or as a recognition gift (*wisat*) (they are occasionally explicitly called the latter, though in the case of the *zins* and *stiur ekker*, the chickens are clearly the rent, the *zins* or *stiur*). In

Note 36 continued
from *sniten*, to cut, and *heller*). It seems likely that at least some of the money rents of other holdings were also commuted labour services, but are not described thus because the commutation lay in the distant past; the fact that in 48 instances dues are recorded as commuted labour services, most of which are for mowing and all of which have to do with harvesting rather than ploughing, suggests that these commutations were relatively recent, and that labour services not related to the harvest had been commuted so much earlier that there was by this point not even any memory of the provenance of the money rents and grain renders as commuted labour services.

[37] All but three of the holdings with a specified grain rent fall into the categories of *Hufe*, *Hof*, or *Lehen*; those holdings that are simply called *Acker* never owe specified grain rent, and when they owe grain, it is a share of the crop. Fourteen of the *Lehen* that render grain to the abbey are, if their money rents are any indication, quite small, and might be smallholdings; and as we have seen, two *Selden* also give grain. Nevertheless, it seems to be the case that the majority of those owing specified grain renders were full holdings. Most holdings giving a share of the harvest are said to owe the *lantgarbe*, which means simply a share, and does not indicate how great a share; it would normally not have been more than a third. Where the share is specified among these holdings, it is almost invariably a fifth. Only one *lantgarbenakker* is specified as owing a third. In addition to these, however, a few holdings that are not said to owe the *lantgarbe* are recorded as owing a share; two of these owe as much as half their produce, and both are *Höfe*, at Neunheim and at Bühlertann: *Ellwanger Urbar,* 239, 580 (both Neunheim), 1160 (Bühlertann). Indeed, one is the *Meierhof* at Neunheim, where the labour services of the citizens of Ellwangen were to be performed: the abbey thus indirectly satisfied at least some of its consumption needs by way of obligatory labour services, though it is still important to recall that these were only for the harvest; the *Meier* would have had to find other ways of satisfying his labour needs for the rest of the year.

[38] Given that most holdings owed two chickens, and many three or more, the abbey would have received over 1000 chickens a year. For English comparisons, see Philip Slavin, 'Chicken husbandry in late-medieval eastern England, *c*.1250–1400', *Anthropozoologica*, 44 (2009), pp. 35–56; and D. J. Stone, 'The consumption and supply of birds in late medieval England', in C. M. Woolgar, D. Serjeantson, and T. Waldron (eds), *Food in medieval England: diet and nutrition* (2006), pp. 148–61.

addition, 117 holdings (15 per cent) owed rents in kind other than, or as well as, grain and chickens; most also paid money rents; 22 did not.[39] To these 65 holdings owing only rents in kind (grain or otherwize), we may add the 94 *stiur ekker* and *zins ekker* giving only chickens, as well as 33 of the *Selden* that also owed only chickens; we arrive at a total of 192 holdings (25 per cent) that paid no cash rents and performed no labour services. The majority of these – 82 *zins* and *stiur* ekker, the *Selden*, 36 of the sharecroppers, and four other holdings that paid rents in kind alone – were smallholdings. Thus 155, or 81 per cent, of the holdings that owed rents and not labour services, and paid these rents in kind only without any money rents owing, were occupied by smallholders. This leads to the conclusion that not only did the majority of the abbey's tenants owe cash rents of some sort, but also that those who owed only rents in kind were overwhelmingly smallholders.[40]

From the foregoing description of the abbey's holdings and the dues they owed, it is clear that the Ellwangen economy was highly monetized: almost two thirds of the abbey's tenants needed to realize a cash income in order to pay cash rents, otherwise they would have been unable to hold on to their land. The majority of Ellwangen's tenants were thus dependent on the market. Furthermore, the bulk of those not paying money rents were smallholders; they may not have been dependent on the market in order to pay rents and thus retain access to their lands, but they had insufficient land to feed their households, and would therefore have to have been engaged in some sort of activity that most likely had a market element in it: cultivating cash crops for the market, wage labour, or rural industry.[41] It is also striking that not just labour services, but even cash fees that are explicitly said to be commuted labour services, were a negligible part of the relationship between the abbey and its tenants.

Since there is no evidence for the abbey holding land in demesne and paying wage labourers to cultivate this land, the only conclusion is that by this point – and probably considerably earlier – Ellwangen had given up direct management of its agricultural land (whether for its own consumption or for the market) preferring instead to collect rents: this was a *Zinsherrschaft* or *Rentengrundherrschaft* (rent-based lordship), rather than the classical *Grundherrschaft* (landlordship). It is equally clear, however, that the abbey had not in any significant measure replaced labour services with its own engagement in the market, profiting from the sale of rents

[39] The natural renders excluding chickens are mainly eggs, oil, cheese, and (more infrequently) wax. Animals or meat are almost never specified as renders, though they were doubtless also included in the tithes; flax or textiles of any sort are also rare. One *Lehen* owed a rent of 6*s*., but earlier used to give 300 clay pots and no money: *Ellwanger Urbar,* 605: 'daz selbe lehen galt wilunt triu hundert schuesschelun und kainen heller. So gilt ez nu heller und nit schuesschelun'. One tenant with a *Lehen* at Aalen owed a pound of pepper every year, clearly an indication of commercialization: *Ellwanger Urbar,* 1554. The only other pepper rent was also paid by a town-dweller, though in this case by someone who appears to have had no fields or meadows: *Ellwanger Urbar,* 54. Note that a monetary value is often given for the cheese and the few renders of pigs, a further indication of the monetization of society; indeed, in some cases it is not clear whether it is actually pigs or meat rendered, or a cash fee instead.

[40] The 78 holdings owing labour services alone, however, cannot be placed in this category; 77 were urban properties with no indication of size recorded, and one, a field of a single *morgen* owing one *mader*, belonged to a member of the lesser nobility who held the office of cellarar at the abbey: see *Ellwanger Urbar,* 523, and the editor's note on that entry.

[41] It is likely that wages were paid in kind, and wage rates were probably based on custom, ties of kinship, or patronage, rather than on some kind of 'free' market rate. Unfortunately, because of the nature of the source, nothing further can be said about the incidence of wage labour or a labour market.

in kind: less than a quarter of its tenants owed grain rents, and while the abbey may well have placed some of this grain on the market, the fact that more tenants did not owe grain suggests that the abbey was not looking to become a large-scale player on the market itself, and was not profiting directly, in any significant manner, from the sale of its tenants' grain. This is equally true of other rents in kind, which are too few to suggest that they were intended for the market (though there is of course a possibility that some renders ended up being sold).[42]

III

The course of medieval German agrarian history in many respects appears different from what is found in England. In the latter region, direct management of demesne lands actually became more common over the course of the thirteenth century, so that in the period of relevance to this article, landlords were themselves actively engaged in farming, and given the size of their estates, this was, at least in the case of major ecclesiastical landlords (comparable to Ellwangen), in large part for the market as well their own consumption.[43] In Germany, the process of the dissolution of the manorial system (*Auflösung des Villikationssystems*) – that is, the abandonment of direct management of demesne lands, and with this the commutation of most labour services for rents in kind or cash – was largely complete by the beginning of the fourteenth century, though many landlords did retain some land in demesne, normally estates close to home.[44]

The situation at Ellwangen was by no means unusual: labour services were rare, cash payments were common, and as we saw, even the perquisites of lordship – the recognition fee, dues pertaining to personal bondage – were often paid in cash. Although Rösener found, on

[42] This conclusion is supported by the fact that we are told on occasion that other renders were sold; but these are hay tithes only: *Ellwanger Urbar,* 265, 950. Since the sale of hay and income therefrom is recorded, it is probable that other renders, of which no sales are mentioned, were not actually intended for the market.

[43] See the syntheses provided by Britnell, *Commercialisation of English society*, pp. 140–7; and Dyer, *Making a living*, pp. 119–45; the fundamental study of English manorial agriculture is Bruce M. S. Campbell, *English Seigniorial Agriculture, 1250–1450* (2000). To be sure, in England as well there were manors that were essentially rent-collecting centres rather than directly managed demesnes. Furthermore, obligatory labour services were by now largely commuted, with perhaps less than 10 per cent of the work on demesnes being carried out by the servile fullholding peasant as his labour service due: Bruce M. S. Campbell, 'The agrarian problem in the early fourteenth century', *Past and Present* 188 (2005), pp. 36–40. Nevertheless, the characterization of diverging paths of German and English agrarian systems, with a far higher incidence of direct management in England than in Germany, remains valid at a broad level.

[44] On this process (and the rest of this paragraph), see Dollinger, *Bauernstand*, pp. 121–37; Rösener, *Grundherrschaft*, pp. 373–566; see also Ludolf Kuchenbuch, '*Potestas* und *Utilitas*: Ein Versuch über Stand und Perspektiven der Forschung zur Grundherrschaft im 9.–13. Jahrhundert', *Historische Zeitschrift*, 265 (1997), pp. 117–46; and Kuchenbuch, 'Abschied von der Grundherrschaft'. There is no direct evidence for the bipartite manor at Ellwangen before the fourteenth century, though it seems likely that in some instances – at Neunheim, for example – the demesne had been directly managed in an earlier period. Nevertheless, it is worth recalling that the classical bipartite manor was, even in the early middle ages, probably less widespread in many parts of Germany than in the Carolingian heartlands further west: see the essays collected in Werner Rösener (ed.), *Strukturen der Grundherrschaft im frühen Mittelalter* (Veröffentlichungen des Max-Planck-Instituts für Geschichte, 92, 1989); it is possible that many of Ellwangen's lands had never really conformed to the model of the bipartite manor.

the estates he examined in southern Germany, that leases were more commonly for a share of the crop, he also states that money payments were not unusual; in this respect Ellwangen differs from Rösener's sample in that shares are actually far less frequent than cash rents. While initially the Ellwangen estates might have been leased out whole, we have seen here, as Rösener did elsewhere, that even the *Höfe* and *Hufen* are sometimes held in fragments; and many of the uncategorized smaller holdings that appear to predominate might well have descended from full holdings that were broken up over time because of population pressure, as Rösener suggests.[45] There is also, as we have seen, some evidence of accumulation: particularly if it is the case, as I speculated above, that the larger *Lehen* reached their size as a result of smaller holdings and fragments being accumulated within one family. Thus even if population growth was one of the principal causes of fragmentation and therefore growing social stratification, here – as in England – there was already some level of accumulation among the upper reaches of the peasantry, which also contributed to economic and social differentiation.

Nevertheless, we certainly do not have here a 'free' land market with anything like 'free' tenant farmers of the sort that emerged in England in the fifteenth and sixteenth centuries, once demesne lands started being leased on a large scale there. Although the Ellwangen polyptych tells us nothing about sales of land among the tenants, we need not assume on that basis that there was no land market: the silence most likely has more to do with the nature of the evidence than the facts on the ground. It is clear from this source, however, that many 'feudal' restrictions did remain on the tenants, and the demands the abbey made on those who chose to give up their tenancies were high. Fees of a third of all crops and movable goods are ubiquitous for departing tenants, and higher rates also occur.[46] Furthermore, the recognition gifts and fees, while perhaps more of symbolic than practical significance for the tenants, nevertheless remain as evidence of subject status.[47] If there was a land market, it was therefore constrained in many ways by the landlord's right to levy fines and fees on tenants who chose to give up their holdings. What we find here, therefore, is a feudal system without a manorial system, and with a great deal of market dependence and commercialization.

While the differing trajectories of the manorial system in England and Germany are well known, what is less commonly acknowledged is that in terms of rural commercialization and concomitant processes of social and economic differentiation, the two regions were not so dissimilar.[48] As we have seen, at Ellwangen, the majority of tenants most probably

[45] Rösener, *Grundherrschaft*, pp. 469–71, 521–30.

[46] These fees are mentioned not in entries for individual holdings, but in separate entries that specify the fees for all the holdings at a particular location.

[47] On the changing face of seigneurial dominance in Germany, see the important theoretical reflections in Julien Demade, 'Ponction féodale et société rurale en Allemagne du sud (XIe–XVIe siècles): Essai sur la fonction des transactions monétaires dans les économies non capitalistes' (unpublished PhD thesis, Université Marc Bloch [Strasbourg II], 2004), here pp. 334–40. Note that subject status (*Untertänigkeit*) and personal bondage (*Leibeigenschaft*) were not, in Germany, necessarily the same thing, and it was possible for tenants to be subject to a landlord (*Grundherr*) without necessarily being tied to the latter through a form of personal bondage; the subject status could arise from the landholding rather than personal status. We have seen (n. 19 above) only limited evidence for fees arising from personal bondage, though in itself this fact says little about how widespread this phenomenon might have been on the abbey's estates. It should be noted further that the *Grundherr* need not always also have been personal lord (*Leibherr*).

[48] For England, see Britnell, *Commercialisation*, pp. 79–101, 113–27; Britnell, *Britain and Ireland*

had smallholdings only, and tenants with such holdings certainly outnumbered those with full holdings: some sort of market dependence was thus not only common, but would have affected more than half the population. Furthermore, the frequency of money rents also implies a dependence on the market on the part of the tenants with full holdings as well. (The abbey, however, doubtless secured enough grain through its rents not to be itself dependent on the market.) The larger holdings certainly would have been able to provide for their own subsistence; but the tenants on these plots also needed to realize a certain level of income on the market in order to retain access to their land, and as we have seen, full holdings tended to pay £1 or more: this was not an insignificant amount (see the Appendix for further discussion), and almost certainly implies the sale of a substantial portion of their crop. That such market dependence was possible was doubtless enabled by the growth of nearby market towns; the importance of small towns and local and regional markets has been stressed with regard to economic growth in medieval England, and it seems apparent that in the Ellwangen region, a similar co-dependence had emerged by the time our source was composed. Clearly, it is not just in England that one needs to understand the significance and consequences of the symbiosis of urban growth and rural commercialization within a feudal economy.[49]

It has been suggested that the dissolution of the manorial system in Germany had something to do with urbanization, population growth, commercialization, and social stratification; it remains unclear, however, what sort of causal links obtain between these various factors.[50] Given that these very developments are found in England as well, it is apparent that they in themselves cannot be seen as the sole causes for the dissolution of the manorial system in Germany. Passive peasant resistance in various forms is another potential cause, and indeed there is some evidence for such resistance even at the late date of our source. A number of entries state that a tenant refuses to pay his rents or some component of them; others say that although a certain rent is recorded, the tenants do not pay it, or that the bailiff (*Ammann*) believes that a rent is or was different from what the tenants actually pay.[51] We have no way

Note 48 continued
1050–1530: economy and society (2004), pp. 138–217; Campbell, 'Agrarian problem'; Dyer, *Making a living*, pp. 166–7, 169–71, 187–227. For southern Germany, see Henning, *Agrargeschichte*, pp. 138–258; Rösener, *Grundherrschaft im Wandel*, 198–207, 335–40, 352–3, 373–86, 407, 502–42; see further, with more detail, Ghosh, 'Rural economies'.

[49] On small towns in England, see Christopher Dyer, 'Small towns', in D. M. Palliser (ed.), *The Cambridge urban history of Britain* I (2000), pp. 505–37; Dyer, 'Small places with large consequences: the importance of small towns in England, 1000–1540', *Historical Res.* 75 (2002), 1–24. On the significance of rural markets in England, see Richard Britnell, 'Urban demand in the English economy, 1300–1600', in James Galloway (ed.), *Trade, urban hinterlands and market integration, c.1300–1600* (2000), pp. 1–22, at pp. 2–6; Dyer, 'The hidden trade of the middle ages: evidence from the West Midlands of England', in Dyer, *Everyday life in medieval England* (1994), pp. 283–303; Dyer, 'Were peasants self-sufficient? English villagers and the market, 900–1350', in Élisabeth Mornet (ed.), *Campagnes médiévales: l'homme et son espace* (1995), pp, 653–66. On local and regional trade in general, see further James Masschaele, *Peasants, merchants, and markets: inland trade in medieval England, 1150–1350* (1997).

[50] Rösener, *Grundherrschaft*, pp. 47–53, 561.

[51] *Ellwanger Urbar,* 291 (the bailiff says the rent was 2*s*. higher but the tenant refuses to pay those 2*s*.); 312 (the bailiff is uncertain as to whether the labour service is properly owed by the tenants of Eigenzell, though the source does not suggest that they themselves dispute it); 334, 480, 530, 545–51 (disputes regarding the number of chickens); 379, 1015a, 1016a (the bailiff believes these holdings should render more than they do); 445 (a dispute about whether 80 or 100 eggs are owed); 471 (the bailiff believes the holdings in Birkenzell should

of knowing whether the commuted labour services appear in such a form because peasants successfully objected to performing labour on the abbey's lands, but this is certainly a possibility.[52]

If peasant resistance of this sort eventually led to the breakdown of the manorial system here, however, we must ask why a similar outcome cannot be found in England. Approaching the issue from very different points of view, both Bruce Campbell and Christopher Dyer find that lordship in England was relatively 'ineffective' by the early fourteenth century.[53] Nevertheless, lords chose to retain direct management of their demesnes, and resorted to wage labour where necessary, rather than acting as did the abbey of Ellwangen, which did not retain any agricultural land, and little meadowland, under its own management. To be sure, there was an incentive for English landlords to retain control of their lands, in that they could profit from sales to nearby markets and towns. But Ellwangen was also located close to a number of towns, and Schwäbisch Hall and Nördlingen were major centres of regional and inter-regional exchange in this period; it is, furthermore, only the existence of nearby markets that enabled tenants to realize the cash income they needed to pay their money rents. Clearly the abbey nevertheless felt, for whatever reason, no compulsion or desire to profit as a market-oriented grain-producer itself. These differing outcomes need explanation, and suggest also that any proposed theory regarding one region must take rural histories elsewhere into consideration; simply to postulate on the basis of one region that peasant resistance, commercialization, and urban growth led to the decline of the manor, or, conversely, that (some of) these factors led to greater lordly control over production, is insufficient.

A further, more theoretically significant consideration is that if, in the long-term trajectories of economic growth of both regions, this period shows significant similarities in terms of commercialization among the bulk of the population, we need to consider how this fact would affect our understanding of the nature and causes of economic change in both regions, and the relationship between economic transformation and prevailing social relations; the ways in

Note 51 continued
provide labour services and eggs, but the peasants dispute this and do not); 486 (the holding should pay 10*s*., but only gives 5*s*. because it is in bad condition); 580 (the *Meierhof* at Neunheim, where the *Meier* disputes his rent since he claims he is owed rents by several *Lehen* that have been taken away from him); 597 (it is said that this holding used to render twice as much oats as it now does); 603 (the entry states that this holding should rightly pay 10*s*., but only gives 9*s*.); 651 (this holding is recorded as earlier having paid 50% more; it is not clear why the renders are now lowered); 992 (the rent should not be recorded in the *summa*, 'quia raro dat').

[52] Demade suggests that the switch from labour services to renders of a share of the grain did not mean that a lower proportion of the peasant's labour was effectively in the hands of the landlord: labour services had in most cases earlier been required for two or three days of a six-day week, and shares were normally of a third or half (Demade, 'Ponction féodale', pp. 406–13). This change, however, could potentially lead to a rise in productivity, since the peasant could now also benefit from any such rise. We have seen that the pattern at Ellwangen does not quite fit this model: few owed shares, and the shares were almost always of a fifth or sixth, rarely as high as a third. It is possible that labour services owed had never been as high as two days a week in this region; it is also possible that even before labour services were commuted, tenants had successfully negotiated a decrease in their burdens, or that the process of commutation brought about such a reduction.

[53] Campbell, 'Agrarian problem'; Christopher Dyer, 'The ineffectiveness of lordship in England, 1200–1400', in Christopher Dyer, Peter R. Coss, and Chris Wickham (eds), *Rodney Hilton's middle ages: an exploration of historical themes* (Oxford, 2007), pp. 69–86.

which the latter developed were possibly more dissimilar than the dynamic of the economy at the level of the tenants and labourers. One of the most influential theories regarding the trajectories of socio-economic change in the later middle ages is the 'Brenner thesis': Brenner argued that out of the collapse of the 'feudal' system in England after 1350 there emerged a tripartite structure of large landlords, tenant farmers, and a rural proletariat of wage labourers: 'agrarian capitalism'.[54] For Brenner, England was the only region in which such a transition took place.[55] Brenner's theory has been disputed on empirical grounds by many scholars (albeit primarily with regard to the fifteenth and sixteenth centuries), and he is unable to account for what we now know regarding the high levels of social stratification and market dependence in England even before 1350: it is hard to reconcile the commercialized rural society of early fourteenth-century England with Brenner's version of the feudal economy.[56] While some other scholars, notably Rodney Hilton, were able to integrate commercialization and even urban growth within a model of the feudal system, there is nevertheless no convincing theory that accounts for these factors and also manages to explain how they contributed to the dynamic of socio-economic transformation in the later middle ages and beyond.[57] English rural commercialization is hard to fit into theories regarding the nature of the feudal economy in the fourteenth century, and the dynamic of this economy still needs explanation; since Germany is quite similar to England in terms of rural commercialization, any proposed theory regarding such commercialization and its consequences in the long term can only hold water if it can explain comparable developments in more than one region.[58]

A greater awareness of the German situation should lead also to the realization that the market involvement and dependence of peasants, tenants, and smallholders could be as significant for our understanding of economic structures and long-term transformations as the decisions of landlords and their forms of engagement in the market. The state of the manorial system and the nature of 'feudal' relationships might be less significant than levels

[54] Brenner, 'Agrarian class structure'; Brenner, 'Agrarian roots'.

[55] More recently, Brenner acknowledged the similarities in economic development between the Low Countries and England: 'The Low Countries in the transition to capitalism', *J. Agrarian Change*, 1 (2001), pp. 169–241.

[56] His most recent publication on this subject brushes these issues aside, and takes no account of the more recent empirical scholarship, including critiques of his theory: Robert Brenner, 'Property and progress: where Adam Smith went wrong', in Chris Wickham (ed.), *Marxist history-writing for the twenty-first century* (British Academy Occasional Papers, 9, 2007), pp. 49–111. For empirical critiques of Brenner (exclusively addressing England), see most recently H. R. French and R. W. Hoyle, *The character of English rural society: Earls Colne, 1550–1750* (2007), and Jane Whittle, *The development of agrarian capitalism: land and labour in Norfolk, 1440–1580* (2000); see also the more theoretical discussion in John Hatcher and Mark Bailey, *Modelling the middle ages: the history and theory of England's economic development* (2001), pp. 67–120. Spencer Dimmock's recent spirited defence of the Brenner thesis appeared too late to be taken into consideration in the present paper: *The origin of capitalism in England, 1400–1600* (Leiden, 2014).

[57] See in particular the essays collected in R. H. Hilton, *Class conflict and the crisis of feudalism* (sec. edn, 1990); and Hilton, *English and French towns in a feudal society: a comparative study* (1992). As theoretical stimulus, Epstein's suggestions, building on Hilton's work, are fundamental: S. R. Epstein, 'Rodney Hilton, Marxism and the transition from feudalism to capitalism', in *Rodney Hilton's middle ages*, pp. 248–69.

[58] I provide a more thorough rebuttal of the Brenner thesis elsewhere, along with suggestions for alternative ways of posing and understanding the question of transition in a comparative perspective: see Ghosh, 'Rural economies'.

of social stratification and market dependence among the non-landowning classes, and the economic relationships between these classes and their urban counterparts. The Ellwangen smallholders had to make a living somehow; someone had to need their labour or products, just as the tenants of full holdings had to have a market to sell their grain in order to be able to earn the coin in which their rents were due; and the smallholders also potentially provided a locus of demand for some of the surplus of the fullholders. Thus it is important, as Govind Sreenivasan has recently suggested, that we shift our focus 'from processes which were not entailed by economic modernization – the destruction of the peasantry as a class – to processes which were', of which one of the most important, I suggest, is 'the commercialization of their production'.[59] This is because, as the late Larry Epstein pointed out, agricultural supply is best understood not as an independent variable determining the rate of growth and the possibility of development, but rather as 'a *dependent* variable that could respond elastically to changes in demand, subject to the opportunity costs of investment and trade'; for this reason, 'students of the transition from feudalism to capitalism need to pay more attention to the conditions that made investment in agriculture profitable, rather than to the technical or organizational characteristics of feudal agriculture itself'.[60]

This is not the place for a detailed discussion of what conditions might have made agriculture profitable, but it is obvious that the existence of a market is a prerequisite for agricultural profits. The kind of social stratification and market involvement that we have seen in the estates of Ellwangen already by the middle of the fourteenth century, with the likelihood of market dependence for many, and market orientation of a good deal of production, is thus arguably one of the preconditions – though by no means a sufficient condition – for further changes in socio-economic organization that could possibly – but need not – have led towards capitalism. This form of low-level commercialization and market dependence was common to both England and Germany, regardless of the differing trajectories of the manorial system; and the dynamic of both their economies was arguably increasingly located within this level of commercialization rather than at the level of luxury consumption. The high incidence of money rents and the high levels of social stratification have significant consequences for our understanding of economic structure, and potentially also of longer-term trends in both regions. Only comparative work can provide plausible theories to explain the continuing spread of market dependence in both England and Germany (and, for that matter, other regions too) and its long-term consequences. I hope, therefore, that the example of the present article will provide an incentive to others also to take up the challenge of comparative analysis of the vast reserves of untapped sources in regions of Europe beyond England.[61]

[59] Govind P. Sreenivasan, 'Beyond the village: recent approaches to the social history of the early modern German peasantry', *History Compass*, 11 (2013), pp. 47–64, at p. 51.

[60] Epstein, 'Rodney Hilton', p. 264.

[61] Ellwangen alone offers enough material for at least one doctoral dissertation on its social and economic history to *c.*1450; a glance at the catalogues of primary sources published by the *historische Komissionen* of even just Baden-Württemberg and Bavaria reveals a large number of edited texts that have scarcely been examined – at least with a view to the questions posed here – even in the German scholarship. In addition, there are literally thousands of sources from these two *Länder* of Germany alone that have yet to be published, principally rent rolls, polyptychs, and cartularies. Manorial accounts of the kind extant in England from the thirteenth and fourteenth centuries are relatively rare in Germany, most likely because of the earlier abandonment of direct management of demesne

APPENDIX
The value of money and the burden of rents

Unfortunately, there are no reliable price (or, for that matter, wage) data from this region for this period, so it is not possible to do more than speculate regarding the weight of the rent burden on Ellwangen's tenants. The polyptych itself provides some information that, although of limited use, allows us at least some slightly informed speculation regarding the relative monetary value of some commodities. One entry states that a tenant may pay either four chickens or 1*s*. as rent.[62] In another entry, a quarter of oil may be substituted with 2*s*.[63] Cheese is in a number of instances valued at 2*d*. each, though on occasion the value is given as 1*d*.; unfortunately we know nothing about how much each cheese weighed.[64] The value of three pigs is given as £10.[65] Unfortunately, grain prices or monetary equivalents of grain renders are nowhere recorded. A further indication of monetary value is given in an entry that states that a *curia* at Rot was purchased for £41; the annual rent from this property was £2, but it also owed 24 cheeses (valued at 2*d*. each), 80 eggs, a quarter of oil, and 3 chickens, and a recognition fee of 1*s*.[66] Going by the equivalences given above, this would mean that this property paid a total value of £2 7*s*. 9*d*., in addition to the eggs; the purchase price was thus equivalent to about 17 years' rent.

It is difficult, from this information, to come to any definitive conclusions regarding the weight of the rent, but we can make some attempts at understanding what the rents might have meant to a peasant economy. We have seen that most *Höfe* and *Hufen* owed at least £1 of rent, and very few *Selden* owed more than 10*s*.; if we take these few indications in the polyptych as reliable information regarding the value of commodities, we would infer that the annual rent of full holdings were thus normally at least the value of 80 chickens, 120 cheeses, or a third of a single pig. In contrast, the average *Selde* owed no more than half that amount, and normally less. In terms of the equivalence of rent and labour, 1 *mader* could be substituted for 1*s*., and a *sniter* was worth 8*d*.[67] If my speculation is valid, namely that these terms refer not to a day's work, but to the labour of a person for the duration of the harvest, the rent for a full holding, at £1, would be equivalent to 20 persons' wages for mowing hay during the harvest, or 30 persons' wages for reaping corn.

Note 61 continued
lands; Campbell suggests that, in England as well, it is precisely the decline in direct management that leads to a decline in numbers of manorial accounts: *Seigniorial agriculture*, pp. 28–9. This genre of evidence is not, however, completely unknown even from late medieval Germany, and two sets of accounts have recently been edited: Bernhard Lübbers (ed.), *Die ältesten Rechnungen des Klosters Aldersbach (1291–1373/1409): Analyse und Edition* (Quellen und Erörterungen zur bayerischen Geschichte, 47/3, 2009); Michael Toch (ed.), *Die ältesten Rechnungsbücher des Klosters Scheyern, 1339–1363* (Quellen und Erörterungen zur bayerischen Geschichte, 36/3, 2009). I am currently preparing a comprehensive study of the latter; account books from the fifteenth century are also extant for Scheyern, and are as yet unpublished.

[62] *Ellwanger Urbar,* 315. The value of 3*d*. per chicken is at the low end of the spectrum for an annual lease of a chicken given by Slavin for various English landlords, but is considerably higher than the 1.5–2*d*. range he records as sale prices during this period: 'Chicken husbandry', p. 38, Figure 3, and p. 53, Figure. 5.

[63] *Ellwanger Urbar,* 659.

[64] Ibid., 748, 1005, 1025, 1154, 1441–6 (2*d*.); 1336–7, 1362 (1*d*.).

[65] Ibid., 12.

[66] Ibid., 1005.

[67] Ibid., 532–41, 1025.

There is little available evidence regarding urban wages and prices from this period.[68] However, the evidence from Ellwangen may be compared with data from a 1342 ordnance of the Speyer town council regulating the wages of construction workers (Speyer is, admittedly, quite far to the north west, but I have been so far unable to find any relevant material from closer to Ellwangen, which is not to say that further researches might not produce better evidence). Wage rates varied depending on the status of the workers and what sort of labour they performed; excluding masters' rates, most construction workers receiving only cash wages were paid between 12*d*. and 15*d*. per day; where they were paid a cash wage along with payment in kind for their expenses, the latter were reckoned at between 9*d*. and 12*d*. per day. The full holding mentioned above, paying rents valuing £2 7*s*. 9*d*., thus owed a sum roughly equivalent to a Speyer construction worker's cash wage for 38 days of labour, or the equivalent of the payment in kind for between 47 and 63 days of work. An Ellwangen full holding paying £1 of rent owed an equivalent of 16 days' cash wages for a Speyer construction worker, or between 20 and 26 days of payment in kind.[69]

[68] An excellent study of income and cost of living in southern German cities is presented by Ulf Dirlmeier, *Untersuchungen zu Einkommensverhältnissen und Lebenshaltungskosten in oberdeutschen Städten des Spätmittelalters (Mitte 14. bis Anfang 16. Jahrhundert)* (Abhandlungen der Heidelberger Akademie der Wissenschaften, philosophisch-historische Klasse, 1978/1); Dirlmeier is concerned mainly with the fifteenth century and the first decades of the sixteenth, with only brief excursions into the second half of the fourteenth, the reason being a lack of available data. His work was, however, based on published sources, and he acknowledged the great untapped reserves of material in the relevant south German archives.

[69] The data for Speyer wages are from Gisele Möncke (ed.), *Quellen zur Wirtschafts- und Sozialgeschichte mittel- und oberdeutscher Städte im Spätmittelalter* (Ausgewählte Quellen zur deutschen Geschichte des Mittelalters, 37, 1982), no. 45.

The transformation of customary tenures in southern England, *c.*1350 to *c.*1500

by Mark Bailey

Abstract

Between the fourteenth and sixteenth centuries the terms on which customary land was held in England were transformed from hereditary villein tenure into copyholds and leaseholds. Historians have been uncertain about the precise nature, pace and geography of this transformation, and, indeed, the variety and fluidity of tenurial forms has caused some bewilderment. This article argues that the original villein tenure was displaced by one of four broad categories of customary tenure, a process which began immediately after the Black Death of 1348–49, i.e. much earlier than previously assumed. These rapidly emerging tenures were more dignified and attractive than villein tenure, due to the removal of servile language from their conveyances, the growing practice of issuing of a 'copy' of the land transfer as proof of title, and the development of monetarized rent packages. The preference for life tenures in western and central England, and for heritable tenures in the south east and east, is already clearly identifiable by *c.*1400, and the reasons for these emerging regional patterns are analysed.

The development of agrarian capitalism and the emergence of commercial farmers is a major theme in British agricultural history. Within this vast subject, a key topic of debate is the extent to which regional differences in the nature of property rights explain different pathways of development. Attention has focused particularly upon the security of customary tenures in England.[1] Customary (also known as 'villein' and 'unfree') land was a significant component of the peasant land market in medieval England, comprising nearly one half of all peasant-held land.[2] Yet, according to historians such as Brenner, during the course of the fifteenth century landlords were able to add a growing proportion of this land to their own demesnes, because it was held on relatively insecure tenures, which in turn enabled their successors in the sixteenth century to repackage it into large farms on commercial rents.[3]

[1] A good recent survey is H. R. French and R. W. Hoyle, *The character of English rural society. Earls Colne, 1550–1750* (2007), pp. 2–42. See also J. Whittle, *The development of agrarian capitalism. Land and labour in Norfolk, 1440–1580* (2000), pp. 5–27. An early version of this article benefited from the comments of participants at the legal History seminar at the University of Cambridge. I am also grateful to Richard Hoyle for his comments on this article and for discussing late medieval tenures with me on various occasions.

[2] J. Whittle, 'Leasehold tenure in England, *c.*1300 to *c.*1600', in B. J. P. van Bavel and P. R. Schofield (eds), *The development of leasehold in northwestern Europe, c.1200–1600* (2008), p. 140.

[3] R. H. Tawney, *The agrarian problem in the sixteenth century* (sec. edn, 1967), pp. 287–310; E. Kerridge, *Agrarian problems in the sixteenth century and after* (1969), pp. 65–93; R. Brenner, 'Agrarian class structure', pp. 10–63; and 'The agrarian roots of European capitalism', pp. 213–327, both in T. H. Aston and

Thus customary tenures lie at the heart of the debate on the emergence of agrarian capitalism in England. In the sixteenth century these comprised leasehold and various forms of copyhold: copyholds of inheritance, copyholds for a life or (usually three) lives, and tenant right (a variant found in parts of northern England). Perhaps two-thirds of the rural population were copyholders, many of them for lives.[4] The latter were found mainly in 'the west country and southern England, running over towards Hampshire and Oxfordshire and through the west Midlands': in contrast, copyholds by inheritance dominated in the east Midlands, the Home Counties and East Anglia.[5] It is widely assumed that these regional differences in tenures contributed to differing trajectories of regional economic development in the sixteenth and seventeenth centuries: tenures offering rights of inheritance and fixed low rents favoured the tenant, whereas insecure leases and life tenancies with variable rents and fines favoured the landlord. As French and Hoyle observed, the 'variegated patterns of tenancy [in early modern England] imply very different structures of power within the countryside', which in turn 'imply very different experiences' from place to place.[6]

Early modern lawyers recognized that copyholds and leases of customary land had emerged in the fairly recent past from the detritus of villein tenure. Writing in the early seventeenth century, Sir Edward Coke commented that 'tenants by copy is but a new-found name, for in ancient times they were called tenants in villeinage'.[7] Whittle has stated that these new 'forms of land tenure were the most significant legacy of the [medieval] manorial system to the sixteenth century and beyond', while Allen argued that the creation of copyhold 'amounted to a democratization of property ownership. The redefinition of land ownership laid the basis for yeoman agriculture in the later sixteenth and seventeenth centuries'.[8]

Although much is known about villein tenure in *c.*1300, and about copyholds from *c.*1550, less is known about the transformation from one to the other. Part of the uncertainty stems from the tenures themselves, whose terms could be vague (some court rolls provide very few details) or fluid: Paul Harvey concluded that they constituted 'a bewildering variety of forms

Note 3 continued
C. H. E. Philpin (eds), *The Brenner Debate. Agrarian class structure and economic development in pre-industrial Europe* (1985); J. E. Martin, *Feudalism to capitalism. Peasant and landlord in English agrarian development* (1986), pp. 119–20. For more recent assessments of the historical validity of Brenner's claims, see R. W. Hoyle, 'Tenure and the land market in early modern England: or a late contribution to the Brenner debate', *EcHR* 43 (1990), pp. 1–20; M. E. Mate, 'The east Sussex land market and agrarian class structure in the later Middle Ages', *Past & Present* 139 (1993), pp. 46–65; S. H. Rigby, *English society in the late Middle Ages. Class, status and gender* (1995), pp. 127–42; Whittle, *Agrarian capitalism*, pp. 302–15; J. Hatcher and M. Bailey, *Modelling the Middle Ages. The theory and practice of England's economic development* (2000), pp. 106–20.

[4] C. G. A. Clay, *Economic expansion and social change: England, 1500–1700,* I, *People, land and towns* (1984), pp. 87–92.

[5] See the summary in, and the quote from, Hoyle, 'Tenure and the land market', pp. 6–7; R. M. Smith, 'The English peasantry, 1250–1600', in T. Scott (ed.), *The peasantries of Europe from the fourteenth to the eighteenth centuries* (1998), pp. 341–7, and 367–9; and R. W. Hoyle, '"An ancient and laudable custom". The definition and development of tenant right in north-west England in the sixteenth century', *Past & Present* 116 (1987), pp. 25–8, 51–5.

[6] French and Hoyle, *English rural society*, pp. 8, 30, 32.

[7] Kerridge, *Agrarian problems*, p. 141.

[8] Whittle, *Agrarian capitalism*, p. 64; R. C. Allen, *Enclosure and the yeoman. The agricultural development of the south Midlands 1450–1850* (1992), p. 73.

and inconsistency of nomenclature'.[9] But another reason is a lack of research. Hoyle, writing a quarter of a century ago, observed that 'it is shocking that so little attention has been paid to the matter … despite the importance which many commentators have attached to this process, there is, to the best of my knowledge, not a single study of the means and chronology of the change'.[10] Consequently, we are incapable of answering with confidence two fundamental questions: how did different forms of copyhold emerge, and what is the explanation for their distinctive regional distribution in the sixteenth century?[11]

Hoyle's response to this incapacity was to write an article to provoke further research. This article is a response to his provocation, which in turn hopes to provoke others into addressing these questions. It surveys the existing state of knowledge, and then outlines the conclusions of recent research, to offer a new explanatory framework for the transformation of villein tenure into copyholds and leaseholds in England south of the river Trent. In particular, it adopts a comparative approach to address some of the major unresolved questions about the process and the outcome of change. When and how did the rent package of villein tenure change, and how did this create the varied rent packages attached to later copyholds? When and why did the practice spread of issuing 'copies' of the court roll entry of land transfers to tenants, which is the origin of copyhold tenure? Why were some copyholds heritable and others fixed-term, and what explains their regional distribution in the sixteenth century?

I

In *c.*1300 the overwhelming majority of customary land was held in villein tenure, whose rent package comprised a mixture of cash, payments in kind, servile incidents and labour services. The title to customary land was defensible only in the lord's manorial court, not in the royal courts of common law. All transfers had to be recorded in the court roll, and this written record of the grant was the ultimate proof of its title. In legal theory customary land was held 'at the will of the lord', implying that it was inalienable without express prior seigneurial consent and also vulnerable to seizure upon a seigneurial whim.[12] In practice the operation of custom meant that the tenant's title to customary land was much more secure than its theoretical vulnerability under the common law would imply. Landlords did not confiscate customary land arbitrarily.[13] The vast majority of tenants in villeinage possessed customary rights of inheritance, and could buy and sell their land, subject to certain standard procedures.[14]

[9] P. D. A. Harvey, 'Tenant farming and farmers: the Home Counties', in E. Miller (ed.), *The agrarian history of England and Wales,* III, *1350–1500* (1991), p. 670.

[10] Hoyle, 'Tenure and the land market', p. 8

[11] Ibid., p. 18

[12] Smith, 'English peasantry', pp. 341–54; M. Tompkins, '"Let's kill all the lawyers": did fifteenth-century peasants employ lawyers when they conveyed customary land?', in L. Clark (ed.), *The fifteenth century,* VI (2006), pp. 73–87; Whittle, *Agrarian capitalism*, p. 67.

[13] Whittle, *Agrarian capitalism,* pp. 76–7; J. Whittle and M. Yates, '"Pays réel ou pays légal?": contrasting patterns of land tenure and social structure in eastern Norfolk and western Berkshire, 1450–1600', *AgHR* 48 (2000), p. 8.

[14] G. C. Homans, *English villagers of the thirteenth century* (1941), pp. 109–43; R. J. Faith, 'Peasant families and inheritance customs in medieval England', *AgHR* 14 (1966), pp. 77–95; E. Miller and J. Hatcher, *Medieval England: rural society and economic change, 1086–1348* (1978), pp. 138–9; J. Whittle, 'Individualism and the family–land bond: a reassessment of land transfer patterns among the English peasantry, *c.*1270–1580',

Sixteenth-century copyholds and leaseholds differed from fourteenth-century villein tenure in three principal ways. First, they had acquired greater legal protection under the common law, such that by the mid-sixteenth century the courts of common law were defending their title. Second, their appearance and dignity had been improved by the disappearance of the old servile incidents, leaving an annual monetary rent, an entry fine, and perhaps a heriot. Finally, they bore greater resemblance to contractual tenancies, because the tenant acquired the land through choice rather than compulsion and, in some cases, for a limited period or specified time.[15]

Customary tenures in the late fourteenth and fifteenth centuries were an intermediate form, no longer villein tenure but not yet recognizable as the copyholds of the sixteenth century. As Bolton remarks, 'the variety of terms is bewildering and in some ways it is a mistake to look for patterns'.[16] Yet, for all their fluidity, and for all Bolton's caution, enough is now known to identify with confidence four general patterns.[17] The first is the decay and then final disappearance of many of the characteristic elements of the original rent package, such as tallage, merchet, millsuit and labour services. It is widely argued that these mainly disappeared between *c.*1390 and *c.*1420.[18] Entry fines and heriot were often the only survivals from the old package, probably because the payment of admission charges and death duties was not exclusive to unfree land. The second development is the spread of the practice of issuing the tenant with a copy of the court roll entry of the transfer of customary land, which was known as early as 1300 and widespread after the mid-fifteenth century. Little research has been undertaken on the pace with which, and extent to which the copy spread between these two dates: it is widely assumed to have been a fifteenth-century development, although Faith suggested that it may have become commonplace in the late fourteenth century.[19] Unfortunately, their pitifully low survival rate presents an insurmountable obstacle to reconstructing an accurate chronology of their spread. Peasant-held archives have simply not survived, and it is not clear why landlords would bother with making copies of copies when the entry in their court roll constituted their formal record.[20]

Note 14 continued
Past & Present 160 (1998), pp. 30–1. The customary right to inherit is enshrined in phrases in conveyances such as 'to hold to him and his' (*teneo sibi et suis*) or 'him and his heirs' (*sibi et heredibus suis*).

[15] Hoyle, 'Tenure and the land market', pp. 6–7; E. B. Fryde, *Peasants and landlords in later medieval England, c.1380 to c.1525* (1996), pp. 238–41; Whittle, 'Leasehold tenure', pp. 139–40.

[16] J. L. Bolton, *The medieval English economy, c.1150–1500* (1981), p. 238.

[17] The following summary draws upon P. D. A. Harvey, 'Aspects of the peasant land market in medieval England', in P. D. A. Harvey (ed.), *The peasant land market in England* (1984), pp. 338–51; Fryde, *Peasants and landlords*, pp. 227–41; J. Whittle, 'Tenure and landholding in England 1440–1580. A crucial period for the development of agrarian capitalism?', in B. J. P. van Bavel and P. Hoppenbrouwers (eds), *Landholding and land transfer in the North Sea area (late Middle Ages–19th century)* (2004), pp. 238–42; and M. Bailey, *The decline of serfdom in late medieval England. From bondage to freedom* (2014), pp. 16–61.

[18] E. B. Fryde, 'Peasant rebellion and peasant discontents', in Miller (ed.), *Agrarian history, III, 1350–1500*, p. 745; Whittle, *Agrarian capitalism*, p. 37.

[19] R. J. Faith, 'Berkshire: the fourteenth and fifteenth centuries', in Harvey (ed.), *The peasant land market in England*, pp. 130, 138, 140, 151; Harvey, 'Home Counties', pp. 671–2; C. C. Dyer, *Lords and peasants in a changing society. The estates of the Bishopric of Worcester, 680 to 1540* (1980), p. 294; H. S. A. Fox and O. J. Padel (eds), *The Cornish lands of the Arundells of Lanherne, fourteenth to sixteenth centuries* (Devon and Cornwall Rec. Soc. 41, 2000), p. *lvii*.

[20] It is possible that the tenant copy was indented and the second copy retained by the landlord, but unequivocal examples of this practice are hard to find.

The third development of significance is that the record of the grant of customary land in manorial court rolls (what we would term the conveyance) gradually dropped the demeaning phrases specific to villeinage, and used more dignified language instead. In *c.*1300 conveyances of customary land in villeinage usually contained the phrases 'held in villeinage' or 'held in bondage for customs and services'. Grants of customary land on fixed-term tenures after 1350 did not contain such phrases: they were 'leased at farm' or 'held for the term of his life according to the custom of the manor'. Conveyances of hereditary tenure retained the use of 'in villeinage/bondage' for longer, although they too began to drop the phrase during the early fifteenth century.[21] Historians have tended to be cautious about admitting an earlier chronology of change to hereditary villein tenure, and about attributing much significance to any other changes in the wording of its conveyances.[22] However, two recent studies have demonstrated that subtle alterations to their vocabulary could carry real significance, and that there is evidence for such change on some manors during the third quarter of the fourteenth century.[23] This area merits further research.

The fourth and final development, and perhaps most important of all, is that the proportion of customary land held on fixed-term tenures of various kinds increased. After 1350, increasing quantities were formally converted to, and re-granted as, tenures for a finite period of time, after which the land reverted to the lord. Crucially, fixed-term tenures tended to be held for a cash rent, rather than burdened with rents in kind and servile incidents. Three main types of fixed-term tenure can be identified. The least common yet most insecure was a tenure at will without any stipulated timeframe, i.e. held literally held at the lord's will, usually for a straight cash rent and no entry fine.[24] It was liable to be recovered by the lord at any time, and was usually employed to attract tenants for abandoned holdings as an emergency measure.[25] The second form was life tenancies, held for the term of the life of the tenant, or for a stipulated term of lives (usually three). This form of tenancy had been known since Anglo-Saxon times, although before 1350 it was not a common form of holding customary land.[26] Many life

Note 20 continued
Individual copies do survive among seigneurial archives, and some landlords are known to have kept registers with tenurial information: Fryde, *Peasants and landlords*, p. 227; Bailey, *Decline of serfdom*, pp. 122, 221. These may have been acquired through the lord's later purchase of copyhold land, although the consistent and fine condition of many such copies is hard to reconcile with the notion that they had spent varying periods in peasant hands. Perhaps these were the steward's – not the landlord's copies – whose responsibility it was to ensure the issue of a copy to the tenant.

[21] B. Harvey, *Westminster abbey and its estates in the Middle Ages* (1977), p. 275; Fryde, 'Peasant rebellion', pp. 814–6; P. R. Schofield, '*Extranei* and the market for customary land on a Westminster abbey manor', *AgHR* 49 (2001), p. 16.

[22] Harvey, 'Aspects of the peasant land market', pp. 329–30; J. Mullan and R. H. Britnell, *Land and family. Trends and local variations in the peasant land market on the Winchester bishopric estates, 1263–1415* (2010), pp. 63–4.

[23] The two recent studies are Tompkins, '"Let's kill all the lawyers"', pp. 75–9, and Bailey, *Decline of serfdom*, pp. 290–2.

[24] Harvey, *Westminster Abbey*, pp. 246–8; Harvey, 'Aspects of the peasant land market', pp. 332–3; P. Larson, *Conflict and compromise in the late medieval countryside. Lords and peasants in Durham, 1349–1400* (2006), pp. 163–4.

[25] These were also known as *de exitus* payments, see M. Bailey, *A marginal economy? East Anglian Breckland in the later Middle Ages* (1989), pp. 224–5; J. Titow, 'Lost rents, vacant holdings and the contraction of peasant cultivation after the Black Death', *AgHR* 42 (1994), pp. 100–4; Fryde, *Peasants and landlords*, p. 229.

[26] The grant of a term for lives avoids references to holding to 'his and his heirs', and instead is identifiable

tenancies appear to have been created through conversions from hereditary villein tenures, a process which often involved the replacement of the old services and incidents with a cash rent.[27] The chronology of, and reasons for, such conversions are obscure. Allen dates their initial spread to the early fifteenth century, although they do not appear to have become widespread until the late fifteenth and sixteenth centuries.[28]

The third form of fixed-term tenure was a lease for a term of years, again created by the direct conversion of villein tenure.[29] Strictly speaking, a lease was an economic contract not a form of tenure, creating a mere chattel interest in, rather than a title to, the land: the conversion was both temporary and at the lord's discretion, and it was by copy of the court roll rather than by indenture.[30] The vast majority of leases were held for cash rent at whatever the market would bear in lieu of all servile incidents, so that the lessee entered into a contractual relationship free of feudal obligations.[31] The area of customary land converted to leasehold increased after 1348–9, peaking in many places between *c.*1390 and *c.*1420 and generally declining thereafter.[32] What, then, became of customary land when its lease expired and was not renewed? Some lay abandoned, and some was absorbed into the demesne, in both cases falling under the lord's direct control.[33] However, some customary land which had been leased was converted into life tenancies, and some back into heritable tenancies.[34] These processes remain dimly understood. How are we to explain the conversion of villein tenure to leasehold? Were landlords or tenants behind the switch?[35] Why did leaseholds decline in importance during the fifteenth century?

Note 26 continued
by conveyances such as 'to hold to him for the term of his life' (*ad terminum vitam suam*), 'to hold to him, his wife and his son for the term of their lives' (*ad terminum vite eorum*) usually supplemented by the phrase 'at the will of the lord/according to the custom of the manor'.

[27] Faith, 'Berkshire', p. 137; B. Wells-Furby, *The Berkeley estate, 1281–1417. Its economy and development* (2012), pp. 96–101; Bailey, *Decline of serfdom*, pp. 120–2, 157–9.

[28] Allen, *Enclosure and the yeoman*, p. 67. See Faith, 'Berkshire', pp. 133, 137, 140–1; A. Jones, 'Bedfordshire: the fifteenth century', in Harvey (ed.), *Peasant land market*, p. 203; Hoyle, 'Tenure and the land market', pp. 7–8; Dyer, *Lords and peasants*, p. 294; and Whittle, 'Individualism and the family–land bond' pp. 57–8.

[29] Whittle, 'Leasehold tenure', pp. 139–50; Mate, 'East Sussex land market', pp. 52–5; Larson, *Conflict and compromise*, pp. 163–4. Strictly speaking, there was little difference between a lease and a life tenancy: one was a lease for defined years, the other for defined lives. They are treated separately here for two reasons. First, the language of the lease for years was consistently different: its grant in the court roll, or its enrolment on the manorial account, invariably deploys one or both of the phrases 'to lease [*dimittere*]' or 'to hold at farm [*teneo ad firmam*]', usually without 'at the will of the lord/according to the custom of the manor'. Second, leases for years and copyholds for lives were regarded as subtly different entities, especially from the sixteenth century.

[30] Kerridge, *Agrarian problems*, p. 47; Harvey, *Westminster Abbey*, pp. 248–50.

[31] Schofield, 'Tenurial developments', pp. 256–60; Whittle, 'Leasehold tenure', pp. 147–8.

[32] Harvey, *Westminster Abbey*, pp. 276–7; Dyer, *Lords and peasants*, pp. 293–4; R. H. Britnell, 'Tenant farming and tenant farmers: Eastern England', in Miller (ed.), *Agrarian history,* III, pp. 615–16; C. Dyer, 'Tenant farming and tenant farmers: the West Midlands', in Miller (ed.), *Agrarian history,* III, pp. 640–1; Fryde, *Peasants and landlords*, p. 229; Whittle, *Agrarian capitalism*, pp. 73–4; M. Bailey, *Medieval Suffolk 1200–1500. An economic and social history* (2007), pp. 199–200, 230–2; M. Muller, 'Peasants, lords and developments in leasing in late-medieval England', in van Bavel and Schofield (eds), *Development of leasehold*, pp. 163–5.

[33] Brenner, 'Agrarian class structure', p. 47; Whittle, *Agrarian capitalism*, p. 70.

[34] H. P. R. Finberg, *Tavistock Abbey* (1951), p. 250; Hoyle, '"An ancient and laudable custom"', p. 27; F. G. Davenport, *The economic development of a Norfolk manor* (1906), pp. 57–8; R. H. Britnell, *Britain and Ireland, 1050–1530* (2004), p. 437.

[35] Brenner, 'Agrarian class structure', pp. 46–7; Hoyle, 'Tenure and the land market', pp. 8–18.

What determined whether they were re-converted to a life tenancy or a hereditary tenancy, and which was the most common form?

II

The proportion of customary land varied on medieval English manors, although, in general, it tended to rise with the size of manor: on average around one third of the peasant land on a small manor was customary, rising to one half on large manors.[36] Before the Black Death of 1348–9 the vast majority of English customary land was held on a heritable villein tenure.[37] The structure of the rent package attached to this tenure varied greatly in its composition, weight and consistency.[38]

Between *c.*1350 and *c.*1500 customary land continued to be carefully labelled as 'native', 'customary' and 'bond' in manorial documents, but the form of tenure on which it was held, and the structure of its rent package, changed. Individual manors in southern England fell into one of four general categories, based upon the dominant form of tenure: hereditary tenure; a mix of hereditary and fixed-term tenures; tenure for the term of a life or lives; and leasehold for years.

Category 1: Hereditary tenure

On this category of manor, all or the great majority of customary land continued to be held on a hereditary tenure. A small minority of the customary land might have been converted to fixed-term tenures. The rent package became simplified and largely monetarized. By *c.*1500 these were proto-copyholds of inheritance.

The non-cash elements of the old rent package – such as servile incidents, labour services and payments in kind – either lapsed informally or were replaced with a cash sum through a formal negotiated commutation, or a combination of the two. Labour services were invariably commuted for cash. Some commutations were collective agreements, others negotiated with individual tenants. As the rent package mutated, so the language of conveyances changed. Phrases such as 'in villeinage/bondage' were dropped and replaced with 'at the will of the lord' and/or 'according to the custom of the manor'.

The pace and timing of each individual element of change varied. For example, change occurred rapidly and quickly at Runton Hayes (Norfolk) with the lapse of millsuit, tallage and merchet in the 1350s, and the simultaneous change in the language of conveyances from one standard format in the 1340s ('held in bondage for him and his heirs') to another in the 1350s ('to hold for him and his heirs at the will of the lord making services and customs').[39] At Kibworth Harcourt (Leics.) change was more protracted. Labour services had been commuted since the 1280s, and entry fines lapsed in the 1350s, but tallage and the use of 'in bondage' remained until 1427. At this date, after opposition from some tenants and problems filling vacant holdings, the

[36] E. A. Kosminsky, *Studies in the agrarian history of England in the thirteenth century* (1956), p. 101.

[37] See the references in n. 14 above, plus Dyer, *Lords and peasants*, pp. 106–7; Whittle, *Agrarian capitalism*, pp. 86–91.

[38] For general introductions, see Miller and Hatcher, *Medieval England*, pp. 101–33; Rigby, *English society*, pp. 25–34; M. Bailey, 'Villeinage in England: a regional case study, *c.*1250–*c.*1349', *EcHR* 62 (2009), pp. 430–57.

[39] Norfolk RO, WKC 2/167 398 x 8.

lord agreed that henceforth tallage and the term 'bondage' would be dropped, and the level of cash rent be reduced.[40] The heavy week works attached to holdings at Telham (Sussex) were permanently commuted after 1400, and then in 1457 the lord formally agreed to commute the remaining seasonal services and liability for manorial office for a nominal sum.[41]

Category 2. Mix of hereditary and fixed-term tenures

When a large minority or small majority of customary land was held on a hereditary tenure, the remainder was converted to a fixed-term tenure, usually leases for years. The use of the lease in this way peaked in the early fifteenth century, then declined: in some places, the area under fixed-term tenures declined as more customary land was re-granted on a hereditary tenure. Hence, by 1500 hereditary tenure was once again the dominant form of customary tenure as a proto-copyhold of inheritance.

The servile rent package and language disappeared from land held on the hereditary tenure in the same manner as on Category 1 manors. Both were formally removed on land converted to the fixed-term tenure, which was usually required to render just a commercial cash rent. Fee farms were usually deployed from the 1420s to convert the former leases back to a hereditary tenure owing an annual money rent and, perhaps, entry fine. For example, a growing proportion of the standardized customary holdings at Birdbrook (Essex) were converted to leases for lives after the 1390s, mainly due to shortages of tenants, although by *c.*1500 nearly all had returned to a heritable tenancy.[42] Most customary land at Forncett (Norfolk) had been converted to leases for years by the 1370s, but then to hereditary fee farms by the 1470s.[43]

Category 3: Tenure for the term of a life or lives

Here all or the majority of customary land was converted to tenure for the term of a life or lives. Hereditary tenure and leases for years were either absent or a minority. Life tenancies are a form of leasehold, and some historians routinely describe them as leases, but they seldom contain phrases such as 'to lease', or 'to hold at farm', which are characteristic of leases for years.[44] By *c.*1500 these were proto-copyholds for lives.

A commercial money rent usually replaced all servile incidents, except heriot and entry fines, upon conversion to the life tenancy. The use of 'in villeinage/bondage' disappeared at the same time. In a few places life tenancies were created but continued to held in villeinage.[45] In the 1350s and 1360s the standardized customary holdings in Cuxham (Oxfordshire) were converted to terms of lives for cash rent, usually because not enough tenants could be found after the Black Death to re-occupy them on the old terms.[46] Other places, such as Sotwell

[40] C. Howell, *Land, family and inheritance in transition. Kibworth Harcourt, 1280–1700* (1983), pp. 17, 33, 50–2; ead., 'Inheritance customs in the Midlands, 1280–1700', in J. Goody, J. Thirsk and E. P. Thompson (eds), *Family and inheritance. Rural society in western Europe 1200 to 1800* (1986), pp. 132–4.

[41] E. Searle, *Lordship and community. Battle Abbey and its banlieu 1066–1538* (1974), pp. 376–7, 382–3.

[42] Schofield, 'Market for customary land', pp. 10–14. For other examples, see Harvey, *Westminster Abbey*, pp. 248–52, 276–84; Whittle, *Agrarian capitalism*, pp. 73–4; and also Bailey, *Decline of serfdom*, pp. 135–8, 145–6, 232–3, 246–50.

[43] Davenport, *Economic development*, pp. 57–8, 70–7.

[44] E. B. Dewindt, *Land and people in Holywell-cum-Needingworth* (1972), pp. 122–30; Wells-Furby, *Berkeley estate*, pp. 96–7, 105.

[45] Harvey, *Westminster Abbey*, 254–6.

[46] Bailey, *Decline of serfdom*, pp. 120–3; see also Wells-Furby, *Berkeley estate*, pp. 106–7.

(Berks.) and Holywell (Hunts.), underwent more gradual conversions from the 1390s: for example, 136 of 149 transfers of customary land at Holywell between the 1390s and 1450s were for life tenancies.[47] During the later fifteenth century, many customary tenants on the estate of the bishop of Worcester surrendered their hereditary tenures voluntarily to be readmitted immediately on life interests for cash rents instead, and by *c.*1470 life tenancies were dominant on the Gloucestershire manors of Westminster Abbey.[48]

Category 4: Leasehold for years

In this case all or a majority of customary land was converted to leases for years, usually owing just a commercial cash rent: a few leases were also liable for a nominal entry fine or seasonal labour services.[49]

The lease of customary land was enrolled in either the manorial account each year, and/or recorded at the time of its grant in the manor court roll. Conveyances included the phrases 'leases' and/or 'at farm', but not 'in villeinage/bondage', a significant and decisive change. The length of leases tended to increase during the fifteenth century, and lessees also tended to obtain the right to assign the lease to a third party during its term. Most of the large customary holdings at Brandon (Suffolk) were converted to leases for years in the 1350s and 1360s, and the old villein tenure and incidents virtually disappeared. Leases continued to be renewed during the fifteenth century, and in the mid-1460s the annual rent from these 'lands at farm' was permanently amalgamated with the assize rents of the manor.[50] Large areas of unfree land throughout Cornwall were held on a conventionary tenure, which was effectively a short-term lease.[51]

The distribution of these four categories of manor throughout southern England has yet to be established, although Whittle has already noted the preponderance of Category 1 and 2 manors in East Anglia, and of Category 3 and 4 manors in the Midlands, by the second half of the fifteenth century.[52]

III

What trends in the formulae of land transfers of customary land, and in the use of the copy, are identifiable as manors transformed from hereditary villein tenure to the forms described above? We are still only able to answer these questions tentatively, although a clearer picture is emerging.

[47] Dewindt, *Needingworth-cum-Holywell*, p. 134; Faith, 'Berkshire', pp. 140–1, 148, 156. For other examples, see Harvey, *Westminster Abbey*, pp. 254–6; Dyer, 'West Midlands', p. 640; Bailey, *Decline of serfdom*, pp. 156–59, 250.

[48] Dyer, *Lords and peasants*, pp. 106–7, 294; Dyer, 'West Midlands', p. 640; Harvey, *Westminster Abbey*, p. 280.

[49] Larson, *Conflict and compromise*, pp. 164–5; Bailey, *Decline of serfdom*, pp. 139, 175, 209, 222.

[50] Muller, 'Peasants, lords', pp. 165–73; the amalgamation of the rent in the mid-1460s is evident when comparing University of Chicago, Joseph Regenstein Library, Bacon mss. 664 and 665. For other examples of this category of manor, see Bailey, *Decline of serfdom*, pp. 251–4.

[51] J. Hatcher, *Rural economy and society in the Duchy of Cornwall, 1300–1500* (1970), pp. 52–79; id., 'Social structure: Devon and Cornwall', in H. E. Hallam (ed.), *Agrarian history of England and Wales,* II, *1042–1348* (1988), pp. 677–8; Fox and Padel, *Cornish lands of the Arundells*, p. lvii.

[52] Whittle, 'Individualism and the family–land bond', pp. 49–59.

Conveyances of customary land held on fixed-term tenures ceased to include the overtly servile phrase 'holds in villeinage/bondage'. From the 1350s this phrase also began to disappear from the conveyances of hereditary tenure on some manors, a change which was usually associated with the lapse of servile incidents such as tallage, merchet and millsuit.[53] This change is clearly identifiable after the first plague outbreak, especially on manors of lower-status landlords, and therefore started much earlier than the traditional timeframe of *c.*1390–*c.*1420.[54] Both the 1350s and the 1390s were periods when landlords experienced particular difficulties in recruiting tenants for customary land. Many responded by making various adjustments to improve the dignity of the tenure and to widen the distinction between customary tenants and tenants in villeinage. Their subsequent success in finding new tenants for much of the untenanted land confirms that these adjustments mattered to the tenants themselves. Many were newcomers to the customary land market, or migrants into the manor, and therefore not hereditary serfs of the lord, who were attracted to tenures which neither conferred nor implied personal servility.

Two particular aspects of the changing formulae of conveyances are worthy of closer exploration, namely the chronology, geography and coincidence of the use of two key phrases: 'at the will of the lord [*ad voluntatem domini*]', and 'according to the custom of the manor [*secundum consuetudinem manerii*]'. The meaning of 'at the will of lord' is capable of misunderstanding. It did *not* mean that the land was vulnerable to seizure and eviction on the landlord's whim, because lords had to, and did, respect the qualifying terms upon which it was held, such as the contractual length of the term or the customary right of an heir to inherit. The purpose of the phrase 'at the will of the lord' was to reinforce unequivocally that the title to the land could only be pleaded in the lord's manorial court, and therefore that this was customary not freehold tenure.[55] After the Black Death of 1348–49 it was increasingly inserted into conveyances of customary tenure, both heritable and fixed, especially in East Anglia.[56]

Before 1350 the phrase 'according to the custom of the manor' was more frequent and ubiquitous than 'at the will of the lord', although it was less common in East Anglia.[57] Thereafter, its usage became more common, and it was routinely included in conveyances of life tenancies (although seldom, if ever, in leases for years).[58] By the late fifteenth century the phrase was being added to conveyances of hereditary tenures in East Anglia.[59] 'According to the custom of the manor' meant that the title to the land could only be defended in the lord's court, without nailing the point as directly as 'at the will of the lord'. But it also conveyed the

[53] Bailey, *Decline of serfdom*, pp. 241–2, 262–3, 288–92; Harvey, *Westminster Abbey*, p. 275.

[54] Bailey, *Decline of serfdom*, pp. 105, 115, 121, 137, 156–8, 172, 199, 220, 241–2, 246.

[55] Kerridge, *Agrarian problems*, pp. 38–9, 138–9; Harvey, 'Some aspects of the peasant land market', pp. 335–6; Z. Razi and R. M. Smith, 'The origins of the rolls as a written record', in Z. Razi and R. M. Smith (eds), *Medieval society and the manor court* (1996), p. 54n; Bailey, *Decline of serfdom*, pp. 291–2.

[56] Howell, *Land, family and inheritance*, p. 51; Howell, 'Inheritance customs', pp. 132–3; J. Ravensdale, 'Population changes and the transfer of customary land on a fourteenth century manor', in R. M. Smith (ed.), *Land, kinship and life-cycle* (1984), pp. 200–1; Bailey, *Decline of serfdom*, pp. 291–2.

[57] Ravensdale, 'Transfer of customary land', p. 200; Searle, *Battle Abbey*, pp. 194, 376; Dewindt, *Needingworth-cum-Holywell*, pp. 122–30, fns.; Faith, 'Berkshire', pp. 124, 130, 151, 156; Tompkins, '"Let's kill all the lawyers"', pp. 75–9; Bailey, *Decline of serfdom*, p. 292.

[58] Bailey, *Decline of serfdom*, p. 292 n. 21.

[59] Ibid., pp. 173, 222, 247, 249–50, 292.

wider meaning that manorial custom dictated the arrangements for customary land, such as the days on which the rent was paid, the arrangements governing entry fines, and other local restrictions on sub-letting and disposal.[60] Custom bound the landlord as much as the tenant, who, as contemporary lawyers recognized, 'cannot break the custom which is reasonable in these cases'.[61]

The practice of granting a written copy of the court record of a customary land transaction was rare in *c.*1300 and commonplace by the late fifteenth century, although copyhold as a distinct and identifiable tenure did not emerge until the sixteenth century. The chronology of its spread between those dates is impossible to chart with precision, because survivals of individual copies are so rare, although Faith observed that during the second half of the fourteenth century incidental references to copies become more frequent in Berkshire.[62] In fact, Faith's observation holds good for other areas of the country, too, because there is also evidence for the use of copies in this period from places as far apart as Essex, Gloucestershire, Suffolk, Buckinghamshire and County Durham.[63] The issue of a copy primarily benefited tenants by providing them with written proof of title, signalling the lord's good faith with respect to it, and enhancing the dignity of customary land by emulating the freeman's land charter.[64] From the landlord's perspective, the contents of the copy overtly reinforced the customary status of the tenure, an obvious benefit when the differences between free and customary tenures were diminishing. Both lord and tenant would have obtained obvious benefit from the spread of copies during the 1350s and 1360s, when the turnover of land was high, when distant relatives and newcomers were acquiring customary land for the first time, and when the range of customary tenures was widening rapidly. The wider use of the copy made very good sense in such conditions, because it improved the security of the tenure and reduced uncertainty about its terms.[65] Hyams has suggested that copyhold was the 'logical conclusion' of a process begun by the introduction of the statute of *Quia Emptores* in 1290, because this had formalized the legal importance of written precision and registration in protecting tenures.[66] It is now apparent that the use of the copy spread rapidly after 1350 and was already widespread by the end of the fourteenth century.

After *c.*1350 a growing proportion of customary land was converted to fixed-term tenures, in which a money rent replaced most, if not all, of the old customs and services. So what determined whether the majority of customary land on a given manor remained on a hereditary customary tenure or was converted to a term?

The principal characteristic of those manors where hereditary customary tenures continued to dominate is that they maintained a ready supply of tenants throughout the generally depressed agrarian conditions of the later Middle Ages, and so they did not experience widespread vacancies of customary land for any length of time, especially after the Black

[60] Whittle, *Agrarian capitalism*, pp. 92–3.

[61] Kerridge, *Agrarian problems*, p. 139.

[62] Faith, 'Berkshire', pp. 130, 138, 140, 151; Harvey, 'Some aspects of the peasant land market', pp. 337–8.

[63] Kerridge, *Agrarian problems*, p. 141; Harvey, 'Home Counties', p. 671; Schofield, 'Market for customary land', p. 11; Wells-Furby, *Berkeley estate*, p. 106; Larson, *Conflict and compromise*, p. 195; Bailey, *Decline of serfdom*, pp. 292–3.

[64] Harvey, *Westminster Abbey*, p. 284.

[65] Smith, 'English peasantry', p. 354.

[66] P. R. Hyams, 'What did Edwardian villagers understand by law', in Razi and Smith (eds), *Medieval society and the manor court*, pp. 81–3.

Death of 1348–49 and 1361–62, and in the sharp agrarian downturns of the 1390s and the 1450s. The capacity of such manors to find tenants for most of their customary land owed much to their structure of landholding, which was characterized by sub-divided holdings, a permissive seigneurial approach towards a peasant land market, and a high proportion of smallholders.[67] Such structures were found mainly in East Anglia, the Home Counties and the south east, where population densities, commercialized agricultural production, and concentrations of wealth were discernibly higher than in other areas of England.[68] These features combined to create a deeper pool of prospective tenants locally, many of them seeking to acquire parcels of land to augment their smallholding, and an established culture of absorbing newcomers to the property market. They also generated higher land values and a more active customary land market, which meant that rights of inheritance were an important mechanism for protecting the resale value of customary land. In other words, such heritable land 'was valuable because it could be bought and sold, rather than because it could be inherited'.[69]

Another explanation for the durability of hereditary customary tenure on Category 1 and 2 manors is that landlords were prepared to make concessions on the rent package in order to maintain its attractiveness to existing and prospective tenants in a deteriorating market. The lapse of tallage, the commutation of labour services, the switch of merchet from unfree landholdings to hereditary serfs, and the changing language of conveyances, all improved the dignity of this tenure, further distancing it from villeinage. Many landlords were offering such improvements in the second half of the fourteenth century, some voluntarily and others in the teeth of tenant demands. Only in a few places were powerful landlords able to maintain unreformed tenure in villeinage much beyond *c.*1400, usually out of stubbornness or an innate conservatism, but invariably in places where landholdings were fragmented and the land market was active.[70]

Retaining hereditary tenure did not involve dramatic change, whereas a decision to convert to fixed-term tenures required conscious and momentous decision-making on the part of both landlord and tenant. What made them do so? A full answer to this question will require more comparative work on the common features of Category 3 and 4 manors, and those of Categories 1 and 2, but a number of explanations immediately present themselves. One explanation is that some landlords promoted conversions to fixed-term tenures because they preferred them to villeinage. Brenner regarded the introduction of leases as strongly beneficial to landlords, and therefore a seigneurial initiative, and Fryde argued that life tenancies were characteristic of conservative lordships, reflecting their 'harsh treatment of the peasantry': both authorities regarded fixed-terms as detrimental to tenants, who could be evicted or subject to

[67] Harvey, 'Aspects of the peasant land market', pp. 338–51; B. M. S. Campbell, 'Population pressure, inheritance and the land market in a fourteenth century peasant community'and R. M. Smith, 'Families and their land in an area of partible inheritance: Redgrave, Suffolk, 1260–1320', both in Smith (ed.), *Land, kinship and lifecycle*, respectively pp. 120–3 and pp. 135–96; A. E. Levett, *Studies in manorial history* (1938), pp. 252–4; Poos, *Rural society*, pp. 12–13; Whittle, 'Individualism and the family–land bond', pp. 44–5; Bailey, *Medieval Suffolk*, pp. 54–5, 59–63; Bailey, *Decline of serfdom*, pp. 105–6, 113–15, 220–2.

[68] For the general characteristics, see B. M. S. Campbell, 'Benchmarking medieval economic development: England, Wales, Scotland and Ireland, *c.*1290', *EcHR* 61 (2008), pp. 906, 924, 929.

[69] Whittle, 'Individualism and the family–land bond', p. 56.

[70] Mullan and Britnell, *Land and family*, pp. 62–5.

rent hikes at the end of the lease.[71] There are certainly some examples of landlords who, for whatever reason, actively promoted fixed-terms in preference to hereditary tenures. Durham priory had converted most of its customary land to leases by the fifteenth century, whereas the neighbouring bishopric did not, because the priory was more active in the management of its lands and in greater need of cash.[72]

The assumption that landlords were *always* the main beneficiaries of fixed-term tenures, and therefore the driving force behind their introduction, is implausible. Some tenants, too, saw real advantages in fixed-term tenures, notably their uncomplicated and money-based rent structure, the absence of servile incidents, and the flexibility either to relinquish the land or to renegotiate its rent package at the end of the term. The availability of land for a fixed duration, often in parcels and locations offering choice to the tenant, proved successful in attracting new tenants from different backgrounds to customary land during periods of agricultural uncertainty or downturn.[73] Hoyle correctly emphasizes that conversions to leases were not initially, and not necessarily, contentious to tenants.[74]

In any given locality, at any given time, the introduction of fixed-term tenures could have been either a landlord-driven or tenant-driven initiative: or, indeed, it could have been driven by their mutual interests.[75] After all, fixed-term tenures were flexible both ways: tenants could choose not to renew at the end of the lease, or could negotiate new terms, while landlords retained the option of restoring the land to villein tenure. Trying to ascertain exactly whether fixed-term tenures were the preference of landlord or tenant is ultimately an exercise in *a priori* reasoning rather than evidence-based proof, because the documents themselves seldom offer any definitive explanation. The most powerful line of reasoning is that for at least a century after 1350 fixed-term tenures were primarily a tenant-driven initiative, because this was essentially a buyer's market.[76] There is some concrete evidence to support this supposition. Time and again, conversion to fixed-terms was the only way of finding any tenants to occupy abandoned customary land, who were therefore consciously preferring them to the old tenure in villeinage;[77] some tenants paid to obtain seigneurial permission to convert their holdings to life tenancies;[78] and landlords occasionally flagged their intention to reconvert leases to villein tenure if a willing tenant should appear in the future.[79]

The most striking common characteristic of Category 3 and 4 manors is that they experienced severe shortages of tenants for their main customary landholdings at some point

[71] Brenner, 'Agrarian class structure', pp. 46–50; Fryde, *Peasants and landlords*, p. 270.

[72] A. T. Brown, 'Estate management and institutional constraints in pre-industrial England: the ecclesiastical estates of Durham, *c.*1400–1640', *EcHR* 67 (2014), pp. 699–719. For another example, see the Berkeleys in Gloucestershire, Wells-Furby, *Berkeley estate*, pp. 96–7.

[73] Smith, 'English peasantry', p. 361; Fryde, *Peasants and landlords*, p. 63; P. R. Schofield, 'Tenurial developments and the availability of customary land in a later medieval community', *EcHR* 49 (1996), pp. 262, 264.

[74] Hoyle, 'Tenure and the land market', pp. 9–11, 18.

[75] Larson, *Conflict and compromise*, pp. 165–7.

[76] Ibid., pp. 162–3, 201, 227; Muller, 'Peasants, lords', p. 164.

[77] Dyer, *Lords and peasants*, pp. 166, 292; Faith, 'Berkshire', p. 124; Dewindt, *Needingworth-cum-Holywell*, p. 205; Schofield, 'Tenurial developments', pp. 255–6; Wells-Furby, *Berkeley estate*, p. 105; Bailey, *Decline of serfdom*, pp. 106, 136–7, 170–1, 187, 244, 247–8, 251–2, 320.

[78] Faith, 'Berkshire', pp. 137, 151.

[79] Searle, *Battle Abbey*, p. 377; Faith, 'Berkshire', pp. 124–5; Mate, 'East Sussex land market', p. 53; Fryde, *Peasants and landlords*, p. 229; Schofield, 'Tenurial developments', p. 257; Whittle, *Agrarian capitalism*, p. 71.

in the later Middle Ages, usually in the 1350s, the 1390s and/or the 1450s. Such shortages were most acute on manors dominated by large, standardized holdings, usually held on impartible inheritance and/or with relatively inactive land markets: for years after the Black Death many of these holdings lay unoccupied in some places. The only way to revive the customary land market in the challenging conditions of the 1350s and 1390s on these manors was to offer unoccupied holdings on fixed-term tenures for money rent.[80] Why were tenant shortages more severe here than on Category 1 and 2 manors? One reason is that large standardized holdings carried greater operational risk than did smallholdings, especially to new tenants in periods of agrarian downturn: this factor was especially potent in the 1350s, when the economic uncertainty of the immediate post-plague era and the sudden shortages of labour made large holdings burdened with labour services appear risky. Converting these holdings to a fixed-term tenure reduced the risk by replacing labour services with a money rent, and by providing a formal opportunity to renegotiate the annual rent downwards, and to re-evaluate options, at its termination.

Another reason for the incapacity of such manors to find sufficient tenants was the structure of their customary landholding. The dominance of large, standardized holdings held on impartible inheritance, and the absence of an active market in land, meant there were fewer opportunities for local people to establish a foot on the property ladder. This served to limit the number and proportion of smallholders, and encouraged the out-migration of many landless people, both of which limited the size of the pool of potential replacement tenants locally. Those remaining in the pool had little direct experience of running a holding, which might have added to their reticence about acquiring a large one in economic conditions where some experienced tenants were abandoning theirs.

The willingness of tenants to opt for an impermanent tenancy in preference to rights of inheritance seems counter intuitive. The reasons for doing so were varied and complex. One explanation is that a fixed-term tenure offered short- to medium-term flexibility, which mitigated risk in an uncertain and deteriorating market, and therefore outweighed the long-term security of inheritance rights. This is similar to Faith's point that peasant families tended to relinquish rights of inheritance during periods when land was abundant and cheap.[81] Yet this does not explain why, say, Worcestershire tenants from the mid-fifteenth century were actively relinquishing inheritance rights around the same time as some of their East Anglian counterparts were once again returning to them. Thus the general economic climate provides only part of the answer.

Whittle has argued that peasants in the Midlands sought fixed terms as a release from the tenurial inflexibility of villeinage, where landlords had imposed a policy of impartible inheritance and few customary land sales, a rigid regime which had stultified the development of a land market.[82] Her perspective that life tenancies were a release from serfdom is far more convincing than Fryde's view that they were an instrument of its re-imposition.

[80] R. A. Lomas, 'Developments in land tenure on the Prior of Durham's estate in the later Middle Ages', *Northern Hist.*, 13 (1977), p. 39; Fryde, *Peasants and landlords*, p. 68; Muller, 'Peasants, lords', pp. 163, 165; Bailey, *Decline of serfdom*, pp. 121, 136, 157–8, 170–1, 187–8, 232–3, 247–8, 250–1.

[81] Faith, 'Peasant families', pp. 88–92.

[82] Fryde, *Peasants and landlords*, p. 270; Whittle, 'Individualism and the family–land bond', pp. 53, 58.

Another explanation is that the strong land–family bond, which had been a characteristic of communities in central-southern, midland and northern England, broke down rapidly from the end of the fourteenth century, coinciding with a sharp fall in kin density. The decline in the density of relatives residing locally had a deleterious impact upon a system which had traditionally been highly dependent upon kinship links for finding tenants for customary land.[83] After *c.*1400 the only viable option was to attract new tenants from outside the conventional range of family connections, but the customary land market was relatively inactive and not very commercialized in these parts, and therefore did not readily produce alternative tenants.[84] Thus when there were insufficient heirs to succeed to customary holdings, when those holdings had limited resale value, when the land market was inactive, and when agriculture was depressed, then the premium upon inheritance rights was low, and fixed-term contracts appeared attractive to tenants of customary land.

Fixed-term tenures were known all over the country, so what determined which particular type of fixed-term tenure came to dominate customary land on a given manor? On a few manors, especially before *c.*1420, different types of fixed-term tenures existed side-by-side for a while.[85] Others experimented initially before settling upon a preferred choice.[86] For example, in the 1380s and 1390s both leases for years and life tenancies were introduced at Brightwalton (Berks.) until the latter became the dominant form, and Durham priory first utilized life tenancies before switching to leases for years.[87] Such fluidity blurred the clean demarcations of the four manorial categories identified above, but, for the most part, a single dominant fixed-term tenure tended to emerge sooner or later on most manors, rather than a variety existing side-by-side.

Once again, some landlords and tenants must have had their own particular preference for either leases or life tenancies, the specific reasons for which are unknowable to the historian. Yet there is also a discernible tendency for manors to settle upon the type of fixed-term tenure which was already best-known locally. Life tenancies were known, but not common, before 1350 in parts of Gloucestershire and Oxfordshire, but then in the 1350s and 1360s they spread in both these counties. Leasing and/or sub-leasing small parcels of customary land had been rare in such areas before and after 1350.[88] When faced with severe shortages of tenants, especially in the unprecedented conditions following the Black Death, landlords and tenants opted for the fixed-term tenure which was already familiar to them. Once life tenancies had established a toe-hold in these areas, they subsequently gained in

[83] Z. Razi, 'The myth of the immutable English family', *Past & Present* 140 (1993), pp. 6–36.

[84] The variations are explored in Harvey, *Peasant land market*; Whittle, 'Individualism and the family–land bond', pp. 49–59; Whittle, *Agrarian capitalism*, pp. 92–100.

[85] Harvey, *Westminster Abbey*, p. 280; Bailey, *Decline of serfdom*, pp. 135–8, 199–201.

[86] Bailey, *Decline of serfdom*, p. 324.

[87] Faith, 'Berkshire', p. 133; Larson, *Conflict and compromise*, p. 163.

[88] W. H. Hart (ed.), *History and Cartulary of the Monastery of St Peter, Gloucester* (3 vols, Rolls Ser., 1863–67), III, pp. 110–12; R. H. Hilton, *A medieval society. The west Midlands at the end of the thirteenth century* (1966), p. 138; Harvey, *Westminster Abbey*, pp. 212–14, 281–2; Wells-Furby, *Berkeley estate*, pp. 96–7; Bailey, *Decline of serfdom*, pp. 119–20, 157–8. The land market in Berkshire was relatively inactive, and life tenancies became established there in the later Middle Ages, M. Yates, *Town and countryside in western Berkshire, c.1327 to c.1600. Social and economic change* (2007), pp. 142, 176, 178, 182.

popularity, gradually displacing the remaining hereditary tenures during the course of the late-fourteenth and fifteenth centuries.

Life tenancies of customary land were unusual before 1350 in East Anglia and the Home Counties. In contrast, small quantities of customary land had been converted to leases for years, while the practice of sub-letting parcels of villein land for short periods was very well established. Both practices derived from the commercialized and precocious nature of the land market in these regions.[89] After 1350 leases quickly became the fixed-term tenure of choice, and by the 1390s they were widespread.[90] Acquiring vacant customary holdings on short-term leases bestowed benefits upon both landlord and tenants in the uncertain and commercially-sensitive land market of the post-plague era, because it presented frequent opportunities to relinquish the land or to renegotiate its terms in response to fluctuating conditions.[91]

The area of customary land converted to leases and life tenancies increased in the second half of the fourteenth century, but thereafter their trajectories of development differed sharply. During the fifteenth century, more and more customary land was converted to life tenancies in central, southern and western England, including through voluntary surrenders of, and conversions from, hereditary tenure. In contrast, after *c.*1420, the area under leases for years in East Anglia and the Home Counties declined. Some customary lands at lease were re-granted for longer and more generous terms, but many were not renewed upon expiry. Most of the latter were returned to a hereditary tenancy, often through the device of the fee farm.[92]

What explains these different trajectories of development of fixed-term tenures? Life tenancies continued to spread during the course of the fifteenth century in those areas of England where the regional land market was relatively inactive, where competition for land was limited, and where fewer heirs were available to inherit. In such places, heirs were unlikely to be outbid if they wished to inherit a family holding, and so they ceased to value the right to inherit. Thus an indifference to inheritance rights was characteristic of places where, not just times when, land had little resale value and was easy to acquire.[93]

In East Anglia, the Home Counties and the south east, where the customary land market was active and commercialized, and where the family–land bond had been broken early, leases for years became popular when the grain market was volatile but contracting between *c.*1350 and *c.*1420, because they provided both landlord and tenant with greater flexibility during the uncertainty. They provided tenants with the flexibility to build up, to restructure, or to run down a property portfolio relatively quickly, and enabled landlords to respond to this demand without making any permanent concessions on tenure. However, when the land market finally settled into the stable trough of the Great Slump of the mid-fifteenth century, leases for short terms lost their popularity. As the land market picked up in the second half of the fifteenth century, so town dwellers, gentry landlords and Londoners invested increasingly in customary land in the south and east.[94] If landlords were to attract these newcomers to the rural land

[89] Bailey, 'Villeinage in England', pp. 441–2.

[90] F. M. Page, *The estates of Crowland Abbey* (1934), p. 112.

[91] Van Bavel and Schofield, 'Introduction', p. 15.

[92] Davenport, *Economic development*, pp. 57–8; Bailey, *Decline of serfdom*, pp. 34, 173, 200–1, 222, 232–3, 248–50.

[93] Faith, 'Berkshire', p. 157; French and Hoyle, *Character of English rural society,* pp. 25, 39; Whittle, 'Individualism and the family–land bond', pp. 51–4.

[94] R. H. Britnell, *Growth and decline in Colchester, 1300–1515* (1986), pp. 259–60; Jones, 'Bedfordshire', pp. 189–90, 234–5, 258; Harvey, 'Home Counties', p. 675;

market, and if they were to entice potential buyers away from the large quantities of heritable freeholds available for purchase nearby, then customary land had to possess inheritance rights and it also had to be free of its old, demeaning, servile incidents.[95] Hence leases gradually disappeared from Category 2, and even some Category 4 manors, during the course of the fifteenth century, to be replaced by heritable tenures.

These trends provide the first real insight into the genesis of the highly distinctive regional distribution of copyholds in sixteenth-century England. By *c.*1400 life tenancies were already firmly established in western counties such as Berkshire, Gloucestershire, Oxfordshire and Wiltshire, and became increasingly common thereafter.[96] They remained uncommon in East Anglia and the Home Counties, where instead a combination of hereditary tenure and leases for years dominated (Categories 1 and 2).[97] In other words, the broad contours of the sixteenth-century pattern of distribution were already established. This emerging pattern owed much to decisions which can be securely dated to the 1350s and 1360s.[98] As leases declined and as life tenancies increased in popularity during the fifteenth century, so the regional differences in the distribution of tenurial forms sharpened.

IV

The varied processes of tenurial change also help to explain how different rent packages came to be attached to sixteenth-century copyholds. The decline of servile incidents and renders in kind left a rent structure comprised mainly of an entry fine payable upon admission to the land; an annual cash rent; and perhaps a heriot. The size, timing and nature of the heriot were fixed by local manorial custom, and had changed little during the late Middle Ages. The levels of cash paid as entry fines and as annual rent, and whether either of these could be altered upon a change of tenancy, were key variables in determining whether the profits of agriculture accrued to the tenant or landlord.[99] Some copyholds rendered low and fixed annual rents, others high and variable entry fines, and others rendered various combinations of the two.[100] Life tenancies and leaseholds with variable rents and fines tended to benefit the landlords of early modern England, hereditary tenures with fixed rents and fines benefited the tenants.[101]

The varying rent packages of sixteenth-century copyholds were determined by the original rent structure attached to the holding under villein tenure, the manner in which that tenure

Note 94 continued
Mate, 'East Sussex land market', pp. 56–7; Fryde, *Peasants and landlords*, p. 272; Whittle, 'Individualism and the family–land bond', pp. 49–50; C. Dyer, *Making a living in the Middle Ages. The people of Britain, 850–1520* (2002), pp. 306, 344–5; M. Bailey, 'A tale of two towns: Buntingford and Standon in the later Middle Ages', *J. Medieval Hist.*, 19 (1993), p. 364.

[95] The dominance of free holdings in the south-east is mapped in B. M. S. Campbell, 'The agrarian problem in the early fourteenth century', *Past & Present,* 188 (2005), map 3 on p. 35.

[96] Whittle and Yates, '*Pays reel* or *pays legal*?', p. 12; J. Hare, *A prospering society. Wiltshire in the later Middle Ages* (2011), pp. 117–18.

[97] Harvey, *Westminster Abbey*, p. 283; Bailey, *Decline of serfdom*, pp. 322–6.

[98] Harvey, *Westminster Abbey*, pp. 255, 279; Bailey, *Decline of serfdom*, pp. 119–20, 157–8.

[99] Whittle, *Agrarian capitalism*, p. 64.

[100] Whittle, 'Landholding and land transfer', pp. 241–2. For examples of the variations in levels of annual rents and entry fines from manor to manor, see Whittle and Yates, '"Pays réel ou pays légal?"', pp. 8–14.

[101] French and Hoyle, *Character of English rural society*, pp. 31–2.

mutated during the fourteenth and fifteenth centuries, and, by extension, the way in which the servile incidents were treated during that transformation. Thus customary land converted to a life tenancy was likely to have an annual cash rent fixed for the duration of the term, at something like a market rate, and an entry fine/heriot upon a change of tenancy. Similarly, a former lease converted to a hereditary fee farm in the late-fifteenth century produced a copyhold of inheritance with a cash rent based on the market rate at the time of the conversion, but now fixed in perpetuity, and an entry fine which might be either variable or fixed depending upon local custom.

The evolution of the rent package on copyholds by inheritance is more complex, because it was mainly determined by the treatment of the various traditional servile incidents over the course of the later Middle Ages.[102] Had they been allowed to lapse informally without any financial compensation, or had they been removed through formal negotiation and recompense, or a mixture of the two? Was the annual cash rent fixed at a low, nominal, level or at something like a commercial rate?

Where labour services were a sizeable component of the original rent package, then their treatment was influential in determining the final level of money rent on the holding: they could either be allowed to lapse, or commuted permanently at the old customary valuation, or formally removed through a new negotiated sum.[103] The resultant money rent was low if the labour services had lapsed without any financial *quid pro quo*, or sometimes if they had been commuted at the customary monetary valuation and the sum added permanently to the annual rent charge.[104] This is because the customary valuation for labour services had often been set in the early thirteenth century, and based on the value of labour not land. Similarly, if other servile incidents, such as tallage and millsuit, had just lapsed over time without any formal monetary compensation; if the original cash component of the rent package had been low and fixed centuries before; and/or if the landlord had agreed at some point in the fifteenth century to freeze entry fines at a low rate, then the resultant rent would be low.[105] A combination of such factors meant that by 1460 heritable customary holdings at Telham (Sussex) paid a fixed and low annual rent per acre, although entry fines were variable; whereas at Kibworth Harcourt entry fines had been formally agreed in 1427 through collective negotiation.[106] Conversely, if the original monetary component had been high, if entry fines were based on whatever the market would bear or some multiple of the annual rent, and if servile incidents had been formally commuted through negotiation for an appropriate cash sum, then the overall cash charge on a copyhold by inheritance would be fixed and relatively high.

The ways of sealing a negotiated commutation were many and varied, ranging from a single collective agreement with all tenants to remove all servile incidents, to a series of one-off agreements with individual tenants at different times to remove a particular incident. There are examples of landlords negotiating a collective cash sum in lieu of the old rents in kind,

[102] Whittle, *Agrarian capitalism*, p. 67.

[103] Harvey, *Westminster Abbey*, pp. 269–71; Fryde, *Peasants and landlords*, pp. 211–12; Bailey, *Decline of serfdom*, pp. 244–5, 249–50, 256.

[104] Harvey, *Westminster Abbey*, p. 271.

[105] For example, M. K. McIntosh, *A community transformed. The manor and liberty of Havering, 1500–1620* (1991), pp. 94–9. See the lapse of tallages and petty fees on the Worcester estates, Dyer, *Lords and peasants*, pp. 284–5, 290.

[106] Searle, *Battle Abbey*, pp. 382–3; Howell, 'Inheritance customs', p. 134.

such as capons, and of individual agreements to replace tallage with a compensatory money payment, rather than allowing them to lapse.[107] The most common method was for a landlord to agree a single payment with an individual tenant to cover the loss of all servile incidents. For example, from the mid-fifteenth century individual parcels of customary land in Norton (Hertfordshire) were increasingly granted for 'rent service', in which a higher money rent now replaced all the old incidents except heriot.[108]

Negotiated commutations and collective agreements were invariably documented in manorial court rolls, creating a written record which provided protection against any subsequent challenge. Thereafter, it would prove difficult for landlord or tenant to alter the terms without joint agreement. However, rent packages which had lapsed informally and gradually during the later Middle Ages were more vulnerable to challenge from sixteenth-century lawyers, because, in the absence of any formal compensatory payment, it could be argued that a theoretical liability for the old services still existed. This is not to argue that later landlords and their lawyers would seek to restore a specific servile incident, but the intrinsic looseness of some historic arrangements provided them with a legal toehold to argue their right to vary rents and entry fines. Some tenants of hereditary tenures appeared to sense this vulnerability, and moved to address it as the land market began to stir again.[109] At Hargrave (Suffolk) in the late 1480s and early 1490s a number of hereditary tenants surrendered their customary holdings, but then either they (or their assignees) were readmitted on a hereditary tenure paying a higher cash rent: a formal surrender and readmission with, effectively, a negotiated commutation to seal off the possibility that ancient services and incidents might one day be restored. This intention was reflected in a change to the language of the conveyance, in which the words 'holding for services and customs' were replaced with 'rendering to the lord each year X*s*.'[110] Thus it is apparent that the scope for sixteenth-century landlords to challenge and manipulate the terms of tenure was enhanced whenever those arrangements remained loose and imprecise.[111]

V

Between the fourteenth and sixteenth centuries the terms on which customary land was held in England was transformed from hereditary villein tenure into copyholds and leaseholds

[107] Bailey, *Decline of serfdom*, p. 151; *Chertsey Abbey cartularies,* II (Surrey Rec. Soc., 12, 1958), pp. 90–1.

[108] Grants of customary land were conventionally described as held 'in villeinage at the will of the lord for services', but land where an annual cash sum had formally replaced the old services was held 'in villeinage at the will of the lord by rent service': the latter also owed suit of court, entry fine and heriot. For examples, see Hertfordshire Archives and Local Studies, Ms. 65532, court held Apr. 1439; and Ms. 65534, courts held May 1450, Apr. 1452, and May 1454.

[109] This also appears to be the explanation for the activity documented by Mate, 'East Sussex land market', pp. 61–2.

[110] Suffolk RO, Bury St Edmunds, E3/15.10/1.27. This is directly comparable to the Norton example, above, where the replacement of the words 'for services' with 'by rent service' signified a formal commutation. Similarly, at Winston (Suffolk) the introduction of a new and higher cash rent on some customary land resulted in the replacement of the phrase 'services and customs' with 'according to the custom of the manor', Bailey, *Decline of serfdom*, pp. 249–50. These examples provide further support for the argument that subtle changes to the vocabulary of conveyances sometimes carried real significance.

[111] Hoyle, 'Tenure and the land market', p. 9.

of various sorts. Landlords respected the title to these customary tenures, as long as the tenant observed the terms on which they were held. Their rent packages were simplified and increasingly monetarized. The dignity of these tenures was lifted through the removal of both servile incidents and overtly servile language from conveyances, and the issue of copies of the manorial court roll entry of the land transfer. The general effect of these developments was to loosen the tight tenurial tangle which had caused such problems in the early fourteenth century, to open up the customary land market to new tenants and capital, and to rationalize and reconfigure the terms on which around one half of the land was made available to the peasantry.[112] The entry of new types of tenant, many from higher social backgrounds, into the customary land market added impetus to tenurial change, including to the language of conveyances, the spread of copies and the monetarization of the rent package. The greater presence of higher-status tenants in the customary land market maintained the pressure upon landlords to respect the title to customary tenures, and helps to explain the growing protection extended to copyholds under the common law during the late fifteenth and sixteenth centuries.

Historians have generally assumed that the main changes to customary tenures occurred during the course of the fifteenth century. They were certainly consolidated then, but there is now conclusive evidence that they had gained their initial and decisive impetus in the 1350s and 1360s, as some landlords offered immediate tenurial concessions in the aftermath of the Black Death in their desperation to attract tenants. The remarkably full uptake of customary land by the mid-1360s owed something to the introduction of monetarized fixed-term tenures, and to improvements to the dignity of villein tenure, and hardly anything to seigneurial compulsion and repression.[113] Indeed, the pace of tenurial change was likely to sharpen in periods when tenants were either scarce or turning over more quickly, because it created more opportunities for renegotiating the terms and conditions of land tenure, and accelerating the move away from villein tenure. It is now indisputable that the rapid growth of various types of fixed-term tenures for commercial rents was the most significant tenurial development of the second half of the fourteenth century, so that by *c.*1400 life tenancies were already established, and concentrated in, those regions of England where they came to dominate during the early modern period. Many fifteenth-century tenants chose actively and consciously to relinquish rights of inheritance in preference for less secure, fixed-term, tenancies of various kinds, confounding Brenner and Fryde's notion that such tenures were primarily a seigneurial initiative. Ironically, the decisions taken by these tenants would prove detrimental to their successors in the very different market conditions of the sixteenth century.[114]

There is still much that remains uncertain. The timing and local geography of late medieval tenurial change is still only vaguely known, and other factors – such as ecology – might have

[112] Campbell, 'Agrarian problem', pp. 69–70; Whittle, *Agrarian capitalism*, pp. 302–5; Mate, 'East Sussex land market', pp. 56–7; Schofield, 'Market for customary land', pp. 8–10, 16; Bailey, *Decline of serfdom*, pp. 332–6.

[113] M. Bailey, 'The myth of the seigniorial reaction in England after the Black Death', in M. Kowaleski, J. Langdon and P. Schofield (eds), *Essays in honour of Bruce M.S. Campbell* (forthcoming).

[114] Harvey, *Westminster Abbey*, pp. 283–4; Muller, 'Peasants, lords', pp. 167–8; Bailey, *Decline of serfdom*, p. 336; Brown, 'Estate management'.

influenced the choice of tenure within particular sub-regions.[115] However, the transformation of customary tenures already reveals something significant about the nature of medieval manorial custom, which is often depicted as immutable, established 'time out of mind' and therefore difficult to shift.[116] In practice local 'customs, although notionally unchangeable, did change over time'.[117] After the arrival of the Black Death, villein tenure proved malleable and mutable in many places, especially on the manors of lower status landlords: only the requirement to plead the title to customary land in the manor court proved non-negotiable. Thus when some sixteenth-century landlords challenged their tenants' rights to inheritance and the nature of their rent package, backed by sharp lawyers and the incentive of rising land scarcity, they were actually drawing upon a long-established culture of manipulating the terms and conditions upon which customary land was held. The emergence 'of both copyhold and tenant right depended not so much on the state of the law, as on the character and circumstance of countless tenants, innumerable lords'.[118] Had it been otherwise, it is hard to envisage how villein tenure could ever have been transformed into copyholds and leasehold.

[115] For example, arable villages tending towards insecure copyholds and pastoral areas towards copyholds of inheritance, French and Hoyle, *Character of English rural society*, p. 31.

[116] Bennett, *Life on the manor*, pp. 100–1; M. L. Bush, 'Tenant right under the Tudors: a revision revised', *Bulletin of the John Rylands Library*, 77 (1995), pp. 161–88.

[117] Whittle, *Agrarian capitalism*, p. 89. See also Hoyle, 'Tenant right', p. 53.

[118] Hoyle, 'Tenure and the land market', pp. 14–15.

Polder mania or marsh fever? Risk and risk management in early modern drainage projects: the case of Kallopolder, Flanders, 1649 to 1662*

by Tim Soens and Pieter De Graef

Abstract

Coastal marshlands are landscapes of risk: risk-taking is central to capitalist farming. The two seem to merge in the large-scale drainage projects of coastal and inland marshlands that proliferated all over Europe during the early modern period. Drainage projects mobilized huge amounts of mainly non-agricultural capital but also relied on advanced financial tools borrowed from merchant capitalism. Drawing on the extraordinary evidence regarding the financial flows and strategies involved in one such drainage project in Flanders, this article argues that risk was indeed a central concept in the funding as well as in the success or failure of drainage projects. Such projects were at the same time examples of financial speculation in pursuit of easy profit and of sophisticated risk-mitigation using all the legal and semi-legal instruments available. Finally the article shows how the risk assessment of a particular project by the major investors often had a profound impact on the further development of the region.

Risk has always been a central element in the history of the coastal lowlands surrounding the North Sea. Over the past few years environmental historians like Petra van Dam, Franz Mauelshagen and most recently Greg Bankoff have analysed how the permanent threat of flooding and disaster in these regions has generated institutions, technologies and coping mechanisms that are often broadly similar from one part of the North Sea area to another.[1] Not only did the inhabitants of coastal wetlands live in the constant fear of dyke breaches and storm

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[1] G. Bankoff, 'The "English Lowlands" and the North Sea Basin system: a history of shared risk', *Environment and History* 19 (2013), pp. 3–37; E. Thoen, 'Clio defeating Neptune: a pyrrhic victory? Men and their influence on the evolution of coastal landscapes in the North Sea area, especially during the Middle Ages and the Old Regime', in: E. Thoen *et al.* (eds), *Landscapes or seascapes? The history of coastal environment in the North Sea area reconsidered* (2013), pp. 397–428; P. J. E. M. van Dam, 'Denken over natuurrampen, overstromingen en de amfibische cultuur', *Tijdschrift voor waterstaatsgeschiedenis* 21 (2012), pp. 1–10; F. Mauelshagen, 'Flood disasters and political culture at the German North Sea coast: A long-term historical perspective', *Historical Social Research* 32 (2007) 3, pp. 133–44.

flooding by the sea, these lands also bordered rivers and river estuaries and suffered frequent episodes of river flooding. Furthermore, the intentional inundation of coastal wetlands for military defence in wartime was increasingly practised from the later Middle Ages onwards.[2] According to Bankoff the coastal lowlands can therefore be labelled 'risk societies' because their inhabitants, in one way or another, have had to accept the risk of flooding as a 'frequent life experience' and continuously tried to adapt both landscape and society to accommodate this risk as well as possible.[3] From an unpredictable hazard, flooding gradually turned into a 'manageable' risk, although the manner of managing this risk varied greatly. In economic and agricultural history, the attitude towards risk is often singled out as a major element distinguishing peasant societies from capitalist societies. Following the 1976 article of D. McCloskey on the inherent risk aversion of peasants in open-field agriculture, there has been much debate on the extent to which peasant smallholders, in order to ensure the survival of the family, tried to reduce risk as much possible, by diversifying income, crops and plots, and by preferring a stable but low income to higher but less certain profit.[4] Risk also remains a central issue in debates on the transition from peasant to capitalist agriculture. Whether forced by competition for land (the view of Brenner and others) or responding to market opportunities (as argued by De Vries *et al.*), capitalist farmers were increasingly tempted to specialize, innovate, experiment and take risks in order to maximize the profitability of their farm.[5]

So far, the debates on the variable role of risk in agricultural history are difficult to square with the 'permanence' of risk as advanced by environmental historians of the coastal lowlands. By stressing the physical origins of the flood risks, environmental historians tend to downplay fundamental differences in the way environmental risk was constructed by different social groups in different social contexts.[6] On the other hand, for agricultural historians, the specific physical environment of the coastal lowlands, including the occurrence of flooding, is mostly analysed as an exogenous factor which impacts on land use and productivity, but the risk itself is not singled out as an integral element that distinguishes coastal farming systems from inland farming systems.[7] In this article, an attempt is made to integrate both perspectives on the role of risk in coastal societies, by focusing on the highly innovative ways of managing risk that characterized the centralized drainage projects undertaken across the North Sea area in the early modern period. As we will argue, centralized drainage introduced a profoundly different way of dealing with risk, as drainers no longer tried to adapt to risk but used technology, institutions and power to control and manipulate it. Drawing on centuries-old experiences of coping with risk in international trade, drainers turned risk into a commodity, the cost of

[2] A. de Kraker, 'Flood events in the southwestern Netherlands and coastal Belgium, 1400–1953', *Hydrological Sciences* 51 (2006), pp. 913–29.

[3] Bankoff, '"English Lowlands"', p. 19.

[4] D. McCloskey, 'English open fields as behavior towards risk', *Research in Economic Hist.* 1 (1976), pp. 124–70 and id., 'The prudent peasant: new findings on open fields', *EcHR* 51 (1991), pp. 343–55. A more recent assessment may be found in G. Richardson, 'The prudent village: risk pooling institutions in medieval English agriculture', *JEcH* (2005), pp. 386–413.

[5] R. Brenner, 'The agrarian roots of European capitalism', *Past and Present* 97 (1982), pp. 16–113; P. Hoppenbrouwers and J.-L. van Zanden (eds), *Peasants into farmers? The Netherlands and the Brenner Debate* (2001).

[6] Bankoff, '"English Lowlands"', p. 34.

[7] For an overview, see the forthcoming volume on *Land Use and Productivity* in the series Rural Economy and Society, to be published by Brepols (Turnhout).

which could be externalized for other groups or for future generations. It is no coincidence that the early modern consortia or companies of investors active in drainage resembled shipping partnerships, with investors taking shares in several consortia, as Piet van Cruyningen has argued for Zeeland-Flanders.[8] Drainage introduced modern risk management methods into coastal societies, combining inherently high risks with maximised efforts to contain it.

I

In the course of the seventeenth and eighteenth centuries, enormous amounts of money were expended on large-scale drainage and embankment projects in the vast coastal marshlands of England, France, northern Germany and the Low Countries.[9] In many of these projects, both the incentive and the capital came from high status investors, many of them belonging to merchant or government elites, who were experienced in the funding of risky trade and shipping operations. Like these, investment in drainage projects was a risky undertaking in many ways. The constant environmental risk of flooding that is inherent to the nature of coastal wetlands has already been mentioned. Whereas the local population was both bodily and materially endangered by flooding, the absentee investors/landowners mainly suffered in terms of the size of their wallets. They saw their prospects of decent profits and high returns on investment diminish while costs for dyke repairs escalated. In addition to, and intertwined with, flood risks, free-loading landowners unwilling to pay their rates to the water management organization could endanger the quality of the water control system and cause a financial headache for the other landowners (since the latter often had to pay more than required to fill the gap). The problems of erratic tax collection sometimes ended in deficient maintenance and hence increased flood risks.[10] Third, every drainage project entailed a redistribution of property rights, often to the disadvantage of the local population. As a consequence, local resistance to drainage was often very high and a constant danger to projects, especially when intertwined with other causes of political discontent.[11] In the reign of Charles I of England (1625–49) for instance, the massive drainage projects in the Fens, some of them coordinated by the Dutch engineer Cornelius Vermuyden as well as (partly) financed by Dutch capital, became profoundly entangled in the violent political conflicts of the English Civil War.[12] Lastly, the

[8] P. van Cruyningen, 'Profits and risks in drainage projects in Staats-Vlaanderen', *Jaarboek voor Ecologische Geschiedenis*, 2005/06 (2006), p. 131. For the shipping partnerships, see O. Gelderblom and J. Jonker, 'Completing a financial revolution: the finance of the Dutch East India trade and the rise of the Amsterdam capital market, 1595–1612', *JEcH* 64 (2004), pp. 641–72.

[9] A general overview is given by S. Ciriacono, *Building on water. Venice, Holland and the construction of the European landscape in early modern times* (2006), esp. pp. 194–250.

[10] On deficient water tax payment, see M. A. Knittl, 'The design for the initial drainage of the Great Level of the Fens: an historical whodunit in three parts', *AgHR* 55 (2007), pp. 48–9; P. J. van Cruyningen, 'State, property rights and sustainability of drained areas along the North Sea coast, sixteenth–eighteenth centuries', in B. van Bavel and E. Thoen (eds.), *Rural societies and environments at risk. Ecology, property rights and social organization in fragile areas (Middle Ages–twentieth century)* (2013), pp. 195–202.

[11] T. Soens, 'Capitalisme, institutions et conflits hydrauliques autour de la Mer du Nord (XIII^{e}–XVIII^{e} siècle)', in P. Fournier and S. Lavaud (eds), *Eaux et conflits dans l'Europe médiévale et moderne*, (2012) pp. 149–71.

[12] K. Lindley, *Fenland riots and the English Revolution* (1982); M. E. Kennedy, 'Charles I and local

actual pay-off for the drainers only occurred after the drainage or embankment project was completed. The return on investment primarily depended on the agricultural output and, at the very start of the drainage project, the future yields of the newly reclaimed lands were highly uncertain.[13] As such every drainage project had to deal with significant degrees of financial, environmental, political and agricultural risk. Both the high amount of capital input and the high degree of risk involved in land reclamation have been considered important elements in the further agricultural evolution of the coastal wetlands as well. As Salvatore Ciriacono puts it, it cannot be a coincidence that 'the capitalist surge in English agriculture came in precisely the same decades as the major fen drainage projects'. Drainage usually brought a new way of organizing agriculture, one based on the collaboration of absentee landowners and large tenant farmers, which often proved an ideal breeding ground for the development of agrarian capitalism in which risk taking, competition and capital intensification was rewarded by a gradual increase in agricultural productivity.[14]

Risk and the management of risk turns out to be a central element in the history of wetland reclamation in general, and the 'grand' drainage projects of the early modern period in particular. However, the existing literature concerned with drainage projects has paid only limited attention to the funding of these projects. Most recent research on drainage concentrates on landscape formation or the technological, agricultural or socio-political impact of drainage.[15] The focus on the outline of the entrepreneurial and rectilinear 'renaissance-style' polders, the technology of the windmill and sluice drainage, land improvement and changing property relations, as well as conflicts between drainers and the inhabitants of the area, or amongst the drainers themselves, has paradoxically eclipsed the main purpose of drainage projects: to make investors' money work in these risky settings.

Despite a rich historiography for drainage and coastal water management, financial analyses of individual drainage projects remain scarce, especially outside the Netherlands.[16] Moreover, much of the investigation tends to concentrate only on the major undertakings of famous engineers and great adventurers, such as the notorious Vermuyden in the English Fens, Jan Adriaanszoon Leeghwater in the marsh regions of Schleswig-Holstein in northern Germany

Note 12 continued
government: the draining of the East and West Fens', *Albion* 15 (1983), p. 26; a more nuanced analysis of the resistance to fen drainage may be found in H. Falvey, 'Custom, resistance and politics: local experiences of improvement in early modern England' (unpublished PhD thesis, University of Warwick, 2012).

[13] H. van Zwet, *Lofwaerdighe dijckagies en miserabele polders. Een financiële analyse van landaanwinningsprojecten in Hollands Noorderkwartier, 1597–1643* (2009), pp. 331–89 on the highly divergent returns in several polders in northern Holland.

[14] Ciriacono, *Building*, pp. 7, 236–43, citation p. 243. Whether or not land drainage invariably led to an increase in agricultural output still remains subject to a great deal of debate, e.g. A. Gritt, 'Making good land from bad: the drainage of West Lancashire, *c.*1650–1850', *Rural Hist.* 19 (2008), pp. 1–27.

[15] On landscape formation, Bankoff, '"English Lowlands"', p. 5; W. Reh, C. Steenbergen and D. Aten, *Sea of land. The polder as an experimental atlas of Dutch landscape architecture* (2007); on drainage technology, Gritt, 'Good land'; Ciriacono, *Building*, pp. 246–47; on agricultural benefits, J. Thirsk, 'The Isle of Axholme before Vermuyden', *AgHR* 1 (1953), p. 28; on conflicts, Soens, 'Capitalisme'; R. Morera, *L'assèchement des marrais en France au XVIIe siècle* (2011), Gritt, 'Good land', pp. 9–10.

[16] Few attempts for Holland by van Zwet, *Landaanwinningsprojecten* and S. Zeischka, *Minerva in de polder. Waterstaat en techniek in het hoogheemraadschap van Rijnland, 1500–1856* (2008). For Zeeland, the most important study is van Cruyningen, 'Profits and risks'.

or Jan van Ens and Jean Hoeufft in the Poitou and Charente region in France. The bulk of wetland drainage remained in the background, completed by lesser known consortia of engineers and investors. Their motives and the success or failure of their investment remains relatively hypothetical: only few attempts have been made to quantitatively assess the degree of risk taken by the investors, the investment strategies of individual stakeholders or the actual returns on investment. These investment strategies might have been very diverse, as the recent literature on drainage emphasizes the multiplicity of interests and stakeholders involved in drainage and the necessity of a firm embedding in local society, which in turn implied the involvement of quite a number of local ruling elites as well.[17]

Precisely this need for a broader participation acts as a trigger for considering the risk profile of investments in drainage projects. A multitude of actors and hence financial strategies were involved and the strength of these projects depended in the end on the ability to raise a great deal of capital from many different participants. The capital of the leading investors was often wrapped up in a larger initiative involving lots of smaller participants. Spreading the risks and risk management were of crucial importance for the success of the investment. In this article, we argue that projects of land reclamation were examples of clever risk assessment: a mixture of speculation – inherent to this kind of investments, given the uncontrollable contextual factors and the high degree of fluctuation in results – and risk limitation, that is, attempts to transform an essentially speculative undertaking into a (more) secure investment. In order to pursue the apparently mutually exclusive goals of speculation and security of return on investment, the larger investors in particular did not hesitate to transfer part of the risk to smaller proprietors and investors. As we will see, they managed to do so thanks to an institutional setting which favoured their interests. This permanent balancing and sharing of risks might have had important consequences for the subsequent agricultural development of the newly reclaimed lands. On the one hand, the many possibilities of risk insurance might have favoured further investment in wetland agriculture, but, on the other hand, too much risk-aversion on the part of the larger landowners might have stimulated rent-seeking behaviour, with landowners trying to regain their initial investment as quickly as possible. If rents were to rise too high, they might have obstructed further productive investment by the farming population, hence impeding, instead of accelerating, agricultural development in the newly drained areas.

An in-depth analysis of the risk profile of early modern drainage projects, depends on the availability of detailed data for the capital flows involved, the social profile of the investors, their returns on investment and the length of their engagement (i.e. short-term speculation or long-term investment). In the rest of this article we will therefore concentrate on one representative drainage project in the Flemish coastal wetlands: Kallopolder on the left bank of the river Scheldt near Antwerp, which was undertaken between 1649 and 1653 (Figure 1).

Almost the entire archive of this drainage project, including accounts and correspondence, has been preserved. We can retrace the financing of the whole drainage scheme through the levying of water taxes – called *geschoten* – and loans, and therefore reconstruct at least part

[17] For England see Knittl, 'Great Level'; Germany, M. L. Allemeyer, *'Kein Land ohne Deich…!'. Lebenswelten einer Küstengesellschaft in der Frühen Neuzeit* (2006); France, Morera, *L'assèchement*; northern Holland, van Zwet, *Landaanwinningsprojecten*.

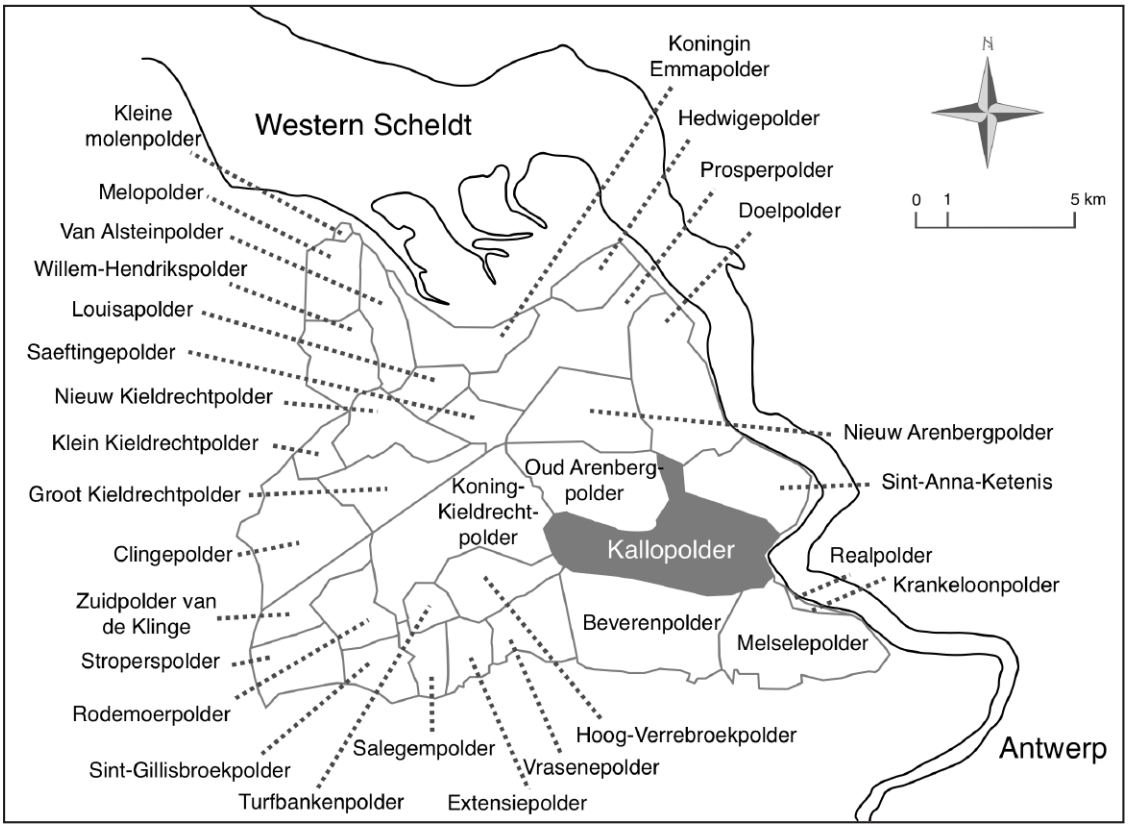


FIGURE 1. Location of Kallopolder on the left bank of the Scheldt Estuary near Antwerp.

Source: I. Jongepier and T. Soens (GIStorical Antwerp).

of the decision-making process that preceded every major stage in the project. What is really exceptional, however, is the opportunity of gaining insight into the crop yields just after reclamation, because the newly drained polder was initially directly exploited by proprietors and land claimants. This provides us with accounting documents in which crop yields and values as well as the costs of ploughing and sowing seed, were recorded.[18] As regards the assessment of risk management in early modern wetland drainage, Kallopolder is also an excellent case study because the odds were against the success of the enterprise. As we will see below, the newly constructed sea defences broke soon after their completion, leading to renewed flooding of the polder and high extra costs. Furthermore, whereas the project was planned during a period of bountiful harvests, the first harvests from the newly drained polder were particularly poor. Even so, the enterprise became a financial success for its initiators, demonstrating their extreme ability to manage risk.

[18] State Archives Beveren (henceforth SAB), P27 (Polder archive Kallo).

II

In the high and later Middle Ages economic activity in this area was dominated by large-scale commercial peat digging, stimulated by the local lords of Beveren, and from 1334 onwards, by the counts of Flanders, who took over the local *seigneurie* and integrated it into their domain. As elsewhere in the North Sea area, intensive peat cutting brought about the undesirable side-effect of lowering soil levels and increasing drainage problems.[19] As a result the area became subject to regular flooding, and part of it was covered by estuarine sediments from the river Scheldt. In 1431 the marshes were sold by the then duke of Burgundy and count of Flanders, Philip the Good, who was motivated by a growing need for cash to fund his campaigns. The sale of the marshes cleared the way for the embankment of the *polders* Haendorp, Sint-Niklaas and Sint-Anna, which together formed the future area of Kallopolder. Renewed flooding followed in the sixteenth century. Right at the start of the Siege of Antwerp by the Spanish army of Alexander Farnese in 1583, the three polders were inundated by the defendants of Antwerp and they remained flooded for many decades until the Peace Treaty of Münster (1648) which officially ended the war between the Spanish Habsburg empire and the newly created Dutch Republic. Kallo remained in the Spanish part of the Low Countries and on 2 September 1649, Philip IV of Spain issued an *octrooi* (licence or patent) granting a company of investors, headed by the Jan Baptiste Cachiopin de Laredo, lord of Kallo, the legal permission to re-embank and drain the flooded lands (Figure 2).[20] The reclamation was finished in 1652, and, in 1653 and 1654, the landowners and claimants began harvesting the crops.[21]

By the middle of the seventeenth century, the granting of a royal licence at the start of a drainage project was a well-established practice all over the North Sea area. Its precise history is yet to be determined, but in the Low Countries the first *octrooien* appeared in the course of the fifteenth century, with precedents dating back to the late fourteenth century. The licence was based on the royal claim to waste or vacant land. When a coastal wetland was flooded, it was deemed abandoned by its former owners, and its ownership was transferred to the sovereign who subsequently granted it to investors.[22] Apart from this transfer of property rights, the *octrooi* also arranged and regulated the future organization of drainage and water

[19] P. van Dam, *Vissen in veenmeren. De sluisvisserij op aal tussen Haarlem en Amsterdam en de ecologische transformatie in Rijnland, 1440–1530* (1998), pp. 58–70; G. J. Borger, 'Draining-digging-dredging: the creation of a new landscape in the peat areas of the Low Countries', in J. T. A. Verhoeven (ed.), *Fens and bogs in the Netherlands: Vegetation, history, nutrient dynamics and conservation* (Geobotany, 18, 1992), pp. 131–71.

[20] Published in G. Wolters, *Recueil de lois, arrêtés, règlements etc. concernant l'administration des eaux et polders de la Flandre orientale*, II, *Polders et wateringues* (1869), pp. 166–74 and also P. De Graef, 'Moeilijke beginjaren van een polder. Indijking en rechtstreekse exploitatie van Kallopolder (1649–1654)', *Land van Beveren* 54 (2012), p. 226.

[21] Ibid., pp. 232–34.

[22] On the medieval origins of the *octrooi*, see Soens, 'Dijkenbouwers of rustverstoorders? De Vlaamse graven en de strijd tegen het water in de laatmiddeleeuwse Vlaamse kustvlakte (veertiende-zestiende eeuw)', *BMGN: the Low Countries' Hist. Rev.* 122 (2007), pp. 334–37 and D. Tys, 'Landscape, settlement and dike building in coastal Flanders in relation to the political strategy of the counts of Flanders, 900–1200', in M. Fansa (ed.), *Kulturlandschaft Marsch – Natur, Geschichte, Gegenwart* (2005), pp. 106–26. P. van Cruyningen is currently preparing an article on the development of the *octrooi* and its contribution to creating an institutional context for land reclamation.



FIGURE 2. Eighteenth-century map of Kallopolder (shaded), on the left bank of the river Scheldt near the city of Antwerp

Source: © National Archives Brussels, *Kaarten en plans*, 2, 8619.

management by establishing a 'polder board' or 'dyke board', which financed its activities through the levy of a water tax or *scot*. From the late fifteenth century onwards the *octrooi* also granted freedom from tax. The *octrooi* of Kallopolder conceded a complete exemption from tax for 36 years, starting from the first harvest. A portion of the ordinary taxes – an indirect tax (excise) of one guilder (fl.) on every vat of beer; and six fl. on every *ame* of wine, were to be transferred to the dyke board to be spent on drainage and dyking. Because these excises were paid by the inhabitants of the newly drained 'polder' as well as by the labourers working in the polder, such a concession of excise duties to the landowners transferred part of the cost of drainage from the landowners to the labourers and inhabitants. Equally important was the threshold of 30 *gemeten* (about 13 ha.) of landed property that an investor needed in order to become involved in the general assembly of landowners. Such restrictions did not exist in the medieval period, but were gradually introduced in the course of the sixteenth and seventeenth centuries, to limit access to the decision-making process – and thus control over the investments – to the larger landowners – the *grote gelanden*.[23]

[23] Soens, 'Threatened by the sea, condemned by man? Flood risk and environmental inequalities along the North Sea Coast (1200–1800 AD)', in G. Massard-Guilbaud and R. Rodger (eds), *Environmental and social inequalities in the city: historical perspectives* (2011), pp. 106–7; G. van de Ven, *Man-made Lowlands. History of water management and land reclamation in the Netherlands* (2004), pp. 116–18.

The 'adventurers' had to gather a large capital sum in order to finance the drainage project. By comparison with the embankment of other polders in Zeeland-Flanders in the same period, the drainage of the polder of Kallo can be considered as one of the more expensive undertakings. In the general polder accounts, the highest *expenditure* was recorded in the years 1650 to 1652 implying that the actual *drainage* works must have been executed in this period. Together with the expenditure for interest and brokerage, the total cost of embanking this area of 1512 ha. ran to 111,668 Flemish pounds (li.) *groten* (or 671,328 fl.). This amounted to 74 li. *groten* (or 444 fl.) per ha. Converted into silver, the directors of the Kallopolder drainage project thus controlled a budget worth the equivalent of 6.6 tons of silver.[24] This undeniably provided them with a great deal of financial responsibility and power. The enormous budgets involved in early modern drainage projects can probably only be compared to state budgets or those of merchant companies engaged in overseas trade.[25]

The drainage of the Zeeland-Flemish Generale Prins Willempolder, the Zaamslagpolder and the Beoostenblij-Benoorden, were all three undertaken between 1650 and 1655. All cost less to complete than the project in Kallo, respectively 204, 245 and 301 guilders per ha, while the Bewestereede only required 112 guilders per hectare (Table 1).[26] Interestingly, the next polder to be embanked in the Waasland polder region, the Oud Arenbergpolder (1685–89) needed a similar investment of about 483 guilders per hectare. Although these Waasland polders were technically comparable with the schemes in Zeeland-Flanders, the cost of drainage resembled the higher expenditure involved in reclaiming the lakes in northern Holland. The reclamation of the Beemster (1612) was the cheapest (260 guilders per ha), but that of the Starnmeer (1643) peaked at 1059 guilders per ha, while the costs of the Purmer (1622), the Wijde Wormer (1626), the Heer Hugowaard (1631) and the Schermer (1635) fell in between these two poles. Lake reclamations were normally more expensive because they necessitated the construction of mills to drain the lakes. This was not necessary, however, when draining most coastal marshes, where gravitation drainage through waterways and sluices was sufficient.[27]

To gather the necessary funds, the adventurers invited those people who claimed rights in the land, whether because their ancestors had lived there or had possessed land before the inundations to participate. Their claims were investigated and if they were not verified, the money the claimants had contributed was refunded. In this way investment in the polder of Kallo was carried by big investors on the one hand – contributing a great deal of capital and in return receiving a large share of the property – and smaller, mainly local, participants on the other. The latter not only provided a substantial part of the capital but also guaranteed at least some local support for the project. Indeed, when analysing the place of residence of the

[24] In 1650 1 guilders (fl.) equalled 9.8 g of silver: J. L. van Zanden, 'The prices of the most important consumer goods, and indices of wages and the cost of living in the western part of the Netherlands, 1450–1800', http://www.iisg.nl/hpw/brenv.php (accessed 24 Jan. 2013).

[25] By comparison, the capital of the first Danish East India Company, at the moment of its foundation in 1616 amounted to 447,498 guilders. See C. van Bochove, *The economic consequences of the Dutch. Economic integration around the North Sea, 1500–1800* (2008), p. 98.

[26] Van Cruyningen, 'Profits', p. 139.

[27] Van Zwet, *Landaanwinningsprojecten*, pp. 245, 305–6; van Cruyningen, 'Profits', p. 128; H. van Damme, 'De Generale Prins Willempolder. Bedijking en bevolking, 1650–55: investeringsmotieven en bevolkingspolitiek', *Tijdschrift voor waterstaatsgeschiedenis* 22 (2013), pp. 6–17.

TABLE 1. Costs of seventeenth-century drainage projects in Flanders and Holland

	Polder	*Year of drainage*	*Total land area (hectares)*	*Costs per hectare (guilders)*
Zeeland-Flanders	Bewestereede	1650	1963	112
	Generale Prins Willempolder	1650–54	3275	204
	Zaamslagpolder	1650	1769	245
	Beoostenblij-Benoorden	1653–55	977	301
Lake reclamation in northern Holland	Beemster	1612	7100	260
	Purmer	1622	2756	334
	Wijde Wormer	1626	1620	351
	Heer Hugowaard	1631	3500	351
	Schermer	1635	4770	534
	Starnmeer	1643	627	1059
Land of Waas	Polder of Kallo	1649–52	1512	444
	Polder of Oud-Arenberg	1685–89	975	483

Source: van Cruyningen, 'Profits', p. 139; van Zwet, *Landaanwinningsprojecten*, 245; Antwerp City Archives, Manual Anthonis Spruyte (Oud-Arenberg)

participants, we notice that 7 out of 16 (or about 44 per cent) of the large participants – acquiring more than 25 hectares of land each – were living in a city (in nearby Antwerp, but also Malines, Ghent, Brussels and Bruges), whereas only 2 out of 16 (or about 13 per cent) were locals. The two principal investors – Jean-Baptiste Cachiopin de Laredo (who received 130 ha.) and Jan Bollaert (91 ha.) – were city dwellers. Cachiopin (d. 1662) offers an interesting example of the type of large investor taking the lead in drainage projects in the early modern period.[28] The Cachiopin family was a merchant family from Spain who had been settled in Antwerp since the middle of the sixteenth century. In the 1650s, however, the Cachiopin became more than just ordinary Antwerp merchants: Jean-Baptiste was knighted and his investment in the Kallopolder project became part of a concentrated effort to acquire land in the Waasland polder region. Their strategy was to buy land already drained in the region, but in addition they purchased the rights to flooded land which might be exploited by drainage. In addition they acquired the seigneurial rights to Kallo in January 1647 at a time when the region was still flooded. The merchant Cachiopin had thus become lord of both water and mud, which he would turn to his advantage through the commencement of the drainage operation. Famous artists like Anthony van Dijck and Pieter Paul Rubens painted portraits of the Cachiopin family, with the one by Rubens hanging in the house of Jean-Baptiste at the moment of his death. Most significantly his post-mortem inventory also listed a large painting portraying the drainage of Kallo.[29]

[28] Most of this information comes from his post mortem inventory. Antwerp, City Archives, WK 968 (1662/05/13).

[29] *In de voorcamer: 'een groote schilderije wesende*

TABLE 2. Place of residence of the investor-landowners, 1649–62

Place of residence	*Property category*					*Total*
	0–5 ha	*5–10 ha*	*10–25 ha*	*25–75 ha*	*>75 ha*	
Large cities (Antwerp, Brussels, Ghent, Malines and Bruges)	3	4	9	5	2	23
Land of Waas	13	4	4	2	0	23
Republic	0	2	0	2	0	4
Rest	0	0	1	1	0	2
Unknown	21	11	2	4	0	38
Total	37	21	16	14	2	90

Source: SAB, P27, no. 731.

The Cachiopins were a merchant family well on their way to integration into the nobility. Amongst the other major investors, we find several families with similar profiles. Many of them made a career in urban administration. Bollaert, for instance, was *groot-aalmoezenier* (director of the urban poor relief) and acquired the seigneuries of Neder and Over-Heembeek near Brussels). Others had entered the service of the Habsburg monarchy – Jean-Antoine Russchen for instance was burgomaster of Malines, but also secretary of the Supreme Court of the Habsburg Low Countries. Apparently, investment in embankment projects perfectly suited this kind of urban elite.[30]

In contrast to the big investors, the majority of the small participants – 17 out of 58 investors, or 29 per cent, receiving less than 10 ha after the embankment was finished – lived in the local region of the Land of Waas. This was probably also true of the many small participants for whom we lack information concerning their place of origin (i.e. 32 unknown cases out of 58, or 55 per cent). More than half of the investors in the 10–25 ha class (9 out of 16, or 56 per cent) also lived in a city (Table 2).

When we consider the total water tax payments over the period 1649–62, the largest share of the capital employed was clearly furnished by urban landowners and city-based noblemen, though the contribution of local, rural participants (either farmers or rural worthies and officials), was somewhat higher than in similar drainage projects elsewhere in the Western Scheldt estuary where it was usual for the urban bourgeoisie from Flanders, Holland, Zeeland and Brabant to obtain 75 per cent or more of the enclosed lands (Figure 3).[31]

Note 29 continued
Callo ingedijckt'. The painting of *Jiacomo de Cachiopin* by Rubens was hanging in the office ('comptoir'). Jacobus (d. 1642) and Thomas Cachiopin were well-known art-lovers (B. Timmermans, *Patronen van patronage in het zeventiende-eeuwse Antwerpen* (2008), p. 43). We have not found any other reference to a portrait of him by Rubens.

[30] Biographical data derived from C. Thomas, *De l'affection, avec laquele je me dispose de la servir toute ma vie. Prospopgraphie des grands commis du gouvernement central des Pays-Bas Espagnols* (1598–1700) (2 vols, 2011).

[31] On the importance of urban capital in early modern drainage projects see C. Dekker and R. Baetens, *Geld in het water: Antwerps en Mechels*

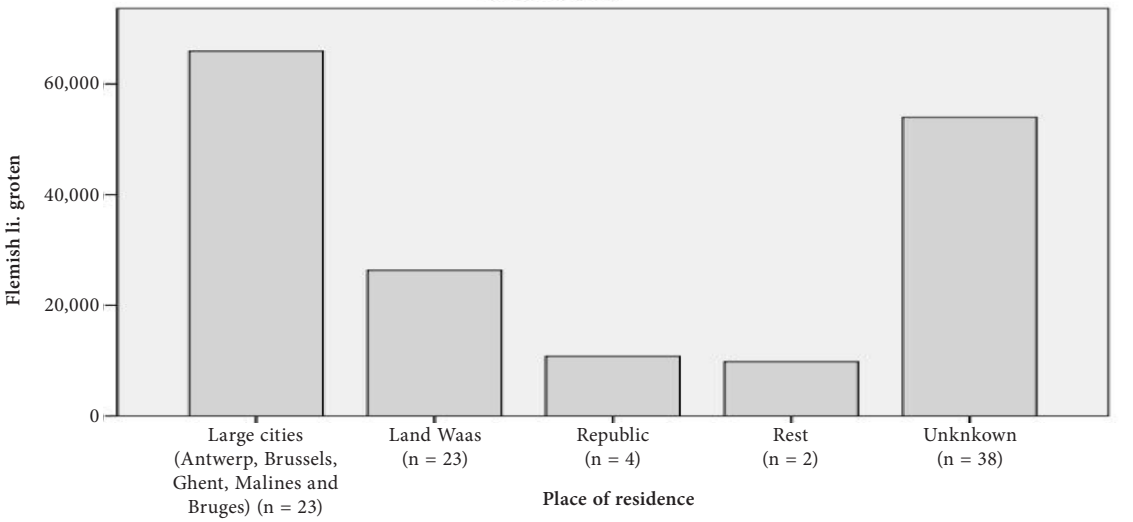


FIGURE 3. Water rates paid according to the place of residence of the investor-landowners, 1649–62

Source: SAB, P27, nos 224 and 731.

The small investors were only admitted when they could provide official titles supporting their claim to the land and, of course, if they proved able to pay the required contributions. In any case, the broad coalition of large and small investors acted as a mechanism for the spreading of risks and, at the same time, enabled the mobilization of the large amount of capital that exceeded the ability of the inner circle of big investors to raise. The fact that those claimants without the necessary capital reserves were excluded from participation, in itself constituted a cover against financial risks.[32] However, this was not enough to prevent financial difficulties during the first years of embankment and exploitation. In these years, the project suffered from the patchy payment of contributions (*scot* taxes). Because participants found it impossible (i.e. smaller ones not having the means to pay) or refused (i.e. wealthy ones deciding to have a free ride) to pay their contribution, the whole enterprise as well as the individual participants ran a considerable financial risk.[33] However, some of the major investors (mostly in the 25–75 ha category) provided a sophisticated answer to this danger, in a way that turned risk into opportunity. They started to contribute higher sums of money than was required by their share in the project. The Antwerp investors George de Nollet and Pieter Melis, as also the lord of Kercken, did so in an almost systematic way. Whereas the required contribution totalled 74 Flemish li. *groten* per hectare (see above), some of them contributed almost 1000 Flemish li. *groten* per hectare (Figure 2). By doing so they solved the project's liquidity problems. They did so however, not because they feared the failure of the project but because these 'excess' payments offered an attractive investment opportunity

Note 31 continued
kapitaal in Zuid-Beveland na de stormvloeden in de 16e eeuw (2010); van Cruyningen, 'Environmental disaster', pp. 1–12; id., *Behoudend maar buigzaam,* p. 104.

[32] This has also been observed in other drainage projects: Soens, 'Capitalisme', p. 162; Kennedy, 'East and West Fens', p. 26; Dekker and Baetens, *Geld*, p. 155.

[33] See Knittl, 'Great Level', pp. 48–9.

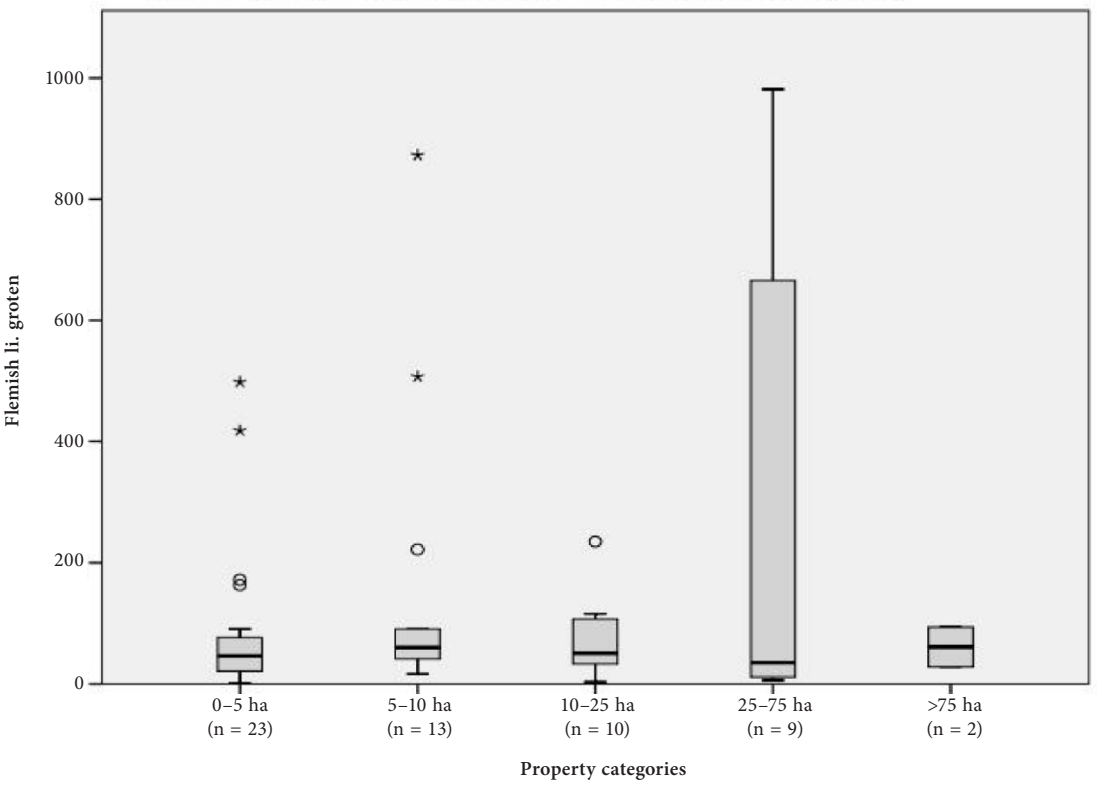


FIGURE 4. Water rates per hectare per property category, 1649–52

Source: SAB, P27, no. 224.

in itself: in fact the 'excess' payments were refunded by the community of landowners at an attractive yearly interest rate of between 6.25 per cent and 8 per cent, considerably above the 4 to 5 per cent rate which, at that time, was normally paid at the Amsterdam money market on both private loans and public ones contracted by the States of Holland.[34] As can be noticed in Figure 4, some of the smaller participants also invested more capital than they were required.

For a minority of landowners, this financial structure offered an attractive additional investment opportunity. The bulk of smaller participants could not profit from this, indeed they saw their contributions increasing because of the interest payments. Theoretically, the latter had to be provided solely by those participants who had failed to pay their share in full, but as many of them ended up renouncing the title to their land, the burden of the repayment fell on the whole community of participants. The repayments are a good example of clever financial risk management: some participants used the project's urgent need for financial

[34] W. Fritschy, 'A "financial revolution" reconsidered: public finance in Holland during the Dutch Revolt, 1568–1648', *EcHR* 56 (2003), p. 64, Table 1; O. Gelderblom and J. Jonker, 'Public finance and economic growth: the case of Holland in the seventeenth century', *JEcH* 71 (2011), pp. 1–39.

means to their own advantage. They initially contributed more than was required but had themselves refunded later using substantial interest payments.[35]

Up until 1652, the participants had contributed 89,335 Flemish li. *groten* in total or 80 per cent of the total of 111,668 li. *groten* needed for the drainage project. Apart from seeking additional advances from benevolent participants, the polder board also had to resort to the capital market. In order to spread the high costs incurred in 1650 and 1651 of more than 50,000 and 40,000 li. *groten* respectively, over a longer period, the polder board contracted loans totalling 76,607 li. *groten*. In the subsequent years – until 1660 – additional loans of 10 to 15,000 li. *groten* per annum were negotiated. Though these official loans were apparently contracted on the Antwerp money market, they were not impersonal loans granted by anonymous bankers, but were negotiated personally by de Nollet and Cachiopin, the leading actors in the embankment project. In total the project's managers obtained more money than necessary for the immediate costs, but we have to take into account the interest and repayments on top of it. Since the extra inputs of big investors can also be considered as loans, the funding of the whole drainage operation relied heavily on credit. This was not, in itself, unusual. However, in Kallo, this happened on much larger scale than elsewhere: contemporary lake drainage projects in northern Holland for instance only involved loans amounting to a few per cent of the total drainage costs.[36] In the polder of Kallo, we can see steps being taken towards creating a consolidated debt, the liability for which fell on the community of participants. By doing this the polder board avoided the immediate imposition of higher contributions, as well the liquidity problems of some of the less fortunate participants. On the other hand, the overall cost of the project increased substantially, and some of the participants clearly saw the credit operations as a further opportunity to increase their private financial gain, either acting as creditors themselves, or negotiating the loans on behalf of the polder board.

III

Part of the financial risk involved in drainage and embankment projects was due to uncertain environmental conditions. In the coastal wetlands, a severe winter storm could easily annihilate all of the participants' work. Many newly reclaimed polders were flooded again quite quickly after their reclamation, probably because their sea defences were not yet settled or compacted enough, or were poorly located. Such misfortune also struck Kallopolder. Shortly after the finalization of the project in November 1651, the polder was struck by a severe storm surge, which broke the newly constructed embankment and flooded the land. The works were redone, with disastrous financial consequences.[37] The renewed flooding also delayed the exploitation

[35] Documents on the water taxes, extra input with the restitutions, loans and interests: SAB, P27, no. 224; regulations concerning restitutions in the resolution books, P27, no. 1, 5 Apr. 1650; registers of those who paid more: SAB, P27, nos 162–6.

[36] Van Zwet, *Landaanwinningsprojecten*, pp. 79, 147–51; M. van Tielhof, 'Financing water management in Rijnland, 1500–1800', in O. Gelderblom (ed.), *The political economy of the Dutch Republic* (2009), pp. 215–18.

[37] Polder accounts on the repair works after the storm surge: SAB, P27, no. 260; recorded for other polders as well: Dekker and Baetens, *Geld*, pp. 54–7; van Cruyningen, 'Profits', p. 126; A. M. J. de Kraker, 'De ontwikkeling van het landschap', in M. Wilssens (ed.), *Singelberg: het kasteel en het land van Beveren* (2007), p. 38.

of the polder, and hence the first return on investment for the participants. The participants responded to this environmental challenge by developing a sophisticated way of directly farming the polder after the completion of the rebuilt embankment 'in order to prevent losses and interests which one would have suffered if refraining from ploughing and sowing'.[38] The problem was that by the time the crops had to be sown, the various plots of land had not been allocated to their final owners due to the many disputes over ownership. The solution was that those owners and claimants who had paid their *geschot* were allowed to begin the cultivation of the land, thus disadvantaging participants whose contributions were in arrears. To avoid yield losses and recover the costs as soon as possible, the polder was ploughed and sown with barley and colza in 1652–53 and with barley, oats, colza and wheat in 1653–54. The costs of the cultivation along with the crop yields and values were meticulously recorded because of the uncertainty concerning the distribution of the land to the different proprietors. As it turned out, some landowners – or the farmers working for them – sowed more than their allocated share. For this reason, and because of the huge variation in observed yields (see below), a complex redistribution mechanism was developed, dividing the profits among the rightful landowners. The farming method has to be situated somewhere halfway between private and collective farming: landowners were cultivating individual plots of land, but their output was added together and divided among the rightful landowners for each part of the polder. Interestingly the administrators used a double-entry style of bookkeeping – technically known as *alla veneziana* – with debits recorded on the left side of the double page and credits on the right side (Figure 5a and 5b). At this time, the adoption of double-entry accounts in public finances had not proceeded very far. It largely remained associated with international trade and merchant families. The decision to use such an advanced bookkeeping system had probably little to do with efficiency, and more with credibility in the circles of wealthy urban investors.[39] For landowners and farmers less familiar with the world of international trade, it might just have complicated their understanding of and control over the accounts.

Newly reclaimed clay polders were reputed to be highly fertile. In Kallopolder, characteristically high amounts of crop produce could be gathered in.[40] Yields of barley reaching more than 35 hl/ha stand comparison with those in the nearby Zeeland polders, where barley yields of 40 hl/ha were not exceptional. Also in the old polders of the Flemish district of Furnes, barley yielded on average 28 hl/ha in the period 1618–44 with peak values of 48 hl/ha in 1638.[41] Oats brought forth 25 hl on average, which is in line with observations of 29 hl/ha in the Furnes polders over the years 1617–43.[42] In 1653, a mean harvest of 18 hl of colza per hectare

[38] SAB, P27, no. 1, resolution May 1652: our translation of 'om te verhueden de schaden en intresten diemen daerdoore bij het naerlaten vande labeure ende besayinghe soude hebben comen te lijden'.

[39] Compare B. S. Yamey, 'The historical significance of double-entry bookkeeping: some non-Sombartian claims', *Accounting, Business and Financial Hist.* 15 (2005), pp. 77–88.

[40] The following data on crop yields in Kallopolder were gathered from SAB, P27, no. 745.

[41] P. Priester, 'Wheat yields in Zeeland from *c.*1585–1995', in B. J. P. van Bavel and E. Thoen (eds), *Land productivity and agro-systems in the North Sea area. Middle Ages – 20th century. Elements for comparison* (1999), p. 312; P. Vandewalle, 'Cereal production in the area of Veurne in the first half of the seventeenth century', in A. Verhulst and C. Vandenbroeke (eds), *Agricultural productivity in Flanders and Brabant, 14th–18th century* (1978), p. 371.

[42] Vandewalle, 'Cereal production', pp. 372–3.

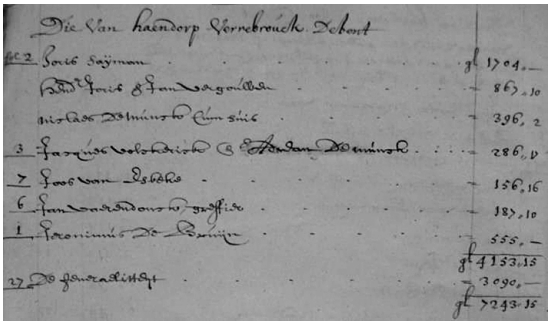


FIGURE 5a. Example of the debit side of the bookkeeping (registering the crop values for each exploitant)

Source: SAB, P27, no. 745.

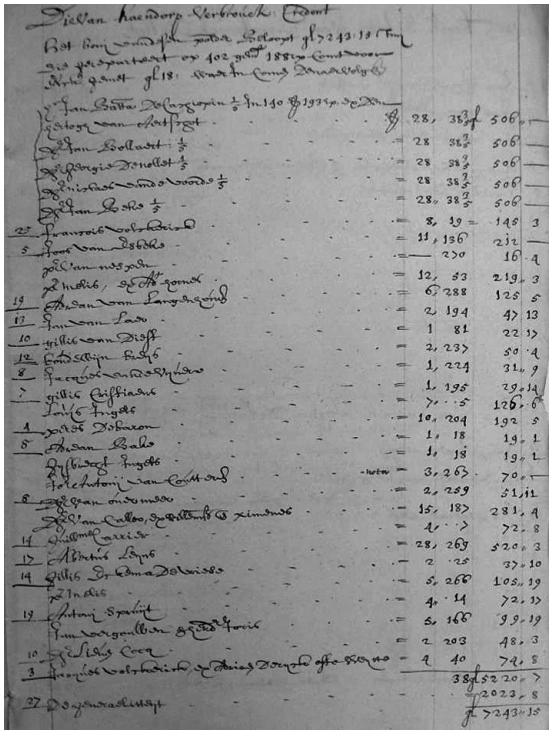


FIGURE 5b. Example of the credit side of the bookkeeping (where the redistribution took place among the rightful landowners)

Source: SAB, P27, no. 745.

is close to the estimations of Lindemans and Priester who argued that colza could produce approximately 20 hl/ha.[43]

Yet, the agricultural enterprise of the first two years after embankment cannot be deemed a total success story since crop yields were highly variable, as Figures 6a and 6b indicate.[44] The box plots of barley especially show a great dispersion around the median value, which indicates yields fluctuating roughly between 10 and 40 hl/ha. An interquartile range (i.e. the difference between the 75 per cent – and 25 per cent level of the data sample, demarcating the edges of the boxes) of more than 12 hl/ha for oats and colza also denotes the high variability of yields in the case of these crops. With 11 hl/ha on average, the harvest of colza for the year 1654 was disappointing and stood in sharp contrast with the good yield of the previous year. The picture is even worse when considering wheat yields. The Zeeland and Zeeland-Flemish polder farms were mostly able to record wheat yields of 15 to 20 hl/ha,[45] while in most of Kallopolder wheat production was below 10 hl/ha, with only a few exceptions. In the case of wheat production, yields in the newly embanked Kallopolder were clearly substandard, whereas the mean yields for barley, oats and, at least for the year 1653, colza were in line with normal harvest data for similar agricultural settings. Yet even these fluctuated greatly in the first two harvest years. The low yields of wheat and the plots of land with barley, oats and colza yielding less than average cannot be attributed to the overall level of cereal production: the years 1653–57 stand out as a

[43] Priester, 'Wheat yields', p. 312; Lindemans, *Geschiedenis,* II, pp. 271–2.

[44] In northern Holland, van Zwet also found varying yields: van Zwet, *Landaanwinningsprojecten*, pp. 331–89.

[45] Priester, 'Wheat yields', pp. 318–20.

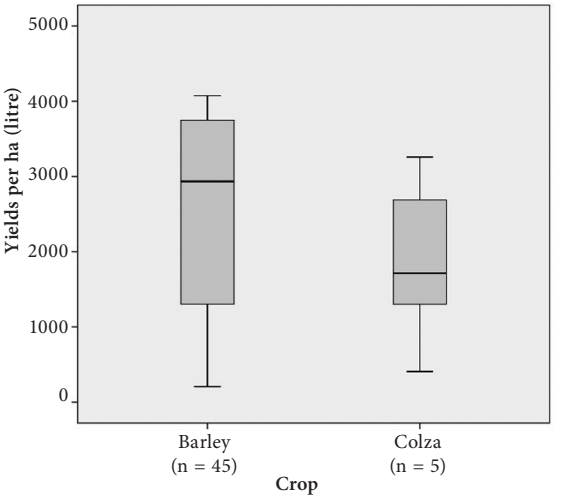


FIGURE 6a. Crop yields per ha, 1653

Source: SAB, P27, no. 745.

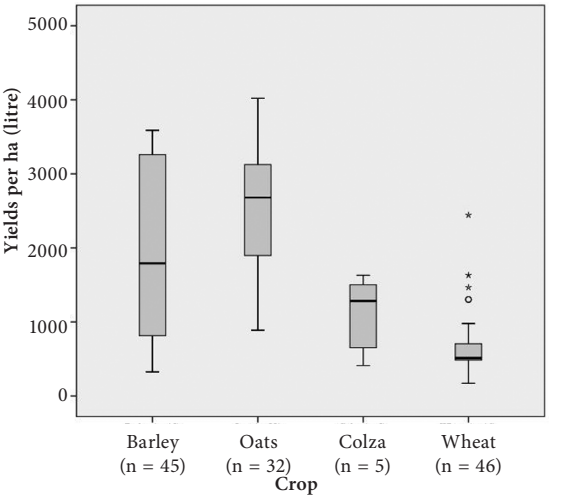


FIGURE 6b. Crop yields per hectare, 1654

Source, SAB, P27, no. 745.

brief period of good weather and relatively abundant harvests – a brief period of climatic calm during one of the most turbulent periods of the Little Ice Age.[46]

So, why were wheat yields in Kallopolder so low and the other yields so variable? No direct reason can be found in the sources, though we can formulate three hypotheses: an extensive method of farming the land, differences in soil composition and structure and beginning the cultivation of the polder too early. From the accounts of 1653 and 1654 it can be calculated that approximately 160 l of barley, 230 l of oats and 300 l of wheat were sown per hectare. This quantity of sowing seed for wheat seems especially high compared with other areas of large-scale commercial 'polder' agriculture, certainly more than the level of 200 l/ha recorded for wheat production in the Zeeland polders.[47] The small farmers in the so-called 'Flemish Husbandry' region of inland Flanders, used as little as 100 l/ha, but they compensated this by a huge labour input, which resulted in extremely high yield ratios (due to the low quantity of sowing seed compared to the high gross yields).[48] Although Zeeland-Flanders was a polder region with large-scale and market-oriented farms, farmers paid a lot of attention to intensive weed control, and hired extra labourers in the spring for that purpose.[49] The landowners of Kallopolder adopted higher seed ratios than the small-scale Flemish husbandry and probably

[46] Both 1648–50 and 1658 count among the worst years of the Maunder Minimum: E. Le Roy-Ladurie, *Histoire humaine et comparée du climat. I, Canicules et glaciers, XIIIe–XVIIIe siècles* (2004), pp. 440–41. Prices of cereal products in seventeenth-century Flanders can be found in A. Verhulst, 'Prijzen van granen, boter en kaas te Brugge volgens de "slag" van het Sint-Donatiaanskapittel (1348–1801)', in C. Verlinden and E. Scholliers (eds), *Dokumenten voor de geschiedenis van prijzen en lonen in Vlaanderen en Brabant* (1959–73), II, pp. 3–70. Local barley prices are not available for this period. We used instead the price series for Groningen by W. Tyms, *Groninger graanprijzen: de prijzen van agrarische producten tussen 1546 en 1990* (2000).

[47] Priester, 'Wheat yields', p. 318.

[48] E. Thoen and T. Soens, 'The Low Countries', in eid., *Land use and productivity* (Rural Economy and Society ser., forthcoming).

[49] Van Cruyningen, *Behoudend maar buigzaam*, pp. 176–7.

even higher ratios than in the polders of Zeeland and Furnes, but farmed their land in such an extensive way that weeds might have been able to grow rampant and overrun the crops on some parcels, hence the lower crop yields.

To cover the cost of ploughing, the preparation of the land for sowing, weed control, harvesting and threshing,[50] landowners received about 337 *stuiver* (17 fl) per hectare. Assessing the price of agricultural labour in the early modern period is very difficult as such labour was seldom paid in daily wages at full market rates.[51] However, even ignoring the actual organization of labour by the landowners, it quickly becomes clear that a labour cost of 337 *stuiver* per hectare is very low. Harvesting one hectare of wheat in the coastal marshlands of Zeeland-Flanders in the eighteenth century already costs about 200 *stuiver* (10 fl.) per hectare.[52] Ploughing and harrowing a hectare of land was valuated at 108 *stuiver* (5.4 fl.) in official manuals of appraisers near Ghent in the 1670s.[53] For another coastal wetland region within the Low Countries – the Guelders River Area – Bas van Bavel has estimated that labour input per hectare oscillated between 50 days on the very large farms to perhaps 225 days on the smallest farms (below four hectares).[54] During the years of direct farming in Kallopolder, the labour input was probably even below 50 days per hectare.[55] The farming of Kallopolder in the first years of its modern existence seems, therefore, to have been undertaken in an extensive fashion and this might explain the great degree of variability in crop yields. Because of this extensive way of farming, most probably with inadequate weed control, weeds had more chance to overgrow crops and thus negatively affect their growing pattern. In northern Holland for instance, some newly reclaimed polders had to deal with the abundant presence of cat's tail grass which was especially harmful to cattle.[56] Without labour-intensive weed control yields could be low.

Differences in the soil composition (from sandy loam to heavy clay and from dry to wet) can also offer an explanation for the big fluctuations in the yields, though not for the generally low level of wheat yields. Taking into account that yields of barley and colza were generally better than those of wheat, the start of wheat cultivation on this newly reclaimed land might have been just too early. Decades of inundations did not only leave a fertile clay layer behind but also salt. Ploughing and sowing in such saline soils might have harmed its structure resulting in disappointing yields. Only colza and barley were better able to cope with salinity. After completing the embankment, it would have been better to postpone cultivation for some years so that rain and snow could wash the salt out of the soil. When the embankment of the

[50] The accounts do not mention which activities were refunded. However, as the full market price for cereals was paid for from the produce of the fields (expressed in liquid measures), the labour must have included all phases of agricultural work, from ploughing to harvesting and threshing.

[51] B. van Bavel, 'Rural wage labour in the sixteenth-century Low Countries: an assessment of the importance and nature of wage labour in the countryside of Holland, Guelders and Flanders', *Continuity and Change* 21 (2006) 1, pp. 37–72.

[52] Van Cruyningen, *Behoudend maar buigzaam*, p. 73.

[53] State Archives Ghent, Varia D, no. 3343; See also Th. Lambrecht, *Een grote hoeve in een klein dorp. Relaties van arbeid en pacht op het Vlaamse platteland tijdens de 18de eeuw* (2002), p. 119.

[54] Van Bavel, 'Rural wage labour', p. 47. Van Bavel uses man-years, which we converted to man-days through multiplication by 250.

[55] Farmers received 337 *stuiver* per ha. for their labour. This represented about 50 days of labour at the very maximum, as 6.75 *stuiver* was more or less the wage a servant would earn on a large farm in this period, though he would live in with the farmer.

[56] Van Zwet, *Landaanwinningsprojecten*.

nearby Nieuw-Arenberg polder was nearing completion in 1784, supervisor Grosfils advised his superior – the Duke of Arenberg – to postpone cultivation until the polder had been properly desalinated, but this advice was ignored.[57] In both Nieuw Arenbergpolder and Kallopolder cultivation started very quickly after the embankment.

Faced with uncertain yields, the choice for an extensive kind of cultivation might have been exactly the right thing to do, given that grain prices in these years were low and labour relatively expensive. In the subsequent decades – in the middle of the famous 'agricultural crisis of the seventeenth century' – the combination of relatively low grain prices and high labour costs caused serious financial trouble for middle-sized farms all over the North Sea area.[58] After all, with a minimum of costs and an extensive type of cultivation, the landowners of Kallopolder still managed to realize profits, as the profits were still (a little) higher than the costs of the cultivation. From the point of view of the landowners, extensification might have been a 'prudent' choice.

As mentioned before, the challenge of highly variable and on average rather low yields was tackled by a distribution mechanism that limited risk. This mechanism provided the fair distribution of the crop values among the different landowners – according to their property share – within each part of the polder (i.e. the former polders of Haendorp and Sint-Niklaas and seven large plots or *kavels* of the old polder of Sint-Anna). The differences between the several constituent parts of the polder remained, therefore, but were rendered equivalent within these parts. Moreover, landowners who had to work the most challenging types of land received an extra sum to compensate for 'harsh labour'. Both the large and the small landowners benefited from this distribution mechanism but the redistribution of profits should likely be seen as an attempt to keep the small and middle class proprietors on board, as the largest proprietors often owned land in different parts of the embankment and hence seldom disposed of land which was entirely of low quality. Buying the produce of the direct cultivation offered additional opportunities for profit for some landowners. The crops were purchased by 65 individuals. Amongst them were 18 landowners, 11 of whom had participated in farming the land. These 18, belonging to all categories of property, cashed in twice. Besides receiving compensation for the cultivation of extra lands and the purchase of the crops of their own estates, they also bought crops to resell on the market. In doing so, risks were mitigated further, at least for those who participated in this system.[59]

Even with low yields and low prices, the investors of Kallopolder were able to realize a satisfactory return on investment, although this varied greatly from investor to investor. When we take into account the water taxes paid from the start of the embanking to 1654 inclusive and balance the sum of the crop values of 1653–54 against these invested sums, we can see that the return on investment was highly variable for the different investors-landowners (Figure 7).

Three landowners managed to earn back their initial investment after two years of cultivation,

[57] On soil salinity see P. Priester, *Geschiedenis van de Zeeuwse landbouw, circa 1600–1910* (1998), pp. 37–41; General State Archives Brussels, Familiefonds Arenberg, S2991.

[58] Especially in the period 1666–95, decades of 'agricultural crisis', in particular for the larger farms and less so for the wage-earning part of the population. For France, see G. Duby and A. Wallon (eds.), *Histoire de la France Rurale,* II, *L'âge classique des paysans, 1340–1789* (1965), pp. 261–75.

[59] On the distribution of the crop values: SAB, P27, no. 745; on crop purchases, SAB, P27, no. 752.

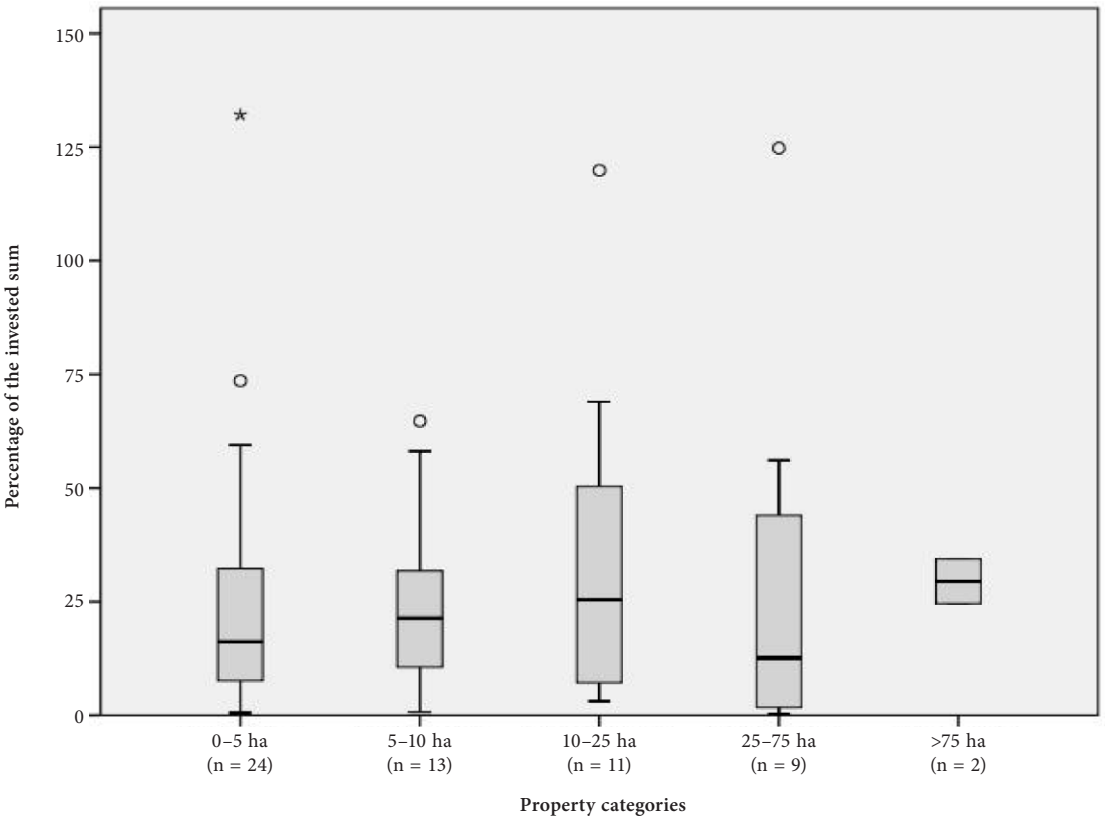


FIGURE 7. Return on investment of the first years' exploitation, 1653–4

Source: SAB, P27, no. 224 and SAB, P27, no. 745.

whereas 18 received less than 10 per cent. On average the investors gained a return of 16 per cent on their investment after two years of cultivation, which is rather high given the variable crop yields. This average return on investment hides huge differences between investors. Principal investor Cachiopin de la Redo – with an allocation of 139.6 ha. of land in 1654 – contributed 29,107 fl. up to 1654. In 1653 and 1654 his share in the profits of the direct cultivation totalled 10,015 fl. or 34 per cent of his investment to date. Nicolas Beke on the other hand, a middle-sized participant with 17.6 hectares, had invested 1991 fl. until 1654, and received 2387 fl., realizing a return on his investment of 120 per cent in two years. In contrast, Pieter Melis (57.5 hectares) was one of those who had invested much more than their actual share in the landed property of the polder. Up to 1654 he had invested 119,764 fl. but received only 2104 fl. as his share in the profits of the direct cultivation (a meagre return on investment of 1.76 per cent). Of course, apart from this return, Melis earned a guaranteed yearly interest of 6.25 to 8 per cent, the rate paid to those landowners who invested more than their actual share of land (see above). The actual return on investment thus allowed for broad differences among the investors. It is clear that some investors (like Beke, but also Cachiopin) had been able to defer a substantial part of their investment – Beke had paid only 113 fl. per hectare, whereas the whole project would

eventually cost 444 fl. per hectare – while still cashing in the full profit of the direct cultivation. In theory, the board of investors had decided that those investors who had not respected their financial commitment would not share in the profits of the direct cultivation, but apparently there was ample room for negotiation. The overall picture nevertheless remains quite positive. In comparison, the return on investment in the lake drainage projects in northern Holland, varied between 1 or 2 per cent up to 11 pr cent a year.[60] In this respect, profits in the polder of Kallo seem rather high. However, we have to take into account the huge debt contracted by the association of landowners, which would only be paid off over the following decades. In this way, short-term profit was made possible by accepting a lower return in the medium to long term.

As mentioned above, some landowners were not going to be able to pay the high initial cost of investment. Drainage law in Flanders prescribed that any landowner unable or unwilling to pay for the upkeep of the dikes could forfeit his land (the so-called *spadesteken* or *spaderecht*). Similar arrangements existed elsewhere in the Low Countries and in northern Germany too.[61] England's marshland customary law also prescribed that 'the Commissioners of Sewers could, as a last resort, sell the land of a person who couldn't or wouldn't pay a sewer rate'.[62] This law was invoked in Kallopolder and resulted in land sales in 1656 and 1659 when the largest proprietors, George de Nollet, Jan Bollaert and Pieter Melis acquired 32, 33 and 72 ha respectively. The register of the (enforced) land sales of deficient contributors recorded land prices of 50 sold properties which varied by and large between 83 and 133 Flemish li. *groten*/ha (i.e. between 500 and 800 guilders/ha). Interestingly, these newly bought lands were exonerated from the outstanding arrears in water taxes, which in part explains the high prices they secured.[63] This way investors could acquire land in the new polder without the uncertainty of the drainage cost.

IV

In the long run, too, this polder area had to deal with a further and even more far-reaching limitation of risks on the part of the absentee landowners. As mentioned before, many coastal wetlands or 'polder' areas in the Low Countries were among the first regions in Europe where proper capitalist social relations – characterized by the triple division of society between (absentee) landowners, leasehold farmers and landless labourers – came into existence.[64] In

[60] Van Zwet, *Landaanwinningsprojecten*, pp. 331–89. For a comparison of the return on investment in lake drainages in France, Morera, *L'assèchement*, p. 214.

[61] T. Soens, 'Flood security in the medieval and early modern North Sea area: a question of entitlement?', *Environment and Hist.* 19 (2013), pp. 227–8.

[62] Knittl, 'Great Level', p. 49.

[63] SAB, P27, no. 733. Compare sale prices of land in the Zeeland polders in van Cruyningen, *Behoudend maar buigzaam,* pp. 400–01 and in inland Flanders in F. De Wever, 'Rents and selling prices of land at Zele, sixteenth–eighteenth century', in H. Van der Wee and E. Van Cauwenberghe (eds), *Productivity of land and agricultural innovation in the Low Countries (1200–1800)* (Belgisch Centrum voor Landelijke Geschiedenis, 55, 1978), pp. 43–63.

[64] See the overview in Bas van Bavel, *Manors and markets: economy and society in the Low Countries, 500–1600* (2010), pp. 242–6; B. van Bavel, P. van Cruyningen and E. Thoen, 'The Low Countries, 1000–1750', in B. van Bavel and R. W. Hoyle (eds), *Social relations: property and power* (2010), pp. 168–97; T. Soens and E. Thoen, 'The origins of leasehold in the former county of Flanders', in Bas J. P. van Bavel and P. Schofield (eds), *The development of leasehold in northwestern Europe, c. 1200–1600* (2009), pp. 31–56.

Kallopolder as well, short-term leasehold became the predominant manner of tenure, and, as we have seen, many landowners were absentee urban or noble landlords. The symbiotic relationship of landlords and farmers in such a system could generate sustained economic growth, with farmers competing for leaseholds, and hence investing in cost-saving farming techniques while landlords offered financial backing to the farmers in case of misfortune.

The type of agrarian capitalism that developed in Kallopolder presents some of the features of this classic model, but not all. Most importantly, not all investor-landlords developed a long-term commitment to the 'polder': they sometimes preferred to cash in rapidly by selling their land shortly after the embankment was completed.[65] Landowners who were not inclined to invest for the long haul sold their properties after a period (mostly after a catastrophic storm surge like the ones occurring in 1661 and 1682 in the polder of Kallo). After profiting from the first years of exploitation – with their returns estimated above at about 8 per cent a year – these landlords quit once they faced new costs. Baars and van Cruyningen found the same distinction between long-term and short-term commitment in other early modern drainage projects in the Low Countries as well.[66]

Those landlords who developed a long-term commitment to Kallopolder, often tried to obtain lease prices that were as high as possible, the equivalent of 4 to 6 hl of wheat per hectare (which is almost twice the average rate of leases in the older Zeeland polders studied by van Cruyningen).[67] On the one hand the high lease prices indicate the eagerness of landlords to recover at least part of their considerable initial investment in a relatively short time, whereas the prospect of high yields on these newly reclaimed lands might have seduced tenant farmers to pay such expensive leases. On the other hand, the high lease prices also include some kind of 'a risk premium' to be paid by the tenant farmers. In the first three decades of the existence of the polder, landlords and tenants faced three major floods (1651, 1661 and 1682), and although the Peace of Westphalia (1648) had ended the hostilities among the Dutch Republic and the southern Habsburg Low Countries, the political situation remained so uncertain that the Dutch Republic continued to maintain fortresses on the very border of Kallopolder. The possession of this polder region itself remained disputed until the end of the eighteenth century. As in many other regions,[68] Flemish leasehold arrangements included an undertaking that the landlord

[65] Morera, *L'assèchement*, pp. 196–97; van Cruyningen, 'Environmental disaster', p. 1.

[66] Cf short- and long-term investment in the Beijerlanden (southern Holland): C. Baars, *De geschiedenis van de landbouw in de Beijerlanden* (1973), p. 109 and in Zeeland-Flanders: van Cruyningen, 'Profits', p. 135.

[67] Sample of 83 lease-prices (1660–1710), with average lease-price of 38.4 guilders per ha.. Based on probate inventories of tenant farmers in Kallopolder, analysed by P. De Graef, 'Polderpioniers in de nieuwe "dyckagie van Calloo". Marktgerichtheid en risicobereidheid van de eerste generatie landbouwers in Kallopolder, *ca.* 1665–*ca.* 1710' (unpublished MA dissertation, University of Antwerp, Belgium, 2010–11). The high lease prices in newly embanked polders are confirmed for other polders in this region as well. For instance, in the 1680s and 1690s, the Antwerp merchant Anthonius Spruyte participated in the drainage of Oud Arenbergpolder adjacent to Kallopolder. Once the drainage was finished, it was leased out at between 27 and 38 guilders per ha. (Antwerp City Archives, Insolvente Boedels 12, Spruyte), compared to 15–22 guilders per ha. in the older Zeeland polders studied by van Cruyningen (*Behoudend maar buigzaam,* p. 402).

[68] A recent analysis in: S. Sonderegger, '… der Zins ist abgelon… Aushandeln von Schadensteilungen zwischen Grundherren und Bauern in schwierigen Zeiten der Landwirtschaft', in: R. Kiessling and W. Scheffknecht (eds), *Umweltgeschichte in der Region* (Forum Suevicum, 9, 2012), pp. 139–57.



FIGURE 8. Monumental polder barn 'Ketelhof' near Kallo (seventeenth-century, demolished 1975)

Source: Private photo collection / Beeldbank Land van Waas.

would share extraordinary costs with the tenants in the event of natural disasters (flooding) or military destruction. Landlords would to pay at least part of the cost of repair works and the tenant farmer would be allowed a reduction in his rent. For many farmers the financial backing of their landlord might have been indispensable in such a high-risk environment, even if this implied paying high lease prices.

As for the landlords, they tried to limit their commitment to investment as far as possible. They did build large, if standardized, wooden barns on their farms (Figure 8) but seldom invested in farm houses, which often had to be built by the tenant farmer himself. Furthermore, landlords often seem to have spread risk further by selling part of their land. Some of the more wealthy tenant farmers were able to buy part of their farm, often starting with the land on which the farmstead was built, and then gradually expanding their landed property. This allowed for the spreading of risk between absentee landlords and local farmers but it also restricted competition on the lease market, a prime characteristic of capitalist farming systems. This is reflected by the gradual rise in the number of smaller and middle-sized properties in Kallopolder between 1653 and the 1690s (Table 3). A new category of owner-occupiers came into being who mostly farmed their own land (from 40 per cent to as much as 70 per cent of their total cultivated acreage).[69] In a similar way successful farmers in the Dutch Beijerlanden or in the Wadden Sea coastal marshes also managed to acquire a lot of landed property in the course of the seventeenth century. In the Zeeland-Flemish polders the *proliferation* of

[69] De Graef, 'Polderpioniers', pp. 7–11.

TABLE 3. Property distribution in the polder of Kallo, 1653–1690s

Year	*Property category*					*Total*
	0–5 ha	*5–10 ha*	*10–25 ha*	*25–75 ha*	*>75 ha*	
1653	13.1	19.8	12.6	21	33.4	100
1655	8.2	10.9	17	35.1	28.9	100
1661	8.7	11.1	21.1	41.2	17.9	100
1690s	18.4	10.1	20.8	29.1	21.5	100

Source: SAB, P27, no. 176, 722, 723, 58–70.

owner-occupied large-holdings did not begin until the eighteenth century.[70] In the high-risk coastal farming system absentee landlords devised strategies to mitigate risk and often quit when risks became too high or profits too depressed. After some decades of farming in the newly embanked polder, successful tenant farmers were willing to accept the full risk of farming in this high-risk environment, albeit in exchange for freehold property rights.

V

Investing in drainage and embankment projects was not the kind of risk-free investment usually associated with landed property. Previous work on large-scale drainage projects in seventeenth- and eighteenth-century England, France, the Low Countries, Germany and the Baltic area has already revealed the huge sums of money and the international financial operations involved in such projects, as well as the considerable degree of risk investors were exposed to, as exemplified by notorious stories of bankruptcies and the failures of drainage projects. However, much of the complexity of the financial transactions and the risk strategies involved in drainage operations remained hidden. Using a micro-perspective focused on one single drainage project in seventeenth century Flanders, we have been able to reveal in detail the strategies of investor-landowners and to demonstrate how they were able to keep the balance between risk-taking (in the environmental, agricultural and financial senses) and the management, assessment and mitigation of risk. In the first place, existing landowners and new investors joined forces in one drainage company, which drained an area formerly consisting of several separate 'polders' and of highly divergent soil qualities. This had the advantage of spreading risk and the possibility of bundling a lot of capital. Second, the agricultural uncertainty with respect to crop yields was overcome through a complex distribution mechanism, effectively allocating the returns of the first year's cultivation among the different landowners according to their share of property in the several constituent parts of the polder. This way differences in soil, drainage quality and desalination between plots were levelled out. Finally, there were – in some respects socially distorted – mechanisms at work

[70] Beijerlanden, Baars, *Beijerlanden*, pp. 106–07; Wadden Sea, O. Knottnerus, 'Yeomen and farmers in the Wadden Sea coastal marshes, *c*. 1500–*c*. 1900', in P. Hoppenbrouwers and B. van Bavel (eds), *Landholding and land transfer in the North Sea Area (late Middle Ages–19th century)* (2004), pp. 149–86; Zeeland-Flanders, van Cruyningen, *Behoudend maar Buigzaam*, pp. 98–108.

for the channelling of risks. The type of funding and the double entry bookkeeping system employed by the company were designed for merchants acquainted with complex financial operations. It must have been very hard for small local proprietors to get a grasp of the financial transactions involved, let alone to detect fraud. Furthermore, upper-tier investors who deliberately contributed more money than required saw their capital refunded with a high guaranteed rate of interest. They were thus able to spread part of the financial risk of their investment. On the other hand, shareholders in arrears would lose their investment if they could not meet calls for money. Their land was then sold by the drainage board without them being compensated for the contributions they had already made. As a result, many smaller participants lost both their land and their investment in the drainage project. In this way the complex financial mechanisms deployed in drainage not only allowed for highly personalized investment strategies, but also for the redistribution of risk from the leading investors to the minor ones.

In the absence of comparative micro-studies on the funding of drainage projects, we are still ignorant of whether the kind of advanced risk management shown with respect to the drainage of Kallopolder was employed in other projects. In any case, our analysis demonstrates the importance of risk management for our understanding of pre-modern coastal agriculture, with financial instruments developed to manage risk in international trade, being transferred to agriculture.[71] In Kallopolder the combination of speculative risk-taking on the one hand and maximum risk-avoidance on the other, seems to have restrained the development of full-blown agrarian capitalist social relations (landlord–capitalist tenant–landless labourer), as landlords in the end shifted part of the risk onto tenant farmers in exchange for property rights. The high level of risk in these coastal areas might be one of the reasons why proper capitalist social relations often did not endure in such regions and why the newly reclaimed land, having started as the property of investors, so often became the property of the people who farmed it. One might even suggest that, during the drainage, there were high risks but the possibility of high profits: in the mature reclaimed landscape, the risk of occasional inundations remained but profits were lower, and the landlords showed themselves to be risk-averse after all.[72]

[71] Compare P. Mathias, 'Strategies for reducing risk by entrepreneurs in the early modern period', in C. Lesger and L. Noordegraaf (eds), *Entrepreneurs and entrepreneurship in early modern times* (1995), pp. 5–24.

[72] Interestingly, environmental problems were often paralleled by the introduction of capitalist social relations. If environmental problems persisted, non-local landowners often gave up and the local population could again regain property rights, although sometimes in a degraded physical environment. On the interaction between agrarian capitalism and environmental problems, see different contributions in Thoen and van Bavel (eds), *Rural societies and environments at risk* and Soens, 'Flood security'.

Controlling the commoners: Methods to prevent, detect, and punish free-riding on Dutch commons in the early modern period*

by René van Weeren and Tine De Moor

Abstract

The making of rules by institutions of collective action, such as commons, has been and still is an instrument to promote desired behaviour and to prevent free-riding and other individual actions that might affect the collective interest negatively. In this article, we use the historical *markeboeken* of four Dutch commons (*marken*) to study the way in which commoners sought to guarantee the resilience and longevity of the common, by analysing the design of regulations against unauthorized use, the interaction of those rules with internal and external developments, and the effects that various forms of penalty may have had on the behaviour of commoners.

Over the past few decades, the New Institutional Economics has had a major influence on a number of aspects of economic history.[1] Institutions have come to the forefront as the sort of mediators that are necessary in a society to keep it in balance, helping it withstand the many external influences that may lead to its demise: 'good' institutions deliver a resilient society.[2] More recently, one particular institution, the commons, has attracted a great deal of interest, both among social scientists – as a direct consequence of the award of the 2009 Nobel prize in Economics to Elinor Ostrom – and outside the academic world, as part of a larger movement, in particular within north-western Europe, to revive citizens' participation in many spheres of

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[1] Since the publication by Douglas North of his *Institutions, institutional change and economic performance* (1990). There is even a *Journal of Institutional Economics*, which is devoted to the study of the nature, role, and evolutions of institutions in the economy, including firms, states, markets, money, households, and other vital institutions and organizations. For reviews of this debate, see F. Gagliardi, 'Institutions and economic change: a critical survey of the new institutional approaches and empirical evidence', *J. Socio-economics* 37 (2008), pp. 216–44.

[2] See D. Acemoglu, S. Johnson, and J. A. Robinson, 'Institutions as the fundamental cause of long-run growth', in P. Aghion and S. Durlauf (eds), *Handbook of economic growth* (2005), pp. 385–472; D. North, *Understanding the process of economic change* (2005).

society and economy. However, notwithstanding the many studies of present-day functioning of commons, our knowledge of how such institutions can – over the (very) long run – offer a meaningful contribution to economy and society is limited. It can only be enlarged by studying – in detail – the functioning of historical examples of collective resource management. Although the early modern context offers us many examples of commons that survived over centuries, the mechanisms that enabled commoners to overcome the social dilemmas they faced are still insufficiently understood. The many similarities in the ways resource use was restricted, how the daily management of the commons was organized, social control was encouraged, and participation was optimized in commons regulation throughout Europe suggest that there is a certain basic logic to how working together in the long-run can be facilitated. Comparing sets of regulations created by long-enduring commons throughout their existence could allow us to 'distil' the mechanisms that are used to overcome social dilemmas over very long periods of time. Such a 'distillation' has already been done by Ostrom in her seminal work *Governing the commons* (1990) but, as she indicated herself in later work, the timeframe within which her cases fitted was rather short, covering no more than a few decades. The real 'art of co-operation' lies in the capacity to build an institution that endures for many generations.

As all students of historical commons will understand, the systematic comparison of commons regulation over time is a cumbersome task, for which no clear methodology has yet been developed. So far as we know, commoners of one common did not communicate with those of another common about how to regulate the use and management of their respective commons, unless they were entangled in conflict over inter-commoning (where commons stretched over the borders of one or more villages). Nor is there any clear evidence of regulations being copied from one common to another; hence we can assume that the rules for the government of any single common are generated locally in reaction to the problems of that common. In this article we will develop a first step towards building a methodology to compare commons regulation, even across national boundaries, by focusing on one particular aspect of commons government, 'free-riding', which we define as people gaining profits by exercising rights to which they were not entitled or by entitled users exercising their rights in an unauthorized way.

The issue of control over the commoners' behaviour, *ex ante* or *ex post* the actual use of the resources, is vital to understanding how a self-governing institution manages to focus its commoners' minds on the long-term survival of their common rather than their individual short-term advantage. Although a third party will need to legitimate, adjudicate, and enforce the relevant rights,[3] the actual design of the rules was largely in the hands of the direct stakeholders: the commons are self-governing institutions, meaning that their stakeholders can define, amend, and even abolish the rules (which we shall call by-laws) that regulate access or usage of the common whenever required. Restraining the *homo economicus* in each of the commoners and promoting their compliance with the body of by-laws can be achieved through preventive measures, through social control, and through monitoring in combination with repressive measures. Prevention by setting ex ante restrictions on the use of the resources clearly is the cheapest solution, although the making of good, effective rules

[3] Compare with E. Ostrom, *Governing the commons. The evolution of institutions for collective action* (1990), p. 101.

for access, use, and governance also demands time and effort on the part of the commoners. However, such 'self-restrictions' may not be enough and somewhat more active mechanisms to detect infringements of the rules may be needed to enforce adherence to them. Social control – commoners controlling each other both actively and passively – is somewhat more time-consuming, but, as we will demonstrate, can also be beneficial for the 'social controller'; monitoring and activating repressive mechanisms are among the more time- and resource-intensive ways to prevent free-riding. As we will demonstrate, the role of the commoner in each of these methods is pivotal. It has been argued, by Elinor Ostrom among others, that a high degree of stakeholder participation is one of the factors that leads to high levels of resilience, and explains why many such institutions – from commons to irrigation systems – managed to survive for many centuries.[4] Whether the users of the institution are capable of dealing with crises – economic, social, or political – is dependent on whether and how they adjust their rules in response to these changes.

In this article we will use the example of the Dutch *markegenootschappen* in the eastern part of the modern Netherlands to explore how these three ways of control were put into practice. Our results are based on a meticulous analysis of the regulation of four commons. All four commons survived for over 200 years, during which timespan they adjusted their body of by-laws at least three times. This selection should allow us to capture change on the commons, and see how such change was dealt with in the regulations. Our analysis is based on a predefined database structure designed to process all the different aspects of governance that can be found in the rules regulating these commons, but which is nevertheless sufficiently specific to capture the many varieties of access, use, and management of the commons.[5] For the four selected commons, we have analysed 1137 original by-laws, i.e. rules that were mentioned as such as well as recorded decisions of the assembly of commoners that concerned the creation of a new rule or the revision of an existing one.[6]

With our systematic analysis, we also try to broaden the scope of methods used to prevent free-riding. With social dilemma games, prisoner games, and public good games, as well as variations on these, experimental sociologists and economists have repeatedly tested in a laboratory setting the willingness of individuals to co-operate, or to show altruism, and the conditions under which they do so.[7] This has led in recent years to a narrowing of the focus

[4] See, for example, Ostrom, *Governing the commons*, pp. 93–4.

[5] Over the past few years, we have composed a large database of *markegenootschappen* in the Netherlands, which currently contains detailed information on 839 cases mainly drawn from the eastern provinces of the Netherlands, based on an extensive survey carried out and published by A. A. Beekman (*Geschiedkundige atlas van Nederland* [1913–1938]). For a much smaller number of these we were able to trace the regulation over several centuries.

[6] Since some original by-laws actually existed of two separate rules contained in one sentence, these were split up into two or more individual by-laws: in the end, this resulted in 1588 individual by-laws out of the original 1137 original rules.

[7] This was not necessarily a computer lab. The work of Bowles and Gintis (see Joseph Henrich *et al.* (eds), *Foundations of human sociality: economic experiments and ethnographic evidence from fifteen small-scale societies* (2004), pp. 1–54) has been conducted in remote areas among tribes by using an alternative way of playing such games. One of the central questions underlying such research was whether co-operation between individuals is a 'natural' feature of human beings, or whether it has been 'nurtured'. The work by Bowles and Gintis has shown that the latter was more likely, and that one of the factors that induced co-operation was the individual's contacts with the market (via labour or the exchange of goods).

onto the punishments or sanctions which might be brought against those who placed their own interest above that of the collective. Other methods – such as social control – can be far cheaper and more efficient ways of discouraging free-riding, as will be demonstrated in this article. Historians have unearthed and identified the mechanisms for preventing free-riding on the commons in the past,[8] but this has (so far) not been done in a systematic and comparative way for (very) long-term cases. With a comprehensive comparison it may become clearer – not just to historians but to scholars of co-operation across many disciplines – that dealing with the threat of free-riding is not just a matter of punishment but of a subtle combination of mechanisms that adapt themselves to the changes in the environment – in its broadest sense of the word – and also to the availability of the resources. This article is a first step in unravelling what methods to control commoners' behaviour and, by extension, individual behaviour in any self-governing institution, are most appropriate.

We will start this article with a short account of the institutional aspects of commons such as the *marken* and the social, judicial, and environmental context within which the commoners had to operate (Section I). In the central part of the article, we will focus on the regulations of the selected commons and describe which control mechanisms the commoners used to promote the proper use of the common and to prevent free-riding (Section II). A conclusion follows.

I

In its origins, the term 'mark' (*marke*) seems to have referred to the marks made to define the boundaries of land owned by either individual owners or by a group of owners: in some cases boundary stones, in other cases (especially in wet or swampy areas, such as the peat bogs, where such heavy markers tended to sink and disappear) poles or other visual markers were used. This practice of determining the boundaries of the various marks is mentioned in the resolutions and regulations concerning the mark, usually registered in the so-called 'books of the mark' (*markeboeken*).

The 'mark' became synonymous with the organizational form of managing and governing the area that was destined for common use. According to Hoppenbrouwers, the term 'marks' was the 'customary general name both for corporations of people entitled to the use of specified common waste lands, and for such lands themselves'.[9] The organization itself, however, is generally referred to as '*markegenootschap*', the latter part of the word literally meaning 'association'. Since other terms (as *meenten*) were also used for the combination of land use and governance system, Hoppenbrouwers narrowed down the use of the term 'marks' to refer to 'user corporations that were set up and initially operated separately from general local government'. This kind of institution for collective action was the predominant form of common land governance in the areas of the current provinces of Gelderland and Overijssel;[10]

[8] There are a number of exceptions, see e.g. C. P. Rodgers (ed.), *Contested commons: environmental governance past and present* (2011).

[9] For what follows, P. Hoppenbrouwers, 'The use and management of commons in the Netherlands: an overview', in T. De Moor, P. Warde, and L. Shaw-Taylor (eds), *The management of common land in north west Europe, c.1500–1850* (2002), p. 92.

[10] A. A. Beekman, *Geschiedkundige atlas van Nederland* (1913–38), *passim*; B. H. Slicher van Bath, *Bijdragen tot de agrarische geschiedenis* (1978), p. 242; Hoppenbrouwers, 'Use and management', pp. 93–4.

in other parts of the northern Netherlands, the management of common and uncultivated land was often linked more closely to the local government and was usually referred to with the term *meent*.[11]

Given the lack of a uniform definition of the concept of the *mark(egenootschap)*, it is barely possible to pinpoint the period of origin of the marks.[12] The most decisive criterion would be the first appearance of the mark as an institution, usually the moment when the first (or at least the oldest preserved) set of rules that governed the access, use, and management of the common were drawn up. The oldest examples of such regulations often consist of a single document, written on parchment, to which the seal of the local authority was put, and date from the end of the thirteenth and the beginning of the fourteenth century. Such documents mostly developed into real *markeboeken*, which contained all further regulations and resolutions agreed upon at the general meetings, as well as more administrative business, such as the registration of shares or financial matters.

Many Dutch *markegenootschappen* have left behind extensive series of by-laws, often contained in the *markeboeken*. However, in order to study the long-term resilience and the dynamics of these regulations, we have selected only commons with a lifespan of at least two centuries. Although we are aware that longevity is just one way to measure institutional success, a lifespan of over two centuries at least indicates that the commoners were able to bridge several generations, whilst dealing with changing circumstances, both internally and externally. To study the dynamics within the institution of the commons, we narrowed our selection even further down to those commons that had amended their regulations at least three times over these two centuries. We do realize that this selection procedure involves some bias. On the one hand, there is the bias created by archival survival: by using the regulations of commons as our main source for analysis, we implicitly exclude those commons that may have been no less successful, but for which no records have been preserved. On the other hand, there is a theoretical possibility that our selection criteria excluded commons which had drawn up rules that were extremely resilient, in the sense that they were not amended more than once over 200 years: however, as we have not yet found any examples of this bias, this seems to be only a theoretical possibility.[13] For this article, we have selected four Dutch commons that complied with these criteria: the mark of Berkum (bef. 1300–1995), the mark of Raalterwoold (bef. 1445–1843), Dunsborger Hattemer mark (bef. 1553–*c*.1847), and the mark of Exel (1616–1852). In order to minimize the effect of different external factors (environmental, political, economic, etc.), we chose four commons that were located in the same region (see Figure 1). The distance from the most northern mark (the mark of Berkum) to the most southern (Dunsborger Hattemer mark) is no more than 55 kilometres as the crow flies. Secondary literature as well as the contents of the regulations indicate that the socio-economic and environmental conditions of the area were broadly similar for all four selected commons.[14] Given the nature of our main

[11] Hoppenbrouwers, 'Use and management', p. 92.

[12] See also the discussion in Hoppenbrouwers, 'Use and management', p. 93.

[13] For more information on this project, see http://www.collective-action.info/_PRO_NWO_Common Rules_Main.

[14] E.g. Hoppenbrouwers, 'Use and management', esp. pp. 87–90 and 104; J. L. van Zanden, 'Inequality in an inland province. Overijssel as a representative of the European pattern?', in L. Soltow and J. L. van Zanden (eds), *Income and wealth inequality in the Netherlands, 16th–20th Century* (1998), pp. 55–76.

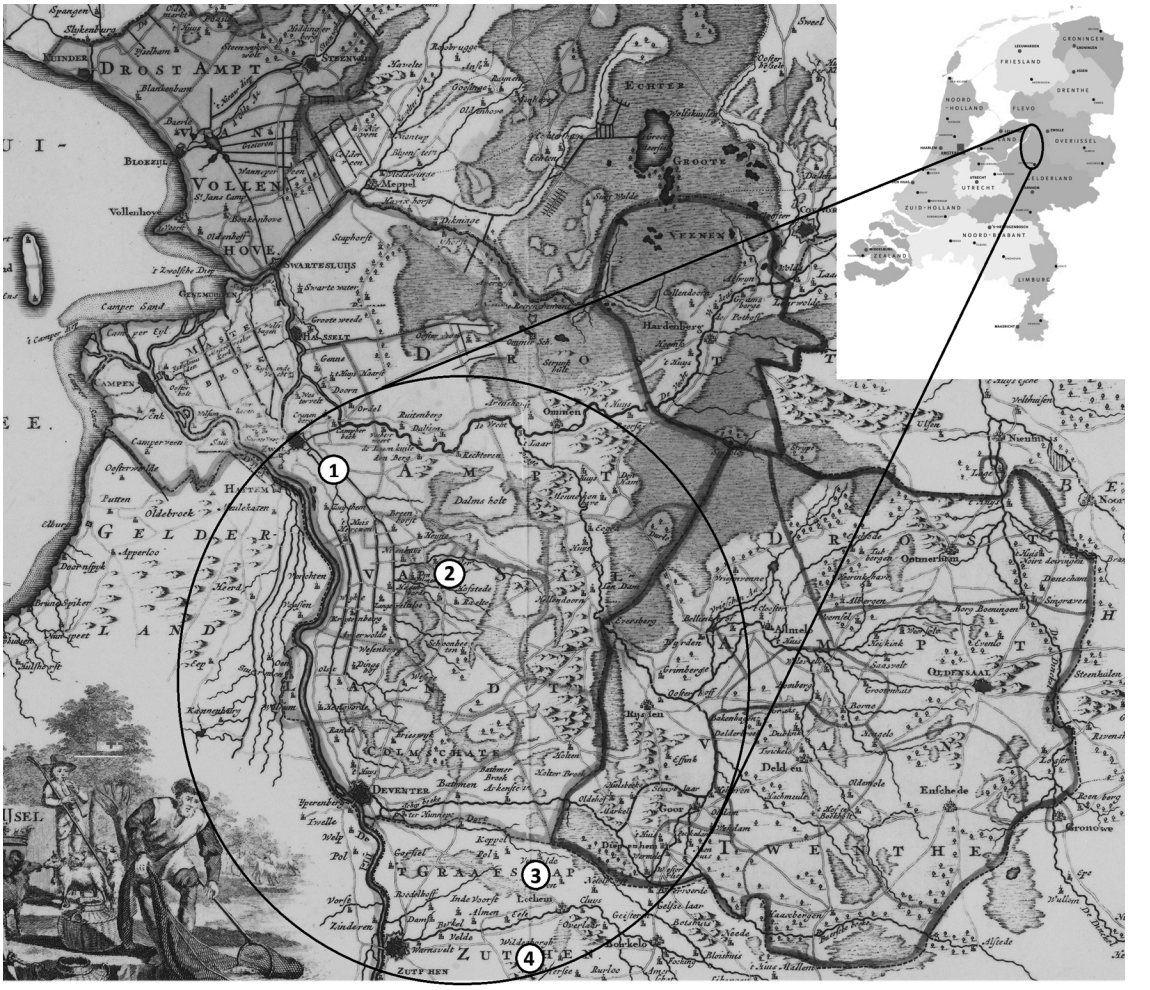


FIGURE 1. Map of the province of Overijssel by Isaac Tirion (1775).

Indicated are the location of this area on a present-day map of the Netherlands and the approximate locations of the respective commons selected for discussion in this article: (1) mark of Berkum, (2) mark of Raalterwoold, (3) mark of Exel, (4) Dunsborger Hattemermark.

research question, we will refrain from an extensive description of the four marks selected for examination: the appendix provides an overview of their main characteristics.

The majority of the marks in the Netherlands ceased to exist in the course of the nineteenth century, with a peak in dissolutions in the 1840s and 1850s. Three legislative measures formed the basis of this 'eventide' of the marks. First, the Royal Decree of 10 May 1810 placed a new financial burden on the marks: all lands had to be taxed, including the uncultivated – and previously untaxed – parts of the mark. An additional incentive for dissolution was the exemption from taxation for newly reclaimed land.[15] The self-governing status of the marks,

[15] Koninkrijk Holland, *Koninklijk besluit, houdende eenige bepalingen omtrent de uitvoering der wet van den*

however, remained intact: it was up to the assemblies of the marks themselves whether or not to decide to divide the common and uncultivated lands of the mark. As the survey undertaken by Demoed shows, this initial decree seems to have had little effect.[16] The contents of the regulations and resolutions of the assemblies of the marks, however, provide more nuance to these figures: although the number of complete and final dissolutions of marks remained relatively low between 1819 and 1839, the *markeboeken* reveal increasing concern among the members of the mark about its financial status, sometimes resulting in the decision to sell parts of the common in order to try to solve the debts owed by the mark.[17] The Royal Decree of 24 June 1837 brought the legislation of 1810 to the attention of the marks once more; the final implementation of tax exemption for reclaimed land that was formerly common and uncultivated, as mentioned in the corresponding Law of 1840, may have been decisive for most marks in their decision to divide and sell the remainder of the common land the mark owned, resulting in the final dissolution of the majority of the marks between 1840 and 1859.[18]

Although almost all marks had disappeared by the end of the nineteenth century, some marks still survived, either *de jure* or *de facto*. One of the case studies we used for this article, the mark of Berkum, managed to survive until the 1990s, after which the remaining assets of the mark were used to create a fund for the promotion of organizations for the advancement of regional heritage.[19]

The *markegenootschappen* were most numerous in the eastern part of the northern Netherlands: our inventory, based on archival sources and secondary literature, proves that, out of a total of 910 commons which existed at some time in the northern Netherlands, about 700 were located in the area of the current provinces of Drente, Gelderland, and Overijssel.[20] The four commons studied in this article were located on the sandy parts of the provinces of Overijssel (the marks of Raalterwoold and Berkum) and Gelderland (Dunsborger Hattemer mark and the mark of Exel) (see Figure 1). Until the first half of the thirteenth century, large areas of the eastern provinces of the northern Netherlands were covered by forests. The rapid population growth and, subsequently, the vast land reclamations which took place between

Note 15 continued
16den van grasmaand 1809 No. 7, betrekkelijk het bevorderen van de ontginning van woeste gronden. Gegeven den 10den van bloeimaand 1810 (1810).

[16] H. B. Demoed, *Mandegoed schandegoed: de markeverdelingen in Oost-Nederland in de 19e eeuw* (1987), p. 65 (Table 1).

[17] In the mark of Raalterwoold, for example, on 13 May 1828, the chairman of the assembly and the commissioned members proposed: '[i]n order to solve the deficit of the mark … to sell some locations, offering the current inhabitants the first privilege of buying, being the locations those that have been taxed before by experts, however being obliged to pay the commission as well as the due tenancy fees on July 25 forthcoming' (G. Hannink, *Markeboek van Raalterwoold* [1992], available online at http://grotenhuis.natuurlijk.nl/documents/Markeboek van Raalterwoold.pdf, p. 167).

[18] Demoed, *Mandegoed*, p. 65 (Table 1); the legislation that is referred to here is the Royal Decree of 24 June 1837, published in *Staatsblad* 17 (1837) and the 'Wet van 6 juni 1840 omtrent den vrijdom van lasten, terzake van landontginningen en landverbeteringen' [Law of 6 June 1840, concerning the exemption from taxes to the benefit of reclamations and improvement of the land].

[19] Web site Historisch Centrum Overijssel, Inventaris Archief Familie Sichterman, met marken Berkum en Streukel en Overijsselsche Kanalisatie Maatschappij (inv.nr. 1321): Inleiding. Available online at http://www.historischcentrumoverijssel.nl [Accessed 30 Mar. 2012].

[20] See database Markegenootschappen, available at https://www.dataverse.nl/dvn/dv/WebsiteICACommons/faces/study/StudyPage.xhtml?globalId=hdl:10411/10026 [Accessed 4 Oct. 2013].

1250 and 1350, in combination with extensive grazing, caused severe deforestation, degradation of the soil, and sand drifts.[21] All the available resources of the area of the selected commons are mentioned in the appendix.

The medieval and early modern socio-economic development of the area to which the selected commons belonged was quite different from the exceptional prosperous economic development of the maritime areas (*gewesten*) of Holland and Zeeland in the same period.[22] The degree of urbanization may at first glance seem to be similar to that of the western maritime *gewesten*, but was however limited to a handful of cities (e.g. Kampen, Zwolle, and Deventer), while the major part of the area had a (very) low population density. The socio-economic differences between the cities and the countryside also applied to the distribution of wealth with substantial inequality between the cities and the countryside. There was, however, less inequality between the farmers: although they had a relatively low income, data from early modern tax registers show relatively little difference between the individual farmers.[23]

In the area in which the commons considered in this article were situated, there was less possibility of extending the farmed area by reclamation than in the maritime areas. First, it was dominated by large manors owned by noblemen and religious institutions:[24] in the first half of the sixteenth century, for example, about half of the area of Salland was owned by either the nobility or the clergy whereas in the same period in Holland such parties owned only about one fifth of the land.[25] Furthermore, due to the absence of extensive nearby market facilities and a relatively low level of urbanization[26] the agricultural activities of farmers focused on local subsistence production.[27] About 95 per cent of the households had at least one cow, but herds remained relatively small, with 4 to 5 animals per household on average. By comparison, in Holland the average number of cows owned per farmer was considerably higher (about 12 to 15), but 75 per cent of the Holland farmers did not own any cattle. The inequality in Holland between farmers was therefore considerably larger than in the eastern regions, even though in the course of the early modern period the number of households in Holland owning cattle doubled.[28]

[21] M. De Moor, L. Shaw-Taylor, and P. Warde, 'Preliminary conclusions: the commons of northwestern Europe', in De Moor *et al.* (eds), *Management*, pp. 248–54; cf. also J. L. van Zanden, 'The paradox of the marks. The exploitation of commons in the eastern Netherlands, 1250–1850', *AgHR* 47 (1999), pp. 125–44, 128.

[22] See van Zanden, 'Inequality in an inland province', p. 55.

[23] The Gini coefficient for the countryside of Salland (where three of the commons used as case studies are located), based on the *Quotisatie* tax source of 1750 is 0.39; in comparison, this coefficient for the three major cities of Overijssel (Deventer, Kampen, and Zwolle) was 0.64, for the maritime *gewest* of Holland 0.71, and for the city of Amsterdam 0.69 (the latter two figures dating from the *Quotisatie* of 1742). Van Zanden, 'Inequality in an inland province', pp. 58–9.

[24] B. van Bavel, P. van Cruyningen, and E. Thoen, 'The Low Countries, 1000–1750', in B. van Bavel and R. W. Hoyle (eds), *Social relations: property and power. Rural economy and society in North-Western Europe* (2010), pp. 169–98, at p. 171; van Zanden, 'Inequality in an inland province', p. 56.

[25] B. J. P. van Bavel, 'Structures of landownership, mobility of land and farm sizes. Diverging developments in the northern part of the Low Countries, *c.*1300–1650', in B. J. P. van Bavel and P. Hoppenbrouwers (eds), *Landholding and land transfer in the North Sea area (late Middle Ages–19th century)* (2004), pp. 131–148, at p. 134, Table 6.1.

[26] Van Zanden, 'Inequality in an inland province', p. 55.

[27] Cf. van Bavel *et al.*, 'Low Countries', p. 181.

[28] Van Zanden, 'Inequality in an inland province', pp. 62–4, specifically Table 4.6.

Short leasehold, generally for 5 to 12 years, was in this area, as in most of the other areas in the northern Netherlands, introduced later than in Holland and Zeeland. The lease ratio in this however rose to over 90 per cent for the Salland region in the middle of the sixteenth century, whereas the overall lease ratio in Holland and Zeeland stayed relatively low.[29] A reason for the success of the short leasehold in the eastern Northern Netherlands may have been the dependence of both landowners and peasants in this area on this type of tenancy. Whereas landowners had a system of serfdom in the high Middle Ages, the dissolution of manorialism in the late Middle Ages and the monetarization of rents in kind forced them to search for new ways of tenancy, since unfree labour was no longer at their disposal.[30] At the same time, farmers had few opportunities to get hold of land themselves due to their limited resources, the absence of an active land market,[31] and the absence of opportunities to reclaim new land (as was the case in the maritime areas, where those who reclaimed new land became the de facto owners of the reclaimed area)[32] and therefore were dependent on obtaining a lease under the most favourable conditions. The combination of this competitive element (landowners searching for capable tenants, farmers looking for suitable land on good conditions), as well as relative low population pressure and ample supply of land to let, may have led to the highest lease ratio in the northern Netherlands, and in north-western Europe for that matter.[33] In the course of the early modern era, landownership in the eastern northern Netherlands changed, and large peasant freeholdings emerged, replacing both manorial landowners as well as a substantial part of the small peasant farms.[34]

Data from archival sources show the practically unchanged importance of agriculture as means of employment in the eastern provinces until well into the nineteenth century: in 1807, about 70 per cent of the rural population in both provinces of Overijssel and Gelderland owned cattle,[35] while at the end of the eighteenth century, some 46 per cent of the working population of Overijssel were still employed in agriculture.[36] In comparison, in the maritime *gewesten,* these

[29] B. J. P. van Bavel, 'The emergence and growth of short-term leasing in the Netherlands and other parts of Northwestern Europe (11th–16th centuries): a tentative investigation into its chronology and causes', in: B. J. P. van Bavel and P. Schofield (eds), *The development of leasehold in Northwestern Europe, 1200–1600* (2009), pp. 191, Figure 9.2; van Bavel, 'Structures', p. 141; cf. B. H. Slicher van Bath, *Een samenleving onder spanning. Geschiedenis van het platteland in Overijssel* (1957), pp. 613–14; also cf. van Bavel *et al*, 'Low Countries', pp. 174–76.

[30] Van Bavel *et al*., 'Low Countries', pp. 172–3.

[31] Ibid., p. 184.

[32] Ibid., pp. 169–98, 171–72, 194; van Bavel, 'Structures', p. 132; T. Soens, 'The social distribution of land and flood risk along the North Sea coast: Flanders, Holland, and Romney Marsh compared (*c*. 1200–1750)', in van Bavel and Thoen (eds), *Rural societies and environments at risk*, pp. 151–52.

[33] Van Bavel, 'Structures', p. 144.

[34] Van Zanden explains this change from the fact that the large landowners used to charge rent at fixed levels; the rise of product prices after 1770, in combination with the custom of farmers holding back rent for several years, lead to increasing wealth among farmers and decreasing income for the landowners. Van Zanden, 'Inequality in an inland province', p. 63. See also B. J. P. van Bavel, 'Elements in the transition of the rural economy: factors contributing to the emergence of large farms in the Dutch river area (15th–16th centuries)', in P. C. M. Hoppenbrouwers and J. L. van Zanden (eds), *From peasants to farmers? The transformation of rural economy and society in the Low Countries (Middle Ages – 19th century) in light of the Brenner debate* (2001), pp. 134–201, at p. 191.

[35] Van Zanden, 'Inequality in an inland province', p. 63, Table 4.5.

[36] B. H. Slicher van Bath, *Samenleving onder spanning*, p. 126.

percentages varied from about 26 per cent (southern part of Holland) to 36 per cent (province of Utrecht). The same figures however also prove the difference in farm size mentioned earlier: whereas the herds of the western farmers in average consisted of about 12 animals, the average size for herds in the eastern provinces was between four and five animals.[37] An indication of the distribution of wealth and the level of income is provided by the income tax records of the so-called *Quotisatie* of 1808: the data show that almost 80 per cent of all inhabitants of the rural village of Delden in the province of Overijssel belonged to the lowest four (of 41) tax categories.[38] The rural area of the eastern Low Countries therefore may be characterized as predominantly rural in character with relatively low income levels for the farmers.

In terms of the legal context, the major part of all land was in the possession of large landowners, many of whom belonged to the landed nobility of the inland *gewesten*. In the case of seigneuries, the position of chairman of the assembly of the common (*markerichter*) was usually connected to the ownership of the seigneurial estate: in those cases the lord of the manor therefore automatically gained the position of *erfmarkenrichter*. In other commons, the *markerichter* was elected by the commoners. Of the cases discussed in this article, both the mark of Exel and the mark of Raalterwoold had an *erfmarkerichter*, although the latter mark changed to elected *markerichters* at the end of the fourteenth century. The mark of Berkum and the Dunsborger Hattemer mark both only had elected *markerichters*. Although the regulations of our four cases do not explicitly mention either the requested qualifications of a (candidate) *markerichter*, nor describe the election procedures, from the rules stating the tasks of the *markerichter* that were copied into the new *markeboek* of Raalterwoold in 1615, we can derive that any candidate for the post of *markenrichter* should be literate, financially well-to-do, and have some accountancy skills. The elected *markerichters* therefore usually belonged to the upper social classes among the commoners.[39]

The *(erf)markerichter* was formally the highest official in the mark: being the representative of the mark in formal matters, he was also in charge of convening and presiding over the regular (annual) as well as the emergency meetings of the assembly of commoners. He was also the keeper of the *markeboek*. The formal status of the *markenboek* is shown in an injunction contained in the regulations of the mark of Raalterwoold of 1445, which stated that the

[37] Van Zanden, 'Inequality in an inland province', p. 63, Table 4.5.

[38] Ibid., p. 72, Table 4.8.

[39] Article 37 states that any *erfgenaam* who would be elected *markenrichter* unanimously at the assembly of the common, would be obliged to accept this function. On his refusal, he was to be fined a barrel of wine whilst remaining obliged to fulfill the task of *markenrichter*. If the fine was not paid by the elected *markenrichter*, it could be imposed on his tenants, who in their turn were allowed to deduct the imposed fine from the contribution they had to pay to their landlord. This latter clause implies that only the owners of large pieces of land in the common would be elected as *markenrichter*. Additionally, article 38 of the same regulation states that the *markenrichter* should annually draw up accounts, to be assessed by committed members of the assembly, therefore implying that the *markenrichter* should be literate and have basic accountancy skills. Literacy of the *markenrichter* is also implicitly presumed in article 39, which prescribes that all decisions made at the annual meeting of the common should be written down in the *markenboek* by the *markerichter*. Finally, articles 41 and 42 indicate that the elected *markenrichter* should have sufficient financial means, since he was held to guarantee that his successor would not be confronted with running debts from commoners incurred under his predecessor (art. 41) as well as to welcome any new entitled member of the common with 'a good drink' (art. 42). See: Hannink, *Markeboek Raalterwoold*, pp. 4–5.

markerichter always had to show this book at the meeting of the commoners. If he failed to do so, he would have to pay a *vierdeel* of wine.[40]

The jurisdiction in the area of our selected commons originally belonged to the bailiff (*drost*) of Salland (for the *marken* of Berkum and Raalterwoold) and the bailiff (*landdrost*) of the County of Zutphen (for the mark Exel and the Dunsborger Hattemer mark); each bailiwick was divided in several sheriff's dominions (in Overijssel called *schoutambten*, in Gelderland *rechter-* or *richterambten*). For the period concerned (from the late fifteenth century on) however, the *(land)drost* already had delegated the administration of justice in most civil and criminal cases to the sheriff (*schout*), who presided over the so-called 'parish courts' (*kerspelgerechten*); only capital offences still had to be brought before higher courts. The jurisdiction of the mark of Exel theoretically differed from the other three commons, since the lord of the estate of Amsen possessed the seigneurial right of administering justice within his seigniory; like most other seigneurial lords he however refrained of this right and referred most legal cases (in any case, all criminal cases) to the regular *kerspelgerechten*.

There is no explicit description of the legal standing of the by-laws made for the regulation of commons within the larger system of law. The texts of the by-laws themselves indicate that they were widely recognized as formal legislation and that the administration of justice in the commons was regarded as a regular form of justice: in several by-laws it is mentioned that the offender should be convicted 'according to the legislation of the mark' ('*naar markenregte*'). The earliest by-laws often also indicate that they were based on previous charters and/or existing customary rights.

Changes in the by-laws, like all other general decisions concerning the management of the mark, the appointment (or dismissal) of officials acting on behalf of the mark, and the access and use of the mark and its resources – including the sanctions on infractions – were mainly made at the regular general meetings of the assembly of the mark (*markevergadering*, in the most eastern parts of the area also known as *holting* or *holtink*) or, in case of very urgent matters, at emergency meetings (*nootholtinke*). Decisions at both annual and emergency meetings were taken by vote, provided that a certain quorum of all commoners would be present. All meetings were to be announced by or on behalf of the *markenrichter* in advance at church.[41]

III

Control of the commons was, as mentioned above, achieved – by and large – in three ways: through preventing the use of the commons' resources by non-entitled users and overuse or misuse by the entitled users; through encouraging social control; and through punishing

[40] Hannink, *Markeboek Raalterwoold*, p. 5. A *vierdeel* is an ancient Dutch measure of content (literally translated 'a quarter'), used for an amount of wine, beer, or grain.

[41] The number of regulations preserved, however, does not always provide an exact indication of the number of meetings held. Sometimes it was decided to replace an older set of previous resolutions and regulations by a completely new one; this new regulation would then only contain the rules and resolutions still in force at that moment. An example is the oldest preserved *markenboek* of the mark of Raalterwoold, dating from 1615, which contains rules still in force from regulations dating from 1445, 1541, 1560, 1598, 1604, 1608, 1609, 1610, 1611, and 1614 (Hannink, *Markeboek Raalterwoold*, pp. 1–21).

free-riders who had committed an offence. In our article we will focus on the latter two control mechanisms, as methods for the prevention of overuse or misuse, for instance stinting, have already received a great deal of attention in the literature. The type of penalties applied in case of the detection of free-riding, and the role commoners had to play in this themselves, through active or passive social control have, however, to our knowledge, received hardly any attention. We will start with a summary of the ways in which free-riding was detected. Next we will pay special attention to the methods of enhancing social control and then move on to an overview of the types and levels of sanctions and penalties that could used against offenders. These needed to be of an acceptable type and level for the offence committed: if monetary fines were too high, then there was a danger that offenders would not pay the sums imposed on them. If fines were too low, the offender might be willing to take the risk of getting caught, since the possible profits gained from his illegal behaviour would outweigh the eventual fine imposed. We will examine the risk of being caught while free-riding as a factor that was of influence on the effectiveness of a sanction. This aspect is hard to detect on the basis of regulation, as this would require a study of the financial records to see the revenues received from fines. However, as we will demonstrate, the by-laws sometimes referred to difficulties in securing the payment of fines.

The surveillance and detection of offences could be accomplished either by appointing officers or via mechanisms of social control, which were often incentivized by giving those who reported offences a share of the fines, or through the so-called liability clauses.

(a) Monitoring

The management of the common and the detection and punishment of offenders against its rules was usually delegated by the assembly of commoners to specific members. None of the regulations we studied actually defines the duties of the officers appointed to govern the common. This may be explained by the fact that the regulations were first and foremost intended for internal use by the commoners themselves, making an explicit job description for officials unnecessary. Management tasks (such as the taxation of land or representing the mark in formal or judicial matters) were usually delegated to the chairman of the assembly of the mark, and sometimes to one or more members authorized for the purpose, who were often drawn from the group of 'inheritors' (*erfgenamen* or *geërfden*). The officers responsible for detecting and punishing offences were obliged to accept this task – be it willingly or unwillingly. The principal task of the sworn members (*gezworenen*, *swaeren*) consisted of enforcing by-laws and fines for infringements, whereas the so-called *schutters* were responsible for impounding animals found grazing illegally (*schutten*), collecting imposed fines, and executing other kinds of penalties.[42] In marks other than those dealt with in this article, additional types of officials

[42] Some of the regulations, however, imply that the sworn members were also involved in the daily implementation of the rules and resolutions of the mark. The regulation of 1445 (transcribed 1615) of the mark of Raalterwoold provides an example in the 29th article, where it is stated that only the chairmen of the assembly of the mark as well as the sworn members were allowed to impound animals; the actual involvement of the sworn members in executing this sanction is also indicated by the additional permission granted to the regular members of the common to execute this sanction themselves in case the sworn members would refuse to execute the sanction at the indication of commoners (Hannink, *Markeboek Raalterwoold*, p. 4). See also Hoppenbrouwers, 'Use and management', pp. 95–6.

have been noticed, such as *vorster* (literally 'investigator', the officer in charge of guarding the proper use of common fields) or *woudgraaf* (best translated as 'forest keeper' or woodward). Although their function reflected local environmental circumstances and the resources of the individual mark, their tasks were broadly similar to those of the *schutters*.

From a reading of the by-laws and other records, we can conclude that this monitoring system was based on a system of rotation and that all members of the mark were obliged to take their turn.[43] Some of the rules clearly indicate that not every member wanted to fulfil his duty, and penalties were set for those who tried to refuse their appointment. Paying a fine could not be used by members as a way of evading this obligation:[44] instead, the rules explicitly state that, having paid his fine, the member nonetheless had to perform the office to which he had been appointed.[45] Many examples show that being a *schutter* was not a very popular job: at the meeting of 4 August 1696 of the Dunsborger Hattemer mark, it was recorded that, 'since year after year there have been many complaints about the current *schutters* … failing to fulfil their tasks, not functioning properly, and not executing the orders issued from time to time by the chairmen of the assembly of the mark and the inheritors', these *schutters* should be 'deported and dismissed, and replaced by other *schutters*'.[46] For some other functions a buy-off could be used; in Exel, for example, the time to be spent as secretary of the mark was provisionally set at two consecutive annual meetings. However, in case any of the farmers 'owning cart and horses' refused to fulfil this role, they would have to pay one *daalder* for each meeting.[47] To make the supervisory system even more watertight, *schutters* themselves could be penalized with various forms of fine, or even dismissal, for failing to report offences to the authorities of the mark.[48] At a meeting of the mark of Exel of 23 May 1695, it was ordered that a *schutter* who did not report an offence would have to pay the fine for the offence himself. At Raalterwoold,

[43] The appointment usually lasted for one or two years. Exceptions, however, have been mentioned in the regulations we studied. The exception could either be an extended duration of the appointment (in case the assembly of the mark saw this fit) or a shortened period of time, in case the appointed members fulfilled their tasks in an unsatisfactory way.

[44] Examples: regulation of the mark of Exel of 4 June 1661: fine of 10 *goudgulden* on transporting peat by farmers, 'these fines to be executed without any connivance'' (G. J. Beuzel, *Markeboek van de marke Exel* (1988), p. 17); regulation of the mark of Raalterwoold of 17 August 1686, fine of barrel of beer at value of *12 gulden*, 'these fines … to be executed without any connivance' (Hannink, *Markeboek van Raalterwoold*, p. 78); regulation of Dunsborgermark of 13 June 1609: fine for not paying proper contribution to war payment of grain [*sware garve*] of 50 *goudgulden*, imposed on both the inheritor and the tenant farmer, 'without any connivance' (A. Menkveld and J. Renema, *Markeboek van de Dunsborger en Hattemer Marke, 1553–1810* [1996], p. 10).

[45] Repeated negligence of these tasks in some cases even led to an early dismissal of the appointed members; we cannot know whether this negligence was only due to the character of the appointed member, or if neglecting his task would gain him more profit than fulfilling his tasks properly, even at the risk of losing his appointment. Nonetheless, punitive sanctions for the poor fulfillment of tasks did not appear to be effective in the end: e.g. almost every regulation issued in the Dunsborger Hattemer mark from 1686 on explicitly stated that the *schutters* should keep a close eye on the strict implementation of these rules; failing to perform this task properly would be sanctioned by their dismissal. Cf. also van Zanden, 'Paradox', pp. 133 and 135.

[46] Menkveld and Renema, *Markeboek Dunsborger Hattemer Marke*, pp. 63–4.

[47] Beuzel, *Markeboek Exel*, p. 17.

[48] See for example the regulation of 15 May 1679, from the mark of Exel, imposing the sanction of a payment of half a barrel of beer on *schutters* not reporting stated offences to the chairman of the assembly of the mark or the commissioned members (Beuzel, *Markeboek Exel*, p. 26).

an order of 1794 stated that a *schutter* could be dismissed from his post if two 'witnesses of irreproachable conduct' would testify that the *schutter* had knowingly allowed offenders to dig sods 'or do any other damage to the mark'.[49]

Notwithstanding the mandatory nature of the appointments, appointed members could also gain some benefit from their appointment. The records of some marks mention a salary for the appointed members (often only in the context of the existing wages being raised). The salary could also be used as a way to incentivize the correct fulfilment of tasks by the appointed members: in some cases, they received a part of the fines they collected. Some of the regulations also seem to suggest that when stray cattle were impounded, the owner not only had to pay the fine for allowing his animals to wander, but also had to pay a certain sum for the impoundment itself – probably to cover the expenses of the *schutters* for taking care of the penned-up animals.

In some cases, when the mark's officers appeared to neglect their duty, all members of the mark were authorized to exercise justice on offenders. In general, what was envisaged in these circumstances was primarily of a physical nature; for example, they might impound an offender's animals, unharness his horses, or immobilize his means of transport.[50] Regulations also stated that the person reporting the offence was allowed to collect the fine from the offender, on the condition that he would disclose his action to the chairman of the assembly of the mark. This measure was also used for situations in which the appointed officials were unable to levy a penalty on the offender themselves, namely those offences reported outside of the mark itself. In those cases, each member was allowed to act according to the law (*naar markerecht*) on behalf of the mark.[51]

(b) Social control

Commoners without an official function were also encouraged to report free-riders by being promised part of the fine if the culprit could be caught. In some cases this could generate a handsome extra income. On 26 May 1618, the first recorded appointment of cattle pounders (*schutters*) in Exel – who were not only in charge of penning up animals that ran astray, but also of imposing other kinds of sanctions imposed on offenders – mentions that they were entitled to half of the fines for the offences they discovered. The revenues of the fines laid

[49] Beuzel, *Markeboek Exel*, p. 33; Hannink, *Markeboek Raalterwoold*, p. 126.

[50] For example, the regulation of 11 Sept. 1761, states that, since 'the shutting in of sheep and geese on the meadows has currently been performed worse than it has ever been, notwithstanding the strict orders of the inheritors, also mentioned in the latest resolution of 1758, even having installed new inspectors in order to aid the old inspectors, the chairmen of the assembly of the mark and the commissioned inheritors have proposed to the assembly (in order to prevent additional costs and complaints) not to appoint any inspectors anymore, but to qualify all tenant farmers and peasants to pen up sheep and geese on the meadows and to be granted the usual fee for shutting in animals; and to order the chairman of the assembly of the mark and the commissioned inheritors (either together or separately) to lend a helping hand to anyone concerned and to proclaim this ruling at church'. Hannink, *Markeboek Raalterwoold*, p. 95.

[51] As mentioned in the regulation of the mark of Exel of 4 June 1661, referring to the new prohibition for all farmers and peasant farmers to transport any peat, and allowing all inheritors 'to apprehend the offender within the city of Zutphen, the city of Deventer, or elsewhere, and to unharness the offender's horses at that location, and to collect the fine, provided that the inheritor would account for his actions to the mark'. Beuzel, *Markeboek Exel*, p. 17.

on the improper digging of peat were to be divided equally among the poor of the mark, the inheritors of the mark, and the chairman of the assembly of the mark.[52] The earliest by-laws of Dunsborger Hattemer mark mention on several occasions that whoever reported an offence received a part of the fine imposed on the offender; given that the fines were set fairly high in this mark, a commoner could make a significant income by reporting offences to the authorities of the mark.[53] Occasionally, the collection of fines normally reserved for the appointed members became also the right of individual commoners if the former were dilatory in performing their tasks. For instance, the 29th article of the earliest laws of the mark of Raalterwoold (1445; transcribed in 1615) states:

> No one but the chairmen of the assembly of the mark with the sworn members are allowed to pen up stray cattle; unless it would be the case that two inhabitants had pointed out animals to be penned up to the sworn members and the sworn members would refuse to pen up these animals – in that case the neighbours were entitled to pen up these animals themselves and would obtain half of the fine imposed, this fine to be collected by the sworn members.[54]

However, this power was a double-edged sword: commoners were in many cases also held liable for punishment if they did not report an offence. Liability clauses which made commoners responsible for reporting free-riders are found in the mark regulations with varying levels of severity according to the commoners' degree of complicity in the committed crime.[55] First of all, when members of the mark were actively participating in breaking the rules, not only the offender himself would be fined, but also his accomplice from within the mark. By-laws containing a liability clause on being an active 'partner in crime' do not mention the penalty imposed on the offending non-commoner – it may be that the punishment of the offender from outside was sufficiently covered by other legislation – but only the penalty to be imposed on the commoner who abetted this offence. Almost all of these regulations of this sort refer to the keeping of livestock: commoners were prohibited from accepting animals from non-commoners in order to prevent free-riding.[56]

[52] 'Nobody will be allowed to dig … any more peat above the amount each one needs for his subsistence, offences to be sanctioned with a fine of five *goudgulden* per transport of peat out of the mark, one-third of this fine being to the benefit of the poor, one-third to the benefit of the inheritors, and one-third to the benefit of the chairman of the assembly of the mark.' Beuzel, *Markeboek Exel*, p. 1. The 'inheritors' (*erfgenamen*) were those members of the mark who had (full) use and access rights to the common based on the use shares (*waardelen*) that were connected to their farm or estate (*erf*).

[53] For example, in 1775, the fine for grazing animals on drifting sands – which had just been planted with lyme grass in order to stop them spreading further – was set at 10 *goudgulden*, of which half was to the benefit of the person reporting this offence. Menkveld and Renema, *Markeboek Dunsborger Hattemer Marke*, p. 139.

[54] Hannink, *Markeboek Raalterwoold*, p. 4.

[55] This type of sanction is not the same as a collective sanction whereby the whole group is punished for the wrongdoings of only one individual (as described by D. D. Heckathorn, 'Collective sanctions and the creation of prisoner's dilemma norms', *American J. Sociology* 94 (1988), pp. 535–62). Collective sanctions would anyhow be rather peculiar (and not effective) in a situation such as a common whereby the whole group sets a sanction.

[56] In most cases, the regulation sanctions the offence of accepting animals from outside of the common. In one particular case, the description of the participationis more extensive: in Raalterwoold in 1824, commoners who would have horses from outside the mark branded

In addition, members of the mark who passively allowed non-members to make unauthorized use of the common resources or who did not report to the officers offences they saw taking place would often be penalized. In most instances the use of a liability clause was, however, confined to appointed members not fulfilling their duties: 'passive' complicity of regular members of the common was mentioned in only two of the sets of by-laws from the marks we have studied so far. In the first case, the liability clause referred to the permission aldermen, employers, or tenant farmers may have given to their dependents (servants, maids, children) to commit an offence. It was decided in those cases not to fine the person committing the offence, but the person who allowed the offence to be committed. Possibly this clause was used to prevent these aldermen, employers, and tenant farmers from gaining illegal profit by instructing those living with them or working for them to dig on their behalf.[57] The other case of 'passive' complicity of regular members comes from 1806, when the assembly of the mark of Raalterwoold decided that commoners who allowed non-commoners to wash their sheep in the waters of the mark would have to pay 'the highest compensation possible' for the damage caused to the mark.[58]

In most cases, the regulation stipulated a fine that was more or less equal to the amount of damage caused by the offence. In some cases, however, the penalties laid down on officeholders held liable for offences was far more punitive than for other members, clearly exceeding the amount required for simply compensating for the damage done (or the profit gained). In the case of the mark of Raalterwoold, for example, the fine was not merely a compensation for the damage caused, but was clearly also meant as punishment; the fine for sworn members (office-holders) found to be guilty of connivance was set at four times the ordinary amount imposed on regular members committing the same offence.[59]

(c) Striking a good balance: the type of sanction and the level of the fine

How did commoners know which type of penalty would deter an illegal action? And if a financial payment was part of the sanction, how high then should that fine be in order to be effective? In only a few cases do the penalties instituted by the mark provide us insight into the way in which their severity was calculated or what penalties sought to achieve, but the way in which the penalties were constructed provides us with insights into the (dis)incentive structure underpinning the by-laws. The records show that in some cases adjusting the fines was subject to a phase of trial-and-error. In the case in Exel, the fine for the offence of transporting peat out of the mark was set fairly high at 20 guilders in 1628, of which 5 guilders would be to the benefit of the person who reported the offence to the officials of the mark. The notes of the

Note 56 continued
as if these were their own, in order to graze them on the common, were sanctioned with a fine of 3 guilders per horse and in addition had their right to use the common for grazing horses revoked for the duration of one year. Hannink, *Markeboek Raalterwoold*, p. 162.

[57] Hannink, *Markeboek Raalterwoold*, p. 81.

[58] '[There have been] proposed measures to prevent the dipping of sheep in the waters of this mark by people from outside of the mark, in order to prevent any damage. It will be prohibited to all those living outside of the mark to dip their sheep in the waters of this mark, offences to be fined at 2 *goudgulden*. The inhabitants of the mark are obliged to take care no harm will be done to the belongings of the mark or the belongings of anyone else, offences to be punished by the highest fines for compensating the damage caused'. Hannink, *Markeboek Raalterwoold*, pp. 138–9.

[59] Hannink, *Markeboek Raalterwoold*, p. 81.

annual meeting of 1642, 14 years later, reveal that this high penalty had not been effective in two ways. First, the notes mention that all but six inhabitants of the mark of Exel had broken this rule and should have been fined. Second, the mark's amendment to its earlier decision seems to indicate that the level of the fines set may have been a deterrent to the enforcement of the rule. It was then decided to lower the fines from 20 to 4½ guilders (those having used carts from outside the mark however being liable to pay double, i.e. 9 guilders).[60]

In the literature, it is not only the level of the fine, but the type of fine, and then mostly the use of 'graduated sanctioning' which has received a great deal of attention. It is identified by Ostrom as one of the principles underpinning the successful design of common-pool resources.[61] Graduated sanctioning refers to the way in which a penalty is increased for repeat offences committed by the same individual, the final and highest penalty being the forfeiture of use rights. However, the number of graduated sanctions found within the regulations of Dutch marks is quite small: from the 1137 by-laws analysed, graduated sanctioning is found in no more than 20 (1.8 per cent). From the content of the graduated sanctions it seems that there was a general consensus that the toleration of offenders only extended to two warnings. When offenders were caught committing the same offence for the third time, the penalty was designed to disable him from committing any future offences (by suspending his use rights). Alternately the penalty for the third consecutive offence was to be determined at the moment the offender was caught.

The status of the offender, the time or location the offence was committed, or some combination of these was more decisive in determining the penalty levied than the number of offences committed. Within the body of rules we can discern three types of differentiation. The most common was between members of the mark or non-members. Offences committed by non-members were usually penalized at double the members' rate; we may assume that this was meant to compensate for the relatively higher profit non-members gained from their offences, since the mark would not receive any countervailing income from them (such as a contribution to the general maintenance and functioning of the mark).

Whereas other marks tended to punish offenders from outside the mark with heavy, and sometimes graduated, sanctions (including the impounding of resources), the sanction in the Dunsborgermark for any offence that would damage the mark committed by a foreign offender was far more physical in nature: if the foreign offender was caught, the members of the mark, together with the chairman of the assembly of the mark, were allowed to 'break the keyholes [*lutsgaten*] of the axles of the cart, decapitate the livestock, and the driver of the cart would be at the mercy of the members of the mark and their chairman of the assembly of the mark'.[62] The remarkable severity of the aforementioned sanction does not seem to be exceptional for this mark. For instance, whereas the digging of sods within the mark of Exel in 1643 was sanctioned by imposing a fine of 5 *oude schilden* (equivalent to about 7½ guilders), the fine in 1637 for the same offence within the Dunsborger Hattemer mark had been set at 20 guilders. The harsh

[60] Beuzel, *Markeboek Exel*, p. 6.

[61] Users who violate the rules should be subject to graduated sanctions that are imposed by the users themselves or by officials accountable to them. See here Ostrom, *Governing the commons*, pp. 94–100.

[62] Menkveld and Renema, *Markeboek Dunsborger Hattemer Marke*, p. 3.

punishment of destroying equipment or animals was however only applied to offenders from outside of the common. A logical explanation for this would be that to damage the equipment of members of the mark for offences they committed would in the end damage the interests of the mark.

A second type of differentiation was related to the time of the day the offence was committed. For example, at the assembly meeting of the mark of Raalterwoold of 6 July 1654, the penalty for outsiders transporting turf out of the mark without prior notification given to and authorization by the sworn members, was set at the impounding of the turf only, whereas the penalty for the same infringement committed at night was not only the impounding of the collected turf, but also an additional fine of 10 golden guilders (goudgulden); the latter penalty, by the way, also applied to anyone from within the common caught transporting turf out of the mark at night.[63] This seems to indicate that the fine correlates with the risk of discovery and the subsequent maximum size of unjustified profit for the offender. It is obviously harder to detect offences committed at night, hence the potential amount of damage (and thus the potential gain by offenders operating at night) could be higher than that of offenders operating in the daytime; therefore, the compensation for the potential damage done to the market should be higher. The types of differentiation mentioned above could also be used in combination. For example, in Raalterwoold, in article 4 of the regulations of 26 August 1806, it states that the fines mentioned in article 3 of the same regulation (regarding the collection of manure and peat in prohibited areas of the mark) should be doubled when the offences were committed between sunset and sunrise by inhabitants of the mark, and quadrupled for offenders living outside the mark.

The third type of differentiation concerned the officeholders of the mark. Often, offences committed by them were to be punished at a penal rate. This might have been designed to emphasize the exemplary function these officers were supposed to fulfil. But from a financial point of view, the explanation could be that the sanctions for officials and appointed members needed to be higher to avoid temptation: their authority and the access they had to the resources of the mark might have made the temptation to free-ride greater, and thus the sanction needed to be higher as well (e.g., the by-laws promulgated at Raalterwoold in 1704 stated that appointed members who committed offences should be fined four times the amount that was imposed on regular members committing the same offence).[64]

The collection of fines appears to have posed a problem at all periods. Several by-laws either implicitly or explicitly suggest that the collection of fines was not performed as well as it should have been: from the content of the rules it can be concluded that some of the *schutters* overlooked their fellow commoners' fines. Even the chairman of the assembly of the mark was threatened with penalties if he did not secure the payment of all imposed fines before the end of his term: the by-laws set out that any deficit remaining at the end of his term was supposed to be satisfied by the chairman himself.[65]

[63] Hannink, *Markeboek Raalterwoold*, p. 60.

[64] Ibid., p. 81.

[65] In the first set of rules in the *markenboek* of Berkum, for example, the sworn member was explicitly forbidden to 'acquit anyone of this fines'. Historisch Centrum Overijssel, Archief Marken in de provincie Overijssel, no. 0157, inv. nr. 148, *Markeboek 1300–1656* (composed 1648), fos 6v–6r. The first set of rules of the mark of Raalterwoold of 22 August 1445 urges all chairmen that are to be appointed to deal with the non-imposed

This inability to enforce the by-laws made by the mark's assembly needs to be seen in the light of other resolutions referring to arrears of other payments to the mark that accumulated unpaid year after year. Although non-payment was mentioned time and time again at the annual meetings of the mark, the offenders remained in default, in some cases for up to 16 years.[66] The apparent incapacity of the mark to make debtors pay their ever-increasing fines created a problem of its own: fines accumulated to such an extent that it became clear that the debtors would never be able to pay off their debts without going bankrupt. Most of these cases were, therefore, in the end resolved by arranging a settlement with the debtor: the fine was heavily reduced, on the condition that this reduced fine was paid instantly and future payments should be paid promptly.[67] Although this enabled the mark to keep the members in default aboard, the minutes of the meetings show this was not an efficient formula, since some years later, the same debtors faced the same problem again. Surprisingly enough, the same debtors were also appointed as cattle pounders (*schutters*) themselves when it was their turn.[68]

The assembly of commoners could also decide to mitigate the sums imposed by fines or mandatory payments where individual commoners appeared to be unable to pay their dues because of illness, old age, or accidents. For instance, in Exel in 1662, some widows were allowed to stay in their cottages after the death of their husbands, and use the cottages and the surrounding gardens rent free for the rest of their lives (on the condition that the cottages would fall to the mark again after their deaths); in a case of 1802 from the mark of Raalterwoold, commoner Hendrik Woolthaar was acquitted not only of his overdue rents, but also exempted from future rent payments for a period because his house burnt down.[69] On the other hand, there are also examples of situations in which, where a fine was not paid, the penalty on the recalcitrant was even increased or his cattle were distrained – even sold – in order to satisfy his debts to the mark.

Note 65 continued
fines well before the moment of their abdication, 'in order to free the new chairmen of the assembly of the mark from the burden of collecting still unpaid fines'. Hannink, *Markeboek Raalterwoold*, p. 5.

[66] In the case of the estate of Ter Aest, for example, the owners were held to pay both a lamb and some money annually to the mark to be entitled to the use of their share. In 1650, however, the payments due by Ter Aest had accumulated to 100 guilders and five lambs over a period of 22 years (1628–50). Another example was the couple of hens that two users of the common, Prijser and Greve (their names may refer to a certain function they had within the mark, but this cannot be confirmed on the basis of the notes of the meetings), were held to pay annually at the meeting of the assembly of the mark. Although this debt was mentioned over and over again at every subsequent meeting and it also was mentioned several times that the outstanding debt should be collected by the officials in charge of collecting debts and fines on behalf of the mark, the debt increased year after year over a period of up to 14 years: Beuzel, *Markeboek Exel*, p. 15.

[67] E.g., the member Broeckman was held to pay a lamb each year for using his (contested) right to graze his sheep on the common. On 25 June 1660, the chairman of the assembly of the mark together with the inheritors decided to solve this recurring issue once and for all, deciding 'that Broeckman once and for all will honour the chairman of the assembly of the mark and the inheritors at the forthcoming annual meeting by presenting them a barrel of Haarlemmer beer and an anker of good wine; in return, Broeckman will be allowed to graze a herd of 50 sheep on the common and will be acquitted of the debt he has regarding the annual donation of lambs'. Beuzel, *Markeboek Exel*, p. 16.

[68] Prijser for example was appointed as *schutter* on 1 Aug. 1656: Beuzel, *Markeboek Exel*, p. 13. At that moment, however, he was already in debt for about a dozen couples of hens, as the resolutions of the annual meeting of 1659 show: ibid., p. 15.

[69] Respectively Beuzel, *Markeboek Exel*, p. 18 and Hannink, *Markeboek Raalterwoold*, p. 130.

III

The analysis of ways to control commoners' behaviour largely remains to be undertaken, but is much needed in order to understand how self-governance can be effectively organized through institutions for collective action. The debate on the quality of the functioning of institutions, which should be the next step in trying to understand the role of institutions in economy and society at large, would surely benefit from a better understanding of the mechanisms institutions use to achieve resilience, to survive generations, crises, wars, and so on. The four case studies presented here demonstrate the wide range of methods, other than simple punitive sanctions, that existed in the early modern period to control commoners' behaviour in order to prevent free-riding. Besides the regulation to limit the use of the common resources – which we have not discussed in this article – two main strategies to control behaviour were present: monitoring – amongst others through social control – and punishment of offences. What is most striking is the responsibility placed on the commoners themselves to detect and report the detection of the offences.

Although we have limited our analysis here to normative sources, and have not included other sources such as account books that could give an impression of the actual collection of monetary penalties, it has already been mentioned that little reference can be found in the *markeboeken* to the implementation of penalties. There are two potential explanations for this: either they were not properly imposed, or discipline and good conduct were so good that there was no need for the execution of the penalties. Although we also found references to difficulties in imposing and collecting fines in some cases, the combination of methods, and the many conditional factors included to tailor penalties to the severity of the offence and the background of the offender, do suggest that rather than imposing and executing flat rate penalties on all the transgressing commoners, the rules were very well-tuned to the local conditions and more directed towards preventing offences. Such sophisticated methods may have proven to be more effective in preventing free-riding than simply fining offenders and thus might turn out to be a more cost-effective and conflict-avoiding way towards achieving resilient commons management. That sophisticated strategies for the punishment of free-loading existed may help to explain why so many commons managed to survive over very long periods of time and have implications for other collective institutions.

Appendix
Main features of the cases selected for this article

	Mark of Berkum	*Mark of Raalterwoold*	*Dunsborger Hattemer mark*	*Mark of Exel*
Year of origin	1300	1445	1553	1616
Year of dissolution	1995	1840	First half of the nineteenth century	1852
Evolution of size	· 1630: lands of Broeck and Ooyte were divided among the owners of, in total, 838½ shares. · 1653: Berckmerbergen and Nemelervelden as well as the Berckmervelden near Dambrugge were divided among the owners of 390½ shares. · 1819: division of the mark of Berkum into a southern and a northern part, each part to be regarded as an individual entity. · From the middle of the nineteenth century up until 1994, some parts still remained as common land.	· Between 1445 and 1600, part of the original mark of Raalterwoold was split off and became the mark of Luttenberg; this split-off part was not recognized by the mark of Raalterwoold until 1722. · Number of users did increase slightly: in the sixteenth century 53½ shares over 67 farms, and 55½ shares over 71 farms in 1840.	· Commons of this mark decreased in size during first half of nineteenth century	· Stayed the same
User types	· Caretaker-farmers who *de facto* used the land on behalf of the inheritors of Berkum, the *de jure* owners of the shares · No peasant farmers mentioned	· Inhabitants of hamlets of Tije, Boethele, Raan, Luttenberg · Inhabitants of (church) village of Raalte (limited access) · Owners of farms surrounding common land of Raalterwoold · Peasant farmers · Inhabitants of adjacent marks, for as far as they had obtained *paalbuurrecht* (customary right of inhabitants of adjacent marks to use part of the mark along the common boundaries, in case this use was essential for taking care of their own animals)	· Members of mark · Peasant farmers · Specific inhabitants of lands of mark Ruurlo adjacent to mark (under strict conditions and limited in number)	· Lord of Ampsen · Owners of farms surrounding Ekselse Enk · Peasant farmers

	Mark of Berkum	*Mark of Raalterwoold*	*Dunsborger Hattemer mark*	*Mark of Exel*
Resource types	· Hay · Arable land	· Peat and peat topsoil · Sods · Hay · Heath · Arable land	· Peat · Wood · Arable land	· Peat · Sods
Animal types	· Sheep · Cows · Pigs · Geese · Horses · Fishing rights	· Sheep · Cows · Pigs · Geese · Horses	· Sheep · Pigs · Geese	· Sheep · Cows · Pigs · Geese · No horses
By laws applying to	· Everybody or unspecified: 68 (31.8 %) · Members: 135 (63.1 %) · Non-Members: 11 (5.1 %)	· Everybody or unspecified: 200 (27.0 %) · Members: 479 (64.7 %) · Non-Members: 61 (8.3 %)	· Everybody or unspecified: 13 (31.7 %)* · Members: 25 (61.0 %)* · Non-Members: 3 (7.3 %)*	· Everybody or unspecified: 109 (29.5 %) · Members: 242 (67.5 %) · Non-members: 11 (3.0 %)
Penalties applying to	· Everybody or unspecified: 39 (54.9 %) · Members: 31 (43.7 %) · Non-members: 1 (1.4 %)	· Everybody or unspecified: 64 (26.6 %) · Members: 130 (54.2 %) · Non-members: 46 (19.2 %)	· Everybody or unspecified: 5 (17.9 %) · Members: 20 (71.4 %) · Non-members: 3 (10.7 %)	· Everybody or unspecified: 81 (38.6 %) · Members: 124 (59.0 %) · Non-members: 5 (2.4 %)
Years for which regulations are available	1300; 1492; 1571; 1602–04; 1606; 1608–11; 1631–32; 1647; 1649; 1651; 1656; 1692; 1725; 1763; 1766; 1772; 1777; 1819; 1830	1445; 1541; 1560; 1604–05; 1608–11; 1614–16; 1618; 1620; 1623; 1625; 1627–28; 1631; 1633; 1635–36; 1639–40; 1642–45; 1647; 1649–50; 1653; 1654–55; 1657; 1660; 1662; 1664; 1670; 1676; 1681; 1686; 1696; 1704–05; 1707; 1710; 1713–14; 1719; 1725; 1731; 1738; 1755; 1758; 1760–61; 1763–64; 1767; 1770; 1775; 1789; 1791; 1793–94; 1797–98; 1800; 1802; 1804–06; 1809–16; 1819; 1824; 1827; 1829; 1831–32; 1834–35; 1839–43	1553; 1558; 1576–77; 1608–09; 1612; 1616–17; 1619; 1621–22; 1637; 1640; 1642–43; 1677; 1683–84; 1686–88; 1690–92; 1694–97; 1699; 1701; 1703–04; 1708; 1711; 1719; 1721–23; 1726–29; 1731–32; 1735–37; 1739; 1741; 1745; 1747–48; 1752–54; 1766–67; 1769–70; 1772; 1775; 1785; 1789; 1792; 1800–01	1616; 1618; 1628; 1634; 1636; 1642–43; 1645; 1647; 1650; 1656; 1659–63; 1667; 1671; 1677–79; 1681; 1684; 1686; 1691; 1695; 1697; 1700; 1703–04; 1706–07; 1714; 1734; 1737; 1740–41; 1745; 1747; 1749; 1751–52; 1768; 1772; 1810–11; 1829; 1835–37

* The data of the Dunsborger Hattemer mark have been analysed for the first period only, covering about one third of all the rules within the *markeboeken* of this mark

Winners and losers: who gained from land auctions at parliamentary enclosures in England?*

by John Chapman

Abstract

The use of land sales to cover the costs of an enclosure has received relatively little attention, and published studies have concentrated on specific areas of the country. This article examines the patterns of use throughout England. It looks at who bought the lots concerned and compares the amounts bought by different groups with what they would have received had they had their full entitlement and covered the costs through a rate charge. The results indicate that the larger landowners tended to gain less than they would otherwise have done, while outsiders, smaller landowners and even labourers took the opportunity to acquire or increase their holdings.

The parliamentary enclosure movement in England has often been characterized as a 'land grab' by large, wealthy landowners at the expense of the smaller and poorer. E. P. Thompson specifically described it as such, and authors from the Hammonds in 1911 through Cohen and Weitzman to Neeson in 1989 have endorsed the view that small landowners were driven out by the process, although there have been a few dissenting voices, for example Gordon Mingay in 1968.[1] A recent article explicitly states, as a motive for parliamentary enclosure, that 'the old landed gentry wished to increase its properties to obtain greater prestige and power on a local, regional or national level and new elites of urban merchants and manufacturers sought to raise their standing by buying rural properties'.[2] However, the evidence presented in support

* My thanks are due to the referees and the editor for their helpful comments on the initial draft of this article. Some preliminary thoughts and conclusions on this topic were presented at the annual conference of the Society some years ago; the current article represents the findings from subsequent research, and a complete recalculation of the original data.

[1] E. P. Thompson, *The making of the English working class* (1963), p. 218; J. L. and B. Hammond, *The village labourer* (1911); J. S. Cohen and M. L. Weitzman, 'Enclosures and depopulation: a Marxian analysis', in W. N. Parker and E. L. Jones (eds), *European peasants and their markets* (1975), pp. 161–76; J. M. Neeson, 'Parliamentary enclosure and the disappearance of the English peasantry revisited', in G. W. Grantham and C. Leonard (eds), *Agrarian organization in the century of industrialization* (1988), p. 110; G. E. Mingay, *Enclosure and the small farmer in the age of the industrial revolution* (1968).

[2] Alvaro Sevilla-Buitrago, 'Territory and the governmentalisation of social reproduction: parliamentary enclosure and spatial rationalities in the transition from feudalism to capitalism', *J. Historical Geography* 38 (2012), p. 212.

of contentions such as these has tended to be limited and partial, drawing on the behaviour of a few individual landowners, on small areas, or on limited time periods. It is the purpose of this article to examine the evidence offered by one specific indicator, the buyers of 'sale allotments', to see whether landowners really took advantage of enclosure to extend their estates.

I

Sale allotments, so defined, were adopted in many enclosures as an alternative way of covering the costs of the enclosure instead of the more usual method of imposing a rate on all the recipients of the land being redistributed. The new method arose from the belief of a number of contemporaries that the use of a rate imposed a particular burden on the poorer landowners. Under the rating system, the recipients of allotments were required to raise cash sums within a very short period of time and, so the argument ran, poorer owners were often unable to do so, and were thus forced to sell part or all of their new allotments in order to meet this demand.[3] This argument has been much quoted by later writers, and Turner, for example, gives specific cases of landowners unable to find the necessary money to meet the rate.[4] Selling some of the land to be enclosed at open auction relieved them of this burden but offered the potential for a significant change in ownership. Unless all existing owners bought in exact proportion to their ordinary allotments (in practice an impossibility, as the number and size of the lots on offer would not have allowed it), the balance would inevitably alter. If anyone, including outsiders with no previous stake in the area, wished to acquire more land, this was their opportunity to do so.

It is surprising, therefore, that sale allotments have received so little attention in the literature, though this may be due to the continued tendency to equate 'normal' parliamentary enclosure with open-field enclosure. Field land was sold, but normally in small quantities, and the over-concentration on the midland belt hides the impact of such sales to the extent that Turner, for example, could dismiss the idea that they were widely used as 'an erroneous view but one which has been repeated often'.[5] On the other hand, the few studies which have looked specifically at the effects of these sales, notably those by Buchanan and Whyte, have almost all focused on upland areas in the west and north of the country, with the exception of one by the present author in 1977 covering the whole of West Sussex.[6] What is lacking is any overall picture of the whole of England, especially the regional variations, and it is this gap that the present article attempts to fill.

Sale allotments were not just a simple alternative to a rate: they offered a degree of flexibility in the means of recovering the costs of the process. As Buchanan has shown, many acts

[3] For example, the contemporary Lord Winchelsea noted that the rate system left cottagers with 'a disproportionate share of the very high enclosure costs' (quoted in Thompson, *Making of the English working class,* p. 217).

[4] M. E. Turner, 'Cost, finance and parliamentary enclosure', *EcHR* 24 (1981), pp. 236–48.

[5] M. E. Turner, 'Some social and economic considerations of parliamentary enclosure in Buckinghamshire, 1738–1865' (unpubl. Ph.D. thesis, University of Sheffield, 1973), p. 326.

[6] B. J. Buchanan, 'The financing of parliamentary wasteland enclosure: some evidence from north Somerset', *AgHR* 30 (1982), pp. 112–26, Ian Whyte, 'The costs of parliamentary enclosure in an upland setting: south and east Cumbria, *c.*1760–1860', *Northern Hist.*, 43 (2006), pp. 97–115; J. Chapman, 'Land purchasers at enclosure: evidence from West Sussex', *Local Hist.* 12 (1977), pp. 337–41.

permitted commissioners to sell land, rather than *compelling* them to do so, and they were normally under no obligation to meet the whole of the costs in this way.[7] The award for Portsea, Hampshire, gives the commissioner the power to sell land sufficient to 'discharge all the costs, charges and expenses', but then notes that 'Persons desirous of paying in money [were] to be exempt from the operations of the powers of sale', and gives powers to raise a rate if the sales prove insufficient. Similarly, the award for Stanton Lacy, Shropshire, reports that the owners were to be consulted as to whether they would prefer a smaller allotment free of charges or their full allocation, but with a responsibility to pay their share of the costs.[8] The Act for Billingborough, Lincolnshire, specifically limited the total amount which could be sold, regardless of whether it covered all the costs.[9]

The decision as to how much land to sell was normally left in the hands of the commissioners. Inevitably it involved a certain amount of guesswork since it could not always be foreseen how competitive any bidding at auction might be. Few records of how they arrived at their conclusions still exist, but the calculations of Richard Richardson, one of the most experienced commissioners, have survived for Holnest and Long Burton commons in Dorset. In a note of 16 November 1798 he calculated that the real area involved was 650 acres, rather than the 800 estimated in the enclosure bill, and he estimated the costs of the process at £1025. Land, he felt, would sell at £15 per acre, and it would therefore be necessary to sell 75 acres, leaving 515 acres to distribute amongst the claimants.[10] In the event his calculations were not tested, as the parties concerned were able to reach agreement and the land was enclosed without the need for parliamentary sanction.[11] Other commissioners occasionally grossly under- or over-estimated the amount needed. At Freshwater, Isle of Wight, sales raised far more than was necessary, the surplus being distributed proportionately amongst the proprietors, while at Lambeth, Surrey, where again there was a surplus, the excess was used for road repairs.[12] Amberley, Sussex, on the other hand, raised too little and it was then necessary to raise a rate to cover the deficit.[13] A number of commissioners seem to have erred on the side of caution, possibly fearing criticism that owners had been deprived of their rightful share, and also aware that they could have a further round of sales if need be, with the option of a rate as a fall-back position.[14]

The use of sale allotments emerged gradually over time: the later the date of the enclosure, the more likely they were to be used, though whether this was a feature of chronology or geography is open to question, since in any given region common waste tended to be enclosed later than open fields. Sales were occasionally adopted in enclosures by agreement, for example, at Baughurst, Hampshire, but their principal use was in parliamentary enclosures, and it is with these that this article is concerned.[15] The earliest examples of their use detected during this study are from Aslackby, Lincolnshire, in 1765 and Castle Sowerby in Cumberland in 1767,

[7] Buchanan, 'Financing of parliamentary wasteland enclosure', p. 113.

[8] Awards for Stanton Lacy, Shropshire RO, QS1/2/48, and for Portsea, Hampshire RO, Q23/1/2, pp. 470–514.

[9] Statute 8 Geo. III, cap. 15.

[10] Dorset RO, D148/17/64.

[11] Dorset RO, D/SHC:2768A and B.

[12] Isle of Wight RO, Q23/2/53 and Surrey History Centre, QS6/4/8.

[13] West Sussex RO, QDD/6/W13.

[14] Two rounds of sales were held at Windlesham (Surrey History Centre, QS6/4/18), and at Abergwili, Carmarthenshire, four were held over a five-year period, Carmarthenshire RO, AE 13.

[15] Hampshire RO, 10M57/89.

and the latest at Bishop's Waltham, Hampshire in 1870, almost at the end of the parliamentary enclosure movement.[16]

As has been mentioned, open-field land was only rarely sold in this way, though where there was no common involved in the enclosure (a relatively rare occurrence) some commissioners did sell open field or common meadow, for example at the Derby Road Fields enclosure in Nottingham and in the Portsea case mentioned above.[17] Elsewhere field land was sometimes sold, even though common was available. Small amounts were sold in Berkshire and sales of common field land occurred at, for example, Charlton Marshall, Dorset, and Staverton, Gloucestershire, but the total quantities were small in these cases.[18] In a few individual cases the amounts might be significant. At Thame and at Beckley, both in Oxfordshire, some 140 acres of field land was sold in each case, in the former to the almost total exclusion of any common.[19] Within the statistical sample mentioned below, field land made up just over four per cent of the total area sold, and some 12 per cent of the enclosures sold at least some, even though several had additional common and waste which they could have used. At Alvescot, Oxfordshire, for example, only field land was auctioned, though ample common was available, and at Bitton, Gloucestershire in 1865, sales were mainly of common meadow though, again, there was common which could have been used for this purpose.[20] Thus though sales of field did occur, and might be locally important, at national level these 'sale allotments' may be regarded for practical purposes as restricted to the enclosure of common pasture and common waste. This does not, of course, mean that enclosures that included open field did not use sales, only that they tended to sell parts of the common in preference to parts of the field.

II

In order to create as accurate a picture as possible of the regional variations in the process, the detailed statistical analysis has been undertaken on a 10 per cent sample of the approximately 5340 individual parliamentary enclosures in England, drawn randomly from each county, but details of how the process operated have been drawn from across the whole enclosure movement. The sampling and testing methods are contained in articles published some years ago in the *Review*.[21]

The nature of the surviving documentation inevitably places certain limitations on the nature and extent of the analysis. Until the General Enclosure Act of 1845 imposed a degree of uniformity across the country, local solicitors tended to follow local custom as to how the record of the process should be presented. There was never any requirement to retain the

[16] Lincolnshire RO, KEST AW4; Cumbria RO, Q/RE/1/41; Hampshire RO, Q23/2/14. There were a handful of enclosures at the end of the nineteenth century and one or two stragglers in the early twentieth.

[17] Nottinghamshire RO, PR3806.

[18] Dorset RO, PC/CHM/SD1; Gloucestershire RO, Q/RI 136.

[19] Oxfordshire RO, QSD A vols 56 and 7. In the former, one lot overlapped onto common meadow, and in the latter onto a common.

[20] TNA, CP 43/856, rot. 64; Gloucestershire RO, Q/RI 23.

[21] J. Chapman, 'The extent and nature of parliamentary enclosure', *AgHR* 35 (1987), pp. 25–35; id., 'Confidence limits and enclosure estimates: some comments', *AgHR*, 39 (1991), pp. 48–51; id., 'The Bootstrap and Dr Walton's Red Herrings', *AgHR*, 39 (1991), pp. 167–8. The sample does not include Wales.

minutes of the commissioners' meetings, or any details of the claims to land or rights made for the commissioners' adjudication, and only a tiny minority of the sample have minutes containing additional information about the sales. Even the financial records were not regarded as essential once the whole process was formally completed. A few such records have survived, but usually amongst the papers of a particular commissioner, solicitor, land agent or landowner.[22] The only documentation which it was necessary to preserve was the award, which recorded which owners had been allotted which plots, together with details of matters such as alterations to roads, rights of way and responsibility for fences.[23] The exact format of the award, and what additional details were included, if any, remained at the whim of the local officials.

The awards had, of course, to name anyone buying lots and describe his purchase, since the award was the legal record of the owner's title to the land concerned, and the overwhelming majority do so in meticulous detail, but there are a handful of exceptions. In one or two of the awards some of the sales to a single individual are grouped together, so it is not entirely clear whether the individual lands specified were offered as a single lot or were individual lots recorded as one in the award.[24] At Castle Sowerby, Cumberland, one sale lot was 'lost' in the owner's allotment by right, the award merely noting that a sale allotment of unspecified size was contained within it, and the award for Newbald, Derbyshire, stated that it was only listing separately lands sold for more than £10.[25] It is therefore impossible to be sure of the precise size of every individual lot, though the missing details have a negligible impact at national level.

A small minority of awards are so worded that it is not entirely clear whether sales fall within the scope of 'sale allotments' as defined earlier. The Lambeth award is particularly confusing in this respect since it describes three groups of different types of sales. The first is recorded as having been conducted at open auction while a second group, consisting of encroachments which 'did abut upon and cause impediment and obstruction to' neighbouring properties was sold to the owners of the obstructed frontages. The first clearly falls within the scope of this article, while the second does not. The third is more problematical. It is recorded as 'by private treaty', which at first sight would appear to exclude it, but a detailed reading of the document indicates that the lands concerned were 'were offered to sale by private contract and were severally sold … for the best prices that could be gotten', implying some form of open bidding.[26] This last group has therefore been included. The Melbourne and Storthwaite, East Riding, enclosure also presents issues of judgement since there were certainly genuine sale allotments, as defined here, but there were also a number of others where land was sold, apparently openly, and the money used to cover the expenses of the Archbishop of York: the land concerned was deducted from the amount due to the Archbishopric.[27] These have been

[22] Both commissioners and solicitors tended to operate within limited regions, often largely one county. See J. Chapman, 'Enclosure commissioners as landscape planners', *Landscape Hist.*, 15 (1994), pp. 51–5.

[23] A map was technically compulsory after 1801, though this requirement was sometimes ignored.

[24] For example Withington, Gloucestershire. Gloucestershire RO, Q/RI 162. Windlesham, Surrey, on the other hand specifies individual plots, but notes that these had actually been grouped into a smaller number of lots. Surrey History Centre, QS6/4/18.

[25] Cumbria RO, Carlisle, Q/RE/1/41; Derbyshire RO, A86.

[26] Surrey History Centre, QS6/4/8.

[27] East Yorkshire RO, RDB BB/311/40.

omitted, since they were effectively private sales by the Archbishop of part of his allotment to cover his personal costs.

Overall these problems have only a negligible impact on the national picture. More significant for the purposes of this article is the fact that some awards include both status/occupation[28] and residence of the buyers, but many include only one or the other, and a handful neither. Infuriatingly, and for no apparent reason, details of a single individual are sometimes omitted. For example, at Glastonbury, Somerset, full details of all 18 buyers are given, apart from one Benjamin Court, who is recorded as 'of Glastonbury', but who is given no status or occupation.[29] There is therefore an 'unspecified' category, though it may be assumed that a missing status was not an aristocratic one, since titles such as 'Sir' or 'Duke' were always given.[30] As a consequence, it is not always possible to examine whether those with a particular occupation were local or not. Furthermore, except in a limited number of cases it is not possible to compare the profiles of the buyers with those of all allottees, since many do not specify these details for those gaining allotments by right. Comparisons have therefore been restricted to examining what particular categories of buyers should have received had they been given their full allocation, but paid a rate, and what they actually received as a consequence of their foregoing a part but being free to supplement their holdings by purchases. This gives the best-available indication of the relative changes in landownership consequent upon the use of sales, and throws considerable light on the impact of the process.

III

The sample on which the study is based consisted of 535 English awards, of which 137, or just over a quarter, used sale allotments as a means of covering some or all of their costs. Full details of every individual allotment in the sample awards, approximately 56,300 in England, were abstracted, and 3048 of these were recorded as 'sale allotments'. The following analysis is based on this group of allotments. All cases where land was apparently offered at open auction have been included, even where the amounts were clearly too small to cover more than a small proportion of the costs. At Ravensthorpe, Northamptonshire, for example, the commissioners recorded that after making all the allocations they discovered that they had a small piece left over and, rather than delay the process by reallocating everything, they had sold the piece concerned and put the money towards their costs.[31] Such cases have all been included since they offered the potential for new owners to emerge, though in practice they make little difference to the total picture, apart from very marginally inflating the percentage of very small sales. Cases where land was offered for auction but was subsequently sold by private treaty, after it did not attract bidders in the first place, have also been included. For example, at Cheam,

[28] For convenience, 'occupation' will be used to cover status titles as well.

[29] Somerset RO, Q/RDe/64.

[30] The difficulties of defining 'aristocratic' have been explored by many authors including F. M. L. Thompson, *English landed society in the nineteenth century* (1963), pp. 25–44, and J. V. Beckett, *The aristocracy of England, 1660–1914* (1986), p. 23. For a recent discussion, Amy Warner, 'Finding the aristocracy, 1780–1880: A case study of rural Sussex', *Southern Hist.* 35 (2013), pp. 98–126. For simplicity in this analysis it has been taken as 'titled'.

[31] Northamptonshire RO, vol. K, p. 145 et seq.

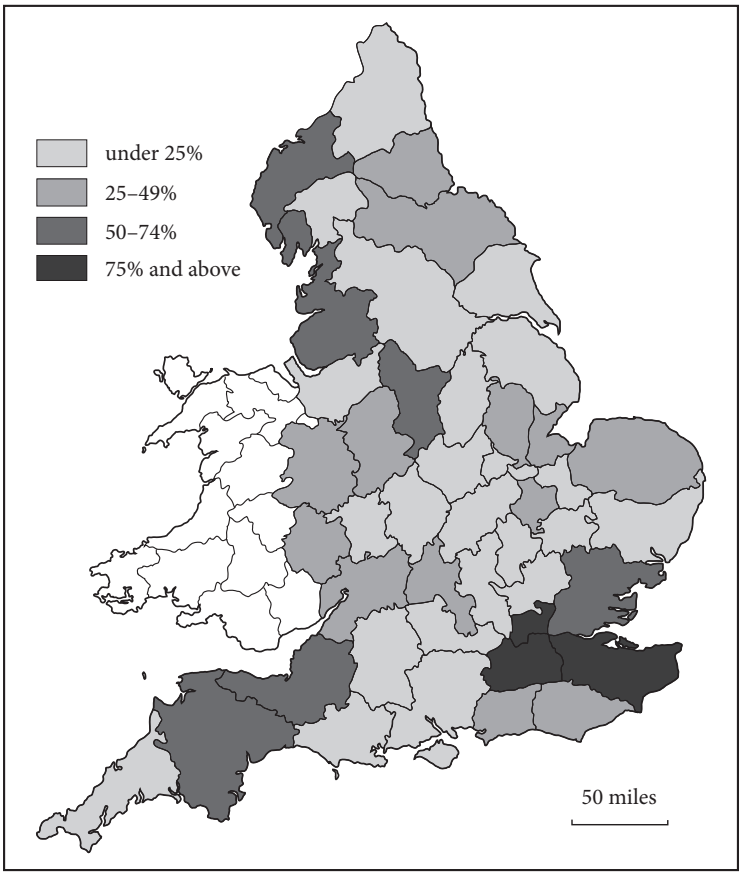


FIGURE 1. Percentage of awards including sale lots, in English counties (Welsh counties not studied)

Surrey, the four acres offered were eventually sold privately for £400 to one James Penfold, but it is clear that that they were initially offered on the open market and that the intention was to raise as much as possible towards the costs.[32]

Overall only just over 4 per cent of all the land enclosed in England was sold in this way, but this accounted for over 8 per cent of the commons,[33] and 13 per cent of all the land enclosed in those enclosures where sale allotments were used. However, there were very substantial regional variations, reflecting in part the variations in the types of land enclosed in different parts of the country. In simplistic terms, the further from a core stretching from east Yorkshire to Hampshire, the later enclosure by act tended to be, and the further from that same core the greater the proportion of the land that was enclosed was common rather than field.[34] Thus the impact of sales was most felt in areas away from the midland belt which has received so much attention in the literature, though as Figure 1 shows, the pattern was rather more complex in detail. The use of county boundaries inevitably hides some of the subtleties; for example, in the North and West Ridings of Yorkshire, which had great physical contrasts within them.[35]

[32] Surrey RO, Acc 488.

[33] As opposed to other types of land, mainly common field and common meadow.

[34] Chapman, 'Extent and nature'.

[35] The map includes Wales, which has not been analysed here.

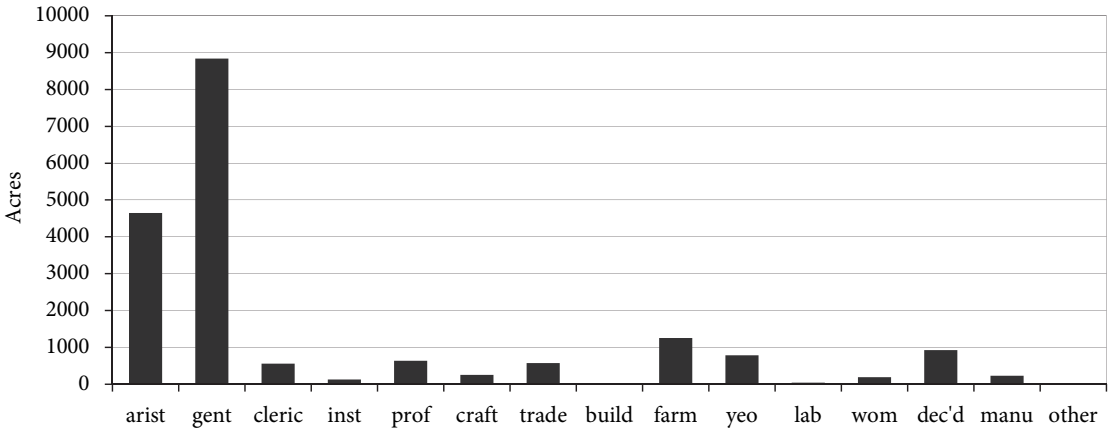


FIGURE 2. Buyers of sale lots by acreage bought

As has already been stated, 3048 lots were put up for sale at open auction, and these were bought by 1663 individuals,[36] giving an average of 1.8 per person. In reality this figure is misleading, as the vast majority of buyers bought only a single lot, and the average is raised by a much smaller group who bought substantial numbers, though this did not necessarily mean they bought large areas of land. Eighty-eight of the 137 enclosures where sales took place have sufficient details of occupation and status to allow for a meaningful analysis, in other words where the 'not stated' element is nil, or very small, and 57 (not necessarily the same ones) have adequate details of residence. The definition of 'adequate' is not easily applied consistently over the whole sample, since the 'not stated' category may be very small in quantity, but make up a significant percentage of that particular enclosure or, conversely, may represent a much larger acreage but a smaller percentage. There is the added complication that the number of individuals in the category may be large, even though they bought very little of the total. There is therefore inevitably a certain subjective element in determining which to include. In the event, the 'not stated' group made up only 3.9 per cent of the acreage in awards examined for occupation, and just over 3.9 per cent of the ones for residence. This article concentrates on the analysis of the occupations of the buyers, and the degree to which they already held a stake in the area being enclosed.

A casual glance at the amounts bought by each occupation group, shown in Figure 2, appears to confirm the 'land grab' idea, since it is quite clear that by far the most significant buyers, by acreage, were the richer landowners. As can be seen, titled individuals and gentry bought over 70 per cent of all the land offered at auction, and the figures clearly indicate that a significant part of the 'deceased' buyers, i.e. where trustees under a will bought on behalf of unspecified legatees, fall into this category.[37] However, they would clearly have emerged in a similarly dominant position had sale allotments not been used. As the owners of by far the

[36] Institutional owners, for example an Oxford college, and joint or multiple owners, are counted as one 'individual', where appropriate, in the text.

[37] The size of the allotments by right often rules out poorer owners, for example at Broughton in Furness (Cumbria RO, Barrow, BSPC/1/3/1) and Chard (Somerset RO, Q/RDE/103).

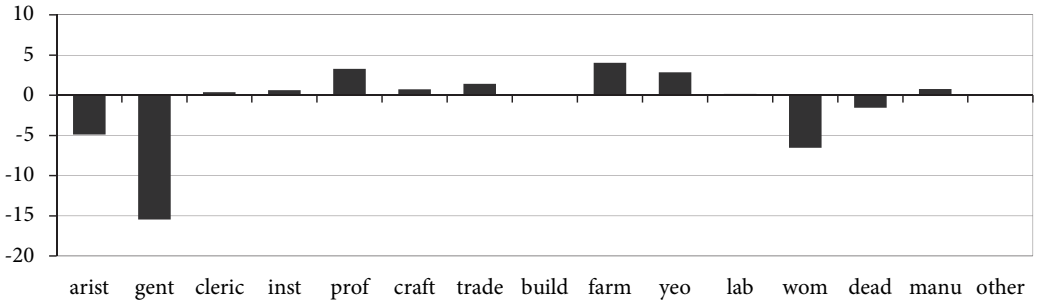


FIGURE 3. Comparison of percentage bought with the original allotment

greatest proportion of the land and rights before enclosure, they would have been entitled to receive the same proportion afterwards. By adopting the sales system they were accepting less land but with the possibility of actually increasing the amount if they were willing to use their resources to dominate the auctions. The issue is whether they did indeed use the system of sale allotments to increase their dominance, and this may be determined by comparing the percentage that they were entitled to by right with the percentage which they bought. This comparison is shown in Figure 3, from which it is clear that they did not.

The graph is in large measure self-explanatory. Both gentry and titled individuals received far less than they would otherwise have done, with female owners and the representatives of deceased owners the only other losers. All other groups were 'winners', to a greater or lesser degree.

IV

An obvious feature for further investigation is those buyers who were not entitled to a share in the common as of right. These made up well over a half of all the buyers, 58 per cent, indicating the scale of influx of new owners in the communities concerned. They were not, however, necessarily outsiders living elsewhere in the country; a significant number consisted of local inhabitants who simply happened to have no stake in the particular pieces of land being enclosed. Not all local inhabitants had rights on the common: rights were attached to particular 'ancient tenements', and not necessarily all houses in a village, and though others had obtained rights, ostensibly through grants from the lord of the manor, even some farmers and landowners might not be entitled to them.

Among the group of 88 awards for which detailed analysis of occupation is possible, the figures are marginally different, since only 55.7 per cent of all the buyers had no entitlement to ordinary allotments, but, as might be anticipated, this figure varied greatly between different occupational groups.[38] The detailed breakdown is shown in Table 1, which excludes the 'unspecified' group.

It will be noticed that the lowest percentage buying without existing rights (excluding the

[38] A small number received 'encroachment allotments', and hence were unofficially, though not legally, partners in the common.

TABLE 1. Numbers of Buyers with and without allotments by right

	with	*without*	*total*	*% without*
Titled	20	8	28	28.6
Gent	136	126	262	48.1
Cleric	10	9	19	47.4
Institutional	3	4	7	57.1
Professional	5	21	26	80.8
Craft	30	77	107	72.0
Trade	33	48	81	59.3
Builder	3	3	6	50.0
Farmer	26	19	45	42.2
Yeoman	38	58	96	60.4
Labourer	6	29	35	82.9
Woman	20	15	35	42.9
Deceased	16	12	28	42.9
Manufacturer	3	3	6	50.0
Others	3	0	3	0.0

Source: calculated from enclosure award sample.

tiny 'others' category) were the titled individuals, less than a third of whom did so. At the opposite extreme, in the case of three categories, professional individuals, labourers and craftsmen, over 70 per cent of those buying had no previous entitlement. That labourers fell into this category is hardly surprising. Sales of this sort offered an opportunity, providing they could find the money, to acquire a garden plot or a plot for a cottage, which might make a significant difference to their lives. A degree of independence and a buffer against high food prices would have been a powerful incentive. The actual amounts bought were small, and made up only 0.2 per cent of the total, but this was an average of 1¼ acres per buyer, a sizeable allotment for the average labourer. What is surprising, perhaps, is that almost 17 per cent of them were able to establish a claim to a share in the common in their own right. However, labourers as a group received only 0.03 per cent of the ordinary allotted acreage, just over a tenth of the percentage which they bought. Small though the bought acreage was, labourers were nevertheless net gainers from the process.

V

If each of the categories is examined in more detail a number of differences emerge. The labourers were successful as buyers in 13 of the 88 enclosures which were strongly clustered in the southern parts of England.[39] Precisely why this regional concentration occurred must

[39] Awards outside the present sample indicate that some did buy in the North of England.

remain a matter of speculation, though it may reflect in some degree differences in social and economic conditions in different parts of the country. In many areas of northern England, the North York Moors or the Lake District, for example, farms tended to be small and heavily reliant on family, rather than paid, labour. Furthermore, numbers of farm labourers were in decline as the growing industries and urban centres drew many away in search of better-paid and more secure jobs. Added to this, labourers in some parts of the North often lived in on the farm until a much later date than was the norm in southern England. The numbers available to buy, and the pressure to do so, may therefore have been less.

The other two groups of major 'outsider' buyers are of interest since they tend to fit with the results of one of the few published studies of enclosure land sales, the pilot study of the whole of West Sussex, particularly if the craftsmen and tradesmen are taken together.[40] It was suggested in that article that local craftsmen and tradesmen were seeking a safe 'bank' for their savings, and possibly seeing the rents from such land as a pension in their old age. The Board of Agriculture report for Middlesex reports that at the Enfield enclosure the original purchasers were 'mostly gentlemen who were retiring from trade'.[41] Some may also, like the labourers, have seen it as a chance to free themselves from the need to rent property. It may have been a necessity for others, such as, for example, blacksmiths or timber merchants, who had been accustomed to using the common to keep horses waiting to be shod or to store timber, but who would not necessarily have been legally entitled to a share at enclosure. Martin specifically records craftsmen and tradesmen as losers in the enclosure process, though he appears to be primarily concerned with those who were farmer-craftsmen and whose subsequent allotment was too small to continue farming, rather than those who had no entitlement at all.[42] Certainly, these two groups were very active in the auctions, buying at 27 and 28 of the enclosures respectively, but acquiring only very small plots of land for the most part. Together craftsmen and tradesmen made up just under 25 per cent of the buyers, though accounting for only 4.3 per cent of the land. On the other hand, they received as of right only 2.1 per cent, so again in relative terms they were gainers by the process, more especially the craftsmen group.

The professional classes made up 3.3 per cent of the buyers, and bought an almost identical proportion of the land. They bought at 14 enclosures, but had rights at only two, both in Sussex. Their original allocation amounted to 0.04 per cent, so they were clearly buying on a much greater scale than their rights would have entitled them to. None were buyers of large acreages, except for Oliver Farrer, a lawyer with an estate at Clapham (West Riding), who bought 444 acres at Dent, which may have been an attempt to develop a grouse moor. An initial assumption was that professional men might have shown a preference for land close to significant urban centres, but no such trend is detectable. The one which does emerge is a strong concentration in the south of the country. Only at Meltham and Dent, both in the West Riding did they buy land north of the Thames Basin.[43] While this may simply reflect the traditional economic

[40] Chapman, 'Land purchasers at enclosure'.

[41] John Middleton, *A general view of the agriculture of Middlesex* (1813), p. 135.

[42] J. M. Martin, 'Village traders and the emergence of a proletariat in south Warwickshire, 1750–1851', *AgHR* 32 (1984), pp. 179–88.

[43] TNA, MAF 1/247 and /1060; West Riding RO, Wakefield, West Riding Registry of Deeds, RDW B45, p. 1.

dominance of the south of England, it might have been expected that the rising wealth of the industrial north and Midlands would have produced some influence. Significantly, Meltham lay close to the rapidly growing industrial heartland of the West Riding, and four of the six 'manufacturers' (a separate minor group) recorded in the sample were also located there.

As might be expected, farmers and yeomen, taken together, formed the second biggest group by number, accounting for just under 18 per cent of buyers, though, as was noted earlier, only just over 10 per cent by acreage.[44] These two groups held no qualifying land in 56 of the 88 analysable enclosures, but they were involved as buyers in 45 in total. Individually, the latter were the third biggest group on their own, after gentry and craftsmen, but accounted for less than 4.25 per cent by acreage, as opposed to just over 6.5 per cent for the farmers. In other words, as again might be expected, they were very active participants in the auctions but for the most part were purchasing relatively modest amounts of land. However, their initial entitlements were only 1.3 per cent and 2.5 per cent respectively, so their relative gains were considerable, more especially the farmers who bought, proportionately, well over 2½ times what they were allocated. There appears to be no obvious distributional bias in their pattern, with purchases in all parts of the country.

As has been indicated, it would be possible with a reasonable degree of certainty to examine the patterns of buying by titled individuals, the 'aristocracy', for the whole of the sample of 137, but as this could not be done for other groups it would not advance the primary purpose of this article and has been omitted here. It should be noted that 'aristocracy', used as a shorthand here, does not necessarily equate to all the wealthiest owners, for some landed estates were heavily encumbered with debts.[45] Equally, not all titled individuals were necessarily the owners of landed estates, since wealthy merchants and, by the nineteenth century at least, successful manufacturers, were increasingly ennobled. However, as a broad generalization, this category may serve as an indication of the role played by the larger landed estates.

Confining oneself purely to the 88 enclosures where full occupation details are available, 28 titled individuals bought 4646.38 acres, amounting to just under 25 per cent of the land sold. They bought at only 23 of the 88, and in only four where they had no formal entitlement. Significantly, three of these latter involved the purchase of large areas of moorland in northern England, and may well have been associated with the rising aristocratic interest in grouse shooting, since these were areas of prime grouse-moor territory.[46] These same individuals were allotted just under 30 per cent of the ordinary allotments as of right. In other words, in relative terms, they lost significantly. When we consider the fact that no less than 33 aristocratic owners failed to take advantage of the opportunities presented at the enclosures in which they had a stake as of right, it is clear that the concept of such owners as voracious seizers of as much land as possible cannot be sustained. There were undoubtedly one or two individuals

[44] The terms 'farmer' and 'yeoman' have been used as in the original documents. In practice, use of the latter term disappeared from much of England during the period under consideration, though continuing in, for example, Cumberland.

[45] See, for example, L. James, 'Changes in estates in southern England, 1700–1850', (unpublished PhD thesis, University of Portsmouth, 2011).

[46] Several were subsequently used for this purpose, and it is clear that the objective was not usually agricultural. The Romaldkirk (Yorks.) award specifies that the land sold was that 'least capable of improvement'. Durham RO, D/X510/1.

who did seek to maximize their holdings: the Marquis of Bath, for example, snapped up all the land at Longbridge Deverill, Wiltshire, but this adjoined the heartland of the family estates.[47] Similarly, the Earl of Egremont bought all five sale lots on the common at Amberley, Sussex, close to his major estates round Petworth, but ignored those at Egremont, Cumberland, where the land was actually sold in 17 small lots.[48]

By far the biggest proportion of the land was bought by gentry, some 46.3 per cent of the total. They were involved as buyers in no less than 73 of the 88 enclosures and made up over 33 per cent of those who bought. As has been mentioned, relatively few gentry bought land outside the areas where they had a normal entitlement, only 29 per cent of the 262 individuals concerned. They were clearly the most important group and appeared throughout the country, at all time periods, and in all types of farming area and urban fringes as well. However, as with the aristocratic group, their *relative* position was less impressive, for they were allotted 61.8 per cent of the ordinary acreage as of right. In other words, in spite of the very large acreage which they bought, they actually ended up as a group with a smaller proportion of the land than they would have done had all the land been allocated and a rate applied instead.

A brief comment is necessary on some of the minor groups involved. Clergymen, for example, as members of the Church of England, were heavily involved in the agricultural system, at least indirectly as the recipients of tithes[49] and as tenants-for-life of the glebe. Furthermore, many were drawn from the younger sons of gentry or even aristocratic families, and owned land and had wealth of their own. Sales of this sort offered an opportunity to build an estate, and a small number seized it, buying as much as 216 acres at Beckley (Oxfordshire) and 120 at Bradfield (West Riding of Yorkshire).[50] In total they made up 2.4 per cent of the buyers and acquired 2.9 per cent of the land. Interestingly, over 47 per cent of clergy buyers had no prior legal interest in the commons concerned, but it may have been that some, at least, were attempting to establish themselves as landowners in parishes linked to their religious duties.

The role of women buyers is worthy of comment, since there is an implicit assumption in some older literature that women landowners were insignificant prior to the Married Women's Property Acts of 1870 and 1882. In fact there was nothing to prevent spinsters or widows from owning land prior to this, and there is increasing evidence not only that they made up a significant element in the landownership pattern, but that many of them took a very active role in managing their estates. Certainly one would not have expected them to appear as buyers of land if they were merely passive owners simply living off the proceeds. Indeed, a number of authors have in recent years shown that women were active in promoting or supporting enclosures.[51] Nevertheless, analysis shows that women had the lowest proportion of 'outsider' buyers, with less than a quarter (24.1 per cent) buying where they had no pre-existing right to an allotment, so they show a much greater tendency to expand their existing estates than

[47] Wiltshire RO, Enc 43.

[48] West Sussex RO, QDD/6/W13; Cumbria Archives Centre, Carlisle, Q/RE/1/30.

[49] The vicar's tithes remained in their hands, though some of the other tithes were in lay or institutional hands.

[50] Oxfordshire RO, QSD A vol. 7; Sheffield Archives, ACM S 73.

[51] See, for example, S. L. Seeliger, 'Female landholders in Hampshire, *c.*1650 to 1900' (unpublished PhD thesis, University of Portsmouth, 1998); Briony A. K. McDonagh, 'Women, enclosure and estate improvement in eighteenth-century Northamptonshire', *Rural Hist.*, 20 (2009), pp.143–62.

other groups. They made up just under 4.5 per cent of the buyers and were involved in 20 of the enclosures analysed, though they actually purchased only just under 1 per cent of the land on offer. There is nothing to suggest that any particular pattern in purchases by women, either regional or, for example, associated with fashionable urban areas to which wealthy widows might perhaps have retired.

Builders were also looked at as a separate category, as it was initially assumed that they might be expected to show a clustering where enclosures took place on the edges of urban areas. In fact they proved to be insignificant in both total numbers involved and in the acreage bought, and only the purchases at Barking and Leicester might be taken to fit the anticipated pattern.[52]

Institutional owners are worthy of a brief comment because of their unexpectedly negligible involvement. Those who were involved were bodies such as the Moretonhampstead and South Devon Railway Company at Bovey Tracey, and the Staffordshire and Worcestershire Canal Company at Wolverhampton, who bought small areas for purely local purposes, such as sidings or quays, or the brewers Ind Coope and Company at Dagenham.[53] Almost entirely missing from the list are the great institutional landowners, the colleges of Oxford and Cambridge.[54] In general these were not involved in those enclosures where sale allotments were used, and it may be suggested that this was a deliberate policy on their part to veto attempts to allow this means of raising the costs. They were notoriously defensive of their own interests and may have felt that bidding for land at auction would leave them at a disadvantage. Certainly, their absence is striking, when compared with their prominence in that part of the sample where sales were not used.

Finally it may be noted that the crown was involved in a number of the enclosures concerned, but only once as a buyer. The crown was lord of the manor in four of those analysed in detail but although some of its agents elsewhere took a very active part in promoting enclosures, there is no evidence that they made any serious attempt to acquire sale allotments. The crown clearly had the resources to outbid other owners should it have wished to do so, but evidence from elsewhere suggests that its agents saw the advantages of enclosure primarily in the potential gains from improving the management of existing lands rather than attempting to expand its acreage. Thomas Bainbridge, the crown agent involved at the Methwold (Norfolk), enclosure, made detailed calculations of the costs and benefits which would accrue, concluding that the crown's best financial advantage would be to *sell* land, thereby covering all its incidental costs. The improved rents from the new allotments would more than compensate for the reduced area, and the crown would not have to raise significant sums of money immediately.[55] Such an argument would seem to lie also behind the failure of the aristocracy to buy as much as might have been expected. They, like the crown, were highly selective in their purchases, seeking to expand their core estates by targeting particular pieces of land, rather than merely increasing their total landholdings.

[52] TNA, MAF 1/233 and /962; Leicestershire RO, QS47/1/51.

[53] TNA, MAF 1/205 and /965; Staffordshire RO, Q/RDc 100; TNA MAF 1/976.

[54] St John's, Cambridge, was a buyer at Windlesham. Surrey History Centre QS6/4/18.

[55] TNA, DL 41/1172. Methwold is not one of the enclosures analysed in detail.

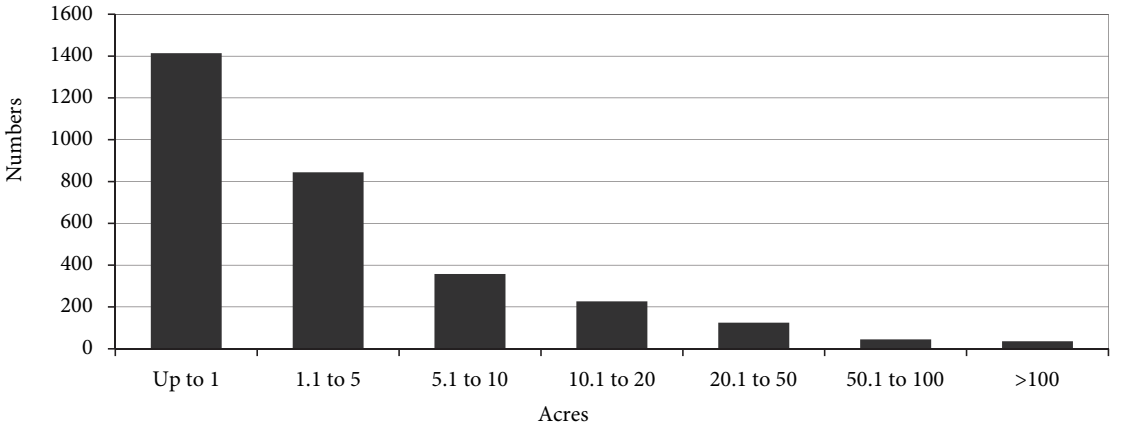


FIGURE 4. Size of sale allotments

VI

In summary, then, it is clear that the use of sale allotments to raise the costs of enclosing the commons did not lead to a universal land grab by the aristocracy and gentry. Though these two groups were by far the biggest buyers in acreage terms, relatively speaking they ended with a good deal less than they might have received if the alternative strategy of imposing a rate on each recipient had been adopted. Conversely smaller landowners, craftsmen and tradesmen, even labourers, gained relatively from this system. A very significant number of individuals in these groups was able to acquire plots of land which otherwise they would not have had, either increasing their existing small entitlements or becoming landowners for the first time. In part this was due to the policy of offering the land concerned in very small lots, within reach of the poorer individuals and with little attraction to the rich (see Figure 4). This policy was occasionally specifically written into the enabling Act, but it was adopted in many other cases. There were cases where large acreages were auctioned in one or two large lots, 1300 and 300 acres at Black Lyne, Cumberland, for example, but it was much more usual to mix large and small lots.[56] At Penistone, Yorkshire, lots ranged in size from 4 perches to 40 acres, and, of the 53 lots, no less than 36 were under an acre in size, compared with only four over 20 acres.[57] Overall, over 46 per cent of the sale allotments were of one acre or less, and a further 27 per cent of between one and five acres.

This analysis poses questions for the widely accepted traditional views of the social effects of the parliamentary enclosure process. It is clear that, where sale allotments were used, the more wealthy sectors of society – far from greatly increasing their holdings – actually lost significantly in relative terms. In contrast, ordinary yeomen and farmers, craftsmen and tradesmen, even labourers, were able to increase their holdings, at least to a modest extent, and in many cases actually established themselves with smallholdings or garden plots where

[56] Cumbria Archives Centre, Carlisle, Q/RE/1/22.
[57] West Riding RO, Wakefield, West Riding Registry of Deeds, RDW B38, p. 141.

previously they had had none. While it might be argued that sale allotments were used in only a minority of cases, they are at least a clear indication that wealthy landowners were not, as a group, primarily concerned to gain the maximum possible acreage from enclosure. Had they wished, not only could they have outbid most other individuals but, through their dominance of Parliament, they could have ensured that enclosure acts imposed a *minimum* size of sale allotment, thereby eliminating competition from poorer bidders, or, indeed, have prevented the use of sale allotments at all, which would have ensured their full entitlement as of right.

It should be noted that some of the other basic assumptions behind the traditional model do not hold good. Obviously, selling a proportion of the land available meant that each right owner got a smaller original allotment than would otherwise have been the case, but this did not mean that they ended up with their overall holdings reduced in size, a basic assumption of the arguments of Cohen and Weitzman and Neeson.[58] The land concerned was almost exclusively 'common waste', and enclosure involved adding land formerly used for extensive grazing to the more intensively cultivated farmland. The use of sale allotments did not therefore diminish holding sizes, it merely reduced the amount of increase. Furthermore, as has been shown, allottees could be allowed to choose whether they accepted their whole allocation or a reduced one free of charges. This is not to suggest that there were no losers as a result of enclosure or that the traditional view is wrong in all circumstances: it merely serves to emphasize that the situation was far more complex than is frequently assumed, and that to neglect the impact of sale allotments is to ignore a factor which introduces a significant regional and temporal variation to a study of the social impact of parliamentary enclosure.

[58] Cohen and Weitzman, 'Enclosures and depopulation'; J. M. Neeson, *Commoners: common right, enclosure and social change in England, 1700–1820* (1993), for example, p. 257.

Science, disease and dairy production in Britain, *c.*1927 to 1980*

by Abigail Woods

Abstract

This article sheds new light on the relationship between scientific research and livestock production through a case study of the dairy cow disease, mastitis. Despite intensive scientific research, the prevalence of this widespread, costly problem barely changed in the period *c.*1927–80. Analysis of three successive framings of mastitis within the broader context of agricultural change suggests that this outcome did not reflect the failure of research, but rather its partial success. Throughout, scientists approached mastitis as a problem of production rather than health. In helping to control one form of mastitis, their investigations facilitated the adoption of more intensive farming methods, which increased milk output while encouraging the emergence of a different form of the disease. This process illustrates the co-construction of cattle health, scientific research and milk production practices. It also shows how productivist agricultural agendas and the practicalities of scientific investigation moulded the conduct of research and its effects on production.

Using bovine mastitis in Britain as a case study, this article aims to shed new light on the relationship between scientific research and the mid-twentieth century transformation of agriculture from a small-scale, self-sufficient enterprise into a specialized industrial business. For dairy farming, this transformation involved wholesale shifts in the ways that cows were fed, housed, milked, bred, monitored and managed. Adopting and applying the industrial values of efficiency and productivity, farmers sought to increase the volume and efficiency of milk production through specialization, economies of scale, mechanization, use of pharmaceuticals, a reduction in labour and the standardization of cow bodies, environments and management. In the process, producer numbers declined, herd sizes increased (Table 1), and the spaces, people and cows involved took on radically new appearances (Figures 1–3).[1]

These changes have been subject to contrasting historical interpretations. Economic, political and business historians portray them as inevitable outcomes of government policy and market

* Versions of this article were presented at the 2012 British Animal Studies Network 'Farm' meeting; the British Agricultural History Society's Winter Conference 2012, on science and agriculture; at a 2013 John Hopkins University workshop on the relationships between science, agriculture and the environment; and at the Centre for History and Philosophy of Science, Leeds University. The feedback received proved invaluable in shaping and improving the article. Especial thanks are due to Denise Phillips, Sharon Kingsland, David Edgerton, Dominic Berry, and two anonymous referees.

[1] John Martin, *The development of modern agriculture: British farming since 1931* (2000). For a discussion on the industrial ideal in American agriculture, see Deborah Fitzgerald, *Every farm a factory* (2003).

forces.[2] For scientist-participants, they were a part of their achievement in providing the nation with cheap food, [3] while for critics of intensive agriculture they were developments which were highly damaging to animal health, welfare and the environment.[4] All perspectives concur in awarding science and technology a crucial role in modernizing livestock production. However, they often portray that role in rather simplistic fashion, as the straightforward unfolding of discoveries and innovations that enabled the production of more food, more efficiently.

Recent work by historians of science adopts a more critical stance, asking why particular forms of scientific research were pursued at particular points in time, by whom, using what methods, and with what effects. In highlighting the changing nature of research agendas and the many factors involved, they show that there was no straightforward scientization of livestock production.[5] However, apart from Theunissen, who examines how dairy farmers' practices and cultures informed their adoption of scientifically informed breeding methods,[6] previous authors have been more concerned with tracing the history of science than the history of livestock production.[7] This article aims to do both, and to interrogate the relationship between them. Against a backdrop of changing production practices, and their political, economic and public health contexts, it will investigate how scientists' research programmes impacted on dairy production, and how the values and objectives of production informed the pursuit of scientific research.

The cattle disease, mastitis, offers a suitable case study because throughout the period

[2] Edith Whetham, *The agrarian history of England and Wales,* VIII, *1914–39* (1978), ch. 5; B. A. Holderness, *British agriculture since 1945* (1985); Martin, *Modern agriculture*; id., 'The commercialisation of British turkey production', *Rural Hist.,* 20 (2009), pp. 209–228; Andrew Godley and Bridget Williams, 'Democratizing luxury and the contentious "Invention of the Technological Chicken" in Britain', *Business Hist. Rev.,* 83 (2009), pp. 267–90.

[3] John Russell, *A history of agricultural science in Great Britain* (1966); G. W. Cooke (ed.), *Agricultural research, 1931–81* (1981); K. Blaxter and N. Robertson, *From dearth to plenty: the modern revolution in food production* (1995).

[4] Ruth Harrison, *Animal machines: the new factory farming industry* (1964); T. Clunies Ross and N. Hildyard, *The politics of industrial agriculture* (1992); Adrian Franklin, *Animals and modern cultures: a sociology of human–animal relations in modernity* (1999); Bernard Rollin, 'The ethics of agriculture: the end of true husbandry', in M. Dawkins and R. Bonney (eds), *The future of animal farming: renewing the ancient contract* (2008).

[5] W. Boyd, 'Making meat: science, technology and American poultry production', *Technology and Culture* 24 (2001), pp. 631–64; Mark Finlay, 'Hogs, antibiotics and the industrial environments of post-war agriculture', in Susan Schrepfer and Phillip Scranton (eds), *Industrializing organisms: introducing evolutionary history* (2004), pp. 237–60; Sarah Wilmot, 'From "public service" to artificial insemination: animal breeding science and reproductive research in early twentieth-century Britain', *Stud. Hist. and Phil. Biol. Biomed. Sci.*. 38 (2007), pp. 411–41; Paul Brassley, 'Cutting across nature? The history of artificial insemination in pigs in the United Kingdom', ibid., 38 (2007), pp. 442–61; Abigail Woods, 'The farm as clinic: veterinary expertise and the transformation of dairy farming, 1930–50', ibid., 38 (2007), pp. 462–87; Karen Sayer, 'Battery birds, "stimulighting" and "twilighting": the ecology of standardized poultry technology', *Hist. Technology* 28 (2008), pp. 149–68; Kendra Smith-Howard, 'Antibiotics and agricultural change: purifying milk and protecting health in the postwar era', *Agricultural Hist.,* 84 (2010), pp. 327–51; Margaret Derry, *Art and science in breeding: creating better chickens* (2011).

[6] Bert Theunissen, 'Breeding without Mendelism: theory and practice of dairy cattle breeding in the Netherlands, 1900–1950', *J. Hist. Biology,* 41 (2008), pp. 637–76; id., 'Breeding for nobility or for production? Cultures of dairy cattle breeding in the Netherlands, 1945–1995', *ISIS,* 103 (2012), pp. 278–309.

[7] Edgerton argues that this orientation is typical of current approaches to the history of science. David Edgerton, 'Time, money and history', *ISIS,* 103 (2012), pp. 316–27.

under review it was widely recognized as one of the most prevalent and costly problems of milk production. Generally defined as inflammation of the udder, its effects ranged from overt clinical symptoms that occasionally resulted in death, to sub-clinical reductions in the milk yield.[8] It was also believed to impact on human health, not least through the large-scale use of antibiotics to control it in the years after the Second World War.[9] Managing mastitis was the farmers' responsibility: the state played little direct role other than to fund research, most notably at the government's Central Veterinary Laboratory (CVL), Weybridge, and the National Institute for Research in Dairying (NIRD), Reading.[10] Against a backdrop of changing production practices, this account focuses on the activities, motivations and achievements of the scientists involved. While farmers' personal experiences also merit analysis, they are beyond the scope of the article.[11]

Despite intensive scientific research that produced multiple control strategies, mastitis prevalence barely changed over time. In 1934, 30 per cent of British cattle were infected, and in 1980 one third of cattle were. Today, mastitis is still the most widespread, costly disease of dairy cattle, with around 40 per cent of cows experiencing symptoms each year.[12] In order to understand this apparent failure of research, the first half of the article takes a closer look at how mastitis was conceptualized and managed from 1927, when investigations began, to 1980. Drawing on scientists' published articles and conference presentations it reveals that mastitis was not a monolithic entity during this period, but rather three different diseases, whose prevalence and perception was shaped by the politics, economics and practices of milk production.

On the basis of these findings, the next section reassesses the achievements of mastitis research and interrogates scientists' approaches to its control. It argues that, when viewed from the perspective of production rather than health, research did not fail. Rather, it facilitated the shift to more intensive systems that enhanced milk output while simultaneously encouraging the emergence of a different form of mastitis. This outcome, and the consistent manner in which scientists approached mastitis as a problem of germs rather than flawed farming systems, suggests that not only was production scientized, but also that science had been 'productivized', or constituted by the values and objectives of modern, productivity-oriented agriculture. However, as the last section of the article reveals, 'productivization' cannot fully

[8] Andrew J. Bradley, 'Bovine mastitis: an evolving disease', *Veterinary J.* 163 (2002), 1–13.

[9] The connection between bacterial resistance, as a public health problem, and the use of antibiotics in agriculture, has been hotly disputed for many decades. Smith-Howard, 'Antibiotics'; Robert Bud, *Penicillin: triumph and tragedy* (2007), ch. 8.

[10] For the history of these institutions, see H. E. Burgess, *The National Institute for Research in Dairying: a memoir* (1962); Anon, *Animal health, a centenary, 1865–1965* (1965), ch. 5. A number of other research institutions and pharmaceutical companies also conducted extensive research.

[11] Such experiences would be useful in revealing how farmers perceived and coped with the everyday, endemic diseases of livestock production. This would offer an important point of comparison with the more studied, scheduled diseases, brucellosis and tuberculosis, whose perception and management was moulded by government policy.

[12] BPP, 1933–4, cmd 4591, IX, Economic Advisory Council Committee on cattle diseases: Report, p. 427; C. D. Wilson, 'A survey of mastitis in the British dairy herd', *Veterinary Rec.* (hereafter *VR*), 106 (1980), pp. 431–5; A. J. Bradley, K. A. Leach, J. E. Breen, L. E. Green, M. J. Green, 'Survey of the incidence and aetiology of mastitis on dairy farms in England and Wales', *VR* 160 (2007), pp. 253–8.

account for the history of mastitis research because scientists recognized numerous routes to achieving higher milk output. Therefore in order to understand the historical co-evolution of science and agriculture it is necessary to consider scientists as active agents, and to scrutinize and explain their choices between different research programmes and interventions.

I

At the start of the twentieth century, mastitis was already well known to vets and farmers. It was experienced as a clinical problem of individual cows that caused sore, swollen udders and bloody milk. A bacterial cause – *Streptococcus agalactiae* – had been identified in 1887 but various predisposing factors were also thought to be involved, including poor milking technique, bad hygiene, chilling or injury to the udder, flies, and hot summer weather. Affected cows were given purgatives to treat systemic symptoms, while fomentations, stripping and massage were applied to the udder, with the occasional amputation of diseased tissue.[13]

Mastitis first attracted the attention of British scientists during the inter-war period. This was largely due to changes in dairy production. Traditionally, dairy cows formed one component of a mixed farming system, valued as much for their fertilizing manure as for their milk. However, during the inter-war agricultural depression, which impacted particularly on arable prices, producers increasingly converted to specialist dairy farming because liquid milk (although not butter and cheese) was relatively protected from foreign competition. The resulting glut led to a fall in wholesale prices which was corrected by the creation of the Milk Marketing Board (MMB) in 1993. In establishing the collective selling of milk at the best possible prices, the MMB encouraged the further expansion of dairying. By 1939, milk and its products accounted for more than 25 per cent of the value of British agricultural produce. There were over 136,000 registered producers, with herds averaging 15 cows. Each cow produced an average of 560 gallons of milk a year (see Table 1).[14]

The rising popularity and economic importance of dairy farming meant that greater significance was awarded to the diseases that threatened it. At the same time, new production practices increased the actual prevalence of disease.[15] Low arable prices enabled cattle to be fed cheaply on purchased concentrates often derived from imports. This encouraged the growth of production in urban or suburban areas where there was little grazing land but a ready market for 'producer retailers' who comprised nearly half of all producers by 1939.[16] Cows of various breed types were kept tethered in traditional sheds where they were fed and milked (Figure 1). In

[13] William Youatt, *Cattle, their breeds, diseases and management* (1858), pp. 553–4; Francis Clater, *Every man his own horse and cow doctor* (1919), revised by D. McTaggart, pp. 109–10; W. Lyle Stewart, 'Summer mastitis in cattle', *VR* 28 (1926), pp. 1055–60; S. J. Edwards, 'The diseases of dairy cattle', *J. Dairy Research,* 7 (1936), pp. 291–318.

[14] R. G. White, 'Systems of dairy farming', *J. Ministry of Agriculture,* 46 (1939–40), pp. 372–78; F. Garner, *British dairying* (1946), ch. 12; Anon, *The work of the Milk Marketing Board of England and Wales, 1933–1951* (1951); Peter Atkins, 'Fattening children or fattening farmers? School milk in Britain, 1921–41', *EcHR* 58 (2005), pp. 57–78; Paul Brassley, 'British farming between the wars', in P. Brassley, J. Burchardt and L. Thompson (eds), *The English countryside between the wars: regeneration or decline?* (2006), pp. 187–99.

[15] Woods, 'Farm as clinic'.

[16] White, 'Dairy farming'; Anon, *Milk Marketing Board*.

TABLE 1. Dairy cow statistics, 1939–85

Year	*Dairy cow numbers (England and Wales)*	*Number of registered producers (England and Wales)*	*Gross yield per cow (gallons per year) (UK)*	*Average size of herd*
1938–9	?	136,519	560	15 (est.)
1950	?	161,937	623	?
1955	2,415,000	142,792	675	17
1960	2,595,000	123,137	735	21
1965	2,650,000	100,448	780	26
1970	2,714,000	80,265	825	33
1975–6	2,701,000	59,740	902	45
1980–1	2,627,000	47,169	1037	56
1985–6	2,583,000	41,055	1078	63

Source: S. Baker, *Milk to market* (1973), p. 42; H. F. Marks and D. K. Britton, *A hundred years of British food and farming: a statistical survey* (1989), p. 230.

the absence of breeding facilities, these 'flying herds' were sustained by intermittent purchases of freshly calved cows, which were sold on when their milk output dropped. The frequent purchase and sale of cattle facilitated the spread of infection. Critics claimed that 'forcing' cows to produce in these 'intensive' or 'factory-style' systems undermined their constitutions and predisposed them to disease.[17] Outbreaks of mastitis were also associated with the adoption of milking machines, 28,860 of which had been installed on farms in England and Wales by 1942.[18] The first surveys of dairy cow health, which were brought together in a 1934 report on cattle diseases, revealed that the average cow remained in the herd for only half of her useful life. Mastitis, which infected an estimated 30 per cent of the nation's dairy cows, was the disease responsible for the greatest aggregate loss.[19]

Two of the nation's leading agricultural societies, the Royal Agricultural Society and the Royal Association of British Dairy Farmers, grew extremely concerned about the mastitis problem. Following their existing tradition of supporting scientific research,[20] they made funds available for its investigation. Additional support was provided by the Development Commission, which distributed government funds for agricultural research.[21] There were also public health reasons for conducting enquiries.[22] Ensuring the quality and safety of milk was

[17] 'Utility and endurance of dairy cows', *The Times*, 1 Feb. 1929, p. 18; S. Burdett-Coutts, 'Correspondence', *The Times*, 21 Nov. 1928, p. 20; W. C. Miller, 'Agricultural rationalism and veterinary science', *VR* 50 (1938), pp. 167–77.

[18] MAFF, *A century of agricultural statistics* (1968), p. 71.

[19] BPP, Committee on cattle diseases.

[20] Abigail Woods, '"Partnership" in action: contagious abortion and the governance of livestock disease in Britain, 1885–1921', *Minerva* 47 (2009), pp. 195–216.

[21] Nineteenth Report of the Development Commissioners for the year ended the 31st March 1929 (1929), pp. 89–90.

[22] F. C. Minett, 'Bovine streptococcus mastitis and the public health', *VR* 44 (1932), pp. 543–8. This article was published simultaneously in the journal *Public Health*.

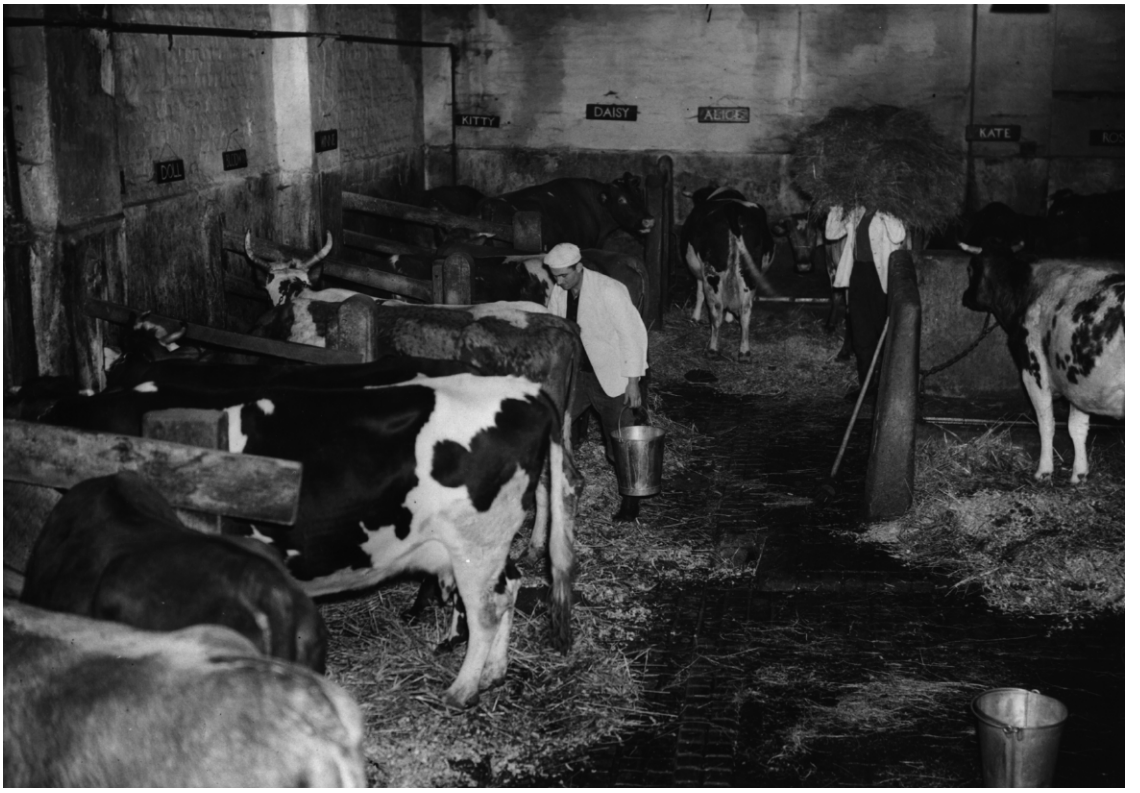


FIGURE 1. A dairy farm in London, 1947.

This was one of the few such farms to survive the war. It exhibits many of the key characteristics of inter-war, urban or suburban dairy farming.
Farmer and Stockbreeder Collection. Reproduced with the permission of the Museum of English Rural Life, University of Reading.

a high-profile political issue in the inter-war period.[23] Although the key focus of concern was bovine tuberculosis, mastitis also attracted attention. Most commonly it caused rapid souring and visible changes in the colour and consistency of milk, but in addition, between 1903 and 1934, mastitis-infected milk was associated with over 100 outbreaks of human epidemic disease.[24] An aetiological connection was suggested just prior to World War I by the discovery in the throats of patients with scarlet fever and septic sore throat, of a streptococcus bacterium similar to that associated with mastitis in cows.[25]

Veterinary bacteriologists at the Royal Veterinary College, London, sought to elucidate this problem. Building on prior investigations in the USA, Frank Minett and his assistants

[23] Frank Trentmann, 'Bread, milk and democracy: consumption and citizenship in twentieth-century Britain', in M. Daunton and M. Hilton (eds), *The politics of consumption* (2001), pp. 129–63; M. French and J. Phillips, *Cheated not poisoned? Food regulation in the United Kingdom, 1875–1938* (2000), ch. 7.

[24] BPP, Committee on cattle diseases, pp. 28, 89.

[25] 'Discussion on milk borne streptococcus epidemics', *Proc. Royal Society of Medicine,* 24 (1931), pp. 1703–12; L. Wilson, 'The historical riddle of milk-borne scarlet fever', *Bull. of the Hist. of Medicine* 60 (1986), pp. 321–42.

A. J. Stableforth and S. J. Edwards used classic 'microbe hunting' techniques to discover a range of bacteria capable of causing mastitis, and to dispel fears that they could infect humans. Subsequently, they chose to focus on the bacterium implicated in 80 per cent of mastitis cases: *Streptococcus agalactiae*. This lived mainly on the udder skin, spread via milking, and caused infection by migrating up the teat canal.[26] Unlike vets and farmers, scientists were not concerned with the clinical cure of individual animals, but with the herd-level manifestations and control of disease. They claimed that while most stockmen were aware of the acute form of mastitis, it was more usually chronic in nature. Manifesting not in symptoms but in reduced milk yield, the only reliable method of detecting it was through the bacterial culture of milk.[27] Since infection occurred independently in each quarter of the udder, samples had to be taken from each teat. This approach made the laboratory an obligatory passage point in mastitis diagnosis, and reduced the individual cow to a collection of udder 'quarters'.[28]

The standard response to infectious cattle diseases in the 1930s was to try to eradicate them from the herd, if not the nation. Drawing on methods already applied to bovine tuberculosis and brucellosis,[29] Minett and his colleagues advocated bacterial testing to identify infected cows, which could then be sold or separated off into a different herd and milked last. Follow-up tests were required to check infection status. As an adjunct therapy, the udders of diseased cows could be infused with a bactericidal agent like acriflavine, although this temporarily reduced milk output and often failed to eliminate infection. Mastitis vaccines and sera, which drug companies included in their growing range of biological products, had little demonstrable effect.[30]

In the later 1930s, supported by the newly established, government-funded Agricultural Research Council (which regarded animal disease research as a major priority) and the MMB (which was concerned by the losses caused by mastitis), scientists embarked on field trials of their herd eradication plan. The ARC set up a technical committee to co-ordinate this work, which took place at the RVC, the Hannah research institute in Ayrshire where S. J. Edwards had moved in 1934, and at two Scottish agricultural colleges.[31] Results were disappointing. This was explained later by the discovery of carrier cows that were infected but did not always shed bacteria in milk.[32]

[26] F. C. Minett, A. W. Stableforth and S. J. Edwards, 'Studies on bovine mastitis: i) The bacteriology of mastitis', *J. Comparative Pathology and Therapeutics* 42 (1929), pp. 213–31; E. Munch Peterson, *Bovine mastitis. Survey of the literature to the end of 1935* (1938).

[27] F. C. Minett and W. J. Martin, 'Influence of mastitis and brucella abortus infection upon the milk yield of cows', *J. Dairy Research* 7 (1936), pp. 122–44.

[28] F. C. Minett, A. W. Stableforth, S. J. Edwards, 'Studies on bovine mastitis: iii) The diagnosis of streptococcus mastitis', *J. Comp. Path. Ther.,* 43 (1930), pp. 163–88; Edwards, 'Diseases', pp. 291–99.

[29] Woods, 'Partnership'; Keir Waddington, 'To stamp out "so terrible a malady": bovine tuberculosis and tuberculin testing in Britain, 1890–1939', *Medical Hist.,* 48 (2004), pp. 29–49.

[30] A. W. Stableforth, 'Mastitis in dairy cows and its control', *J. Min. Ag.,* 41 (1934–5), pp. 945–55; Edwards, 'Diseases'; A. W. Stableforth and N. Scorgie, 'Entozon and acriflavine for the treatment of chronic contagious bovine mastitis', *VR* 50 (1938), pp. 661–76.

[31] TNA, JV 10/257, Report of conference on mastitis research, 20 May 1938 and ARC committee on mastitis: Report for the period ended 31 Dec. 1940; Timothy DeJager, 'Pure science and practical interests: the origins of the Agricultural Research Council, 1930–37', *Minerva,* 31 (1993), pp. 129–37.

[32] Agricultural Research Council, *Modes of spread of Streptococcus agalactiae infection in dairy herds* (1944).

In wartime, patterns of dairy farming shifted to more extensive production, as scarce shipping space and the loss of shipping to enemy action in the Atlantic reduced the supply of imported concentrate feed. While these changes constrained the keeping – and detrimental health impacts – of 'flying herds', labour shortages caused farmers to turn increasingly to machine milking, which was applied to one third of the cows in Britain by the end of the war. Due to the nutritional importance of milk and the capacity for its domestic production, dairy farming was actively encouraged by government. Producers received generous set prices and expert guidance on how to grow fodder crops.[33]

This effort to increase milk production resulted in the intensification of state-supported mastitis research. Multiple institutions conducted enquiries, including the government's Central Veterinary Laboratory (CVL), Weybridge, where A. W. Stableforth now headed the bacteriology department; the ARC's field station at Compton, where S. J. Edwards moved in 1939; the Hannah Institute; the East and West of Scotland agricultural colleges; the National Institute of Research in Dairying (NIRD), Reading; the Dick (Edinburgh) veterinary school and the Moredun Institute. Privately funded enquiries were carried out in the research laboratories of Boots and Burroughs Wellcome drug companies. Scientists met to report on their progress and future plans at an annual ARC 'mastitis conference' chaired by the director of the CVL, Thomas Dalling.[34]

Shortages of glassware, laboratory and advisory staff impeded the wartime continuation of inter-war bacterial testing for mastitis.[35] Instead, control was pursued under a clinically based scheme, proposed by the National Veterinary Medical Association and implemented by practising vets, who diagnosed mastitis on clinical grounds. Infected cows were segregated, milked last, and their udders infused with an anti-bacterial agent, acriflavine. Systemic symptoms were treated with government-subsidized sulphanilamide.[36] These measures were not particularly successful.[37] However, the development of penicillin offered scientists a new tool for achieving their existing goal of herd eradication. Due to the political and nutritional importance of milk production they were granted preferential access to this scarce drug. Mastitis therapy trials began in 1943 and gave promising results.[38]

Mastitis research remained a priority after the war as food shortages continued and producers strove to raise output. In 1945, scientists embarked on large-scale field trials of penicillin therapy in commercial herds located near the CVL (where A. W. Stableforth replaced Dalling as director in 1950), Compton and NIRD. Similar efforts were undertaken by the drug companies, Burroughs Wellcome and Boots. Researchers continued to share their findings at the annual mastitis conference. From working with the same herds over a number of years, they developed an understanding of the practices, priorities and psychology of farmers and

[33] Martin, *Modern agriculture*; Woods, 'Farm as clinic'.

[34] TNA, MAF 52/257, Diseases of dairy cattle: memo to milk production policy committee, April 1940; MAF 189/434, ARC conferences on mastitis, 1944.

[35] TNA, MAF 35/488, Notes on a scheme formulated by the mastitis committee of the ARC, 1940 and Minutes of meeting on livestock disease control, 20 Dec 1940.

[36] NVMA, 'Report on diseases of farm livestock', *VR* 53 (1941), pp. 3–14. For details of the scheme, which also included infertility, see Woods, 'Farm as clinic'.

[37] P. S. Watts, 'The practitioner and mastitis control under the national scheme', *VR* 55 (1943), pp. 175–9.

[38] S. J. Edwards and A. Brownlee, 'Therapeutic treatment of bovine mastitis', *VR* 55 (1943), pp. 335–43.

their workers. These insights guided their search for the simplest, cheapest, most effective penicillin preparations and dose regimes.[39]

Penicillin trials reasserted the bacteriological approach to mastitis control. Laboratory tests were used to identify cows infected with *Str. agalatiae* and to determine the effects of treating them with repeated doses of penicillin, a regime that became known as 'blitz therapy'. Drug companies facilitated these efforts by devising, in collaboration with field-based researchers, a straightforward method of administering penicillin via single-use intra-mammary tubes.[40] However their influence should not be overestimated because drug-centred, bacteriological approaches to mastitis pre-dated their involvement. Herd trials continued until 1953, by which time penicillin had been released for use by practising vets and was proving its worth.[41] In 1950–52, *Str. agalactiae* caused less than ten per cent of mastitis cases, compared to 80 per cent in the 1930s. Incidence had dropped to four per cent by 1956, and hundreds of herds were freed entirely of infection.[42]

This brief account shows that mastitis research in Britain was initially dominated by veterinary bacteriologists, who defined the disease as the product of udder invasion by *Str. agalactiae* bacteria. Unlike farmers and practising vets, they were not concerned with the fate of individual animals or with achieving clinical cure. Although production practices were widely associated with the mastitis problem, they did not attempt to investigate their contribution. Approaching mastitis as a bacterial infection of the herd, their preferred solution was to detect germs by bacteriological testing, and then eliminate them, initially by hygienic and later by pharmaceutical means.

II

Although *Str. agalactiae* incidence had reduced considerably by the 1950s, there was no reduction in the clinical and sub-clinical forms of mastitis caused by a different germ, *Staphylococcus aureus*. In fact its prevalence appeared to be increasing. The habitat of *Staph. aureus* was not restricted to the udder, allowing it to evade the effects of penicillin therapy.[43] The causes of increased prevalence provoked considerable debate. Some asked whether in eradicating *Str. agalactiae*, penicillin had somehow facilitated the emergence of *Staph. aureus*.[44] Others pointed to post-war changes in breeding and husbandry practices, which were prompted by government efforts under the 1947 Agriculture Act to bring stability to agriculture, and encourage expansion of output in the face of continuing food shortages.

[39] TNA MAF 189/434–6, Mastitis conference papers, 1944–47.

[40] Ibid., also A. W. Stableforth, 'Penicillin in str agalactiae infection: trials made in Britain in 1945 and 1946', *VR* 61 (1949), pp. 235–6.

[41] ARC Technical Committee on Mastitis, 'A method for the eradication of strep agalactiae', *VR* 67 (1955), pp. 410–11.

[42] MAFF, *Machine Milking* (Bulletin no 177, 1959), pp. 105–6.

[43] J. Berger and J. Francis, 'Mastitis in practice: epidemiology and bacteriology', *VR* 63 (1951), pp. 283–92; TNA MAF 189/664, Reports by D. L. Hughes and J. L. K. Pearson to mastitis conferences, 1952, MAF 189/665; D. Howell and C. D. Wilson, reports to mastitis conference, 1955.

[44] 'Report: management factors in the control of mastitis', *VR* 63 (1951) p. 211; C. D. Wilson, 'Factors that predispose to mastitis with special reference to milking technique', *VR* 70 (1958), pp. 159–66.



FIGURE 2. Milking pits and tandem units, 1956.

Farmer and Stockbreeder Collection. Reproduced with the permission of the Museum of English Rural Life, University of Reading.

In addition to an assured market and guaranteed prices, the 1947 Act offered increased access to capital grants. Some producers used these to erect separate hygienic dairies for machine milking (Figure 2) and labour-saving loose housing (Figure 3) where cows could exercise freely and be fed silage en masse. Higher yielding, specialist milk breeds, particularly Friesians (as in Figure 3) were adopted in place of dual purpose cows that could be used for milk or meat, while new artificial insemination services run by the Milk Marketing Board allowed producers to use proven bulls to father more productive offspring. The 1953 relaxation of controls on purchased feed encouraged a shift to pre-prepared rations, devised by feed companies on the basis of new scientific research. Together with the state-led control of bovine tuberculosis, and the mainstream application of antibiotics, these changes caused the national output of milk to rise 131 per cent above the pre-war average by 1952–3, while the milk output per cow rose from 560 to 675 gallons between 1939 and 1955 (Table 1).[45]

[45] Paragraph drawn from K. Russell, *The principles of dairy farming* (1953), ch. 1; Anon, *Animal health*; S. Baker, *Milk to market: forty years of milk marketing* (1973); Martin, *Modern agriculture*; Woods, 'Farm as clinic'; T. Corley and A. Godley, 'The veterinary medicines industry in Britain, 1900–2000', *EcHR* 64 (2011), pp. 832–54.



FIGURE 3. Cows on slatted floors, 1961.

Farmer and Stockbreeder Collection. Reproduced with the permission of the Museum of English Rural Life, University of Reading.

Commentators, who included some mastitis researchers, suggested that these 'unnatural' changes in breeding and husbandry, and the continuing uptake of machine milking, had upset the proper balance between animals, microbes and their environment.[46] They argued that selection for high milk yields had made cows less resistant to mastitis infection, and produced overdeveloped udders that were more susceptible to injury from slatted floors and faulty milking machines.[47] In this interpretation, bacterial mastitis was secondary to bad husbandry.[48]

Husbandry changes continued to accelerate in the next decade, as the near-achievement of national self-sufficiency in milk production caused the government to reduce its subsidies. In the 15 years from 1954/5 over 60,000 farmers chose to leave milk production, but those who remained were forced to become more efficient in order to survive. The search for economies of scale caused average herd size to rise to 33 cows by 1969–70, with no corresponding increase

[46] C. D. Wilson, 'Field control of mastitis', *State Veterinary J.,* 9 (26) (1954), p. 22.

[47] Wilson, 'Factors that predispose'; C. D. Wilson, 'Man, machines and mastitis', *VR* 75 (1963), p. 1312.

[48] TNA, MAF 189/666, Minutes of Scottish AIC committee on mastitis, 29 Oct 1958; MAF 189/666, J. W. Howie, correspondence to A.W. Stableforth, 19 Nov 1962. For a critique of this view, see F. H. Dodd, F. K. Neave, R.G. Kingwill, 'Control of udder infection by management', *J. Dairy Sci.,* 47 (1964), 1109–14.

in labour. The time available to tend to each cow fell from 124 to 88 hours per worker per year. Machine milking became almost universal, and some producers adopted new parlour systems like the herringbone in an attempt to use labour more efficiently. Ongoing selection for milk production and the continuing shift away from dual purpose to specialist milk breeds (Friesians made up 64.2 per cent of the national herd in 1965, compared to 40.6 per cent in 1955) caused output to increase to 780 gallons per cow per year by 1965. Milk was increasingly handled in bulk tanks rather than churns, and different forms of labour-saving cow housing emerged, including cow cubicles. This period also saw a growth in farm management techniques and services, as farmers sought to quantify their inputs and outputs, and rationalize their businesses.[49]

A series of disease surveys conducted in the late 1950s and early 1960s revealed the scale of the mastitis problem. Ten per cent of cows experienced clinical mastitis each year, of which 30 per cent was caused by *Staph. aureus*. Around 25 per cent of cows had sub-clinical mastitis at any point in time. This caused a 10 per cent drop in milk yield and an 11 per cent drop in solids-not-fat content, a measure that now influenced the price paid for milk.[50] Bacterial resistance to antibiotic therapy was increasing, and streptococcal infection soon returned to pre-penicillin levels. The leading veterinary expert on *Staph. aureus* mastitis, C. D. Wilson, voiced concerns that 'we shall be doomed to try out, use, and then discard one antibiotic after other until cows will be infected with some of the most resistant staphylococci known to man'.[51] Despite growing recognition of the limits to antibiotic therapy, its ease of administration meant that it remained popular with farmers and practising vets, to the extent that in 1963, 11 per cent of milk samples were found to contain antibiotic residues. This not only created problems for milk processors reliant on bacterial cultures for the manufacture of cheese. It also posed a new threat to the public's health. Contaminated milk endangered humans allergic to penicillin, and concerns emerged that antibiotic use in agriculture might promote resistance amongst human pathogens.[52]

Drug companies responded to this situation by seeking alternative anti-bacterial agents, while scientists at the ARC's Compton laboratory engaged in an ultimately fruitless search for vaccines.[53] A different approach was adopted by dairy bacteriologists and husbandry experts at the NIRD, including F. H. Dodd, F. K. Neave and R. Kingwill. Departing from the existing veterinary paradigm of germ-focused enquiries, they proposed, in 1949, to study the 'soil' as well as the 'seed' of mastitis. Whereas penicillin use had partially concealed the health impacts of changing dairy husbandry, they aimed to make these effects visible by approaching mastitis as a problem of management. They proposed to use identical twins to establish two

[49] Martin, *Modern agriculture*; G. F. Smith, 'Evaluating recent movements in the dairy industry', *VR* 84 (1969), pp. 388–90; Baker, *Milk to market*; K. Russell, *The principles of dairy farming* (seventh edn, 1974); O. Grant, 'The diffusion of the herringbone parlour' (University of Oxford, discussion paper in economic and social history, 1998).

[50] C. D. Wilson, 'The treatment of staphylococcal mastitis', *VR* 73 (1961), pp. 1019–20; D. Howell, C. D. Wilson and M. P. Vessey, 'A survey of the incidence of mastitis in dairy cows', *VR* 76 (1964), pp. 1107–12.

[51] Wilson, 'Staphylococcal mastitis'.

[52] Milk and Milk Products Technical Advisory Committee, *Report on antibiotics in milk in Great Britain* (1963); Bud, *Penicillin*, pp. 175–77.

[53] J. Carmichael *et al.*, 'The therapy of penicillin resistant mastitis', *VR* 62 (1950), pp. 55–8; C. D. Wilson, 'The present position with regard to bovine mastitis and a review of recent trials of various antibiotics', *VR* 66 (1954), pp. 775–88.

separate herds which could be kept under controlled conditions. The effects of different factors on cow susceptibility to mastitis would then be studied in turn.[54] Meanwhile, at the CVL, C. D. Wilson tested new antibiotic products, and worked with another vet, I. Davidson, on the 'ecology of mastitis staphylococci'. This involved bacteriological and epidemiological research into the sources of *Staph. aureus* and how milking influenced its spread.[55]

Drawing on wider epidemiological thinking,[56] knowledge of *Staph. aureus* epidemiology, and insights gained from working closely with dairy farmers, Wilson and the NIRD scientists developed a shared perspective on mastitis. Agreeing that 'straightforward infection isn't the whole story',[57] they saw it as the outcome of dynamic herd-level interactions between populations of germ parasites and their udder hosts. It required a 'stress factor' or 'trigger mechanism' to disturb the normal state of balance between host and parasite,[58] with disease occurring when 'sufficiently heavy infection is brought to sufficiently susceptible animals under conditions that will favour establishment of the infection in the bovine udder'.[59] Milking was heavily implicated, both in transferring germs between cows and inflicting mechanical damage on the teats, thereby enabling germs to invade. Correspondingly, scientists' investigations focused on the design, operation and use of the milking machine.[60]

This approach was less reductionist than of the earlier period. It did not focus simply on germs but also the milking process. Instead of eliminating germs from cows it sought their peaceful co-existence. However, curing the individual sick cow, and elucidating the causal role of wider management factors were again neglected as scientists continued to focus on herd health and production.[61] Already favoured by the growth in herd size and reduction in labour, this perspective was facilitated by a new method of detecting udder inflammation from the number of cells shed in milk. Devised in 1957, the California Milk Test (CMT) made sub-clinical mastitis visible. The results correlated with bacteriological testing and were considerably easier and cheaper to obtain. When applied to the bulk milk (the bulk milk cell count, BMCC), it indicated the mastitis status of the herd.[62]

In devising methods of controlling *Staph. aureus* mastitis, scientists kept the needs and perspectives of dairy farmers in mind, and sought ways of encouraging and empowering them

[54] TNA MAF 189/358, Mastitis conference meeting, 6 Dec. 1949.

[55] Wilson, 'Field control'; I. Davidson, 'The ecology of mastitis staphylococci', *State Veterinary J.,* 13 (39) (1958), pp. 36–40; Wilson, 'Staphylococcal mastitis'.

[56] R. Lovell, 'Epidemiology', *British Veterinary J.,* 121 (1965), pp. 421–6.

[57] TNA, JV 10/257, ARC conference on mastitis, 7 Oct. 1966.

[58] Wilson, 'Factors that predispose'; Dodd, Neave and Kingwill, 'Udder infection'.

[59] C. D. Wilson and I. Davidson, 'The control of staphylococcal mastitis', *VR* 73 (1961), p. 321.

[60] On udder management, see the papers by J. Oliver, F. H. Dodd and F. K. Neave in *J. Dairy Res.,* 23 (2) (1956). Many aspects of machine milking were researched at the NIRD during this period. See MAFF, *Machine milking.* On its relationship to mastitis, see F. H. Dodd and F. K. Neave, 'Milking machine rate and mastitis', *J. Dairy Res.,* 18 (1951), pp. 240–45; F. H. Dodd, J. Oliver and F. K. Neave, 'The effect of design of teat cup liners on mastitis incidence', *J. Dairy Res.,* 24 (1957), pp. 20–26.

[61] For the influence of these management factors on mastitis, see the document drawn up by the British Veterinary Association's Technical Development Committee: 'Controlling bovine mastitis', *VR* 77 (1965), pp. 612–22.

[62] Scottish mastitis researchers applied cell counting prior to the development of the CMT, but their methods were not widely accepted. TNA MAF 189/665, Minutes of mastitis conference, 26 Oct. 1955 and 21 June 1956. Blackburn reviewed the literature on the CMT in 'Reviews of the progress of dairy science', *J. Dairy Res.,* 25 (1958), pp. 494–5.

to act. Recognizing the limited time and money available for mastitis control, they sought simple, proven, cost-effective controls that would work in all production systems and against all germs.[63] Initially they focused on the proper use of the milking machine. In 1966, following promising experimental results, they began field trials in commercial herds of a simple, quick hygienic milking routine.[64] Although this reduced mastitis levels, scientists felt that farmers would be discouraged by its slow rate of progress, and so decided to incorporate antibiotics for treatment of clinical cases and of all cows at drying off. They also recommended regular cell counts, on the grounds that they would make mastitis visible, demonstrate herd-level effects of interventions, and thereby inspire and maintain farmers' interest in mastitis control.[65]

From 1968, these measures were piloted by a new Mastitis Research Unit established by the MMB, whose findings guided the development of a voluntary nationwide BMCC service.[66] In 1972, controls were codified and advertised to farmers and practising vets under a Mastitis Awareness Campaign, launched jointly by all organizations with an interest in milk production (including the National Farmers' Union, MMB, British Veterinary Association and pharmaceutical companies). This identified six action points. The first, good management, had not been subjected to scientific investigation, and was defined in vague terms as 'good housing, feeding and adequate bedding.' It was later dropped to produce what became known as the 'five point plan':[67] teat dipping in disinfectant after milking; prompt antibiotic treatment of clinical cases; antibiotic treatment of all cows when milking ceased before calving (known as 'dry cow therapy'); culling of chronically infected cows; annual testing of milking machines, and monthly bulk milk cell counts.[68]

Elements of this plan were adopted unevenly by livestock producers, and it was not an immediate success.[69] Slowly, however, in the 15 years from 1966, the national BMCC fell from over 600,000 to just over 400,000. The proportion of infected cows dropped from 50 per cent to 32 per cent, and the number of clinical cases from 150 to 70 per 100 cows per year. The plan was also taken up internationally, and widely regarded as an economic success.[70] High prices

[63] Dodd, Neave and Kingwill, 'Udder infection'; F. K. Neave, F. H. Dodd and R. Kingwill, 'A method of controlling udder disease', *VR* 78 (1966), pp. 521–3; R. G. Kingwill, F. K. Neave, F. H. Dodd, T. K. Griffin, D. R. Westgarth, C. D. Wilson, 'The effect of a mastitis control system on levels of subclinical and clinical mastitis in two years', *VR* 87 (1970), pp. 94–100.

[64] Similar measures were tested concurrently at Cornell University veterinary school. Kingwill *et al.*, 'Mastitis control system'; C. D. Wilson and R. G. Kingwill, 'A practical mastitis control scheme', *International Dairy Federation Annual Bulletin,* 85 (1975), pp. 422–38.

[65] C. D. Wilson, 'The mastitis awareness campaign in the United Kingdom', *State Vet. J.,* 29 (87) (1974), pp. 153–62. BMCCs were introduced into Northern Ireland in 1968 and Scotland in 1970, and formed the basis of mastitis control programmes in other countries. The EEC proposed to link measurements to the payments received for milk. J. K. L. Pearson, D. O. Greer, B. K. Spence, 'Mastitis control: the use of electronic cell counting methods', *VR* 90 (1972), pp. 485–6; TNA, JV 10/258, MMB, 'Mastitis: a brief review of incidence and control', 25 Jul. 1968 and Scottish MMB document, Mar. 1970.

[66] TNA, JV 10/258, MMB, Review of mastitis research unit, 1968–9.

[67] M. Green and A. Bradley, 'The changing face of mastitis control', *VR* 173 (2013), p. 518.

[68] The MMB started a milking machine testing service in 1966. Statistics in 1969 showed that 88 per cent of machines had at least one major fault. 'News', *VR* 85 (1969), p. 365; Wilson, 'Mastitis awareness campaign'.

[69] D. A. K. Thornton, 'The Southern Counties Veterinary Society Mastitis Control Scheme', *VR* 90 (1972) , pp. 68–71; Editorial, 'Controlling mastitis', *VR* 93 (1973), p. 527.

[70] Wilson and Richards, 'Survey'; Bradley, 'Survey'.

for cull cows, the ongoing decline in producer numbers (those leaving the industry often had above average cell counts), the rolling out of BMCCs to all producers in 1977, NIRD research into the actual costs and benefits of mastitis control, and threatened penalties for high cell count milk (eventually introduced in 1991) all contributed to this outcome.[71]

III

Concurrently with the implementation of the NIRD/CVL mastitis plan, a new form of mastitis rose to prominence. Caused particularly by coliform bacteria (*E. coli* and *Klebsiella*) and *Streptococcus uberis*, it was associated with acute clinical symptoms, which often occurred around calving time and could end in death. Cows that survived took time to recover and their milk output rarely returned to pre-infection levels. The condition was referred to as 'environmental mastitis' because the causative agents did not live on the cow. This meant that they were little affected by milking hygiene or dry cow antibiotics.[72] Compared to the sub-clinical forms of mastitis which could only be detected by the BMCC, environmental mastitis was more visible and costly. Farmers referred cases to practising vets, whose reports to the veterinary press alerted scientists to the scale of the problem.[73] The results of bacteriological testing showed that, whereas in the early 1940s these germs were present in less than two per cent of milk samples taken from clinically affected cows, in 1960 they were found in 9.8 per cent of samples, and around 50 per cent by 1975. On some farms they were responsible for up to 80 per cent of clinical mastitis cases.[74]

Environmental mastitis often occurred on large, intensive farms, where standards of mastitis control – as defined by adherence to the CVL/NIRD plan – were high. This finding drew attention, once more, to the continuing intensification of dairy production as a contributing factor to mastitis. While Britain's 1973 entry into the EEC temporarily eased economic pressures on farming by increasing the price of milk used for manufacturing, surpluses soon emerged. Subsidies were removed entirely in 1977, and in 1984, quotas were introduced. By then, there were only around 40,000 milk producers left in England and Wales. Dairy cow numbers fell slightly as herd sizes increased to an average of 98 cows in the south of the country and 59 in the north. Rotary parlours enabled faster milking, while producer retailers virtually disappeared. Selection for yield continued, and electronic methods of identifying cows were devised, which enabled precise quantities of feed to be delivered automatically at milking time. These developments raised average annual yields to well over 1000 gallons by 1985, from a national herd comprising 95 per cent Friesian cows.[75]

[71] C. B. Asby *et al.*, 'The benefits and costs of a system of mastitis control in individual herds' (University of Reading, Department of Agriculture, study no 17, 1975); TNA, JV 10/260; J. Booth, Reports to the MMB: Mastitis, 1972–76, JV 10/261, J. Booth, 'A review of the current mastitis situation', report no 618 to MMB, Nov. 1978.

[72] Bradley, 'Survey'.

[73] Technical Development Committee, 'Coliform and pseudomonad mastitis: epidemiology and control', *VR* 100 (1977), pp. 441–2; A. Marr, 'Bovine mastitis control: a need for appraisal?', *VR* 102 (1978), pp. 132–4.

[74] D. Howell, 'Survey on mastitis caused by environmental bacteria', *VR* 90 (1972), pp. 654–7; Technical Development Committee, 'Coliform'.

[75] K. Russell, *The principles of dairy farming* (tenth edn, 1985).

Some mastitis commentators suggested that these changes in cow genetics and management had increased susceptibility to environmental mastitis,[76] and that 'the concentration of large numbers of animals, frequently held under conditions of stress, could increase the danger of cross infection'.[77] Others asked whether dry cow antibiotic therapy had killed off harmless bacteria in the teats and udder, whose presence had stimulated the production of defensive inflammatory cells. American researchers, Schalm and Lasmanis, provided support for this view by showing that a BMCC of more than 300,000 could protect the udder against coliform mastitis. Such findings cast doubt on the merits of striving for ever-lower BMCCs, and on the CVL/NIRD plan itself, with critics asking whether, in the light of recent husbandry changes, its findings were still relevant. Some even suggested that farmers abandon it, as although sub-clinical mastitis would result, this was less costly and dramatic than the environmental form.[78]

Although they were forced to admit that environmental mastitis was a growing problem, CVL and NIRD scientists were not convinced by the evidence implicating antibiotics, and continued to uphold their plan, as did veterinary representatives of drug companies like Beechams which had invested heavily in the antibiotic control of mastitis.[79] While drug companies sought new antibiotic solutions,[80] scientists at the NIRD focused, once more, on preventing the dissemination and invasion of germs. Although for farmers and practising vets, environmental mastitis was a disease of individual cows, requiring management on a case by case basis, scientists still regarded it as a herd problem and continued to neglect its predisposing causes. However, in a new departure that may have reflected the wider recognition of environmental hazard as disease risk, they extended their gaze beyond the milking process, to the cow's immediate environment.[81]

On discovering that the usual source of *E. coli* was faecal contamination of the teat, which occurred mainly between milkings, scientists looked for ways of stopping germs from gaining access. While turning cows out to grass or reducing stocking densities could have achieved this goal, they deemed these measures to be impractical. Having identified an association between mastitis incidence and the bacterial population of the cow's bedding, they attempted to reduce bacterial numbers by changing the bedding material, disinfecting it, regulating its temperature (which influenced the speed of bacterial multiplication) and cleaning out regularly.[82] While these measures helped in some herds, environmental mastitis remains a problem to this day.

[76] J. O. L. King, 'Mastitis as a production disease', *VR* 91 (1972), pp. 325–30.

[77] G. C. Brander, 'Dairy herd environment and the control of mastitis', *VR* 92 (1973), pp. 501–06.

[78] Howell, 'Survey'; Technical Development Committee, 'Coliform'; A. Marr, 'Bovine mastitis control: a need for appraisal?', and subsequent correspondence, *VR* 102 (1978), pp. 132–4, 321, 369–70 and *VR* 103 (1978), p. 39.

[79] Wilson, 'Mastitis awareness campaign'; G. B. Brander, 'Bovine mastitis control', *VR* 102 (1978), p. 221; G. H. Yeoman, 'Bovine mastitis control', *VR* 102 (1978), pp. 291–2; A. J. Bramley, 'Bovine mastitis control', *VR* 102 (1978), pp. 447–8; A. J. Bramley and F. H. Dodd, 'Reviews of the progress of dairy science: mastitis control – progress and prospects', *J. Dairy Res.,* 51 (1984), pp. 481–512.

[80] H. Watkins and J. F. Buswell, 'The treatment of clinical mastitis with a combination of ampicillin and cloxacillin', *VR* 96 (1975), pp. 289–90.

[81] L. Nash, *Inescapable ecologies: a history of environment, disease, and knowledge (*Berkeley, 2006).

[82] A. J. Bramley and F. K. Neave, 'Studies on the control of coliform mastitis in dairy cows', *British Vet. J.,* 131 (1975), pp. 160–69; Technical Development Committee, 'Coliform'; Bramley and Dodd, 'Reviews'.

IV

Our analysis reveals that although mastitis was consistently regarded an important condition that merited intensive scientific research, it was not a uniform entity during the period 1927–80, but rather three different diseases that were problematized and investigated in turn. Each involved a different bacterial cause and was associated with changing production practices, themselves moulded by the economic and political context and public health concerns. While scientists tailored their research and control strategies to each of these three diseases, their activities also reveal certain continuities. Despite acknowledging that mastitis was more of a problem within intensive systems, their published research did not attempt to find out why, or to examine how production systems could be adjusted in order to enhance cow health. Although they gradually extended their gaze from the cow, to the milking machine and then to bedding, scientists consistently constructed mastitis as a problem of bacteria rather than flawed production systems, and focused their energies on tracking and controlling the germs responsible. Individual cows (and individual farmers) were similarly overlooked in their search for universally applicable, herd-level solutions.

So what did the scientization of mastitis control achieve? When viewed in isolation, the statistics give an impression of failure: 30 per cent of British cattle were reportedly infected in 1934, and 33 per cent in 1980.[83] However, the above frame-by-frame analysis permits a more nuanced reading. Both the antibiotic blitz therapy directed against *Str. agalactiae*, and the NIRD/CVL plan to manage *Staph. aureus* achieved some success in controlling the germs targeted. However, these gains were partially concealed by corresponding increases in mastitis caused by different germs. Therefore one possible interpretation of the achievements of mastitis research is that, like the nineteenth century cropping innovations studied by Paul Olmstead and Alan Rhodes,[84] it managed to shore up cattle health in the face of ongoing threats: scientists stopped the situation from getting worse.

However, it could also be argued that scientists' partial solutions contributed to the recreation and re-problematization of mastitis. While the causes and extent of antibiotic resistance are difficult to discern, scientists may have facilitated its development by promoting the routine use of antibiotics. Antibiotic therapy also generated public health concerns about milk residues, and was blamed, in the later 1970s, for increasing cow susceptibility to environmental mastitis.[85] In addition, by helping to tackle a disease that was already more of a problem in productivity oriented systems, scientists enabled producers to continue reshaping cow bodies and environments without worrying about the limits imposed by the disease. They thereby helped to create conditions conducive to the emergence of a different form of mastitis, which then became the subject of renewed scientific research. In this way, mastitis research, production practices and cow health were co-constructed.

In this process of co-construction, the scientization of livestock production was coupled with

[83] Bradley, 'Survey'.

[84] A. Olmstead and P. Rhodes, 'Biological innovation in American wheat production: science, policy and environmental adaptation', in S. Schrepfer and P. Scranton (eds), *Industrialising organisms* (2004), p. 70.

[85] Bramley and Dodd, 'Reviews'.

the 'productivization' of science. Internalizing the goals and values of productivity-oriented dairy farming, mastitis researchers aimed not to improve cow health as an end in itself, but rather to tackle its detrimental effects on milk production. From the outset, their research was inspired by the high prevalence of infection, which was mostly sub-clinical and therefore evident only in reduced milk output. Managing the highly visible and costly effects of mastitis in individual animals was left to the practising veterinary surgeon. Public health concerns also stimulated research, but mainly by alerting agricultural interests to the prospect of reduced consumption of, and confidence in milk, to the detriment of farming profits. Public health experts did not participate in mastitis enquiries. The key figures were veterinary bacteriologists and dairy husbandry experts, who were oriented towards farmers and the state. Their field trials brought them closely into contact with producers, who were under considerable pressure to increase the volume and efficiency of milk output. Such pressure was exerted by market forces, which the government manipulated during and after the Second World War through its subsidy regime, while simultaneously funding research that could help farmers to achieve these ends. In accordance with the goals of their government funders and farming audiences, scientists tailored their mastitis investigations to meet the objectives of modern, intensive production.

This finding suggests a further interpretation of the achievements of mastitis research: scientists' partial solutions actually succeeded because, during the period under review, milk production per cow doubled in spite of the continuing prevalence of mastitis (Table 1). Of course mastitis control was not the only factor responsible for increased productivity. Many other innovations occurred concurrently. But, in tackling a disease that was known to be more of a problem in intensive systems, scientists helped these systems to survive and progress, thereby facilitating the pursuit of productive efficiency.

V

The 'productivization' of mastitis research helps to explain why scientists approached it in the ways that they did, and to resolve the apparent paradox whereby they recognized the role of intensive systems in producing mastitis, yet ignored such systems in their research. When viewed from the perspective of production, their construction of mastitis as a herd-based problem rather than a disease of individual cows makes perfect sense because cumulatively, its sub-clinical effects on herd milk output were more costly than its individual clinical effects. Inspired by the standardization of cow bodies and environments within intensive systems, scientists sought standardized methods of mastitis control that would prove both practical and profitable to the farmer. Realizing that changes to the farming system might reduce mastitis but at the cost of other efficiency gains, they focused on tracking, controlling and killing whichever germ was responsible for mastitis at that time, an agenda that was facilitated – but not driven – by drug company efforts to devise additional, more effective antibiotic preparations.

However, while the values and objectives of productivist agriculture certainly moulded mastitis research and control, they cannot fully account for it, because as recent studies have shown, there was no single, unidirectional route to greater farming productivity. In pig farming, for example, producers sought greater efficiency in a variety of ways, ranging

from high input–high output indoor systems of production, to low input–low output outdoor methods.[86] The analysis of scientists' unpublished discussions reveals that they too faced choices in how to investigate and control mastitis for the purpose of increasing milk production. Their ultimate focus on bacterial causes and standardized solutions was not inevitable.

Throughout the 1940s, Tom Dalling, head of the ARC mastitis conference, argued that mastitis research and control should pay more attention to the contributing roles of management, overstocking, driving cows, accidental injuries, soiled litter, poor hygiene and milking technique.[87] Alongside efforts to identify the optimal use of penicillin in mastitis control, he oversaw a number of farm surveys which aimed to correlate mastitis incidence with husbandry factors. The results – which were never published – were not clear cut. It transpired that the growing availability of penicillin left few herds in which the 'natural' course of mastitis could be studied, while ongoing changes in husbandry systems made it virtually impossible to isolate the effects of one management factor from the others. Due to these difficulties, the optimism surrounding penicillin, and the belief that without the germ there was no disease, this approach was abandoned.[88]

As already noted, in 1949 NIRD researchers planned to study the relationship between mastitis and management. However, they, too, found it difficult to draw meaningful deductions from the herd history of mastitis.[89] Discovering that mastitis was often absent from herds with defective milking machines, yet present in apparently well-run herds, they resisted its definition as a problem of management, not least because husbandry methods were in flux and good management meant different things to different people. They argued that while associations between mastitis and particular production practices were easily drawn, it was far harder to demonstrate causality. Only controlled experiments could reveal what factors were implicated, and which interventions worked. From their knowledge of mastitis epidemiology, they saw the milking machine and milking process as good places to start.[90]

At the CVL, scientists also showed interest in going beyond germs when considering the causes of mastitis, but their proposal to study the influence of nutrition was rejected on the grounds of cost.[91] The MMB, which promoted the use of the Bulk Milk Cell Count as a herd-level indicator of mastitis, attempted to relate the results to farm management, but the wider questions it raised about the influence of hormones, husbandry and inherited resistance fell beyond its remit to investigate as a near-market organization.[92] Various researchers suggested trying to breed mastitis-resistant cattle, but this was not pursued due to the lengthy, difficult nature of research, and concerns about a possible conflict with high yields.[93]

[86] A. Woods, 'Rethinking the history of modern agriculture: pig production in mid-twentieth century Britain', *Twentieth-Century British History,* 23 (2012), pp. 165–91; Theunissen, 'Breeding without Mendelism', Theunissen, 'Breeding for production'.

[87] TNA, JV 10/257, ARC committee on mastitis: Report for the period ended 31 Dec. 1940; Woods, 'Farm as clinic'.

[88] TNA MAF 189/358, MAF 189/436–7, Mastitis conference papers, 1944–49; S. Hignett, 'Farm health problems', *VR* 67 (1955), p. 900.

[89] J. Oliver, F. H. Dodd and F. K. Neave, 'Infection and mastitis in a dairy herd', *J. Dairy Res.,* 23 (1956), pp. 169–80.

[90] C. D. Wilson and F. H. Dodd, 'Mastitis', *VR* 75 (1963), pp. 1311–26; Dodd, Neave and Kingwill, 'Udder infection'.

[91] Wilson, 'Man, machines and mastitis'.

[92] TNA, JV 10/257, MMB report, 16 Nov. 1964.

[93] J. O. L King, 'Mastitis'; C. D. Wilson, 'Looking to the future in dairy science', *VR* 96 (1975), p. 22; Bramley and Dodd, 'Reviews'.

These examples show that, while enhanced milk production was an overarching goal of mastitis research, the decision to pursue it through germ-focused enquiries rather than wider frames of reference was based essentially on pragmatism. Located within organizations that were primarily concerned with near-market research, the causal roles of genetic and husbandry factors were simply too complex, too difficult and too costly for scientists to study. Investigating the bacterial causes of mastitis promised quicker and more commercially viable results.

Scientists' search for standard, universally applicable mastitis solutions was not an inevitable consequence of this approach. While they agreed that more intensive systems required more standard animals, they repeatedly acknowledged the individuality and diversity of cows, germs and stockmen. They often observed that there were multiple strains of *Staph. aureus*, whose different degrees of pathogenicity could affect the outcome of scientific trials.[94] Natural variation in cow susceptibility meant that they responded differently to hygienic and antibiotic interventions. Therefore the results of research in one herd could not necessarily be applied elsewhere, especially as scientists also differed in their methods, such that 'sampling procedure and timing, the design of trials, vested interests, and even optimism and pessimism are only a few of the factors which steer us towards results at variance'.[95] Cows also varied in their milking habits.[96] As C. D. Wilson pointed out in 1963, 'there is no such thing as a standard cow giving a standard volume of milk through a standard teat orifice': each milked at different rates. Leaving the machine on for a fixed amount of time might suit one cow, but could predispose others to mastitis by damaging their udders. The men who oversaw this process possessed varying degrees of an indefinable quality known as good stockmanship, which brought the 'human element' to bear on the incidence, spread and control of mastitis.[97]

Such variability and individuality contributed to the complexity of the mastitis problem. It led J. K. L. Pearson, a mastitis scientist working for the Northern Ireland government, to reject the philosophy of universal mastitis controls, in favour of individualized approaches that considered in turn the range of factors known to influence the disease.[98] However, while NIRD and CVL scientists agreed that 'understanding the causes [of difference] is probably the key to further improvements of the mastitis control system',[99] they chose not to investigate this matter. This was not simply because they thought that uniform controls would be more effective in promoting production, but because again, pragmatics won out. Instead of engaging with real-world complexity, they chose to simplify it, through a narrow focus on udders, germs and milking.

VI

In analysing the shifting identity of bovine mastitis, and scientists' multiple attempts to investigate and control it within the wider context of agricultural change, this article has illustrated the co-constitution of agricultural science and production. For the purposes of

[94] Wilson, 'Man, machines and mastitis'.

[95] J. K. L. Pearson and C. L. Wright, 'Dry cow therapy as a means of controlling bovine mastitis', *VR* 84 (1969), p. 297.

[96] F. H. Dodd, *Machine milking: the relationship between man, cow and machine* (1975).

[97] Wilson, 'Man, machines and mastitis', p. 1317.

[98] J. K. L Pearson *et al.*, 'Factors involved in mastitis control', *VR* 91 (1972), pp. 615–24.

[99] Kingwill *et al.*, 'Mastitis control system', p. 100.

mastitis control, milk production methods were scientized, while at the same time mastitis research was productivized. Influenced by the values and objectives of modern dairy farming, scientists constructed mastitis as a problem of production rather than health. Although mastitis prevalence remained high, their research did not fail because it facilitated the shift towards more intensive systems of milk production.

While important, productivism alone cannot explain the direction of scientists' research and their preferred mastitis solutions. Although their published papers give the impression that investigations and interventions unfolded in a logical, self-evident manner, scientists' unpublished and informal discussions show that there was no straightforward embrace of productivist agendas. Rather, scientists recognized multiple routes to productive efficiency, brought pragmatic considerations to bear on choosing between them, and acknowledged the tensions and problems associated with this choice. These findings add important nuances to the dynamic relationship between science and production. They help to explain how and why modern dairy production assumed the shape that it did, and the manner in which scientists contributed to this process.

The emergence of agribusiness in Europe and the development of the Western European broiler chicken industry, 1945 to 1973

by Andrew Godley

Abstract

This article presents new data on the emergence and growth of the leading Western European poultry industries after 1945. It shows that those countries where poultry output grew most quickly – especially the UK, Italy and Spain – were also the countries where the agricultural sectors adopted US technologies and US agribusiness organizational structures most vigorously. Elsewhere in Western Europe, poultry output grew much less quickly and the adoption of agribusiness structures lagged behind. By contrast, the poultry sector in the USSR was based on the Soviet collectivist system. This was the largest poultry sector in Europe, but also much less efficient. The article suggests therefore that the diffusion of agribusiness and the increase in poultry output were deeply entwined across Europe, with potentially important consequences for the different roles and impacts of agribusiness in Europe.

On 28 May 1964, the President of the Soviet Union, Nikita Khrushchev, visited the Cobb Breeding Company's stand in the British Agricultural Pavilion in the Park of Economic Achievement of the People of the USSR in Moscow. There he marveled at the genetic advances that enabled Cobb-bred broiler chickens to be so productive. Historians recently discovered that the encounter prompted Khrushchev to write a long memorandum to the Presidium of the Central Committee of the Communist Party of the Soviet Union, admonishing Soviet scientists for being insufficiently attentive to solving the problems of Soviet agriculture. Given the Cold War context, Khrushchev's rebuke was remarkable, praising the 'capitalists' of Cobb, who, by contrast, represented 'a high minded approach to poultry husbandry'.[1]

[1] Roger Ransom, 'Cobb's early lesson in capitalism', at http://www.thepoultrysite.com/poultrynews/16168/cobbs-early-lesson-in-capitalism (accessed 3 Sept. 2013). The memorandum is dated 18 July 1964. Ransom's article is drawn from correspondence between Wim Dekkers, of Cobb Germany, André Gerrits, of the University of Amsterdam, and Professor Sergei Khrushchev, son of the former Soviet leader, of Brown University, Providence, Rhode Island. This correspondence was also sent to Professor Hoyle who showed it to the author, indirectly precipitating this article. This correspondence also includes a letter from Professor Nils Roll-Hansen, University of Oslo, outlining the context of the memo, and the politicization of Soviet science during the Khrushchev era, with specific reference to the Lysenko controversy. See email correspondence Wim Dekkers (Cobb-Germany) to Richard Hoyle, 25 Mar. 2008. Cobb, then headquartered in Massachusetts, had opened a British subsidiary in 1961, hence its stand on the British pavilion. Khrushchev reputedly had a lifelong interest in poultry.

The episode is revealing because Khrushchev's response to the Cobb broiler chicken was born out of the deep crisis in Soviet farming in 1963 and 1964. While little was known about it at the time in the West, Soviet grain production suffered during a prolonged drought in 1963, and, in the absence of feed grains, Soviet poultry meat output fell by a quarter in 1964 (see Table 1 below).[2] Collectivism appeared to be less successful at providing food than capitalism, and partly, according to Khrushchev's memo, because of the relative failings of Soviet science.

However, the capitalist agriculture that had produced the Cobb broiler chicken was markedly different to the capitalist organization of agriculture that had been prevalent only a few years earlier. It was Cobb, and indeed the poultry sector as a whole, according to the renowned British agricultural commentator, Geoffrey Sykes, that was responsible for introducing the term *agribusiness* into Europe.[3] Agribusiness was an American term, coined to describe a critically important innovation in the organization of food production, the rapid move to vertical integration and increasing use of technology in many areas of US agriculture in the 1950s. It was this form of capitalist agriculture that had prompted Khrushchev's admiration.

After an extended visit to Harvard in 1952, Sykes had come away impressed with the US poultry sector.[4] While at Harvard, Sykes must have attended some early lectures by John H. Davis, who created the Agribusiness programme at Harvard Business School from 1955.[5] Davis was articulating the view that applying new technology within larger and more integrated firms held significant advantages for agricultural producers in marketing. While it was widely understood that increasing investment in technology and exploiting economies of scale led to production efficiencies, the advantages of the agribusiness model lay more in the ability it gave producers to reduce price volatility. The risks faced by small producers in selling agricultural output in spot-markets were well understood. Indeed both Soviet Collectivization and the late nineteenth-century agricultural co-operative movements in Europe can be understood partly as organizational responses to the problems of marketing perishable foods.[6] Agribusiness was a new response to an old problem.

[2] Ransom, 'Cobb's early lesson', fails to mention the wider context of the Soviet agricultural crisis. Naum Jazny, 'Production costs and prices in Soviet agriculture', in Jerzy F. Karcz (ed.), *Soviet and East European agriculture* (1967), pp. 212–34, notes the fall in output but offers no explanation (p. 277, n. 40). It is my speculation that the dramatic fall in Soviet poultry meat output was caused by a shortage of feed grains.

[3] Geoffrey Sykes, *Poultry: a modern agribusiness* (1963). This is an important book, articulating the economics of the modern poultry industry better than anyone hitherto. Sykes had written many articles for the trade journal *Poultry Farmer and Packer* from 1953 onwards, which show the evolution of his thinking.

[4] The biographical information is taken from the jacket of Sykes, *Poultry*. Also see Sykes, 'Letter to the Editor', *AgHR* 18 (1970), p. 51.

[5] And subsequently developed the highly influential *Concept of agribusiness* (1957), co-authored with Ray Goldberg. See Shane Hamilton, 'Agribusiness, the family farm, and the politics of technological determinism in the post-World War II United States', in *Technology and Culture,* forthcoming.

[6] Bruce Gardner, *American agriculture in the twentieth century: how it flourished, what it cost* (2002), pp. 165–7 emphasizes productive efficiencies, p. 175 on gains through marketing. Hamilton, 'Agribusiness'. Co-operatives were organizational innovations to enhance production efficiencies as well of course. Eva Fernandez, 'Selling agricultural products: farmers' co-operatives in production and marketing, 1880–1930', *Business Hist.* 56 (2014), pp. 547–68; A. Carlos Morales Gutiérrez, Teresa Romero Atela and Dolores Muñoz Dueñas, 'A comparative synthesis of twentieth-century agricultural cooperative movements in Europe', *J. Rural Cooperation* 33 (2005), pp. 47–65; Koen Frenken, 'The evolution of the Dutch dairy industry and the rise of co-operatives. A research note', *Eindhoven Centre for Innovation Studies*, Working Paper 13.07 (2013).

Agribusiness diffused throughout Western Europe in the 1960s and 1970s. This coincided with the development of the EEC, and so agribusiness became a central element in the growing controversies surrounding the Common Agricultural Policy in the 1980s, on whether European policy had been captured by large corporations rather than rural societies, for example.[7] As agribusiness organizational structures spread around Europe, it also became apparent that there were differences between countries' industrializing food supply systems.[8] These differences in organizational structures in turn influenced the positions adopted by different EEC nations in policy debates. Understanding the origins and development of agribusiness in Europe may therefore contribute to a better appreciation of both the evolution of food systems within Europe and their relationship with the policy debates and controversies in European agriculture over the past half century. The origins of this organizational innovation in the United States can be traced to dairying and fruit growing. But this article follows Geoffrey Sykes' observation that the birth of agribusiness in Europe was associated with the diffusion of the broiler chicken.

The article presents new data on the emergence and growth of the leading European poultry industries after 1945, and shows that those countries where poultry output grew most quickly – especially the UK, Italy and Spain – were also the countries where the agricultural sectors adopted both US technologies (like the Cobb broiler chicken) and US agribusiness organizational structures most vigorously. Elsewhere in Europe, where co-operatives remained influential, or where central wholesale markets remained important as clearing houses, poultry output grew much less quickly. The article suggests therefore that the diffusion of the agribusiness type of organization of agriculture and the increase in poultry output were, as Sykes claimed was the case for the UK, deeply entwined across Europe, with potentially important consequences for the different roles and impacts of agribusiness across European nations.

In Section I, the article returns to Khrushchev marveling at the Cobb broiler chicken in Moscow in May, 1964. While the Soviet poultry industry was then the largest in Europe by some distance, it had been dramatically overtaken by the US poultry sector, with its novel broiler chicken breeds, during the 1950s. Section II is a data-driven exercise in identifying the exact periods that broiler chicken output began to take off in Western Europe. This is then followed by a discussion of the different institutional paths taken by the emerging poultry industry centres of Europe, contrasting the British agribusiness model (in Section III) with the cooperative association models that remained so influential in northern Europe (Section IV) but which saw only relatively slow growth in poultry output, before going on to consider (in Section V) a group of countries that moved from very traditional farming to agribusiness systems in poultry very quickly – it was these economies that went on to become Western Europe's leading centres for poultry industry output by 1973. Section VI concludes the article with a discussion and suggestions for further research.

[7] John Gray, 'The Common Agricultural Policy and the re-invention of the rural in the European Community', *Sociologica Ruralis* 40 (2000), pp. 30–52.

[8] David Burch and Geoffrey Lawrence (eds), *Supermarkets and agri-food supply chains* (2007).

TABLE 1. Chicken Meat Output in Selected European Nations, 1956–1973 (tonnes)

	1956	*1957*	*1958*	*1959*	*1960*	*1961*	*1962*	*1963*	*1964*
USSR						813000	822000	802000	606000
France		225000	265000	305000	350000	439000	458000	494000	531000
United Kingdom	139000	157000	179000	229000	275000	294000	307000	306000	326000
Italy	84000	98700	140000	180000	221600	246700	292600	341400	410400
West Germany		80000	88000	96000	124000	150100	150200	164000	185400
Netherlands		47600	56200	70400	70000	84000	98413	104800	127598
Spain		12000	12000	12500	13000	79100	107200	185000	210600
Denmark	24000	23000	35000	45000	60750	76500	84000	77600	90100
Belgium–Luxembourg		44500	48700	54000		70212	80481	81399	85979
Sweden		10335	10900	11800		19000	17000	19000	18800

Note: the order of nations is by output in 1961, the first year of the United Nations series of data. The nations listed are the nine leading producers of chicken meat in West Europe in 1973, along with the USSR, for the purposes of comparison. Were the table to include other East European nations, then Poland, Romania, Hungary, Bulgaria and Yugoslavia all attained higher output than Sweden in 1961, and so would be included.
Sources: For all years from 1961 onwards: Food and Agriculture Organization of the United Nations (FAOSTAT) http://faostat3.fao.org/home/index.html. Before 1961 figures are for chicken meat: from this date onwards, the table gives figures for *all* poultry meat. Data for earlier years are drawn as follows. France: 1960 from OECD, *Survey*, 1961, p. 116 (deadweight uneviscerated); 1957 inferred from Talbot, *Chicken*, p. 12 (Talbot states that French output was almost half EEC6 output in 1957) and OECD, *Survey*, for the output of the other EEC6 nations; 1958–60 values are straight-line (SL) interpolations to the nearest 5000. Netherlands: OECD, *Survey*, p. 145, reports liveweight totals for 1957–9; these have been deflated to 80% (following the formula reported on p. 125); note that this broadly agrees with Talbot, *Chicken,* p. 12, which states that Dutch output doubled between 1957 and 1961. West Germany: OECD, *Survey*, p. 125 for 1957–59; 1960 is a SL interpolation. Spain: Clar, email to author 12 July 2013, with 1957 SL interpolation for 1954 (unreported here) and 1960 observations. UK: Richardson, *Poultry*, Table II for pre-war, 1946/7, and 1953/4 values; 1957–60 values all from OECD, *Survey*, p. 172. Italy: Tessari and Godley, 'Poultry', Table 2 for 1957 and 1960; 1958 and 1959 are SL interpolations; 1956 is also a SL interpolation between 1955 (not reported here) and 1957; 1955 value from OECD, *Survey*, p. 142. Denmark: OECD, *Survey*, p. 105, Table II – 'Disposal' – includes all poultry – for 1956–59; 1960 value is a SL interpolation. Sweden: OECD, *Survey*, p. 156 for 1958–59. Belgium: OECD, *Survey*, p. 98 – all poultry.

I

Khrushchev's Cobb memorandum was a footnote in the growing crisis in Soviet agricultural production, a crisis which contributed to Khrushchev being deposed and replaced by Leonid Brezhnev in October 1964. USSR poultry output was already enormous in the 1930s, and by 1961 it dominated the rest of Europe (see Table 1). Soviet poultry farming was organized around large flocks of dual-purpose birds, producing both eggs and meat, the meat either from redundant cockerel chicks or, more frequently, spent laying hens. Poultry farming had

TABLE 1. *continued*

	1965	*1966*	*1967*	*1968*	*1969*	*1970*	*1971*	*1972*	*1973*
USSR	696000	745000	764000	817000	866000	1071000	1183000	1237000	1295000
France	555000	389500	401350	404800	494572	523357	535678	588174	618344
United Kingdom	341000	369000	402000	456200	477500	494800	501000	556800	552000
Italy	490100	527500	507100	528700	535900	561000	543000	579000	641000
West Germany	192000	213400	240400	250000	267800	299100	326600	327200	366800
Netherlands	150650	183000	206000	220000	245000	292000	319000	328000	339000
Spain	231400	302600	350350	347540	382800	496000	474000	551000	597000
Denmark	78100	60300	58500	56500	60700	70100	70900	75800	80100
Belgium–Luxembourg	92012	95928	99465	101316	102774	112102	111611	109901	114814
Sweden	20200	20600	26400	27800	26000	24500	25500	29700	33000

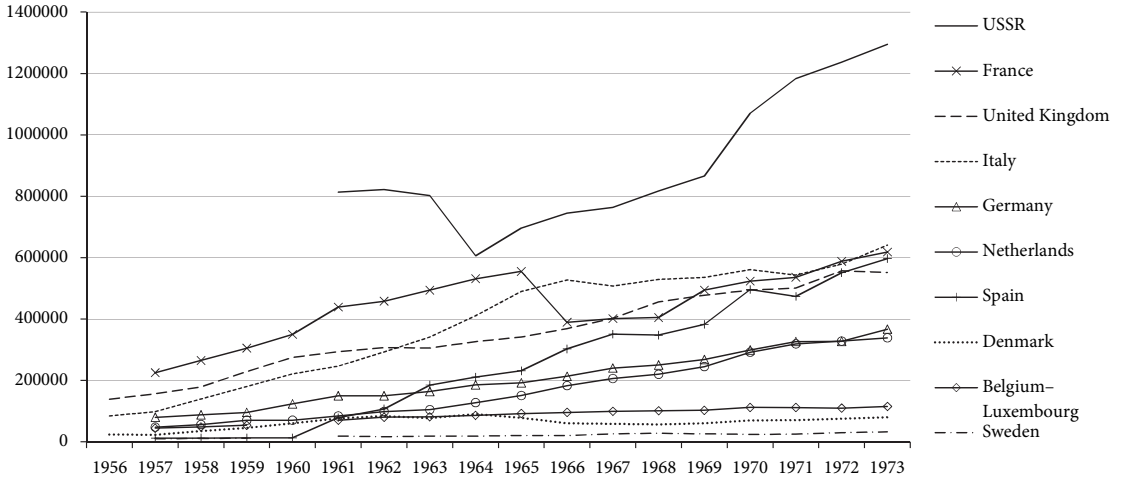


FIGURE 1. European chicken meat output, selected nations, 1956–63

Source: drawn from Table 1.

increased quickly in the 1930s, with poultry meat providing significant export earnings.[9] During World War Two the USSR poultry population fell by half, but then quickly recovered.[10] By 1961 Soviet egg production totaled 23.5 billion, twice that of the UK, and three times that of

[9] Stuart Thompstone, '"Bab'ye Khozyaystvo": poultry-keeping and its contribution to peasant income in pre-1914 Russia', *AgHR* 40 (1992), pp. 52–63; and *Poultry Farmer* 16 Jan. 1954 on UK pre-war imports of poultry meat from Hungary, Lithuania and Russia.

[10] Gregor Lazarcik, 'The reformation of Czechoslovak agriculture since World War Two', in Karcz (ed.), *Soviet*, pp. 385–406, esp. p. 396.

France.[11] But the increase in the scale of output masked underlying problems in the efficiency of Soviet poultry farming. Poultry farming on any scale is dependent on animal feeds, and the Soviet agricultural model was increasingly unable to deliver the necessary surpluses over human grain consumption required for animal feed to remain cheap. USSR feed costs were estimated to be more than 50 per cent higher than in the US in the late 1950s and early 1960s.[12] Moreover, dual-purpose chickens took much longer to reach slaughter weight than the increasingly efficient US broilers.[13] More expensive feed fed to birds for a longer period added up to Soviet poultry meat prices in 1960 being estimated as five times higher than in the US.[14] When Khrushchev focused on what to him seemed the remarkable feed conversion ratio of the Cobb broiler chicken, of around two pounds of feed required to produce each pound of poultry meat, it reflected his acute awareness of the vulnerability of the Soviet agricultural system to increasingly perilous grain output.

From an American perspective, however, the irony of Khrushchev latching on to the Cobb broiler was undoubtedly that other breeds were even more productive and commercially successful during the 1950s.[15] These included Vantress, Hubbard, Arbor Acres and, of particular importance for the emerging European poultry industries, Nichols.[16] Nichols strains delivered such superior feed conversion ratios that they priced competing strains out of the market. With feed costs forming 60 to 70 per cent of the total costs of rearing birds, the feed conversion rate was the single most important indicator of commercial viability. Nichols birds also had low mortality rates and, critically, produced meat that European consumers were increasingly happy to eat, as can be inferred from Table 1.[17] Nichols distributed its birds across Western Europe through its two European subsidiaries, Chunky Chicks (Nichols), located just outside Edinburgh, and Nichols Lohrmann of Cuxhaven, near Hamburg, West Germany, and several franchisees.

Table 1 confirms that the Soviet chicken meat production ran at a higher level than any of

[11] *Poultry Farmer and Packer*, 16 May 1962. UK 1961 output was 12.4bn eggs, French 8.5bn eggs.

[12] Jazny, 'Production costs', pp. 223–4.

[13] Ibid., p. 232. Margaret Derry, *Art and science in breeding: Creating better chickens* (2012), pp. 154–77.

[14] Jazny, 'Production costs', p. 227.

[15] Cobb, established in 1916 in New Hampshire as a laying hens breeding company, entered the broiler market in the late 1940s/early 1950s, no doubt inspired by the successive 'Chicken of Tomorrow' contests of 1948 and 1951. See Roger Horowitz, *Putting meat on the American table: taste, technology, transformation* (2006), ch. 5. Also more generally on the US developments, see William Boyd, 'Making meat: science, technology, and American poultry production', *Technology and Culture*, 42 (2001), pp. 631–64; and Kathy J. Cooke, 'From science to practice, or practice to science? Chickens and eggs in Raymond Pearl's agricultural breeding research, 1907–1916', *Isis* 88 (1997), pp. 62–86. By 1956 Cobb was selling broiler chicks throughout the US. In 1961 it opened its first overseas subsidiary, in conjunction with Anglian Hatcheries, establishing Cobb Breeding Co. UK. The UK subsidiary went on to become a global force in the late 1960s and 1970s. Cobb was acquired by the pharmaceutical company Upjohn in 1974, and is now a part of the Cobb-Vantress division of Tyson Foods. See Redcomb Genetics, Poultry industry histories, http://www.redcomb.co.nz/ (accessed 10 Sept. 2013).

[16] Hubbard opened its first European subsidiary in Belgium in 1962: *Poultry Farmer and Packer*, 1 Aug. 1962. Nichols was one of the first commercial broiler breeders in the US, beginning in 1938. By the end of the 1950s over 40% of female broilers worldwide were Nichols stock, see Redcomb Genetics, web reference as in n. 15. Arbor Acres and Nichols merged in the summer of 1960, *Poultry Farmer and Packer*, 9 July 1960.

[17] *Poultry Farmer and Packer*, 16 May 1962, p. 29. In time the Feed Conversion Rate was superseded by Low Cost Feed Formulation calculations, see *Poultry World*, 26 July 1973, p. 26.

its Western European peers until the early 1960s (and again after its 1964 crisis). Table 1 also shows how poultry output began to increase rapidly in the late 1950s and 1960s in all West European countries. Some countries, notably the UK, Italy and Spain, saw their poultry sectors grow from very small beginnings to become European leaders by 1973. By contrast French output, initially the largest in Western Europe by some distance, suffered a sharp collapse in the mid- to late-1960s, only exceeding its 1965 output by 1972. Finally it is worth noting that several countries, including Germany, the Netherlands, Belgium, Denmark and Sweden, all began with established poultry sectors in the 1950s but experienced only relatively slow growth (or even decline) in output over the period. By 1973 the leading poultry meat producers in Western Europe were Italy, France, Spain and the UK, the production of which, in aggregate, exceeded the output from the Soviet industry.

II

While Table 1 gives a clear picture of broiler chicken output in Europe by 1973, making any similar inferences about the late 1950s and early 1960s may be problematic. Partly this is because statistics of poultry output before the early 1960s were only haphazardly collected across Europe.[18] But mostly it is because of the inability to disaggregate the new meat-producing broilers from the traditional table poultry output within these figures, at least until the broiler flocks became utterly dominant everywhere after, say, 1964 or 1965.

Before the late-1950s, the European poultry population was overwhelmingly a population of egg-laying, not meat-producing, birds. Meat production was a by-product of the egg business. The additional income received for chicken meat from spent layers and redundant cockerels was not insignificant, and had the effect of subsidizing egg prices somewhat.[19] But in Western Europe until the late 1950s the specialized meat-producing sector was very small. Instead European poultry farmers overwhelmingly focused on these dual-purpose birds and so followed what the OECD described as 'traditional' poultry-farming methods.[20] Specialist chicken meat production was confined to smallholders in a few regions (notably in southern England, France and Italy) where chicken cramming was a traditional trade.[21] The imperative to adopt agribusiness organizational structures only arrived with broilers.

The very first broilers introduced to Europe were a small number of Nichols birds brought into Scotland by Rupert Chalmers Watson (of Chunky Chicks) in 1949. Numbers remained trivially small until the mid-1950s, when broiler growing began to increase in the UK, followed then by experiments in Netherlands, Germany, Scandinavia and Italy. The increase in these

[18] OECD, *Survey on the organisation of marketing poultry meat with special emphasis on broilers* (OECD Documentation in Food and Agriculture, 58, 1961), p. 1 includes the caveat about the scarcity of reliable statistics for several European countries.

[19] National Farmers Union, Report on Marketing (1957), p. 6.

[20] This is the overwhelming conclusion of the 1961 OECD *Survey*, for example, pp. 10–11 (where it concludes that laying flocks predominate in Europe, and numbers of broilers are modest).

[21] Brian Short, '"The art and craft of chicken cramming": Poultry in the Weald of Sussex, 1850–1950', *AgHR* 30 (1982), pp. 17–30; Karen Sayer, 'Battery birds, "Stimulating" and "Twilighting": the ecology of standardised poultry technology', *History of Technology* 28 (2008), pp. 149–68; and *ead.*, '"His footmarks on her shoulders": the place of women within poultry keeping in the British countryside, *c.*1880–*c.*1980', *AgHR* 61 (2013), pp. 301–29. For Italy and France see below.

TABLE 2. Broiler Output, 1957–63 in Selected European Nations ('000 tonnes)

	1956	*1957*	*1958*	*1959*	*1960*	*1961*	*1962*	*1963*
United Kingdom	51	60	73	113	138	220.5		
Denmark		1.9	6	13				
West Germany				16.3				
Italy			20	46.8	70.9	93.7	128.7	170.7
Netherlands		15.6	22.3	29.2		40		
Sweden			1.2	2	2.7			
Spain							64.3	133.2

Source: OECD, *Survey*, 1961 and Table 1. Italian data deflated after consultation with Alessandra Tessari (email with author, 25 Sept. 2013), where broilers actually formed 20% of the total in 1958, rising (in equal increments) to 80% by 1968. Using total output from Table 1 this produces the figures used here.

countries' poultry populations from the late 1950s, was almost entirely attributable to the growth in broiler chickens, not dual-purpose birds, nor specialist egg-laying birds, and so was associated with the first attempts to adopt US technologies and organizational structures.

While there was considerable experimentation with local strains, increasingly from the late 1950s, these additional meat-producing flocks were stocked with US broiler strains.[22] As far as interpreting Table 1 is concerned, this means that the share of each country's poultry population that was composed of broilers was growing from a very small base, but at different rates and different start dates in the late 1950s. Table 1 above is therefore an incomplete guide to identifying where poultry-related agribusiness emerged first in Europe. For that we need to identify the growth of the broiler populations in these countries more carefully.

Table 2 presents what are very imperfect data, but are nevertheless the best estimates available of the broiler populations in the leading West European centres from 1956 to 1963. This shows that the economies that led Europe into broiler production were the UK, followed by Italy and then Spain. The next section turns to consider the UK example in more detail.

III

Agribusiness emerged first in Europe in the British poultry industry. This can partly be observed in the emergence of very high concentration ratios in the poultry industry from the late-1950s onwards when compared to any other agricultural sector, and partly in the emergence of some very large, fully integrated, poultry firms. Already in the mid-1950s the disappearance of the small farmer was becoming widely acknowledged.[23] K. E. Hunt's

[22] British breeding companies, notably Ross, Cobb (UK) and Sykes (as well as British United Turkeys in that sector), began to meet with increasing global success from the mid-1960s. See M. E. Trelford, Peel H. Holroyd, and R. G. Wells, *History of the National Institute of Poultry Husbandry* (1986), pp. 164–72.

[23] Rupert Coles, 'Dual purpose birds are finished', speech to BOCM Poultry Conference, reported in *Poultry Farmer*, 26 Nov. 1955; and his comments on changes to flock sizes, reported in *Poultry Farmer*, 27 Oct. 1956, p. 10.

report on the European Poultry industries for the OECD mentioned that already by 1960 less than three dozen groups were responsible for 60 per cent of total output. These were still overwhelmingly relatively small firms, but one, Buxted, was alone responsible for a quarter of total output and was growing quickly to become a sizeable food company in its own right.[24]

After an initial period of experimentation in the broiler industry until the end of the 1950s, the pace of consolidation increased rapidly. Buxted began by acquiring several smaller producers in the south of England in the late 1950s and in 1960 MacFisheries, Unilever's fish and poultry retailer, made a tentative start to integration through acquiring a few processing stations and groups of farmers. But it was in May 1961 that, in the words of the trade journal *Poultry Farmer and Packer*, 'the age of integration' began when Ross acquired the breeding company Sterling Poultry Products.[25] Within three years the British poultry sector underwent a dramatic consolidation, led by Ross. Ross was one of the three companies – together with Findus and Unilever's Birdseye – that dominated the British frozen foods sector. The driving force there was Alex Alexander, who wanted to diversify away from the company's traditional strength in frozen fish and saw great opportunities in broilers. In 1962 Ross first acquired Spinks (another breeding company of laying hens), and then in September it acquired Fairbairn (a Carlisle-based breeder of laying hens) and, crucially for its broiler interests, Chunky Chicks (Nichols), to become the largest poultry concern in Europe. Spillers, with its large animal feeds division, acquired a twenty per cent stake in Buxted also in 1962. Fitch Lovell, one of the emerging regional grocery supermarket groups, acquired substantial processing interests to become vertically integrated in its poultry division. That same year the Fatstock Marketing Corporation invested in a new, large processing station, especially to serve Cooperative Retail Society outlets. In 1963, the Vesteys' Union International group, with its huge Dewhurst and Eastman chains of retail butchers, acquired a 50 per cent stake in Sun Valley, and the feed company, Bibby, acquired a large minority stake in J. P. Wood. The final acts in this episode were when the feed company Nitrovit muscled Spillers out of its minority stake in the Buxted concern, and J & B Eastwood (then Europe's largest egg producer) diversified into broiler production during 1963 and early 1964.[26]

Ten years before there had been no broiler chicken industry, merely a few experiments in chicken meat production by several dozens of small-scale farmers in the immediate aftermath of the derationing of animal feeds in 1953.[27] But between May 1961 and February 1964 the entire UK broiler sector in the UK was totally restructured, and moved from a somewhat disaggregated to a highly concentrated and integrated industry. By 1964 the UK poultry industry was dominated by eight large food processing firms, with the leading four now responsible for half of total output. The leading firms were responsible for co-ordinating production from the hatching of both parent stock and the flocks reared for meat, through to all components of the rearing and processing of these birds in now massive flocks, in what had

[24] OECD, *Survey*, p. 11.

[25] *Poultry Farmer and Packer*, 8 May 1963, p. 16.

[26] See Table 3 for sources for this paragraph.

[27] Geoffrey Sykes opened the country's first broiler farm just outside Salisbury in early 1953. See *Poultry Farmer*, 3 May 1953. Andrew Godley and Bridget Williams, 'The chicken, the factory farm, and the supermarket: the industrialization of poultry farming in Britain and the United States, 1950–1980', in Roger Horowitz and Warren Belasco (eds), *Food chains: provisioning, from farmyard to shopping cart* (2009), pp. 47–61.

TABLE 3. Consolidation in the UK Poultry Industry, 1961–70

Entrant	*Existing related subsidiaries*	*Investment*
Ross	Ross Foods – frozen fish and vegetables	1961: acquired Sterling Poultry Products. 1962: acquired Spinks, Faribairn and Chunky Chicks (Nichols)
Fitch Lovell	Food Retailing – Key Markets	1962: Fitch Lovell Poultry
Fatstock Marketing Corporation	None – but strong relations with Co-operative Wholesale Society	1962: processing station
Spillers	Supplied animal feeds, but no direct interests	1962: purchased 20 per cent holding in Buxted
Vestey family/ Union International Group	Dewhurst the Butchers, Eastman Butchers, and two processing stations	1963: acquired 50 per cent holding in Sun Valley
Bibby & Co	Supplied animal feeds, but no direct interests	1963: acquired a minority holding in J. P. Wood (Midland Poultry Holdings)
J & B Eastwood	Eggs	1964: built broiler division
Nitrovit	Supplied animal feeds, but no direct interests	1964: acquired the Spiller's minority holding in Buxted.
Allied British Foods (Weston family interests)	None	1968: acquired Ross and renamed it Allied Farm Foods
Unilever	Birdseye (frozen food), BOCM (animal feeds), Macfisheries (food retailing)	1968: J. P. Woods (Midland Poultry Holdings)
Imperial	None	1969: acquired Allied Farm Foods (Ross) and 1970: acquired Buxted.

Sources: in general reports in *Poultry Farmer and Packer, passim,* in particular Ross, 5 Sept. 1962 and 8 May 1963; Bibby and J. P. Wood, 5 June 1963; Fitch-Lovell, 24 Oct. 1962 (p. 29); the Eastwood diversification, 5 Sept. 1962; Vestey-Sun Valley, 27 Mar. 1963; Spiller-Buxted, 1962, and Nitrovit-Buxted: *Economist* 15 Feb. 1964. Additional content from: Fitch Lovell: Monopolies and Mergers Commission, *Linfood Holdings plc and Fitch Lovell plc – a report on the proposed merger 1983* (HMRC, London), pp. 19–20; Unilever – J. P. Wood see Ted Burnham obituary, *Farmers Weekly,* 15 Sept. 2010 (http://www.fwi.co.uk/articles/15/09/2010/123976/ted-burnham-1924-2010.htm); and for the shortlived Weston family involvement in the broiler industry and subsequent entry by Imperial, see Trelford, Holroyd and Wells, *History*, p. 171.

become a highly capital-intensive concentrated industry. This represented a dramatic transformation of the structure of what had become an important branch of British agriculture. Poultry sector output totaled 16 per cent of total British agricultural output already by 1960.[28] It signaled the initial diffusion of the agribusiness structure into British agriculture. When Imperial Tobacco acquired first Ross and then Buxted in late 1969 and early 1970, this new group, together with Eastwood, controlled over 60 per cent of the UK poultry sector. No other branch of British agriculture by then displayed anything like a similar level of concentration. The poultry industry was integrated, exploited economies of scale and high levels of capital

[28] Trelford, Holroyd and Wells, *History*, p. 168 – the leading four producers in 1964 were Buxted, Fitch Lovell, FMC and Ross. *Poultry Farmer and Packer*, 19 Nov. 1960.

intensity in its attempt to minimize price volatility in marketing. As Sykes had claimed earlier, the agribusiness structure emerged and reached maturity in the UK first in the poultry sector.

Agribusiness in the UK poultry sector was also the first case of agribusiness structures becoming significant within Western Europe as a whole. Agribusiness structures were adopted elsewhere in Western European poultry industries, but they lagged behind the UK. The explanation why the UK poultry industry was the first in Europe to adopt US agribusiness structures is not simply one rooted in the growth in poultry output. Italian output quickly exceeded that of the UK, for instance, and by the end of the period French output had regained its former lead and Spanish output had grown more quickly than that of anywhere else (Table 1). Rather the explanation for why agribusiness structures were adopted first in the UK is rooted in the distinctive nature of the end product in Britain. For here, unlike almost anywhere else in Europe, the near universal method of distributing poultry meat was as a frozen chicken. As will become clear, this innovation was of critical importance in enabling the UK poultry industry to scale up quickly, but it was itself entirely dependent on the legacy of the British food industry's refrigeration infrastructure that had been built up before World War Two.

The UK had traditionally imported vast amounts of its food, more than any other nation in the world, at around one third of the total consumed as late as 1937.[29] Before World War Two, the UK was Europe's largest food importer by far. Those economies that focused on producing food for the British market, Denmark and the Netherlands especially, Sweden to a lesser extent, specialized on exporting butter, bacon and other meats. The ownership ties between London food retailers and Dutch, Danish and Swedish producers became ever more enmeshed.[30] These large food multinationals had developed their business models around the importation of food: Unilever imported fats, Vestey and the Danish Bacon Company imported meat, and so on. Many of these imported foods required some sort of storage facilities, notably for frozen meat, and so the investment in cold storage within the UK, especially at ports, was far in advance of anything available elsewhere in Europe.[31] So entrenched in the British food supply system were these large import-oriented food companies that they were the most obvious candidates for organizing and co-ordinating the supply of food and emerging as the UK's version of agribusiness after World War Two. That they did not fulfil this role, and that it was

[29] Paul Brassley, 'British farming between the wars', in Paul Brassley, Jeremy Burchardt and Lynne Thompson (eds), *The English countryside between the wars: regeneration or decline?* (2006), p. 190 and Table 3, p. 194. Also see Abigail Woods, 'Rethinking the history of modern agriculture: British pig production, *c*.1910–1965', *Twentieth-Century British History* 23 (2) (2012), pp. 165–91.

[30] Jesper Strandskov and Kurt Pedersen, 'Pioneering FDI into the Danish bacon industry: Building and agro-industrial diamond', *Scandinavian EcHR* 48 (2000), pp. 42–56; Doreen Arnoldus, *Family, family firm, and strategy: Six Dutch family firms in the food industry, 1880–1970* (2002) on Dutch processors and their ties to UK. More generally on foreign ownership of British retailing, see Andrew Godley and Scott Fletcher, 'Foreign direct investment in British retailing, 1850–1962', *Business Hist.*, 42 (2000), pp. 43–62; eid., 'International retailing in Britain, 1850–1994', *Service Industries J.* 21 (2001), pp. 31–46; and 'Foreign entry into British retailing, 1850–1994', *International Marketing Rev.* 17 (2000), pp. 392–400; and Andrew Godley, 'Foreign multinationals and innovation in British retailing, 1850–1962', *Business Hist.* 45 (2003), pp. 80–100.

[31] Derek Oddy, 'From roast beef to chicken nuggets: food technology and meat consumption in Britain in the twentieth century', in Derek J. Oddy and Alain Drouard (eds), *The food industries of Europe in the nineteenth and twentieth centuries* (2013). Oddy focuses on the UK experience, but includes occasional European comparisons, such as the absence of any refrigerated shipping in France and Italy prior to 1939, p. 5.

the hitherto obscure poultry industry that was the vanguard of agricultural reorganization, was a consequence of the end of Lend Lease, and hence the inability of the large import-led food companies to operate their traditional model after the end of World War Two.

The 1947 Agricultural Act recognized this as a permanent change by introducing a system of support that ensured that British farmers would produce an ever greater share of British food.[32] The British-grown food product that experienced the greatest change under these new policy conditions was poultry. Yet paradoxically poultry was not included in the Agricultural Act's provisions, or even envisaged as being one of its beneficiaries. Rather the Act's largesse was indirectly received by the poultry industry.[33]

The first direct cause of the rise of the poultry industry in the 1950s was the memory of its rapid rise in the 1930s. Poultry meat consumption, particularly in restaurants, had then increased very quickly. Poultry meat prices had declined as a direct result of the 1930s decline in world prices for grains. Frank Sykes (who, along with his brother Geoffrey, was one of the pioneering poultry farmers) claimed that poultry farming 'flourished on the low corn prices ruling before the war'.[34] But then the war, and specifically the way that wartime meat and feedstuffs rationing prioritized staple meats and not poultry, meant that the table poultry industry died out.[35]

After the 1954 derationing of meat, almost no one was anticipating a rapid growth in demand for poultry. Three organizations that were willing to entertain the prospect between them transformed the entire industry, and so indirectly gave rise to the British version of agribusiness. These three organizations were Sainsburys, Unilever's MacFisheries and the Co-operative Wholesale Society. Sainsburys was by far the most important.

All three were committed to retailing chicken meat. Butchers did not sell chicken meat in the UK in the 1950s. Instead it was sold by multiple grocers like Sainsburys, or the Co-operative retail societies, or fishmongers and poulterers, of which the only organization to have anything close to nationwide coverage was MacFisheries.[36] Butchers did not sell chicken because poultry carried a lower profit margin and needed to be stored at a cooler temperature than red meat. Butchers were roundly criticized by the British poultry interests.[37] Multiple grocers, Co-ops,

[32] Kenneth Blaxter and Noel Robertson, *From dearth to plenty: The modern revolution in food production* (1995), esp. ch. 2; Paul Brassley, 'Post-war agriculture in UK', unpublished ms, talk given to MERL, University of Reading, 12 May, 2011.

[33] The war did lead to the creation of very large numbers of Domestic Poultry Keepers, but these individuals were of negligible importance in the development of the post-war poultry industry.

[34] Brassley, 'British farming between the wars', p. 190 estimates real grain prices fell by 50% in the inter-war period. Frank Sykes, *This farming business* (1944), p. 94. OECD, *Survey*, p. 163, also mentions that layers were culled after one year rather than two in the UK before the war, so increasing the supply of chicken meat, and producing a more tender meat than elsewhere in Europe. The origins of twentieth century demand for chicken meat in the UK probably lie in the mass migration of East European Jews to London before 1914, and their preference for Sabbath chicken. See Andrew Godley, *Jewish immigrant entrepreneurship in London and New York: Enterprise and culture* (2001), pp. 94–108.

[35] NFU, *Marketing*, p. 6.

[36] *Poultry Farmer*, 14 Nov. 1953.

[37] Geoffrey Sykes speaking to the Farmers Club, London, reported in *Poultry Farmer*, 14 Nov. 1953 and confirmed by Harold Temperton in *Poultry Farmer*, 15 May 1954 (Temperton was the Director of the National Institute of Poultry Husbandry, Harper Adams College). Curiously, multiple grocers also sold sausages but butchers did not. Oddy, 'Roast beef to chicken nuggets', p. 7, n. 15.

and MacFisheries had all earlier invested in refrigeration capacity that enabled them to retail chilled New York dressed chicken.[38] The necessary retailing refrigeration infrastructure was in other words diffused well beyond the butchers' chains tied to the big meat importing groups, or the dairy and fats retailing chains tied to their large importing groups.[39] Moreover, during the mid-1950s these multiple grocers were also in the midst of a format revolution, as British food retailers launched themselves on two decades of experimentation with self service. Their early experiments were predictably very simple. By 1956 Sainsbury, until then a laggard, decided to adopt self-service. But critical to its preferred version of the format was its increasing investment in refrigeration capacity.[40] Among the emerging supermarket groups a few were taking the self-service model to a new level by including meat and dairy products in refrigeration cabinets in their new versions of the format.

The combination of the emerging supermarkets with their enhanced refrigeration infrastructure, and the potential for the poultry industry to deliver a novel meat product that depended on suitable refrigeration infrastructure meant that there was an extraordinary moment between 1956 and 1959 when a few individuals were able to shape the entire structure of the future poultry industry. The key decision they took was to prioritize frozen chicken.

The British decision to focus on frozen chicken was 'a deliberate decision by the pioneers'.[41] Unilever's Birdseye subsidiary had already experimented with frozen chicken in 1954 and 1955, but its reception was muted. In 1954 less than 1 per cent of 5 million birds were sold frozen.[42] But by 1960 three-quarters of 100 million birds, and in 1961 over 80 per cent of the 140 million birds sold, were sold as frozen oven-ready whole birds.[43] This remarkable growth in sales was not attributable to some latent demand for frozen chicken among British households. The retailers were fully aware of consumers' ambiguity towards it. When asked, British consumers reported a strong preference for fresh over frozen chicken.[44] Moreover, British families were not well equipped to store frozen chicken. The diffusion of refrigerators in British households was

[38] 'New York dressed chicken' was uneviscerated chicken, and so was less perishable than eviscerated.

[39] The large butchers chains (Bell, Eastman, Dewhurst and the Co-operative Wholesale Society) all had large central cold storage facilities in ports, then cold rooms in their branches to manage the thawing out of carcasses. Oddy, 'Roast beef to chicken nuggets', p. 5. What became important for the poultry industry by the 1970s was the creation of major cold storage facilities in the major fishing ports along the East Coast, notably around Grimsby. Fishing companies, especially Ross, invested in provision to mitigate the effect of reduced catches. Once the infrastructure was in place, the marginal cost of freezing different products became almost trivially small. My thanks to one of the referees for alerting me to this point.

[40] Andrew Godley and Bridget Williams, 'Democratizing luxury and the contentious "Invention of the technological chicken" in Britain', *Business History Rev.* 83 (2009), recollections of John Maunder, p. 287. Also *Poultry Farmer* 12 June 1955 on Sainsbury's plans. More generally see Gareth Shaw, Adrian Bailey, Andrew Alexander, Dawn Nell, and Jane Hamlett, 'The coming of the supermarket: the processes and consequences of transplanting American know-how into Britain', in Ralph Jessen and Lydia Langer (eds), *Transformations of retailing in Europe after 1945* (2012), pp. 35–54, for a useful summary of Alexander's and Shaw's recent work on the emergence of supermarkets in the UK.

[41] OECD *Survey*, p. 48.

[42] *Poultry Farmer*, 30 Oct. 1954; also 31 July 1954 on Birdseye.

[43] OECD *Survey*, p. 48 (for 1960 estimate); Economist Intelligence Unit, 'Broilers: a special report' (1963), p. 23 (for 1961 estimate).

[44] *Poultry Farmer and Packer*, 14 Aug. 1963, 'nine out of ten customers … prefer fresh [to frozen] chicken. Although it was dearer, they thought it had more flavor … [But] frozen chicken was easier to handle'.

relatively low and lagged behind other West European countries. Only 20 per cent of British households had a refrigerator in 1960, for example, and few of these would have had a freezer cabinet big enough to store a frozen chicken.[45]

This decision by suppliers to focus on frozen chicken is only explainable when the emerging agribusiness structure is understood. The big retailers of poultry entered into informal 'understandings' with those few chosen producers (seen in Table 3 above) able to deliver fixed quantities of birds at certain pre-specified time points.[46] Such was the scale of production and the capital investment required to guarantee cost savings, that producers needed to be confident that they would not be committing resources to crops that, at the point of slaughter, would be entering a market along with an excess supply from other producers, leading to price declines and profit losses. The retailers were content to keep prices stable as long as supplies were guaranteed. Producers therefore had a strong incentive to devise some method of storing temporary surplus output and so to co-ordinate the market and stabilize the price. Moreover, in 1958 and 1959 the leading retailers switched away from New York dressed to eviscerated birds. This dramatically increased poultry meat's perishability when chilled, but not when frozen.[47] The existence of a large pre-existing refrigeration infrastructure within distribution channels in Britain meant that the costs of freezing chicken were more than outweighed by the benefits of improved price stability from co-ordinating supply. These conditions meant that developing a full-scale poultry industry from scratch within just a handful of years was therefore possible in the UK. But it still required entrepreneurs of great vision and organizational discipline to make it happen.

IV

Several Western European countries had developed highly successful agricultural sectors before World War Two, as already noted above, with large multinational food companies dominating food processing and trading. But farming remained small scale, with co-operative associations having emerged in the late nineteenth century to organize the production and marketing of farm produce. These co-operative associations were overwhelmingly viewed with great admiration by agricultural authorities around the world. In 1961, W. T. Price, the Principal of Harper Adams College, pointed to the co-operative associations of the nascent EEC as providing a far superior model for the marketing of food than that prevailing then in the UK.[48] While there were substantial differences between them, there were also sufficient similarities in the influence and nature of co-operative associations to think of the

[45] Sue Bowden and Avner Offer, 'Household appliances and the use of time: the United States and Britain since the 1920s', *EcHR* 47 (1994), pp. 725–48, Table 1, p. 729 on the diffusion of refrigerators in the UK.

[46] OECD, *Survey*, p. 168 on 'understandings' in the UK. This is widely confirmed in various articles in *Poultry Farmer and Packer*, e.g. 31 Oct. 1959 on Sainsburys and suppliers, Geoffrey Sykes in 13 Feb. 1960, 24 Oct. 1962, p. 29 and the Economist Intelligence Unit, 'Broilers'. See Godley and Williams, 'Democratizing', and Sykes, *Poultry*, for more detail.

[47] D. H. Shrimpton, *Quality control in marketing fresh poultry* (Department of Scientific and Industrial Research, Food Investigation, Technical Paper 7, 1959); also see Shrimpton writing in *Poultry Farmer,* 25 Nov. 1959.

[48] Reported in *Poultry Farmer,* 8 Nov. 1961.

Netherlands, much of Scandinavia and Germany as being more like each other than other European agricultural systems.[49]

The poultry industry of the 1950s in these European countries was, as Table 1 indicates, relatively advanced and well developed. Poultry meat production here was firmly a by-product of the egg-producing sectors, several of which (the Netherlands and Denmark in particular) were focused on producing eggs for the British market.[50] By the 1950s there was an organized infrastructure in these countries that enabled chickens to be processed and delivered to market to meet the demand for chicken meat.[51] But in all these countries the co-operative system meant that the poultry farmers remained independent: they contracted in open markets and their flock sizes remained relatively small. Despite the same access to superior US technology, the agricultural systems in these northern and Western European nations were unable to take advantage of the potential benefits compared with the nascent poultry agribusinesses in the UK. This was because there were no actors able to coordinate these markets sufficiently to allow the investments required for successful broiler production. Even in 1961 the overwhelming majority of chicken meat sold in these markets was still the 'poor types of cockerel reared by the egg producer… [and] hens culled from [laying flocks]'. The inferior meat from the dual-purpose birds spoiled the market for the potential specialist chicken meat producer wanting to invest in broilers.[52] Writing for the OECD in 1961, Hunt placed the blame squarely at the 'co-operative tradition', which inhibited vertical integration. The net result was much less concentration, far smaller businesses, a far smaller uptake of the new broiler breeds, much less advanced nutrition in the feeds industries, and the persistence of traditional slaughtering practices.[53]

There were variations on this theme in each of these countries. Sweden, for example, stands out as being the only European country other than the UK to have adopted the US model by 1960. Swedish growers were buying US strains for rearing from the early 1950s.[54] The frozen food company Findus was able to exploit its dominant position within Sweden to make major investments in frozen chicken. It alone supplied 50 per cent of the Swedish market.[55] Moreover, Sweden had developed the self-service format in food retailing more than any other European nation by 1960.[56] The Swedish Findus-led model of poultry industry was

[49] Morales Gutiérrez, *et al*, 'Comparative Synthesis', contrasts the market-led co-operatives in Denmark and the Netherlands with the ideologically led ones in Italy, France, Belgium and Portugal, for instance.

[50] OECD, *Survey*, p. 13. Frank Sykes, *Farming Business*, p. 95: 'the British market is their [Dutch and Danish] chief outlet'.

[51] OECD, *Survey*, p. 15.

[52] Sykes, *Farming Business*, p. 98.

[53] OECD, *Survey*, pp. 11–16, 19. New York Dressed and the European variant, 'Ohne Darm', ways of presenting poultry were less perishable than eviscerated, and this was how 'the great bulk of fowls in Europe' were sold, OECD, *Survey*, p. 14. Professor Gerald Combe was an authority on poultry nutrition, and considered continental practices to be lagging behind those in the US and UK by some distance. *Poultry Farmer and Packer,* 22 Oct. 1960.

[54] 'British broilers with Swedish strain', in *Chicken: J. British Chicken Association* 34 (Sept.–Oct. 1963), pp. 32–6. OECD, *Survey*, p. 151.

[55] OECD, *Survey*, p. 152.

[56] J. Carles Maixe-Altes, 'Interpreting the early stages of the self-service revolution in Europe: the modernization of food retailing in Spain, 1947–72', Munich Personal RePEc Archive, MPRA paper no. 18164 (2009), pp. 1 and 14; and Fredrik Sandgren, 'From "peculiar stores" to "a new way of thinking": Discussions on self-service in Swedish trade journals, 1935–1955', *Business Hist.* 51 (2009), pp. 734–53.

more concentrated, and more integrated than even in the UK by 1960. But in volume terms, it was tiny (Table 1).[57]

The West German poultry industry was certainly not tiny, and it had the potential to adopt US technologies and organization quickly, but it failed to do so. West German consumers, like the Swedish and British, were quick to adopt frozen chicken, with over one third of German sales of chicken in 1963 being frozen.[58] These were retailed easily enough through the relatively advanced German food distribution system, where voluntary chains and co-operatives had quickly adopted the self-service format and invested in extensive refrigeration capacity.[59] More German households had refrigerators than anywhere else in Europe, with 31 per cent of West German households having a domestic refrigerator in 1959.[60] Moreover, with the Nichols subsidiary in northern Germany, German producers had easy access to superior breeds. While poultry output grew quickly after World War Two, there was no move towards increasing scale of production and no attempts to pursue vertical integration among the co-operative associations in Germany at this time.[61] When US frozen chicken imports to Germany increased from 1960 to 1964, German producers were uncompetitive and exited the market.[62]

Imports of frozen chicken meat from the USA were banned in the Netherlands and Denmark, but in these two countries the co-operative associations of farmers also failed to switch from traditional dual-purpose flocks to broiler chickens anything like as quickly as in the UK, Sweden, and, as we shall see, Italy and Spain. In both the Netherlands and Denmark agricultural production was advanced. Indeed, they were the most advanced and commercially successful agricultural sectors in Europe. Both egg production and meat processing were central to both these countries' agricultural systems. The Danish meat processing sector was dominated by four big co-operative slaughterhouses, and Dutch by a handful of large independent processors.[63] Both possessed the necessary refrigeration infrastructures, but neither country had particularly advanced distribution systems for poultry. Despite the self-service format being widespread there, the Netherlands restricted poultry distribution to only 600 poulterers, so consequently domestic consumption was low.[64] Danish chicken meat

[57] OECD, *Survey*, pp. 48, 151–2.

[58] *Poultry Farmer and Packer*, 11 Sept. 1964, p. 21, on German sales, OECD, *Survey*, p. 48.

[59] Ibid., p. 121 on the majority of sales going through voluntary chains' self service stores. Karl Ditt, 'Rationalisierung im einzelhandel: Die einfuhrung und entwicklung der selbstbedienung in der Bundesrepublik Deutscheland, 1949–2000', in Michael Prinz (ed.), *Der lange weg in den uberfluss* (2003), Table 1, p. 325 on growth in self-service in German food retailing. Maixe-Altes, 'Interpreting', n. 41, p. 24, on German voluntary chains, especially SPAR, being the leading source of expertise in all Europe on refrigeration techniques.

[60] Ditt, 'Rationalisierung', p. 327, n. 53.

[61] Hans Teuteberg, 'Der verzehr von nahrungsmitteln in Deutscheland pro kopf und jahr seit beginn der industrielisierung (1850–1975)', in *Archiv fur Sozialgeschichte* 29 (1979), pp. 331–88, esp. pp. 344–9 on German post war growth in poultry consumption. OECD, *Survey*, p. 11 on the low level of integration.

[62] Talbot, *Chicken war*, p. 11; OECD, *Survey*, pp. 48 and 125.

[63] For Denmark see *JS Journal*, Apr. 1955, p. 32; OECD, *Survey*, p. 19. On the Dutch industry, *Poultry farmer and packer,* 8 Nov. 1961, which reports the export dependency of Dutch broiler producers and fears for future. Also Arnoldus, *Family* and Tony Corley and Andrew Godley, 'The veterinary medicines industry in Britain in the twentieth century', *EcHR* 64 (2011), pp. 832–54, on the links between food Dutch processors and the UK veterinary medicines sector.

[64] OECD, *Survey*, pp. 19, 63 and 144–8. According to *Poultry World* 30 Aug. 1973, profits in the Dutch and Belgian broiler industries were still relatively low compared with Italy and France.

production actually declined after 1964 as its livestock farmers switched into pork and bacon production (Table 1).[65]

Where Danish and Dutch firms had developed superior techniques was, however, in machinery production. Already by 1960 Danish and Dutch incubators and hatchery machinery began to be sold throughout Europe displacing US suppliers. By the mid-1960s the Danish and Dutch processing machinery manufacturers were acquiring a world leading reputation.[66] Overall therefore Europe's most advanced agricultural sectors in the late 1950s, Denmark and the Netherlands, found they were unable to increase broiler chicken output anything like as quickly as the UK, or Italy or Spain. While they were able to specialize in machinery production, broiler chicken flock sizes remained relatively small, and vertical integration muted. In these economies agribusiness did not emerge through poultry but rather, later, through different agricultural sectors, with different characteristics, and hence with different priorities in the developing discussions within European agriculture in the 1970s and 1980s.

V

In contrast to the economies of Denmark, Germany, the Netherlands and Sweden, those of France, Italy and Spain had all developed major poultry meat sectors by 1973 (Table 1). By then these sectors were all dominated by large, vertically integrated, US-style agribusinesses – albeit concentration levels here did not reach the levels seen in the US or UK until the 1980s and 1990s. As was the case with the UK, agribusiness organizational structures emerged first in France, Italy and Spain through the poultry sectors. The similarities in these end points disguise differences in the development paths.

The French poultry industry in the late 1950s was clearly the largest in Western Europe (Table 1). But it was organized around many thousands of small-scale farmers rearing slow-growing birds for local markets, with a significant minority distributed through the wholesale market of Les Halles in Paris.[67] France, like elsewhere, had developed a sophisticated egg-producing sector, especially in the north west, during the inter-war period. What was novel, however, was the development of a French meat bird, the Bresse, in the 1930s, with its AOC awarded in 1936.[68] The demand for these birds is likely to have been disproportionately influenced by the Parisian restaurant trade, for they were an expensive product. While French banks, especially Credit Agricole, had provided funds for consolidation in the 1950s, there was no significant move towards vertical integration until the 1970s, when a few Brittany-based slaughterers and feed producers (including the French subsidiary of US feed producer, Ralston Purina) reorganized the poultry sector and adopted US methods.[69] The French poultry

[65] *Poultry Farmer and Packer*, 4 June 1960, 'Danes have lost their lead over the British in the broiler industry'; and Table 1.

[66] Ibid., on machinery; also Alessandra Tessari, 'The growth of the Italian poultry industry: the case of Arena Company, 1957–1980' (unpublished ms, 2012), pp. 37–47 on machinery, and pp. 58–59 on Stork.

[67] French birds were slow-growing, three months typically, and farmed in small flocks of 50–100 birds. One quarter of French output went via Les Halles in 1961, OECD, *Survey*, pp. 15 and 107–9.

[68] Ibid., p. 110.

[69] Ibid., p. 109, Tessari, 'Growth', p. 49. Gilbert Noel, 'L'engagement de l'Etat en faveur de la modernisation agricole et du developpement rural en France (1950–1970)', unpublished paper given to Third meeting of

industry therefore remained based around small-scale farmers and small-scale processors until the early 1970s, with little cold storage capacity within the distribution channels.[70] So while output was relatively high, it was expensive. As competition with Dutch and British poultry producers began in the mid-1960s, French output fell (Table 1). French producers complained of being 'sacrificed to the Common Market'.[71] French distribution costs were high. Refrigeration infrastructure was under developed.[72] In 1961 there were cold storage facilities in only 12 French cities.[73]

In Italy the poultry sector originated mostly with egg laying, but also from a traditional market for chicken meat from farmyard birds. These were reared in small flocks on peasant holdings and sold in local markets.[74] Food retailing was relatively backward, with the smallest percentage of food shops converting to self-service in all Europe by 1960.[75] Refrigeration infrastructure within the distribution channel was also underdeveloped compared with the UK or other Western European nations.[76] On the other hand, 24 per cent of all households had domestic refrigerators in 1961, which was relatively high for the time.[77]

Italian poultry meat production grew quickly from 1955 to 1960, initially through the expansion in the number of farmyard birds produced by many thousands of smallholders (Table 1). But already by the early 1960s a small number of innovative entrepreneurs were adopting US technologies and methods. 'Generally speaking the Italian situation follows the American patterns [of integration] much more closely than that of other European countries', opined Hunt in his *Survey* for the OECD.[78] Feed companies and hatcheries had begun to integrate by 1960. Notably the firm of CipZoo had adopted US techniques and methods more or less entirely. Other fast-growing poultry firms imported machinery from the Netherlands, veterinary medicines via the UK subsidiaries of US pharmaceuticals firms, and US strains via breeding companies' subsidiaries and franchisees in Belgium, the Netherlands and Germany.[79]

Note 69 continued
Franco-British rural history societies, Rennes, 18–20 Sept. 2008. This deals generally with the debate surrounding attempts to improve agricultural productivity, of which poultry was one sector in need of modernization. In conversation with the author, Professor Noel kindly provided the additional information reported here.

[70] OECD, *Survey*, pp. 109–11.

[71] On expensive French eggs and meat, see *Poultry Farmer and Packer*, 19 Sept. 1962, p. 28; and their producers being 'sacrificed' to the EEC, *Poultry Farmer and Packer*, 11 Mar 1964, p. 10. On Dutch imports in France see OECD, *Survey*, pp. 117. Sun Valley opened a French subsidiary by 1963 (Tessari, 'Growth', p. 34) and Rupert Chalmers Watson was reporting the beginnings of UK exports to France in 1961, despite the 15–20% tariff into EEC countries (*Poultry Farmer and Packer*, 18 Oct. 1961).

[72] Oddy, 'Roast beef to chicken nuggets', p. 5.

[73] OECD, *Survey*, p. 111, on Sociétés d'Entrepôts Frigorifique.

[74] Ibid., p. 135. There were already 20,000 commercial chicken farmers in existence in Italy in 1961.

[75] Maixe Altes, 'Interpreting', p. 1; Emanuela Scarpellini, 'The long way to the supermarket: entrepreneurial innovation and adaptation in 1950s–1960s Italy', in Jessen and Langer (eds), *Transformations*, pp. 55–70.

[76] Oddy, 'Roast beef to chicken nuggets', p. 5.

[77] Tessari, 'Growth', Table 6, p. 20. I am deeply indebted to Dr Tessari for additional information on Italian developments gleaned through many a happy hour of conversation and email correspondence.

[78] OECD, *Survey*, p. 136, not including UK here in 'other European'. Tessari, 'Growth', pp. 13–15.

[79] Andrew Godley and Alessandra Tessari, 'Made in Italy. Made in Britain. Quality, brands and innovation in the European poultry market, 1950–1980', *Business Hist.* 56 (2014), pp. 1057–83; OECD, *Survey*, p. 141. Nichols birds had 68% of the market in 1960, *Poultry Farmer and Packer*, 9 Mar. 1960. Corley and Godley, 'Veterinary Medicines', on the US pharmaceuticals firms subsidiaries operating in UK, including those with sales in Italy such as Elanco, Pfizer and Merck.

But CipZoo's progress faltered, despite a major injection of equity by the UK feed company Bibby, which acquired the business in 1970. This was largely because Italian consumers rejected both the frozen chicken and the chilled wet chicken. It was not until the early-1960s, when a second company, Arena, devised a method of refrigerating chickens without using ice-water, that Italian consumers began to increase their consumption of broiler chickens substantially, enabling Arena to grow into Italy's largest poultry producer. By the early 1970s the Italian industry, with Arena, AIA (a later entrant) and CipZoo its leading firms, was Europe's largest poultry sector.[80]

Spanish producers also saw accelerated growth through the 1960s and 1970s. But unlike Italy, the growth in poultry output began from essentially nothing in the early 1950s. There were not even any small-scale producers in Spain at that date. This was because prior to the 1953 Pact of Madrid, Spanish agriculture had struggled to supply enough grain for human consumption and so the use of grain as animal feed was forbidden. After 1953 with the first US imports, there was some experimentation with an egg industry, and the Spanish subsidiaries of US multinational feed companies provided substantial technical assistance.[81] The broiler chicken industry did not begin until after 1960, when restrictions on animal feeds were lifted (and then were fully liberalized from 1962), along with the growth in demand from the liberalization of the economy, and the consequent urbanization and rise in living standards. Newly resident city dwellers brought with them a taste for chicken meat from their home-reared yard birds in the country. The Spanish poultry meat and egg industries began only from 1960. Entrepreneurs imported US chicken strains (notably from Hubbard), imported machinery and feedstuffs, and adapted US-style vertically integrated organizations. Prices fell and US-style New York dressed, chilled chicken quickly became popular with Spanish consumers. While the costs of distribution were initially high (with very low diffusion of the self service format), the Spanish food distribution system modernized quickly from the second half of the 1960s onwards.[82] With imported feed prices low, chicken meat prices quickly fell below alternative meat products and demand took off. Indeed the broiler became known as a cheap meat in Spain. In Spain, as elsewhere, the agribusiness structure first entered and acquired influence through the poultry sector.

VI

Considering post-war Western Europe overall, it is not wholly surprising that agribusiness structures first emerged in the UK. The UK remained the wealthiest economy after the war, with the highest standard of living and the most developed food industry. What surprised contemporaries was that agribusiness emerged first in the poultry sector. The signs had been

[80] *Poultry World*, 24 Aug. 1972, pp. 16–17 on Bibby's acquisition of CipZoo. In 1973 Slater Walker acquired almost one quarter of Bibby and Co. stock, signaling its subsequent break up and Cip Zoo's liquidation, *Poultry World*, 26 July 1973, p. 9.

[81] The following is based on Ernesto Clar, 'A world of entrepreneurs: the establishment of international agribusiness during the Spanish pork and poultry boom, 1950–2000', *Agricultural Hist.* 84 (2010), pp. 176–94; and id., 'Was Spain different? Agricultural change in Spain in a southern European perspective, 1961 to 1985,' *AgHR* 61 (2013), pp. 330–50. I am also indebted to Dr Clar's email correspondence with me, 11 July 2013.

[82] Maixe Altes, 'Interpreting'.

there for a few years. Geoffrey Sykes warned British poultry farmers in February 1960 that, if they failed to adopt big business practice, within a few years either the processors or the retailers would control the sector.[83] Sykes's thinking had evolved over the previous few years. In 1955 he had advocated 'co-operative ownership' as the preferred vehicle for integration and capital injection in the poultry sector. But by the late 1950s he was forecasting the emergence of large firms.[84]

This occurred in poultry, as opposed to other more established sections of British agriculture, because of a unique set of opportunities to make a new market for frozen chicken.[85] First, the roles played by the select group of retailers must be emphasized. Sainsburys, MacFisheries and the co-operatives (along with several smaller chains) were deliberately pushing first refrigerated and then frozen produce in their versions of the self-service format. This proved attractive to consumers, and so propelled the emerging poultry farmers into positions as lead suppliers. The high perishability of chilled chicken and the potential for what would have been unacceptable levels of price volatility meant there was a strong incentive to co-ordinate the market through informal 'understandings', and so to stabilize the price. Given the widespread presence of a cold storage infrastructure with the UK food distribution system, the decision to emphasize frozen chicken with consumers allowed retailers and producers to scale up quickly. By 1961 almost every food shop had a deep freezer cabinet.[86] With such a developed cold storage infrastructure, the relative cost of freezing was much lower in the UK than elsewhere in Europe. In the early 1960s the cost of storing frozen goods in Britain was less than one per cent of that in France, for example.[87] With the potential benefits from market co-ordination and price stability so high, the selection of frozen chicken as the product to develop was obvious when freezing was so cheap. Producers had to organize production, which required organizational and managerial competences that few farmers possessed. It is noteworthy in the British case that almost all of the leading integrated poultry businesses were headed by owners and senior managers who had been military officers during or immediately after the war.[88] It would be impossible to prove, but it was perhaps the organizational skills developed during military service which were to prove so valuable in building the poultry industry so quickly in the UK.

[83] A remarkable prophetic statement, made even more noteworthy by observing that the only correction that subsequent events would introduce would be that it was not either processors or retailers but both together that organized and controlled the sector. *Poultry Farmer and Packer*, 13 Feb. 1960.

[84] *Poultry Farmer,* 26 Feb. 1955 contrasted with 19 Nov. 1960: 'Wanted a Ministry of Agribusiness'.

[85] Andrew Godley, 'Entrepreneurial opportunities, implicit contracts and market making for complex consumer goods', *Strategic Entrepreneurship J.* 7 (2013) pp. 273–87; and Andrew Godley and Mark Casson, '"*Doctor, Doctor* …": Entrepreneurial diagnosis and market making', *J. Institutional Economics* 10 (2014), doi:10.1017/S1744137414000162. Published online 13 May 2014.

[86] *The Grocer*, 2 Apr. 1960, reported that 65,000 food shops in the UK had deep freezer cabinets, this when the number of self-service food outlets (a proxy for those above a certain size) was only 11,000. This meant that households had less need for domestic refrigeration than elsewhere, because the shopkeeper 'is every housewife's cold store' (*Poultry Farmer*, 25 Jan. 1958), perhaps explaining why the diffusion of domestic refrigerators among British households was relatively low.

[87] French costs from OECD, *Survey*, p. 112. UK costs from Economist Intelligence Unit, 'Broilers', p. 24.

[88] Obvious candidates being Major Antony Fisher, creator of Buxted, and Lt Col Corbett, creator of Sun Valley. But there were many other less well-known ex-military figures. My thanks to Peel Holroyd for raising this point.

In Western Europe those countries with relatively efficient agricultural sectors also seemingly had many or all of the preconditions for an agribusiness-led poultry industry in place. But it was the farmers here, according to Hunt, that were not wanting to be as forward-looking as the poultry farmer entrepreneurs in the UK, and so were resisting the logic of agribusiness.[89] This is a potential explanation for the differences in the pattern of poultry industry growth and in the adoption of agribusiness organization. The Netherlands and Denmark, and perhaps also Germany, could have developed a frozen chicken industry efficiently had farming and retail interests there wished to do so. The costs of cold storage are unlikely to have been significantly higher than in the UK. Their food retailers had largely switched to self-service, and so, presumably, were able to accommodate frozen or chilled chicken. The access to domestic refrigeration in households was at least as high – if not higher – than in the UK. The existing level of husbandry skills among the livestock farming communities was also as high as in the UK (although by comparison few farming entrepreneurs came from military backgrounds). But the poultry industry in these countries failed to take off as it did in the UK, and when the agribusiness structure diffused here it was by a different route. The explanation that seemed most persuasive to contemporary investigators was that the prevalence of co-operative associations among farmers acted as an institutional constraint to vertical integration within broiler farming. Without more research, such an inference must be treated with caution. An alternative explanation might focus on the differences in the structure of food retailing and the implications for promoting poultry. Supermarkets in the Netherlands, West Germany and Denmark mostly emerged out of department store chains, in contrast to the UK, where it was multiple grocers that developed the self-service format most successfully. Did this difference have an impact on the relative commitment to refrigeration?[90]

By contrast the countries where the poultry industry grew most quickly and reached the greatest level of output by 1973, and where the agribusiness method of organization became established were Italy, Spain and France. The existing sector in France, with its focus on a sophisticated but high-cost product, may well have had to defer to the new broiler chicken industry that emerged later in Brittany. Currently too little is known (at least in the English language literature) on developments in the broiler chicken industry in France to be able to draw robust conclusions. Italy and Spain by contrast grew their broiler industries from very small beginnings.

But even here there were significant differences. The Spanish poultry industry entrepreneurs essentially adopted US-style techniques and agribusiness structures in their entirety. In Spain the product was similar to the US wet, chilled chicken. In Italy, however, where there was relatively little cold storage capacity in the distribution channel, the key event was when Arena began to distribute dry-chilled chicken, a much higher quality product, which met with immediate and widespread market acceptance.[91] But neither Italian nor Spanish producers

[89] OECD, *Survey*, p. 11.

[90] The significance of department stores is highlighted in Andrew Godley and Haiming Hang, 'Globalization and the evolution of international retailing: a comment on Alexander's "British Overseas Retailing, 1900–1960"', *Business Hist.* 54 (2012), pp. 529–41.

[91] Tessari, 'Growth', reports that in 1960 only 1000 shops in Italy had freezer cabinets, Table 33, p. 134. Compare with the British case in n. 86 above.

were joined by food retailers in any form of market co-ordination. Indeed the food retailing systems in both countries remained relatively backward until after this period.

The final conclusion therefore, for what remains an exploratory discussion, seems to be that agribusiness emerged first in Europe through the UK poultry industry because of the unique circumstances there that propelled frozen chicken into the market as the near universal form the food took for a decade or more. In the rest of Europe, where frozen chicken was less popular or more expensive or both, the emergence of the broiler chicken sector was slower. This may have been from inertia imposed from the co-operative associations, or it may have been more to do with differences in their emerging supermarket sectors. In the UK, Italy and Spain (and then latterly in France), where the broiler sector grew quickly, agribusiness structures diffused there through the poultry industry. In those countries where the broiler sector grew only slowly (Germany, Denmark and the Netherlands), agribusiness organizations emerged through other sectors. The final conclusion must remain somewhat conjectural, for, while we have good knowledge of the emergence of the broiler sectors and their organization in the UK, Italy and Spain, relatively little is currently known about the French, Dutch, Danish and German sectors.

To return to the article's starting point, had Khrushchev remained vigilant for the interests of the Soviet poultry sector, what would he have concluded from this institutional complexity that either promoted or retarded the diffusion of the modern broiler chicken strains, like the Cobb? Soviet poultry farming was organized around large collectivist farms, with ties to leading research centres. While the Soviet farms had little concern with efficient marketing and price volatility, they had acquired considerable expertise in breeding and rearing livestock. As Table 1 shows, Soviet poultry output quickly recovered its position as European leader. By 1973 Soviet output was twice its 1964 level. While this growth in meat output was based on imported strains (notably Dutch breeds), it is noteworthy that the Soviet sector retained its preference for dual-purpose birds. Perhaps in consequence, its broiler production remained very inefficient by comparison to US and West European norms. The diffusion of the agribusiness structure in the leading broiler producing countries in Europe appeared, in other words, to have led by 1973 to significant gains in relative efficiency over the USSR, not primarily through technological advantages but instead through the marketing imperative to reduce price volatility.[92]

[92] FAO Corporate Depository, *Animal Genetic Resources of the USSR* (n.d., 1985), ch. 13 (http://www.fao.org/docrep/009/ah759e/ah759e22.htm, accessed 25 Apr. 2014). This states 'For meat production the prevailing stocks are the four-line crosses Broiler-6 and Broiler-compact-8 which have been formed from Dutch lines of the Evribreed firm'. (I have not been able to locate evidence of such a firm.) The source goes on to state that the feed conversion rate of Soviet cross-bred broilers in 1984 was 2.8. This would be less than half the feed conversion rates obtained across the US and West European poultry sectors at that date.

Irish agriculture and agricultural policy during the hot, dry summer of 1976*

by David R. Stead

Abstract

This article focuses on the experiences of Irish agriculture, and agricultural policy initiatives, during the final months of the mid-1970s pan-European drought. Overall, Ireland's agricultural sector experienced some production problems arising from heat and moisture stress but was not severely affected. Nationally barley and potato yields fell most markedly, and with grass growth generally depressed, purchases of animal feedstuffs rose substantially. Milk yield increased, as did farm-gate output prices, strikingly so for potatoes. In many cases, rises in nominal family farm income surpassed considerably the rate of general inflation. Immediate policy measures included aids to private beef storage and thwarting the potato smuggling incentivized by export restrictions and higher prices overseas. By and large central government responded well. The main focus of political concern was the adverse impact of weather-induced food price rises on low-income consumers.

In the summer of 1976, the Republic of Ireland experienced its highest air temperature recorded in the twentieth century, and the final months of a prolonged spell of low rainfall, part of the iconic pan-European drought of the mid-1970s. Yet there has been no account of the effects of this extreme weather event on Irish farmers, or of how the government in Ireland responded, comparable to the studies published for, say, Britain.[1] The closest historical work is

* For invaluable comments, the author thanks the editor, anonymous referees, John Martin, Cormac Ó Gráda, Jacqueline O'Reilly and conference and seminar audiences in Cork, Dublin, Leicester and Marcham. The usual disclaimer applies.

[1] Contrast the minimal coverage across T. W. Moody, J. G. Simms and C. J. Woods, 'Chronology 1921–76', in T. W. Moody, F. X. Martin and F. J. Byrne (eds), *A new history of Ireland*, VIII (1982), pp. 469–72; J. C. I. Dooge, 'Droughts in Irish history', in É. de Buitléar (ed.), *Irish rivers* (1985), pp. 26–8; J. J. Lee, *Ireland, 1912–1985: politics and society* (1989), pp. 469–87; M. E. Daly, *The first department: a history of the Department of Agriculture* (2002), ch. 10; D. Keogh, 'Ireland, 1972–84', in J. R. Hill (ed.), *A new history of Ireland*, VII (2003), pp. 365–73; G. Kiely *et al*., *Extreme weather, climate and natural disasters in Ireland* (2010); E. Sweeney, *Down down deeper and down: Ireland in the 70s and 80s* (2010), ch. 5; D. Ferriter, *Ambiguous Republic: Ireland in the 1970s* (2012); T. Hennessy and A. Kinsella, *40 years of Irish farming since joining the European Union* (2013), ch. 3; C. Meehan, *A just society for Ireland? 1964–1987* (2013), ch. 6; Raidió Teilifís Éireann (RTÉ) television programme 'Behind closed doors: 1976' (2007); with e.g. E. S. Carter, 'The effect of the drought on British agriculture', *Proc. Royal Society of London, Series A* (*PRSLA*) 363 (1978), pp. 43–54; G. E. B. Morren, 'The rural ecology of the British drought of 1975–1976', *Human Ecology* 8 (1980), pp. 33–63; J. Kay, 'Dust to dust: the summer of 1976', *Weather* 59 (2004), pp. 247–50; J. Martin, 'Long hot summers revisited', *Rural Hist. Today* 19 (2010), pp. 1, 8.

Brennan's recent discussion of water supply in the Dublin area.[2] Irish historians have instead given more attention to cold and wet weather episodes.[3] This article seeks to address this neglect by analyzing the experiences of agriculture and agricultural policy initiatives in Ireland during 1976. What follows, therefore, is not a general account but a focused case study on a very narrow period and one country, which only considers immediate on-farm impacts and short-term domestic policy responses such as thwarting potato smuggling. As it transpired, generally the year was not a particularly bad one for Ireland's farmers, despite the existence of some production problems. Hence the main focus of political attention was on the adverse impact of weather-induced food price rises on low-income consumers, especially for potatoes, rather than the direct effects of heat and moisture stress on farm output and incomes.

I

The exceptionally warm, dry and sunny Irish summer of 1976 was part of a longer, broader anomalous weather pattern, which extended over much of western Europe more or less from May 1975 to August 1976. Contemporary meteorologists put the unusual weather down to, *inter alia*, a northward shift in the position of the mean jet stream.[4] Ó Laoghóg of Ireland's Meteorological Service dated the beginning of the 'dry period' in the Republic back to October 1974, since large areas in the south and east of the country (where the land generally most favours agriculture) did not experience the wet March and April 1975 that occurred elsewhere in Europe to break up the weather pattern following the rather dry winter of 1974/5.[5] In the north and west of Ireland, however, there was no material rainfall deficiency until after January 1975. Altogether, during 1975, nationally rainfall totalled just 83 per cent of average, the chief drought period being from approximately mid-May until the first week in July inclusive. Generally the first three months of 1976 were balanced between wet and dry, yet April was very dry: the driest April so far that century at the National Botanic Gardens, Dublin. Rainfall was well above normal in many parts of Ireland during May; dry weather returned in June. Late June and early July were remarkably warm, dry and sunny: air temperatures peaked on 29 June, with a national twentieth-century record 32.5°C at Boora, county Offaly, and historic highs of at least 31.5°C at Kilkenny city and Shannon airport, county Clare. Some other stations

[2] N. Brennan, 'Dublin region water supply area – a case study of the 1976 drought' (Irish Met. Society conference poster paper, Dublin, March 2012).

[3] E.g. D. Dickson, *Arctic Ireland: the extraordinary story of the great frost and forgotten famine of 1740–41* (1997); K. R. Hickey, *Deluge: Ireland's weather disasters, 2009–2010* (2010); K. C. Kearns, *Ireland's arctic siege: the big freeze of 1947* (2011).

[4] European Commission, 'Communication from the Commission to the Council concerning the effect of the drought on agriculture', COM(76)480/final (Sept. 1976), pp. 1–4; R. M. Morris and R. A. S. Ratcliffe, 'Under the weather', *Nature* 264 (1976), pp. 4–5; R. A. S. Ratcliffe, 'Meteorological aspects of the 1975–76 drought', *PRSLA* 363 (1978), pp. 3–20.

[5] Met. Service (now Met Éireann) internal memo. 88/79 by S. S. Ó Laoghóg, Jan. 1979. Complementary weather data sourced from ibid., 82/76, Feb. 1976; Department of Agriculture and Fisheries (DAF), *Annual report of the Minister for Agriculture and Fisheries, 1976* (1977), p. 121; Central Statistics Office (CSO), *Statistical abstract of Ireland, 1976* (1978), pp. 6–10; M. MacCárthaigh, 'Assessment and forecasting of drought flow conditions in Irish rivers' (paper to the Institution of Engineers of Ireland, Nov. 1992); id., *An assessment of the 1995 drought: including a comparison with other known drought years* (1996); Hickey, *Deluge*, Figure 2.1; Brennan, 'Dublin water supply'; Met Éireann website, www.met.ie.

from county Donegal to county Kerry reached their (still-unbroken) record peak temperature for June or July. At the National Botanic Gardens, 27 June was the sunniest day of the year with 15.2 hours. After outbreaks of mostly thundery rain around 5 to 15 July, the main drought period began, lasting through August until about 7 September.

Figure 1 reproduces Ó Laoghóg's map of aggregate rainfall during April to August 1976 expressed as a percentage of the long-term average. Overall the Republic received just 66 per cent of average rainfall during that five-month period. The north west, west and south west suffered least from deficient precipitation. Most of the rest of the country, however, had only between 50 and 70 per cent of average rainfall, the worst-affected areas with less than 50 per cent being largely confined to isolated pockets on the east coast. Across large parts of the east, midlands and south, these five months were among the half-dozen driest such periods in 150 years. Nine heat waves (five consecutive days with maximum temperature above 25°C) were recorded at synoptic stations, a total exceeded in only one year between 1947 and 2013, including the two longest: 10 days at Kilkenny, ending on 23 August; and 14 days at Birr, county Offaly, ending four days later. The drought broke in early September with heavy rains, especially in the east: this became one of the wettest months then on record at the National Botanic Gardens. These continued into October and were to some extent a product of the unusual summer arising through elevated sea temperatures, among other things, and caused flooding in much of Leinster.[6] There was no general lack of precipitation during the following winter. Although groundwater was a widely used supply source on Irish farms, surface water was important too,[7] and the river flows measured in 1976 were among the lowest ever documented in Ireland. At most hydrometric stations around the country, there was a steady trend decline in daily mean flow from April or May, typically reaching a nadir around early September, followed by a generally rapid recovery with the heavy autumn rains.[8] If the 1976 low flows were unconnected to the comparable low flows of the previous year, nonetheless water stored in many aquifers and reservoirs had already been reduced to below-normal levels in 1975; and crucially precipitation over the winter of 1975/6 was very often inadequate to restore storage sufficiently to meet the higher demand from agriculture, and other users, during the subsequent summer. Many wells in rural areas dried up. In August 1976 part of one of Dublin's principal reservoirs, Roundwood, was described by a television reporter as 'more like a parched desert waterhole', being overall approximately less than half full, although the shortfall was considerably less evident at Poulaphouca on the other (western) side of the Wicklow Mountains.[9] As the drought continued, a meeting of farmer representative groups saw '[g]reater emphasis on aid to farm water supplies … as an urgent need'.[10]

[6] The island of Ireland contains the provinces of Leinster (east), Ulster (north), Munster (south/south west) and Connacht (west). Three Ulster counties are in the Republic.

[7] H. Richards, 'Water everywhere?', *Nature* 264 (1976), p. 6.

[8] MacCárthaigh, 'Assessment and forecasting'; id., *Assessment*; L. Brogan and C. Cunnane, 'Low flows and low flow distributions for Ireland' (National Hydrology Seminar paper, 2005), pp. 86–7, 90; C. Murphy *et al.*, *HydroDetect: the identification and assessment of climate change indicators for an Irish reference network of river flow stations* (2013).

[9] Met. Service memo. 88/79, p. 6; *Irish Times* (*IT*), 2 July 1976, p. 1; 17 Aug., p. 11; 19 Aug., p. 11; 28 Aug., p. 1; RTÉ television programme 'Reeling in the years: 1976' (2002); Brennan, 'Dublin water supply'.

[10] *Irish Farmers' J.* (*IFJ*), 11 Sept. 1976, p. 37.

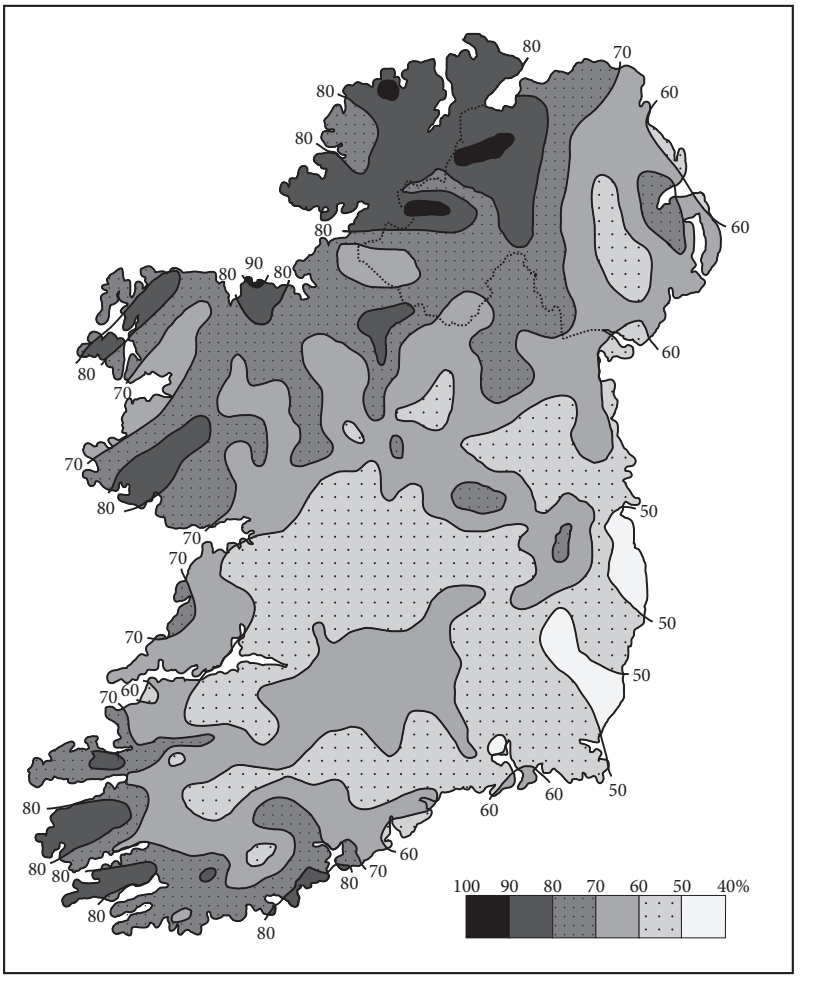


FIGURE 1. Total rainfall during April to August 1976, island of Ireland, expressed as a percentage of the long-term average (1941–70)

Note: Northern Ireland is outside the scope of this article.
Source: Met. Service internal memo. 88/79, Figure 6. Reprinted by permission of Met Éireann.

For agriculture, one drought indicator is the divergence between the water need of crops and that actually available via precipitation and soil reserves, that is the difference between potential and actual evapotranspiration. Figure 2 reproduces Mills's spatial estimate of the annual water deficit for Ireland in 1976.[11] Naturally the broad regional pattern reflects that in Figure 1, with the highest deficits again being in the south east (it also reflects his calculated long-term average, although of course the absolute values in Figure 2 are substantially greater). Due to local circumstances, however, serious on-farm water shortages were reported as far west as north Limerick, south Roscommon and east Galway.[12] The previous year was also exceptionally dry, with almost all of the country experiencing a deficit of over 20mm. Data on soil moisture deficit at three locations show values rising to very high levels by August 1976, then recovering quickly to virtually zero by the end of September with the

[11] G. Mills, 'Modelling the water budget of Ireland – evapotranspiration and soil moisture', *Irish Geography* 33 (2000), pp. 99–116. Met. Service memo. 88/79, Figure 4, gives thrice monthly statistics for two stations.

[12] *IFJ*, 28 Aug. 1976, p. 3; 11 Sept., p. 10.

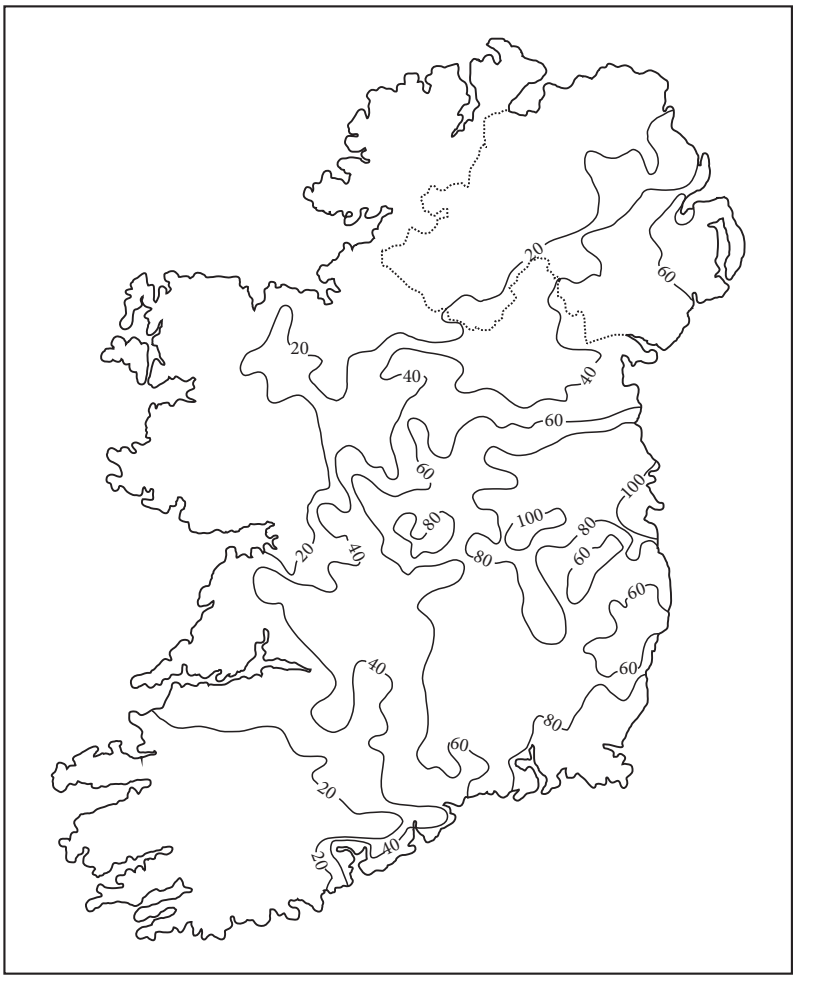


FIGURE 2. Estimated annual water deficit (mm), island of Ireland, 1976

Source: G. Mills, 'Modelling the water budget of Ireland – evapotranspiration and soil moisture', *Irish Geography* 33 (2000), Figure 8. © Geographical Society of Ireland, reprinted by permission of the author and Taylor & Francis Ltd on behalf of the Geographical Society of Ireland.

heavy rain.[13] Offsetting these water deficits through irrigation was probably unlikely to have been cost effective for many farmers, apart for some high value crops such as fruit in badly affected areas.[14] Yet for all the extremities of the summer weather by national historical standards, even greater irregularities occurred in other parts of Europe. In Britain, total rainfall during April to August 1976 relative to normal was 18 percentage points below the corresponding figure for Ireland; rainfall maps show central-southern Britain and northern France to be the driest regions. In Fitzgerald's comparison, meanwhile, soil moisture deficits were more severe and prolonged at Cambridge, compared to Kilkenny.[15]

[13] Met. Service memo. 88/79, p. 5, Figure 4; D. Fitzgerald, 'Farming weather in the drier areas of Ireland and England in 1976', *Biatas* 30 (1976), p. 205.

[14] J. F. Collins, F. J. Larney and M. A. Morgan, 'Climate and soil management', in T. Keane and J. F. Collins (eds), *Climate, weather and Irish agriculture* (sec. edn., 2004), pp. 127, 130; J. I. Burke *et al.*, 'Weather and crop production', in ibid., pp. 161–210.

[15] Fitzgerald, 'Farming weather', p. 205; Morren, 'British drought', p. 44; references in n. 4 above.

II

The volume of total gross Irish agricultural output in 1976 decreased by only 4.6 per cent year-on-year; the decline in net output was a more notable, though still not disastrous, 10.0 per cent due to an increase in purchased farm materials. The annual rise in the nominal value of aggregate output approached 20 per cent in both gross and net terms, but this performance looks much less impressive when compared against the general inflation rate of 18.9 per cent.[16] Meanwhile nominal aggregate income from self-employment in agriculture rose 12.9 per cent year-on-year, an outcome close to a forecast that '[f]armers' incomes' would increase by at least 10 per cent.[17] Quill and Teahon's new estimates of real gross value added in agriculture, together with forestry and fishing, for 1972–86, and Matthews's series of real aggregate income from self-employment in agriculture during 1970–98, provide inflation-adjusted data to place 1976 into a longer-term perspective. In neither series does it stand out as a particularly bad year.[18] Indeed, real income from agricultural self-employment in 1976 was higher than during most of the 1980s and 1990s, and worse annual declines occurred in other years, such as 1979. Furthermore in 1977 real gross value added had almost recovered to its 1975 level, while real self-employment income had surged to an historic peak.

Table 1 shows that Irish crop yields were consistently lower in 1976 than in 1975, and apart from sugar beet, were also below their three-year mean. The former finding provides reasonably strong evidence for overturning Ó Laoghóg's claim, based largely on drought indicators and without citing output statistics, that the effect of drought on Irish tillage was more severe in 1975 than 1976.[19] Nationally yields fell most heavily for malting and then other barley, with moisture stress during the growing season and an unusually high level of mildew reducing grain quantity and quality. 'This must now rank as one of the worst malting barley harvests ever', complained the *Irish Farmers' Journal*. 'Large quantities of the crop have gone straight for feed'. In one experimental trial, the yield of the then standard malting barley variety was 20 per cent below its five-year average, and drought forced the abandonment of another trial. This marked impact is unsurprising, not least because malting barley was often grown on lighter soils which are more susceptible to water stress; moreover it was

[16] CSO, *Statistical abstract*, Tables 62–3, summary. The sources herein warn about data quality and explain the indicators utilized. Keane and Collins (eds), *Climate*, summarize the agricultural science literature on how water stress, sunlight and high temperatures affect farm production in Irish conditions.

[17] National Archives of Ireland, Dublin (NAI), TAOIS/2006/133/247, memo. to An Taoiseach (Prime Minister), 20 Jan. 1976; CSO, *Statistical abstract*, Table 65.

[18] P. Quill and P. Teahon, 'Structural economic change in Ireland 1957–2006: statistics, context and analysis', *J. Statistical and Social Inquiry Society of Ireland* 39 (2009/10), Table 5.2, but note discussant F. Barry's surprise, p. 140; A. Matthews, *Farm incomes: myths and reality* (2000), Figure 1.1. The same conclusion applies to the indicators in Hennessy and Kinsella, *40 years*, Figures 1–4.

[19] Met. Service memo. 88/79, pp. 6–7. This paragraph and the next draw on *Dáil debates* 291, cols 579–80; 293, col. 894; *IFJ*, 26 June 1976, p. 2; 3 July, p. 2; 14 Aug., pp. 1–3; 28 Aug., p. 3; *IT*, 19 Aug. 1976, p. 14; *Irish statistical bulletin* (*ISB*), Dec. 1977, p. 307; March 1980, p. 63; Fitzgerald, 'Farming weather'; DAF, *Annual report*, pp. 71, 78–9, 118 (source of most of the quotations); CSO, *Statistical abstract*, Table 62; Burke *et al.*, 'Weather', pp. 177, 195; M. J. Hennerty and M. J. Maher, 'Amelioration of climate for horticulture', in Keane and Collins (eds), *Climate*, pp. 221, 223.

TABLE 1. Percentage change in estimated 1976 crop yields, Ireland and Britain: 1976 yields relative to 1975 and preceding three-year mean

Crop	*Ireland*		*Britain*	
	vs. 1975	*vs. 1973–5*	*vs. 1975*	*vs. 1973–5*
Wheat	–9.2	–6.6	–10.8	–15.1
Oats	–4.5	–5.5	–0.6	–7.5
Malting barley	–15.9	–14.8	n/a	n/a
Other barley	–14.2	–11.2	n/a	n/a
Total barley	–14.2	–11.7	–1.7	–8.6
Potatoes	–1.0[a]	–7.8[a]	–7.6[b]	–26.7[b]
Sugar beet	–1.2	+3.9	+24.3	+6.2

Note: Irish yields calculated using area grown; unclear for Britain.
[a] For 'sound' potatoes; the figures for 'diseased' potatoes were –12.5 and –19.2 respectively.
[b] Main crop; figures for the early crop were +15.6 and –7.7 respectively.
Sources: *Irish statistical bulletin*, Dec. 1974, p. 270; Dec. 1977, p. 307; March 1980, p. 63; E. S. Carter, 'The effect of the drought on British agriculture', *Proc. Royal Society of London, Series A* 363 (1978), pp. 44–6.

frequently planted in the spring whereas some barley intended for animal feed was winter sown. Table 1 also indicates that Irish wheat was more adversely affected than oats: the warm weather encouraged aphids in the former, though reduced the risk from other diseases, and the latter was frequently planted in naturally wetter soils. The potato yield figures need to be interpreted especially cautiously because presumably a varying proportion of the harvest was classified as 'diseased'. In fact, no tillage crop experienced a greater year-on-year percentage decline in the volume of national output (–13.7 per cent) – even though the area planted with potatoes for 1976 had increased by 16.7 per cent, despite, or more probably because of, the crop being badly drought affected in 1975. The wet weather during March 1976 had generally delayed sowing of sugar beet, yet beet made 'excellent progress' until August when drought reportedly 'completely stopped growth in many parts of the country', with the crop apparently 'wilting under the sun'. Subsequent rains produced 'a flush' of regrowth of leaves and roots, resulting in yields being the least impacted of those reported for Ireland in Table 1. As with potatoes, however, harvesting conditions were difficult and the rapid late autumn growth meant that sugar content was 'very low'. Overall it was quite a turnaround from late June when the editor of the *Irish Farmers' Journal* wrote that 'we could end up with record yields [of cereal crops]'.

For what the comparison is worth, considering that the Table 1 statistics mask crucial regional variations, and differences between winter and spring sown crops, Britain's tillage sector was apparently not as consistently adversely affected relative to Ireland as might be expected from the drought indicators noted in section I above. Declines in British yields were indeed greater than in Ireland for wheat and probably potatoes, but the evidence for oats is mixed and barley and sugar beet fared better in Britain. Despite some initial concerns, Irish supplies of cereal seeds for planting for 1977 were said to be unproblematic, even for malting

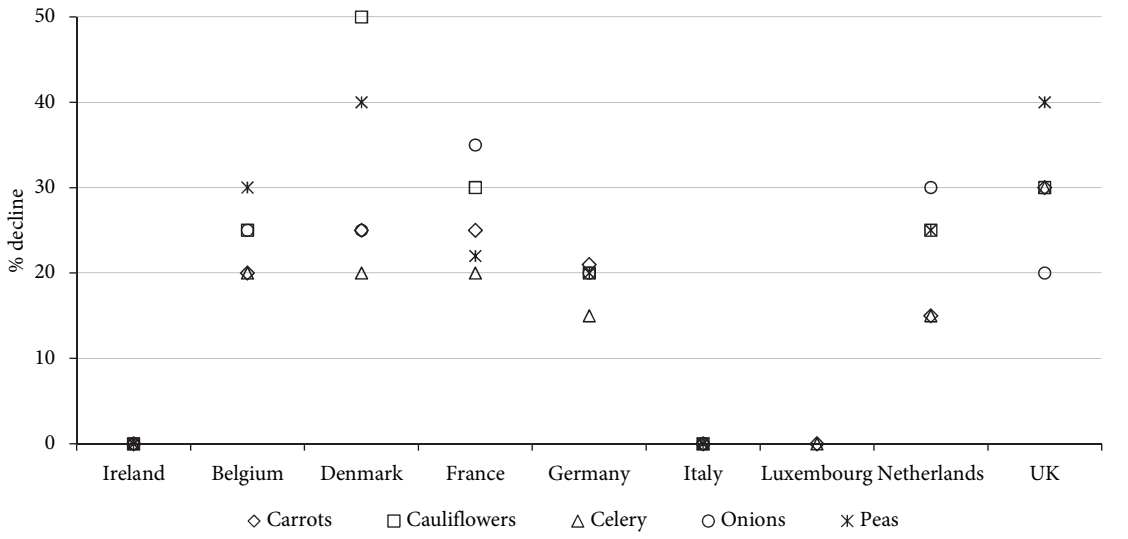


FIGURE 3. Estimated annual percentage decline in national vegetable production volumes, EEC member states, 1975–6

Source: National Archives of Ireland, DFA/2010/19/699, note regarding Special Committee on Agriculture meeting, 8 Sept. 1976, annexes 1, 3.

barley;[20] and again encouraged by very high prices (see below), the acreage under potatoes rose substantially (12.8 per cent). Apart from sugar beet, national crop yields were uniformly much higher in 1977 than in 1976, with the estimated nitrogen content and brewing extract of malting barley more favourable for brewers. In horticulture, meanwhile, the long, dry summer of 1976 had a 'slight adverse affect' on the yield of 'some' field vegetables, 'but this was compensated by excellent quality in most crops'. Nationally cropping of top fruit was 'satisfactory', although as with tillage, water stress impacted quite severely in some localities: irrigation trials on apples undertaken in county Dublin in 1976 found yields to be a statistically significant 27 or 28 per cent higher on irrigated trees compared to the control group.[21] European Economic Community (EEC) forecasts made around early September 1976, the type of information on which policymakers were basing decisions, show Ireland to be the joint least affected member state in terms of the year-on-year percentage falls in national vegetable production, along with Italy and where data are available, Luxembourg (Figure 3). The same judgement applied to the sugar harvest. Germany and the UK were noted as suffering the worst declines from their normal aggregate potato crop.[22]

The extraordinarily high temperatures at the turn of July 1976 had Irish farmers focusing on haymaking rather than selling cattle, especially since the heat was depressing retail beef

[20] NAI, GIS/1/73, speech by the Minister for Agriculture, 30 Sept. 1976.

[21] The difference was far larger in 1975, yet generally horticulture had 'a reasonably satisfactory year in 1975. While … the yield of certain crops was affected by drought, overall quality was good'. *Dáil debates* 291, col. 580.

[22] European Commission, 'Communication', pp. 8, 14.

sales with prices for fat cattle generally holding steady at best. Yet '[t]hose farmers who are still buying store cattle [to later sell fat] seem to have plenty of confidence'.[23] Subsequently chronic moisture stress in affected regions depressed the growth and digestibility of grass, the main animal feedstuff. According to the *Irish Farmers' Journal* in late August, 'the situation for … grass has become critical, particularly in the eastern half of the country'.[24] Mills, utilizing a formula derived from 1970s experimental evidence and making sound assumptions, calculated that yields from managed pasture were approximately 10 per cent below potential in areas with an annual water deficit of 60mm in Figure 2 above.[25] Seasonal estimates of herbage dry matter production at four sites, three in the south east, suggest that yields during the critical period of May to August inclusive were actually much better in 1976 than 1975, being extremely high in two locations; and exceptionally poor in September through December 1976.[26] Nonetheless overall, despite the use of failed intended cash crops, reports of 'heavy' hay, silage and straw crops, and reduced intake by heat stressed livestock, lower-than-normal grass growth and digestibility coupled with mixed fodder crop yields and (to some extent) shortage prices forced a substantial increase in purchased animal feed during 1976, spilling over into 1977. 'This must be the first time in living memory', bemoaned one commentator, 'that Irish farmers were feeding hay and straw to dry cattle in the fields in August'.[27] The challenges were covered in the farming press;[28] nationally purchased feed surged 38.6 per cent in value terms and 12.6 per cent by volume, far outstripping the rises in 1975, although causal factors other than drought existed, including the ongoing international commodity price boom (the increase in total feed costs had been even larger in 1973). There were calls to restrict hay exports, as in France – however animal feedstuff exports rose 39.7 per cent by value year-on-year.[29] Another additional expense was transporting water further distances to animals that were usually exceptionally thirsty as a result of the hot weather: some private carriers charged around £1 per 100 gallons.[30]

Actual and anticipated increases in feed costs, longer periods of animal rest instead of grazing, and a shortage of drinking water in 'many' cases where farmers relied on surface water,[31] reduced weight gain efficiency and incentivized premature slaughtering of livestock, without finishing them. But the degree of this was apparently not particularly pronounced, at least when viewed at national level. Monthly data on the numbers of slaughtered cattle, calves, sheep and pigs, expressed as a percentage of the respective annual totals, show little clear upsurge in relative slaughtering during the summer of 1976, compared to the previous summer, except in June and for pigs where a cost–price squeeze induced by higher feed costs was beginning to materialize. Yet even in these instances any month-on-month annual increase

[23] *IT*, 1 July 1976, p. 14. Also *IFJ*, 26 June 1976, p. 2; 24 July, p. 16; 21 Aug., p. 4.

[24] *IFJ*, 28 Aug. 1976, p. 3; Fitzgerald, 'Farming weather'; DAF, *Annual report*, p. 121.

[25] Mills, 'Water budget', p. 114, based on A. J. Brereton and T. Keane, 'The effect of water on grassland productivity in Ireland', *Irish J. Agricultural Research* 21 (1982), pp. 227–48, who estimated drought losses in 1956–75.

[26] Burke *et al.*, 'Weather', pp. 175–6.

[27] *IT*, 19 Aug. 1976, p. 14; Hennessy and Kinsella, *40 years*, p. 19.

[28] E.g. *IFJ*, 14 Aug. 1976, p. 3; 4 Sept., pp. 6–7; 11 Sept., pp. 2, 8, 10, 18, 24–5; 9 Oct., p. 48.

[29] *IT*, 2 Sept. 1976, p. 14; CSO, *Agricultural output, 1976* (1977), Table 3; DAF, *Annual report*, pp. 32, 72–3; CSO, *Statistical abstract*, Table 64.

[30] *IFJ*, 28 Aug. 1976, p. 3.

[31] *IT*, 9 Sept. 1976, p. 12.

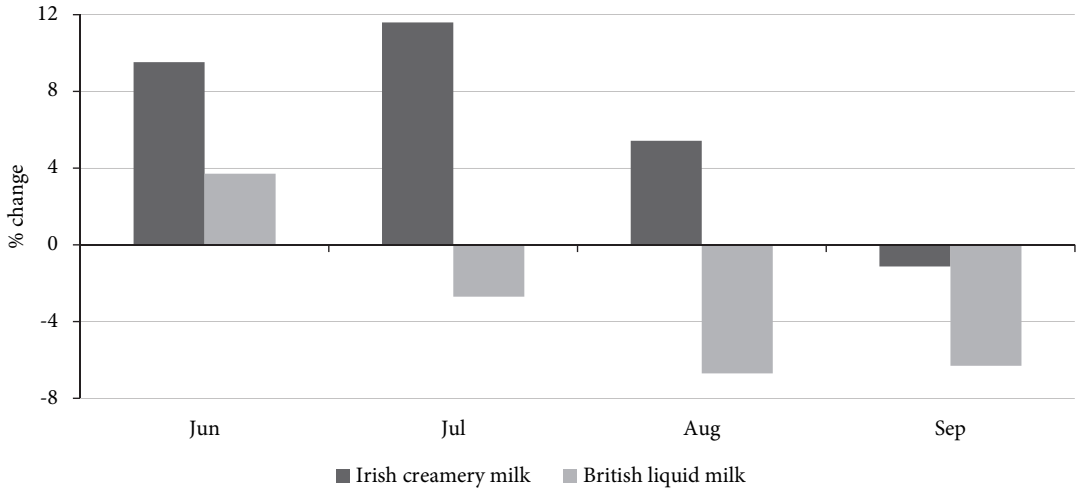


FIGURE 4. Percentage change in monthly total intake of cows' milk by Irish creameries and pasteurisers, and sales of liquid milk from British farms, 1975–6 (volumes)

Sources: Central Statistics Office StatBank, AKM01, www.cso.ie; E. S. Carter, 'The effect of the drought on British agriculture', *Proc. Royal Society of London, Series A* 363 (1978), p. 48.

never exceeded 2.2 percentage points.[32] There was a 5.9 per cent fall in the mean weight of beef exported per head of cattle slaughtered at meat export factories in 1976, the exact reverse of the 1975 situation. Elsewhere in the livestock industry, however, mean hen eggs per ordinary fowl aged over six months rose by 5.2 per cent, and crucially milk yield per dairy cow increased by 4.9 per cent over the calendar year, above the 4.0 per cent rise in 1975.[33] Indeed Figure 4 shows that the overall intake of cows' milk by Irish creameries was substantially higher in June, July and August 1976 relative to those months a year earlier, with just a small decline in September. Compared to Britain, Ireland apparently had the greater requirement for additional purchased feedstuffs, based on relative changes in hay production and concentrate use. But, tellingly, the lack of direct comparability in Figure 4 notwithstanding, aggregate liquid milk sales from British farms 'showed a severe drop' over the summer, in contrast to Irish creamery milk supplies.[34] The same divergence existed relative to EEC aggregate production: total milk deliveries to dairies 'between 1 July and 30 September will be 3½ to 4% lower than in the corresponding period of 1975', with reduced output noted in six member states, not including Ireland. The heat wave seemingly increased European consumption of fresh milk products but depressed butter sales. Meanwhile in France and Germany, unlike in Ireland, summer cattle slaughterings rose sharply year-on-year.[35]

[32] CSO StatBank, ADM01, www.cso.ie; DAF, *Annual report*, p. 55.

[33] *ISB*, Sept. 1975, p. 199; DAF, *Annual report*, pp. 40–1; CSO, *Statistical abstract*, Tables 50, 52, 62.

[34] Carter, 'Drought', pp. 47–8.

[35] *IFJ*, 18 Sept. 1976, p. 13; European Commission, 'Communication', p. 12. A fuller comparative analysis, extending beyond data from some secondary literature and Irish primary sources, is outside the scope of this article.

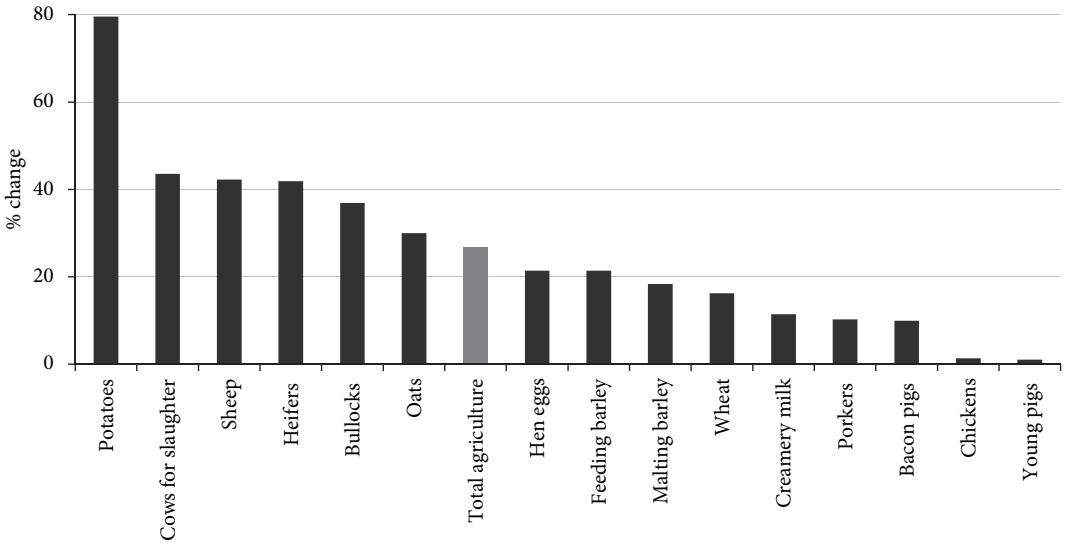


FIGURE 5. Annual percentage change in Irish agricultural output prices, 1975–6

Notes: Liveweight for all livestock except porkers and bacon pigs (deadweight) and chickens (live pair). Middle weight class used where possible.
Sources: Central Statistics Office, *Statistical abstract of Ireland, 1976* (1978), Tables 311, 313, 315–6; *Irish statistical bulletin*, March 1978, pp. 75–7.

Figure 5 shows that the prices Irish farmers received for their outputs increased across all sectors year-on-year, including beef. The rise in the price of potatoes is striking, being far above any other commodity and much more dramatic than the declines in potato yields (recall Table 1). A similar situation, if less extreme, applied to oats. Doubtless differences in own price elasticities of demand at least partly explain the variations between products. Catch-all contemporary attempts to estimate these elasticities were inconclusive,[36] yet, in particular, potatoes are often perceived as being characterised by fairly inelastic demand, with changes in supply therefore having a greater effect on price compared to commodities for which, say, more substitutes existed.[37] As later sections describe, however, other causal factors also operated, such as potato smuggling and the presence – or absence – of market support under Europe's Common Agricultural Policy (CAP).

The overall effects of these changes in the prices and quantities of outputs and inputs are summarized in Figure 6, which reports the 1975–6 percentage change in mean nominal family farm income (FFI) for eight farm systems in each of Ireland's four provinces. Unfortunately systematic Irish data at individual farm level are not readily available for the period under consideration.[38] However the sample size in each provincial group in Figure 6 is usually

[36] W. K. O'Riordan, 'The demand for food in Ireland, 1947–1973', *Economic and Social Rev.* 7 (1976), pp. 401–15.

[37] Illustrated in G. E. Clayton, *Economics: principles and practices* (2005), Figure 6.3. Potato price inflation had been even higher in 1975.

[38] L. Connolly, 'The history of the Teagasc national farm survey', in Hennessy and Kinsella, *40 years*, p. 79. It is difficult to identify farms on manuscripts recording

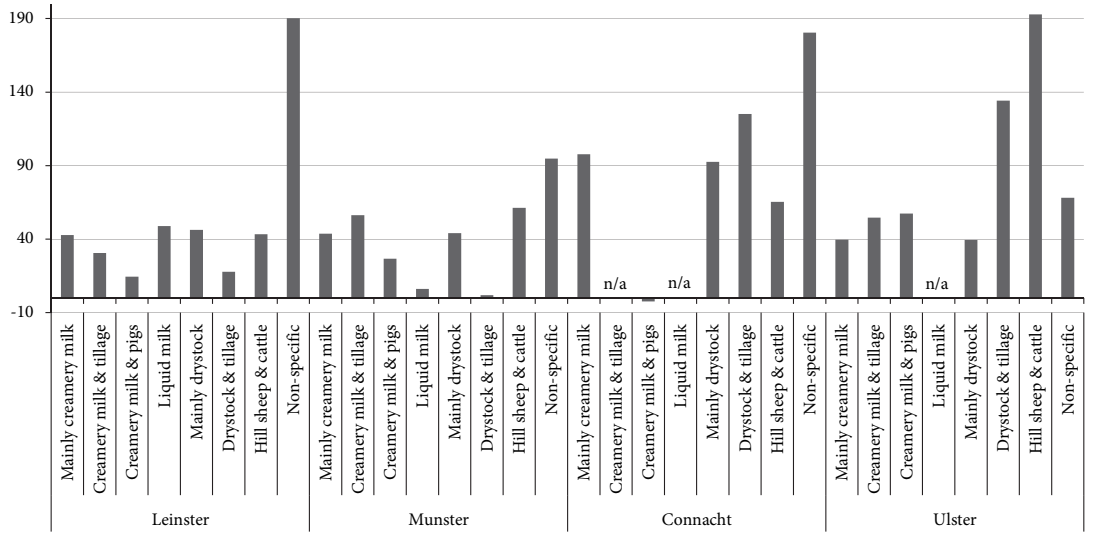


FIGURE 6. Annual percentage change in mean nominal family farm income per farm, various farm systems in each province, 1975–6

Note: n/a denotes not available due to sample size <5.
Sources: J. F. Heavey *et al.*, *Farm management survey, 1972–1975* (1977), Tables 68, 74, 80, 86; id., *Farm management survey, 1976* (1978), Tables 68, 74, 80, 86.

less than 50, and sometimes just five. In only one category, creamery milk and pig farms in Connacht, did nominal FFI actually fall year-on-year, although it was relatively static across liquid milk and drystock and tillage holdings in Munster. That neither province was at the drought's geographical centre strongly suggests the existence of spillover effects. Across these three worst-affected provincial farm systems, the production cost categories where increases were proportionately greatest included general upkeep of land and buildings, crop protection, the fodder crop inventory adjustment and machinery operation. In Leinster, where water deficits were typically most pronounced, FFI rose notably in every system, in all but two cases by well in excess of the general rate of inflation. Comparing systems across provinces, strikingly drystock and tillage farms fared comparatively well in Connacht and (three-county) Ulster, but relatively badly in Leinster and Munster. Creamery milk and pig farms consistently performed relatively poorly outside Ulster, with the largest proportionate cost rises generally being in crop protection, purchased concentrates, machinery use and rent. Yet crucially FFI for the two most numerically important systems nationally, mainly creamery milk and mainly drystock, rose by at least 39.4 per cent in all provinces, considerably above the general inflation rate. The miscellaneous category non-specific experienced the highest FFI increase, by a

Note 38 continued
rent arrears or rate waivers e.g. Boole Library Archives, University College Cork, BL/EP/B/709, Bantry estate rents, 1976–8; and only about 7% of farmland was leased: J. F. M. Swinnen, 'Political reforms, rural crises, and land tenure in western Europe', *Food Policy* 27 (2002), Table 2.

sizeable margin, in three of the four provinces. Here, only potatoes always featured in the list of the top third sources of proportionate increases in receipts, suggesting that these holdings also benefited from the 'natural hedge' provided by output diversification in the testing environment.[39] Many Irish farmers, then, if they profited from higher prices, were actually better off in 1976 compared to 1975, perhaps substantially so. This must have contributed to the very buoyant sales of, for instance, private cars, new and second hand tractors and, as outlined below, store cattle at the time.[40] Indeed it is tempting to speculate that some of the largest farmers undertook such on-farm investments with a view to offsetting tax liabilities in the current financial year.

Beyond the farm gate, the unusual weather had a mixed impact on the costs of initially processing the malting barley crop. In internal correspondence on the setting of commission rates for its barley agents, Guinness Brewery called it 'an extremely dry and easy harvest with lower than expected drying and handling costs'; one agent later acknowledged that the 'extraordinary weather gave us a saving of oil'. Yet the crop's screenings content was generally around four times the norm due to increased tailings (small grains), raising labour, energy and plant depreciation costs. In the circumstances the brewery paid a 60 per cent supplementary screening allowance to its agents. Lower domestic malting barley yields (Table 1) and quality issues, coupled with supply problems internationally, forced Guinness to incorporate some feeding varieties of barley to stretch out their malting varieties; ultimately there was a 'modest' improvement in brewing trading profit.[41]

An Irish EEC delegation neatly summarized the national experience: 'while we had escaped the worst of the early season drought we had extremely low rainfall in the late [s]ummer with resulting low cereal yields and poor grass growth. In regard to beef we were facing difficulties because of low prices on the Continent [and] reduced demand due to the hot weather'. A 'greatly reduced supply of dried fodder and catch-crops and forage beet' forced early broaching of winter fodder stocks, although shortages were 'affecting some categories of fodder more than others'. This and other EEC level discussions,[42] together with domestic commentators and farmers' representatives, were unequivocal that 'British and Continental farmers are, of course, far worse hit than we are'.[43] Despite the extreme air temperatures, there was not much comment on behavioural or productivity changes in livestock arising from heat stress.[44] Reassuringly these remarks are generally quite consistent with the quantitative evidence presented above. However, the output and income indicators utilized usually fail to isolate the effect of the weather *ceteris paribus*, or show the great local and temporal variety in production impacts due to factors such as differing terrain and microclimates, farm size and commercial

[39] In their commentary, J. F. Heavey *et al.*, *Farm management survey, 1976* (1978), emphasize the general large improvement in FFI and do not mention the weather.

[40] *IT*, 30 Dec. 1976, p. 10; *IFJ*, Jan. 1977 tractor supplement; 5 Feb., p. 16; 1 Oct., p. 3.

[41] Guinness Archive, Dublin, GDB/RM04/0029, barley commissions file, 9 Jan. 1976 to 10 July 1977; *IFJ*, 14 Aug. 1976, pp. 1, 3; *IT*, 19 Aug. 1976, p. 14; 9 Sept., p. 12; 15 Dec., p. 14.

[42] NAI, DFA/2010/19/699, file on EEC drought situation, 19 July 1976 to 18 Feb. 1977.

[43] *IT*, 19 Aug. 1976, p. 14; and, especially, *IFJ*, 4 Sept. 1976, p. 34.

[44] See *IFJ*, 17 July 1976, p. 33; 14 Aug., p. 13; 28 Aug., p. 14; P. B. Lynch, 'Effect of the climatic environment on farm animals', in Keane and Collins (eds), *Climate*, p. 330. Also *IT*, 20 July 2013, p. 14.

orientation, water supply infrastructure, crop varieties and stages of development, and animal breeds and ages.

III

Ireland's government comprised a Fine Gael–Labour coalition, with Liam Cosgrave as Taoiseach and Mark Clinton the Minister for Agriculture (both Fine Gael). As a new EEC member, Irish agricultural policy was determined largely within the parameters of the CAP. Forward planning at this level was not helped by the failure of long-range forecasters to predict Europe's anomalous summer weather,[45] although given the inevitable very wide margins of forecast error and a predicament that only emerges slowly over time, it is a moot point how seriously an accurate prediction would have been taken.

With the cattle sector in a number of member states badly drought affected, emergency CAP measures were implemented. The two main policy instruments whose application extended to Ireland comprised the introduction of financial aids to private operators for the storage of beef, and higher export 'refunds' (subsidies) for sales of cattle and beef outside the EEC. With conditions encouraging increased slaughtering, and consumer demand reduced, the intention was to mitigate downward pressure on farm-gate prices by artificially removing supply from the internal market. Unfortunately the very few contemporary DAF files deposited in the NAI contain almost no relevant material,[46] necessitating discussion of national action in the cattle industry and elsewhere at one remove via published sources and official papers from the Departments of An Taoiseach and Foreign Affairs – which rarely provide the details necessary for sustained insight on the political economy issues that arose, such as interest group behaviour.

A private beef storage scheme commenced in Ireland in May 1976, working through tendering, and covered carcases and sides from intervention grade cattle together with forequarters from other cattle. Just 200 tonnes of beef were taken into storage. A second scheme introduced in July was more generous, being a fixed aid scheme with coverage expanded to also include carcases and sides of non-intervention category animals such as cows. 'It was much more successful', publicly acknowledged the DAF: take-up was 23,000 tonnes, approximately half of which comprised the newly eligible non-intervention grade carcases. Together, these schemes removed from the market a volume equivalent to about 15 per cent of national beef trade exports in 1976.[47] Figure 7 presents the average monthly prices of bullock liveweight expressed relative to the annual average price for that year. By removing the influence of year-on-year inflation (one year of which was depicted in Figure 5), this index facilitates an examination of seasonal price changes. It suggests another possible explanation for the minimal demand for the May scheme, since the size of the rise in bullock prices over the first four months of 1976 was not dissimilar to the mean increase across the preceding six years. Operation of the second storage scheme did not prevent an unusually large seasonal price decline between July

[45] Ratcliffe, 'Meterological aspects', p. 9. Also NAI, DFA/2012/59/636, conference report, 9 July 1976; *IT*, 27 Aug. 1976, p. 11; 30 Aug., p. 1.

[46] E.g. NAI, AGF/8/15/98, 113, 180, files on local markets/fairs, 3 Dec. 1974 to 12 Dec. 1978. The Department's Records Branch holds no pertinent papers (pers. comm.).

[47] DAF, *Annual report*, pp. 38–9, 41.

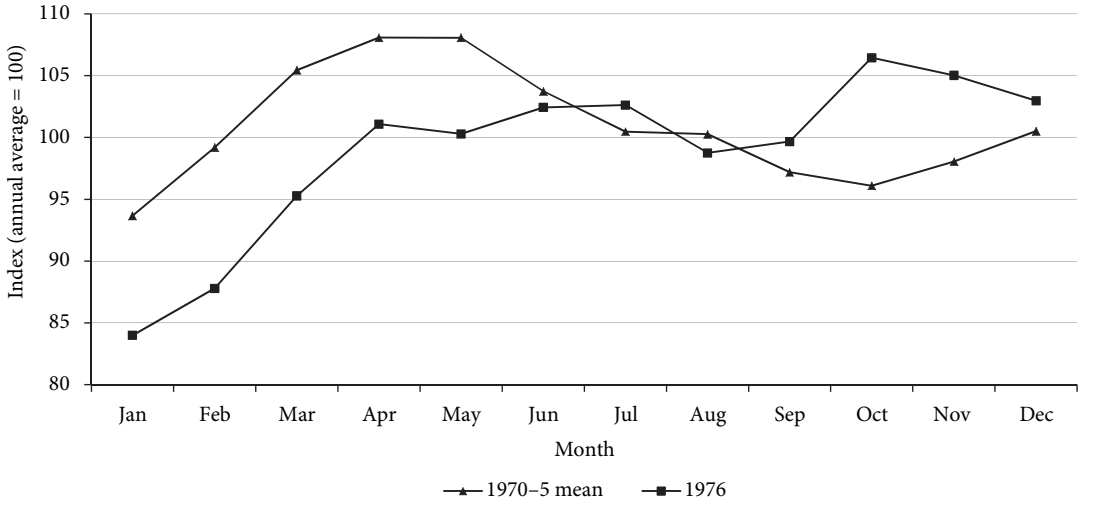


FIGURE 7. Monthly average price per cwt liveweight of bullocks at auction marts, relative to annual average in that year, 1970–6

Note: Pertains to bullocks between 9 and 9.99 cwt.
Source: Central Statistics Office, *Statistical abstract of Ireland, 1976* (1978), Table 314.

and August 1976; as reported in late August: 'Dry weather is forcing more beef onto the market … Again this week both fat and store prices are down all over the country … With very good prospects for beef next spring a good week's rain should reverse the present downward trend in prices'.[48] Yet the overall price fall from April to August in Figure 7 was noticeably less pronounced than the six-year mean, indicating that this policy had some success in alleviating short-term price pressure. However, this analysis lacks a clear counterfactual of what would have occurred had the government not acted.

Appraising the effectiveness of increased export refunds is harder still, but the share of non-EEC countries in Irish live cattle exports rose 10 percentage points year-on-year, suggesting at least some impact, although the corresponding figure for beef dipped by four points.[49] Britain, though, remained by far the most important destination for exports of live cattle, and by the early autumn of 1976, with British farmers often forced into premature slaughtering, 'a scarcity' of finished prime cattle drove a 'buoyant trade in fat cattle': 'Heavy bullocks are being shipped live [from Ireland] to drought hit England for immediate slaughter'. Irish beef prices 'shot up'; the price of stores 'responded … in spite of the drought', reportedly 'breaking all records for the time of year'. Such market developments help to explain the abnormal price rises in September and October 1976 in Figure 7. Indeed during those months commentators expressed some concern over, especially, the high prices store cattle were fetching, which partly reflected demand from some large farmers seeking to reinvest profits and, potentially, to offset tax liabilities.[50] Nonetheless the overall number of live cattle exported to the UK from Ireland

[48] *IFJ*, 28 Aug. 1976, pp. 2–3. Also 21 Aug., p. 2.
[49] DAF, *Annual report*, pp. 40–1.
[50] *IFJ*, 14 Aug. 1976, p. 3; 11 Sept., pp. 2–3; 18 Sept., p. 13; 16 Oct., p. 57; *IT*, 14 Oct. 1976, p. 15; 21 Oct., p. 14.

was down 57.7 per cent on 1975, and 46.1 per cent on 1974. Considering all destinations, exports of live fat cattle were well below the numbers of the previous year and the preceding three-year mean, while store cattle exports slumped by 55.1 and 43.5 per cent respectively.[51]

At the beginning of July 1976, with first-half milk deliveries up six per cent on 1975, the EEC Commissioner for Agriculture, Pierre Lardinois, had seemed quite sanguine about the general supply situation in Europe's dairy sector.[52] Yet by early autumn it was apparent that some member states, not including Ireland, were unable to produce sufficient skimmed milk powder (SMP) to meet demand. To ensure adequate supply to these markets, on 10 September Regulation 2213/76 was adopted, authorizing the immediate sale of SMP from public intervention stocks, as long as the commodity had been stored for at least six months, at 'slightly above' the intervention price: 'an amount', according to the legislation, 'which takes into account the market situation and storage costs'. Under this regulation, and helped by favourable exchange rate movements, 44,000 tonnes of Irish intervention SMP were sold in 1976, equal to approximately four fifths of the amount taken into intervention during the year.[53] Lardinois had used Europe's reduced harvest to counter criticism that CAP price support created overproduction and thus required reform: 'Yesterday's [food] mountain has become today's stock. Yesterday's political mismanagement is today's good sense'.[54] Nonetheless he was clear that policies addressing the structural output surpluses in European dairying should not be delayed; and in early September 1976, supported by the EEC farmers' organization, advocated rapid implementation of recent proposals to subsidise the non-marketing of milk and milk products, and for dairy farmers to convert to beef. These measures, it was argued, would not only reduce overproduction but also relieve demands on fodder supplies and financially assist dairy farmers. The Irish government was one of several to express reservations.[55] For Lardinois, 'at present Ireland would be less affected by the proposed incentives than other member states which have a severe shortage of fodder'. Ultimately a decision was postponed and the subsidies not introduced until 1977.[56] In Dublin, proposals from the DAF to increase the minimum domestic producer price for liquid milk, following rises in EEC institutional creamery milk prices, met with some resistance in government, despite the inevitable pressure applied by farmer representative groups through meetings, letters and telephone calls. The inflationary impact was one of the key concerns, especially when in some quarters it was felt that: 'All milk producers are enjoying high – and largely untaxed – returns at present'.[57]

The potato received most attention from Irish policymakers.[58] Since common EEC

[51] DAF, *Annual report*, p. 40; CSO, *Statistical abstract,* Table 68.

[52] European Commission, press release IP(76)145, 5 July 1976; id., 'Communication', p. 12.

[53] DAF, *Annual report*, pp. 48–9; EUR-Lex website, http://eur-lex.europa.eu. The regulation was suspended from March 1977.

[54] Commission press release IP(76)145. Wageningen memo., 'Reform of the European Community's Common Agricultural Policy', *European Rev. Agricultural Economics* 1 (1973), pp. 151–60, had been one call for change.

[55] NAI, DFA/2010/19/699. One reason given was 'our very heavy cow slaughterings over the last year'. Yet the number killed at meat export factories was 44.1% lower in 1976 than in 1975: DAF, *Annual report*, p. 40. The reason for this apparent discrepancy is unclear.

[56] Daly, *First department*, pp. 513, 608.

[57] NAI, TAOIS/2006/133/496, 2007/116/447, files on dairy produce, 2 April 1976 to 6 May 1977; DAF, *Annual report*, pp. 52–3. Inflation was a great concern of the time: e.g. TAOIS/2006/133/32, file on sugar prices, 6 Feb. to 1 Oct. 1976.

[58] What follows is based on NAI, DFA/2010/19/699,

organization of the market in this product was only at the proposal stage, Dublin possessed greater policy autonomy. More fundamentally, the European Commission identified potatoes as the sole major basic foodstuff where difficulties might exist in providing supplies from EEC or world markets to consumers at reasonable prices, although it was hoped that price increases in Ireland would be relatively moderate. The Irish government's principal policy measures were to impose restrictions on potato exports and to permit 'limited' imports. The latter action followed the successful precedent of 1975, apparently agreed on the initiative of the Minister for Foreign Affairs Garret FitzGerald despite DAF opposition, probably primarily on the grounds of the risk of importing plant and animal diseases. At the end of January 1976 Clinton decided to again grant import licenses, 'but because of the overall scarcity in Western Europe it was difficult to get supplies'. The position 'improved' from April when the Mediterranean crop became available, yet in mid-May Irish wholesale and retail potato prices were 2–3 times higher than a year earlier. In this context it is unsurprising that soon afterwards a DAF proposal to raise the guaranteed minimum output price under the state's potato price support scheme was withdrawn from the cabinet agenda. Ireland imported around 1400 tonnes of potatoes during 1976, under strict phytosanitary conditions. These imports, the equivalent of a mere 0.4 per cent of domestic output that year, were largely absorbed by producers of chipped and pre-peeled potatoes for catering outlets, and were facilitated by an EEC decision in late July 1976 to suspend the common customs tariff duty on ware (table) potatoes. On 9 September that suspension was extended until the end of the year, and at the request of Italy, to seed potatoes. Ireland's delegation had advocated a shorter extension until details of the main crop harvest became known, but given subsequent events the EEC's decision looks prescient. The export of ware potatoes, meanwhile, was subject to licensing control from the DAF. Caught between consumer concern and industry pressure ('Export surplus potatoes now' thundered a newspaper headline in late June 1976), on 2 July the cabinet agreed that they would receive advance notification of any granting of export licences. But with prices persistently high, no licences were issued for at least four months after 29 July. Some growers claimed 'great difficulty in recovering their high production costs' (including fertilizer and especially seed, caused chiefly by – respectively – high oil prices and reduced 1975 yields), despite the considerable farm-gate price rise (recall Figure 5). They complained that this policy contravened the spirit of the EEC, juxtaposing it with Dublin's contemplation of a legal challenge to French restrictions on lamb imports, and advocated a weekly export quota. European policymakers did express concern over the use of emergency national measures which risked hindering the free movement of goods within the common market, yet France's fodder export restrictions were highlighted more than Irish potato policy.

With potatoes selling wholesale in the UK for at least approximately 40–50 per cent more than in Ireland, the non-issue of export licenses incentivized potato smuggling, especially across the border to Northern Ireland. This became a public concern by mid-August. Soon afterwards

Note 58 continued

TAOIS/2006/133/55, file on potato supply and price, 20 May to 9 Dec. 1976 (source of most of the quotations); PRO of Northern Ireland, Belfast, AG/38/30, unlawful potato imports file, 18 Aug. 1976 to 12 Jan. 1977; *IFJ*, 26 June 1976, pp. 2–3; 14 Aug., pp. 2–3; 4 Sept., p. 5; *IT*, 31 Aug. 1976, p. 6; DAF, *Annual report*, pp. 74–7; G. FitzGerald, *Just Garret: tales from the political front line* (2010), pp. 168–9.

the Consumers' Association of Ireland were claiming weekly illegal movement of 1000–2000 tons and blaming it for the recent sharp rise in retail potato prices; a DAF spokesman said that anti-smuggling measures were under discussion with the customs authorities. The *Irish Farmers' Journal* put the illicit trade at 800–1000 tons per week, summarizing: 'This is bad business, bad policy and bad for the future of the potato grower'.[59] By mid-September the problem had reached cabinet level. Special steps implemented included inspecting all ostensibly empty containers leaving Irish ports, making spot checks on loaded containers and other vehicles, and from 21 September, requiring carriers of potatoes using roads crossing border salients to obtain a transport permit in advance. The even more drastic measure of prohibiting the movement of more than 1–2 tons of potatoes within five miles of the border, unless certified by the DAF, was considered but deemed unfeasible. Customs officers, though, faced formidable challenges in proving intent: 'it is commonly given as an excuse that they [potatoes on lorries on border roads] are being delivered to local State [i.e. southern] farmers who usually corroborate the story'; and indirectly from the continuing 'Troubles': 'Normally we could count on the unofficial co-operation of the British Customs … but … there is only one point where they operate in the border area and … [otherwise] are rarely seen within fifteen or twenty miles'. Northern officials did make at least two seizures, yet equally highlighted the difficulties, for instance: 'One can not be sure that the potatoes actually crossed the border unless the offence is witnessed'. Nevertheless, on 12 October, in a note seen by Taoiseach Cosgrave, the DAF was 'satisfied' that illegal exports had been 'checked … for the present'.[60] Overall the Irish authorities reported 11 seizures, mostly during September 1976 in border-adjacent areas, totalling just approximately 193 tons. Even then confidential official papers did not attempt to quantify the scale of potato smuggling, and no one claimed it had been eliminated, yet prices at one major retailer reportedly tumbled by 17.5 per cent following the introduction of transit authorizations and a series of successful tip-offs. However, as in 1975, prices remained high, and into early December ministers were requesting continued customs vigilance. One north-west consumer's letter to Cosgrave provides a personal insight into the impacts felt: 'I am diseabled [sic] and have six children and I cant [sic] afford to bye [sic] potatoes [e]very day … they are to expences [sic]'. Conversely local farmers were allegedly prospering from high prices and could still collect state benefits, 'in their new cars'.[61] Seed potatoes were unaffected by export restrictions, but smuggling through Northern Ireland also occurred, at least before the official exporter announced substantially increased prices.

In a rare parliamentary discussion of the abnormal summer weather,[62] the long-serving Fianna Fáil deputy for Longford-Westmeath, Frank Carter, raised the 'emergency situation in regard to a prime source of food' in two Dáil questions on 20 October 1976 and a subsequent adjournment debate. '[S]ome of those in the chain of production and distribution', he argued in emotive language, 'are creating what is tantamount to a famine'.[63] Highlighting

[59] Quotation from *IFJ*, 14 Aug. 1976, p. 2.

[60] NAI, TAOIS/2006/133/55, informal note on potatoes.

[61] Ibid., letter to An Taoiseach, circa 1 Dec. 1976.

[62] A search of the full text of debates during 1976–7 at http://historical-debates.oireachtas.ie generated just nine occurrences of 'drought' and none of 'heat wave'.

[63] This was not a clear reference to the Great Irish Famine (1846–52), the proximate cause of which was potato blight: C. Ó Gráda, *Ireland's Great Famine: interdisciplinary perspectives* (2006). No obvious reference was found in the policy discourse.

cross-border smugglers in particular, and expressing especial concern for lower-income households, Carter asked the Minister for Agriculture to initiate steps to ensure price stability, such as combating smuggling, encouraging producers (including cottiers and gardeners) to sow more potatoes, and operating a buffer stock scheme to guarantee 'a fair price', thereby discouraging speculators. Clinton admitted that, while Irish consumers currently had the cheapest potatoes in Europe, 'I regret that it [price] has gone so high'. Noting the government's export restrictions and anti-smuggling initiatives, he said that smuggling was 'not the real reason' for the scarcity: that was low yields. 'I do not think that there is any reasonable way to try to control the price', Clinton continued. Although not ruling out the possibility that middlemen's margins were excessive, retail prices could not be lowered without consumer subsidies and the government, since 1975, were already paying 'enormous subsidies' on some other foodstuffs; EEC market organization proposals were confined to artificially removing surpluses in years of overproduction to provide a safety net for growers; '[t]he fellow who used to grow half-an-acre or a couple of acres is gone'; and any institution running a potato buffer stock scheme 'could not get down to the retailing of them in stones and small packs'. 'I am sorry', Clinton concluded, 'that I cannot find a way, no matter how anxious and concerned I am about the price that poor people have to pay'. The impact of black market activity on consumer prices had been raised previously in the Dáil in early June 1976, and potato prices returned briefly to the chamber in December. Blaming drought and 'some speculation on a European scale' for the very large price rise, the Minister for Industry and Commerce outlined how the increased cost of potatoes relative to bread, and 'in some circumstances' actual scarcity of the former, was one of the causes of an unexpected switch towards the consumption of standard bread in 1976, growing the total expense of consumer bread subsidies by 30.2 per cent.[64] Estimated national per capita consumption of potatoes in 1976 fell 6.7 per cent from the previous year, over and above a 4.6 per cent decline in 1975 and the pre-drought trend reduction of 1.6 per cent per annum.[65]

There was also no common market organization for sheep meat. Ireland's government, though, did not obviously show great concern about the effects of the extreme weather on sheep farming. Indeed at the height of the drought, in late August 1976, the cabinet decided to discontinue the, albeit quite modest, subsidy for finishing mountain lambs for export. The Minister for Finance argued that 'prices for sheep meat have never been higher than at present', and also highlighted the need to limit public expenditure. He added that fodder supplies for fattening lambs were 'well above normal due to the good summer'. His last statement must largely reflect the generally favourable weather effect on sheep production in upland areas, illustrated in Figure 6. These points carried more weight than Clinton's counterarguments about, *inter alia*, the uncertain trade outlook and 'widespread criticism of Government policy by sheep producers' if the subsidy was withdrawn. The Irish Farmers' Association was indeed '[d]eeply disappointed': 'it is the small hill and mountain producers who will be directly hit'.[66]

[64] *Dáil debates* 291, cols 812–3; 295, cols 413–31. Compare NAI, TAOIS/2006/133/31, flour and bread prices file, 11 Aug. 1975 to 1 Nov. 1976. Clinton also later repeated some points.

[65] *ISB*, Dec. 1978, p. 300.

[66] NAI, TAOIS/2006/133/180, file on sheep exports and subsidies, 11 Dec. 1975 to 27 Aug. 1976; *IFJ*, 14 Aug. 1976, p. 3; 21 Aug., p. 5; 11 Sept., p. 37; DAF, *Annual report*, ch. 6.

Domestic policymakers were also seemingly little worried about the vegetables sector. Unlike Denmark and the UK, Ireland did not request EEC sanction to suspend totally duties on certain vegetables imported from non-EEC countries, and were not minuted as emphasizing the high price inflation of beans and onions. Overall, the relative lack of impact of the pan-European drought in Ireland is perhaps best symbolized by Dublin being the only EEC government which by early September 1976 had clearly ruled out granting special national aid to farmers.[67]

IV

Records from three county councils provide some indication of the immediate policy response at local government level. Attention here was overwhelmingly on the operation of water services, for which councils were responsible. In county Cork, part of the heartland of Irish dairying, the council expressed no drought concerns, beyond resolving on continued investment in local water supply schemes. Indeed in August 1976, 'in the interests of good relationship', the county manager offered to sell water to drought-stricken Wales, since a temporary surplus existed at a new scheme.[68] In the midlands county of Offaly, where air temperatures peaked, questions regarding water supplies featured in every monthly council meeting from June to October 1976, although no rationing was planned. Sometimes the situation was used in making the case for service improvement. Thus a deputation from Killurine village on 16 August said that 'little or no water was available over the last three weeks' from their group scheme, yet 'the problem was not only one of scarcity of water but of unauthorised manipulation of the valves'.[69] Finally, in the south-eastern county of Wexford, on 6 September 1976 one council sub-committee 'complimented the Engineering Staff on the success of the various schemes in the County in maintaining [water] supplies during the present exceptionally dry year'. In late August, Enniscorthy District Committee agreed to contribute towards filling in a disused reservoir, evidently little concerned about maintaining potential future storage capacity. In Gorey district, 'although there was no actual shortage of water this year there was a shortage to the consumer due to deficiency in the distribution pipes'; a pumping system was one remedy considered.[70] County Wexford therefore escaped the worst of the local authority water restrictions, unlike two neighbouring areas: by mid-August, water pressure in Kilkenny city was being reduced overnight; and at the resort town of Tramore, county Waterford, supplies were turned off from 8pm to 8am, boreholes sunk, and water distributed by fire tender to the new housing estates. Meanwhile in south Roscommon, some well drilling businesses were fully booked out for two months ahead.[71] Yet in a decision suggestive of the challenges faced by at least a few Wexford farmers,

[67] NAI, DFA/2010/19/699.

[68] Cork City and County Archives, Cork, CC/CO/M/42, County Council minutes, 21 June to 18 Oct. 1976; county manager's orders, 28 July to 7 Sept. 1976; CC/NO/Newberry box 381(11), Minehill pump file, 14 Sept. to 13 Dec. 1976; *IT*, 17 Aug. 1976, p. 4; 18 Aug., p. 11; 21 Sept., p. 11; E. J. Marnane (ed.), *Cork County Council, 1899–1985* (1985), pp. 500–13.

[69] Offaly Local Studies and Archive, Tullamore, Offaly County Council minutes, 21 June to 18 Oct. 1976; county manager's orders, 30 July to 7 Sept. 1976; *IT*, 17 Aug. 1976, p. 11.

[70] Wexford County Archive, Wexford County Council and other committee minutes, and associated county manager's orders, 14 June to 11 Oct. 1976.

[71] *IT*, 17 Aug. 1976, p. 11; *IFJ*, 28 Aug. 1976, p. 3.

in October 1976 the council waived the requirement that abated rates on agricultural land, if not paid on time, would revert to the original amount.

National level political discussions highlighted the increased capital expenditure on water services in recent years, which was beginning to address the serious investment backlog. 'There is no great glory in the provision of water and sewerage', Cosgrave was advised in September 1975. Hence 'the service tends to be neglected' with 'still enormous arrears to be overcome'. That the higher budget remained inadequate was repeatedly underlined by the Minister for Local Government and his department, in public as well as in private, and ensured that Cosgrave regularly received representations for improved local water services. Nonetheless, an outside expert noted that Ireland as a whole was better placed in regard to underlying pressure on water resources than other European countries. In the Dáil, the absence of a more severe Irish drought was ascribed to perhaps 'more rain than other areas' and the foresight of constructing Poulaphouca reservoir which served Dublin and Wicklow.[72]

V

In short, then, almost no issues were clearly mishandled by central government. Moreover the sources do not suggest any obvious inter-agency coordination problems, although absence of evidence does not necessarily equate to evidence of absence. It would, too, probably be unfair to criticise Cosgrave's administration for insufficient preparations given the weather forecasting errors, and far more fundamentally, the existence of CAP market stabilization tools for most of the main farm products. Indeed Clinton was already advocating the expansion of tillage desired by one opposition deputy who viewed it, in particular, as a feed standby for when grass was scarce due to adverse weather.[73]

In hindsight, however, the policy response might have been improved in a few instances. While there were general public appeals for water conservation, exhortation of water reuse was said to be neglected.[74] The crackdown on potato smuggling probably should have begun around a fortnight sooner with, as ever, policymakers needing to react as swiftly as possible to unfolding events. A more open attitude towards potato imports may also have been desirable, considering the very substantial potato price inflation. This is perhaps where the strongest case could be made that the interests of farmers were unnecessarily prioritized over those of consumers and taxpayers, with measures in the beef sector being another potential target for neo-liberalists: the second private storage scheme, particularly, provided an outlet for cow and other beef of manufacturing quality, and later in the year beef farmers also had the advantage of increased prices arising from, in part, Britain's prime cattle shortage. Yet if the other major component of potato policy, restricting exports, helped to mitigate retail price rises in Ireland, it must have exacerbated the inflation experienced by consumers in other countries. Comment from the public about profiteering farmers, merchants and speculators underlines the need for

[72] NAI, TAOIS/2006/133/366, water schemes file, 16 Sept. 1975 to 28 July 1977; *Dáil debates* 293, cols 494–524; Richards, 'Water everywhere?'; Ferriter, *Ambiguous Republic*, pp. 496, 613.

[73] *Dáil debates* 291, cols 579, 803, 820–3. Compare *IFJ*, 11 Sept. 1976, p. 18.

[74] *IT*, 17 Aug. 1976, p. 11; 21 Aug., p. 9.

excellent communications by ministers, but Clinton seemingly did not make a formal speech for two months after 29 July 1976.[75] Locally, the business community at afflicted Tramore felt that Waterford County Council failed to learn from 1975, and took inadequate precautions to conserve water during the winter of 1975/6. A major new water scheme was sanctioned soon afterwards, thereby addressing the situation in one of the worst hit localities.[76]

Correspondents to national newspapers called for ministers to stop 'gadding about in Brussels' and arrange proper rural water services, and 'to have farmers exempt from rates this year'.[77] Unsurprisingly most complaints from the agricultural industry centred on potato export restrictions: 'The Department's refusal to issue export licences for main crop varieties this year, thereby directly encouraging producers to get involved in smuggling to cash in on the most attractive prices, is no way to encourage the development of a potato industry'.[78] But there was not the same widespread strong public criticism of central government action, or more accurately inaction, which was characteristic of other extreme weather events in modern times. Neither, unlike two years earlier, was there great disappointment with EEC assistance.[79] At the start of September 1976 the Irish Farmers' Association called for more liberal intervention arrangements if cattle and beef prices did not improve, yet they subsequently did (Figure 7).[80] Hence few political consequences are easily discernible. Clinton retained his seat in the 1977 general election, and was offered the deputy leadership of his party. Drought management might have been a minor contributor to the decline in the government's opinion poll rating between August and October 1976, and the weather's exacerbation of food price rises cannot have helped their very low approval rating on handling inflation, one of the more important factors in the coalition's surprise election defeat. Large farmers, however, were more concerned about the government's taxation policies.[81] The agricultural policy response to the testing weather, then, seems to be a specific instance supporting the largely favourable academic assessment of Clinton's ministerial tenure, and of the DAF's performance over recent decades, at least in terms of promoting the short-term farm interest; and a positive element in the somewhat mixed record of Cosgrave's administration.[82]

Of course extreme temperatures and drought were far from the most formidable challenge faced by the state in 1976. Ireland began the year with the highest number unemployed since 1940, and in the Troubles, the British ambassador was assassinated: the government declared a national emergency on 1 September, the ensuing legislative process producing the President's resignation. Clinton had to contend with, among other issues, a dispute with the Irish Veterinary Union. Furthermore both the agricultural policy decisions, and the ability of most farmers to cope with

[75] NAI, GIS/1/73, speeches 29 July to 30 Sept. 1976.

[76] *IT*, 17 Aug. 1976, p. 11; 9 Sept., p. 15.

[77] *IT*, 10 Sept. 1976, p. 9; 30 Sept., p. 9; *IFJ*, 11 Sept. 1976, p. 10.

[78] *IFJ*, 18 Sept. 1976, p. 7.

[79] Ferriter, *Ambiguous Republic*, p. 414; references in n. 3 above.

[80] *IFJ*, 4 Sept. 1976, p. 34.

[81] R. Sinnott, 'The electorate', in H. R. Penniman (ed.), *Ireland at the polls: the Dáil elections of 1977* (1978), pp. 35–67; B. Farrell and M. Manning, 'The election', in ibid., pp. 133–64; B. M. Walker (ed.), *Parliamentary election results in Ireland, 1918–92* (1992), pp. 224, 228, 232; FitzGerald, *Just Garret*, pp. 176–7, 282.

[82] Matthews, *Farm incomes*, p. 85; n. 1 references above; C. Curtis, 'The implications of independent government for the farm labourer in Ireland, 1922–76' (Trinity College, Dublin, Centre for Contemporary Irish History seminar paper, April 2014).

the anomalous weather, must have been facilitated greatly by learning from the experience of past dry summers, especially 1969 and 1975; from access to unprecedented CAP support; and by the continuing recent general buoyancy in farm-gate prices and real farm incomes and wealth due to rising world commodity markets and EEC entry (along with drought-induced and other causes), including six devaluations of the 'green pound' during 1975–6.[83] Recall that beef prices increased quite substantially year-on-year (Figure 5), despite generally greater European slaughtering; an expected green pound change was one reason behind a recommendation to buy store cattle in early September 1976, for example. Regarding that devaluation, the editor of the *Irish Farmers' Journal* believed that 'in the present drought situation Mark Clinton must push for a good deal more than the suggested five per cent', although the fundamental reason why the industry desired devaluation was to reduce the monetary compensatory amounts charged on Irish agricultural exports;[84] and if the government saw it as a drought assistance policy, this is not evident in the available sources. The importance of the CAP notwithstanding, there was no price-stabilizing common market organization for two of the three commodities whose prices rose most rapidly in Figure 5, potatoes and sheep meat; here, farmers benefited from the upside of price volatility. Neighbours, farm organizations and local agricultural advisers would also have assisted farmers, although that bank workers were on strike for most of the summer hindered access to credit. Meanwhile Figure 6 verifies that on-farm output diversification provided some insurance against challenging weather, albeit presumably at the cost of forgone profits from specialization.

Yet, fundamentally, Ireland's agricultural sector was, on the whole, one of the least affected by heat and water stress in the EEC. It did not even turn out to be the worst year experienced nationally during the 1970s. The greatest water supply problems were quite localized, and although many farmers were affected by higher feed costs, FFI fell in only one case in Figure 6. Admittedly some of the observed variations in costs, output and income might have been larger in the absence of government initiatives, and the regional evidence presented above is unfortunately insufficient. But there were no widespread disastrous effects on grass growth, milk yields and creamery deliveries, and the two crops whose yields nationally fell most markedly, unsurprisingly barley and potatoes, comprised only around eight per cent of mid-1970s aggregate production value.[85] In addition to some issues in the beef and pig sectors, possibly only a few barley, potato and apple growers in the east and south east experienced a very serious decline in yields. There is also evidence, albeit mixed, that Irish agriculture benefited commercially from market opportunities created by greater weather-induced production problems elsewhere in Europe, most obviously in the export sales of intervention SMP and increased autumn beef prices. Thus on this occasion *ex post* financial compensation to farmers was eschewed. Political concern focused especially on the adverse implications of the extremely high retail potato prices, which accentuated the ongoing trend to reduced per capita consumption, not farm production and incomes in circumstances where many Irish farmers profited from price increases.

[83] *Inter alia*, Matthews, *Farm incomes*, pp. 3, 9–10, 47–8, 53. The green pound rate was used to convert CAP prices into their equivalent in Irish pounds.

[84] Arising from a difference between the green and market exchange rates. *IFJ*, 4 Sept. 1976, p. 6; 11 Sept., pp. 2, 37; *IT*, 6 Oct. 1976, p. 1.

[85] CSO, *Statistical abstract*, Table 62.

Book Reviews

RICHARD BRITNELL (ed.), *Durham Priory manorial accounts, 1277–1310* (The Surtees Society, CCXVIII, 2014). lxxiv + 379 pp., 15 tabs. £50.

One can only approach this edition with sadness. The editor, Richard Britnell, in his acknowledgements thanks Alan Piper for his archival work in identifying and dating the early account rolls of Durham Priory, but regrets that Piper's premature death meant that he could not contribute to the introduction of this edition. A further note on the same page records that Richard Britnell himself died after taking the text to the proof stage, and that three scholars completed the work of proofreading and indexing. This volume represents the last major contribution to agricultural and economic history by Britnell, and we can only salute his creativity, the fertility of his ideas, and his industry which enabled him to complete more than a dozen volumes as author or editor over a period of 30 years.

The book presents us with a further example of Britnell's careful scholarship, unselfishly applied for the benefit of other researchers. This is another valuable addition to the primary materials available to historians of the medieval agrarian economy, together with a lengthy introduction that provides background and context. The documents printed here (in Latin) fall into three categories. The first group are the 'original accounts', that is, accounts (in cash and kind) from eight individual manors on the Priory estate compiled between 1277 and 1306. Occupying much more space is a series of enrolled accounts which were intended to provide a full summary of the accounts from individual manors for the whole estate. These cover the period 1296–1310, though with some gaps. The third small group of documents comprises miscellaneous items, such as manorial inventories of 1302 (listing seed corn, grain in store, livestock and deadstock), and an inventory of livestock for 1310. The summary records for all manors are a familiar accounting device for large estates, of which the best-known examples are the pipe rolls of the bishopric of Winchester. After such central accounts had been compiled, the accounts of individual manors were often discarded, so the handful of 'original accounts' for Durham are a fortunate survival.

The estate economy bore a strong resemblance to that of other large church estates, generating an annual income of about £2,000, partly from tenant rents, and partly from demesnes on which each year about 3000 acres were sown, and which profited from a flock of some 5000 sheep. Much produce was sent to Durham for consumption, and self-sufficiency was practised even in the supply of iron.

The documents have some peculiar characteristics. Whereas conventional accounts include both income from rents and from production, Durham Priory recorded rents separately, so the documents here are focused on demesne agriculture. The local officials could not use money derived from rent to pay expenses such as wages or the cost of equipment – instead cash was sent out to the manors from the central administration in Durham. The administrators did not observe a standard accounting year, so the period covered does not begin and end at the conventional date of 29 September, but often at apparently arbitrary dates between August and November, which varied from manor to manor and from year to year. This would have presented difficulties for any official attempting to calculate the annual rise and fall of profits, but there is no evidence that such profit estimates were made. The measures of corn included, as well as the usual quarters and bushels, such units as chalders, rasers and kennings. Britnell's introduction guides us through these unusual features, and also explains that the important local officials were the sergeants, who were more substantial men appointed by the priory, with more varied responsibilities than the manorial reeves most often encountered elsewhere. Manors slipped in and out of direct management, though the reasoning behind the decision to lease or not to lease cannot be certainly established.

Historians pursuing particular themes will find valuable data in these records. Those interested in technology will learn much here about choices of crops, the balance between arable and pasture, and yield ratios. Oxen on one manor were fitted not with yokes but with

collars. In spite of the emphasis on self-sufficiency, within the estate there is still valuable information on markets, such as the cart acquired ready-made in the town of Darlington, and the horse and cattle bought at Corbridge, the site of a busy livestock fair.

The editor has provided a glossary which is not confined to unusual words, apparently in a move to help those with imperfect Latin. The Surtees Society is thereby recognizing a problem: for how long can they continue to publish documents entirely in Latin and exclude many potential users of their publications?

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MARK BAILEY, *The decline of serfdom in late medieval England: from bondage to freedom* (The Boydell Press, Woodbridge, 2014). xii + 373 pp., 56 tabs., 6 figs., 4 maps. £60.

Mark Bailey's new study consciously echoes the title of Rodney Hilton's classic short student guide, offering (amazingly) the first ever monograph on this important topic. Where others have given up in the face of a plethora of fragmented evidence buried in manorial records, Bailey has applied a clear-headed and systematic approach. Part one offers an overview, surveying the existing literature to consider the importance of serfdom in late medieval England, the chronology of its decline, and the causes of that decline. Part two examines the evidence of court rolls and accounts from 38 manors in two localities: 29 from East Anglia (mostly Suffolk) and nine from the South Midlands (mostly Oxfordshire and Buckinghamshire). While the geographical coverage is far from comprehensive or even, the manors are chosen to represent different size categories and a variety of types of lords. The three main aspects of the decline of serfdom are tracked using this documentation: first, the disappearance of servile incidents such as chevage, childwyte, merchet, millsuit and tallage, along with labour services – with a particular stress on heavy week works rather than harvest works; second, the conversion of villein tenures to non-servile fixed-term tenures for money rent; and third, the disappearance of the language of servility in describing customary terms of tenure. In part 3, two concluding chapters return to the issue of timing (when did serfdom disappear on most manors?) and causation (what was the most likely cause of serfdom's disappearance?).

The conclusions drawn from this approach are startling. Rather than finding evidence of an 'Indian summer' in the third quarter of the fourteenth century, when serfdom was retained or even strengthened, and life went on more or less as normal, as much of the existing literature assumes, Bailey finds that serfdom decayed immediately after the Black Death, before 1381. This was true whether disappearance is judged by the majority of customary land being converted to non-servile tenures, or by the majority of servile incidents falling into disuse. Evidence of land values from leasehold rents showed a steep decline between the 1340s and 1360s, with customary tenures not fully reoccupied until early 1360s. The growing rental income of some manors between the 1350s and 1370s was due to the replacement of labour services with money rents, in other words it was due to the weakening of serfdom not its intensification. Only one aspect of serfdom was tightened after the Black Death and particularly after 1381: a growing distinction emerged between villein tenure and personal serfdom. While villein tenure was largely no longer regarded as servile, those identified as personally unfree were labelled 'bondmen of blood' and charged some servile incidents, particularly chevage, more frequently than before. Thus the institution of serfdom continued to change in character even as it disappeared. The findings also include some important observations about the emergence of different forms of copyhold tenure from the collapse of serfdom. The creation of fixed-term tenures for lives or years was most common on manors which had difficulty finding tenants; these tended to be manors with standard-sized holdings, heavy labour services, and little or no land market in the pre-Black Death period. Such manors were more common in the South Midlands than in East Anglia. The fixed-term tenures of the 1350–1450 period, which were often leaseholds, later developed into copyholds for lives. The less radically reformed villein tenures on manors where demand for land remained strong, which were common in East Anglia, developed into copyhold of inheritance.

Where the study is weakest however, is in its consideration of the causes of these changes. Four main candidates for ending serfdom are suggested: manumission, resistance, migration, and economic forces underpinned by demographic change. And despite acknowledging the multi-faceted nature of historical change, the conclusion argues that the sharp decline in land values immediately after the Black Death offers the only convincing explanation of the speed and comprehensiveness of serfdom's decline in England. Differences between manors in the timing and nature of changes are explained in terms of lordly policy, landholding structures, and levels of over-population before the Black Death. Certainly, manumission was never a serious contender for the end of serfdom in England, but resistance and migration deserve more careful consideration. Here Bailey's

rigidly systematic approach is less helpful. Evidence of popular resistance against aspects of serfdom, of which this study notes many instances, is rarely clear cut. Bailey chooses to conclude that resistance was limited, accusing other historians of cherry-picking examples of active resistance to serfdom in order to overplay its significance. But given that he is only willing to consider overt acts of resistance to servile incidents clearly recorded in the manorial documents, and that such acts are recorded in the many of the manors in his well-documented category, another historian might interpret this as widespread resistance. He is even more conservative in his interpretation of migration, only counting those people formally presented for leaving a manor as migrating to escape serfdom. Yet it remains likely that the most widespread form of resistance to serfdom was for tenants or heirs to leave the manor to which they belonged to take up land elsewhere, and that most of these cases were not presented. The unusually high turnover in tenant surnames between 1348 and 1440 surely needs to be explored in this context, but Bailey's method does not admit evidence of tenant turnover, even when it is available in print for one the manors studied, as at Kibworth Harcourt. This is also symptomatic of the book's sparing engagement with existing scholarship on the topic, even those studies mentioned in the bibliography. Despite these quibbles, however, this is an impressive and valuable study, which will hopefully provoke further lively debate on this important but neglected chapter in England's economic development.

JANE WHITTLE
University of Exeter

BRODIE WADDELL, *God, duty and community in English economic life, 1660–1720* (Studies in Early Modern Cultural, Political and Social History, The Boydell Press, 2012). xii + 273 pp., 8 figs, 1 tab. £60.

Reading Waddell's incisive, incessantly questioning, and extremely impressive work, I kept finding sections, particularly in chapters 1 and 4, that I wished to set for undergraduates. At the same time, I wondered what they would make of them. At their best, modern history undergraduates are supremely goal-oriented readers, stripping through swathes of literature at lightning speed with a locust-like appetite for synthesis. Their objective is to identify and typify arguments, and (ideally) to formulate a synthesis that will encapsulate a subject, and answer the question. Brodie Waddell's self-consciously disruptive tome may therefore come as something of a shock.

A large number of sacred cows were harmed in the writing of this book. Waddell has no truck with much of the received ancestral wisdom that British social history has passed down the generations since the early twentieth century. Out goes Weber's Protestant Ethic ('neither the world… nor Protestantism were particularly "capitalist" well into the eighteenth century', p. 80, n. 215). Out goes E. P. Thompson's distinction between 'moral' and 'market economy' (because repeatedly it becomes reduced in practice 'to a superstructural façade supported by the "real" economy', p. 12). Out goes a 'declension' narrative that began with Tawney, which construes the economic and social history of early modern England as 'the process of economic "modernisation" – essentially the shift from a "moral economy" to an "amoral economy"' (p. 18), from *gemeinschaft* to *gesellschaft* via 'the World We Have Lost'.

In its place, Waddell introduces a new, non-linear narrative. At its heart is the idea that economic life and thought in early modern England was always governed by moral ideals, primarily those of English Protestantism. This was not a moral framework which either endorsed unrestrained accumulation, or (*pace* Weber) encouraged it inadvertently by the desire to seek material assurances of God's favour. Rather, it was and remained, a creed that was highly judgemental in matters economic, that placed social responsibilities to the poor above untrammelled individual acquisition, that sanctioned 'direct action' by the poor in times of dearth, that remained uncomfortable with usury, that continued to threaten the miser and the covetous with the pains of hell, and regarded 'contract' as inferior to the social bonds of patriarchal authority, lordship and reciprocity. He emphasizes the ways in which the widespread social acceptance of these values ensured that the poor could invoke them effectively to secure redress. This was not by knowing Scott-ian manipulation of the 'public transcript', or self-conscious acts of Thompson-ian patrician 'hegemony'. Rather, it was because the dictates of conscience combined with entrenched notions of paternalism, stewardship and patronage, to form a relatively uncontested (and perhaps unconsidered) *habitus* understanding of the moral imperatives of economic relations.

Waddell's source material is primarily, but not exclusively, the stuff of more 'cultural-history' approaches (sermons, ballads, chapbooks), focusing on the discursive content and boundaries of such values. However, he takes pains also to investigate lived experiences and practices through a wide range of other source material, including corporation records, guild books, personal memoranda, equity cases and parish vestry sources. There is scope for his argument to be pursued through a fuller and further-reaching

exploration of these latter materials, and this is likely to form the basis of his next project.

Since this book was published, Andy Wood has produced his most recent monograph, *The memory of the people. Custom and popular senses of the past in early modern England* (Cambridge U. P., 2013). While the perplexed undergraduate mind might rebel at the prospect, it is worthwhile reading both works together. Wood's highly nuanced analysis of an all-encompassing popular understanding of 'customary' ways of governing, sharing, conserving, exploiting and apportioning resources, communal and individual assets and entitlements tends to fall within the 'declension' narrative criticized by Waddell. However, it also emphasizes a conceptual point that would strengthen Waddell's discussion of household duties and communal bonds in chapters 2 and 3. This is Wood's demonstration that profound social conflict can occur within a single discursive field – so that landlords and tenants might both agree implicitly on the importance of limiting exclusive rights to private property by allowing the poor to glean corn, and might express this through a shared common moral language, but might fight bitterly over its precise practical implications. This is not merely the revival of a hoary reductionist, materialist objection to taking expressed values seriously. Rather, it suggests that contests over genuinely shared meanings and values are just as powerful as the cleavages of base and superstructure so beloved of earlier generations of social historians. It also implies that Waddell is correct to argue that we should not expect such contests to resolve themselves in any neat teleology of the 'rise of capitalism' or the 'decline of neighbourliness', either.

So, this is a book to confound the undergraduate desire for a linear narrative, an either/or argument, and a neat and tidy concluding paragraph. I hope that it also a work that causes some conceptual reconfigurations within English social history. The last person really to attempt the task was Alan Macfarlane in 1978, with *The origins of English Individualism*. Ultimately, Macfarlane's book was better at challenging the sufficiency of existing grand narratives of modernization and capitalist development, than in convincing practitioners that individualism began with the sources of English local history, in the twelfth and thirteenth centuries. In effect, Waddell is trying to argue the reverse, that English Individualism never superseded morally bounded economic discourses until the advent of utilitarian principles around 1800, and that it never swept all other challengers from the field. Historians, whether in embryo as undergraduates, or as fully fledged practitioners, still remain change-seeking animals, who sometimes overlook arguments that push against this reflex. This is much too good a book to deserve such a fate.

H. R. FRENCH
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HAROLD FOX, *Dartmoor's alluring uplands: transhumance and pastoral management in the Middle Ages*, ed. and intro. by Matthew Tompkins and Christopher Dyer (Exeter University Press, 2012). xii + 291 pp, 22 illus., 45 figs, 7 tabs. £55.

Sadly, Harold Fox died before completing the final stages of preparing this book for publication. His death was a significant loss to medieval economic history and the history of Devon, but the loss would have been all the greater had Matt Tompkins and Chris Dyer not stepped in to see this book through to publication. This book bears the hallmarks of Harold Fox's research style and expertise: meticulous and thorough in his approach to the surviving documentation, deeply knowledgeable about Devon, but also imaginative and flexible. It draws evidence from archaeology, maps, place-names and the landscape as well as from manuscript documents, and uses comparative examples from other parts of England and Europe and from later time periods where this was helpful in developing the interpretation. The result is an impressive and revealing study, with a firm focus on Devon's medieval pastoral economy and the unique role of Dartmoor within it.

The study ranges from the Anglo-Saxon period to the nineteenth century, but its core is the golden age of manorial documentation from fourteenth to sixteenth centuries. Fox's central argument is that Dartmoor, far from being an area of wild and unusable 'waste', was the key element in a wide-reaching system of pastoral transhumance. In the early medieval period this was genuine transhumance, with people as well as livestock moving seasonally to Dartmoor to benefit from the summer pastures. In the high-to-late medieval period it was what Fox describes as 'impersonal transhumance', by which 'down country' farmers entrusted cattle to the guardianship of either moor-side middlemen or royal officials on Dartmoor for part of each year. As a result Dartmoor's pasture benefited not only the parishes and farmsteads that bordered the moor, but the majority of Devon, an extensive area west of the Exe and lower Taw rivers. The evidence is not always exactly watertight, but is presented clearly and in detail to the reader. The earliest evidence is the remains of huts on Dartmoor, possibly used by transhumant shepherds and dairymaids each summer. Certainly intriguing are the detached moor-side sections of distant manors such as Kenton on the Exe estuary and Cockington

on the Torbay coast. Place-names and administrative boundaries provide further evidence of the movement of livestock, seasonal occupation and links between Dartmoor and a much wider area of Devon. Comparative evidence from studies of the Kentish Weald and Warwickshire Arden where transhumance was also practiced shows that such systems were not unknown in England, as is often assumed. For the late medieval period the large numbers of cattle sent to Dartmoor (although not sheep which must also have been moved) in the summer are documented, with grazing fees of 1½*d.* per head paid for over 10,000 cattle in the fifteenth century, in addition to cattle sent by more local farmers of 'venville' tenements which were exempt from the fee. As might be expected from a book not quite finished at the time of the author's death, some parts are a little uneven in style and approach, and there are romantic interludes alongside hard-headed assessments of the available evidence. The editors provide a helpful introduction and summarizing conclusion, which draw out the wider issues addressed. The book is well illustrated with diagrams, maps and photographs (many in colour). This all adds up to a vivid and accessible account of a neglected topic despite the complexity of the evidence and issues discussed. It is an important addition to the literature on the agricultural systems of the medieval period, as well as to the history of Devon.

JANE WHITTLE
University of Exeter

DAVID HEY, *A History of the Peak District moors* (Pen & Sword Local, 2014). viii + 207 pp., 84 illus., 4 maps. £12.99

This is a very personal book which carries evidence of David Hey's love of this area, his deep knowledge of its history and – it must said – his politics. On the face of it, the structure of the book is standard in that it starts with pre-history and works forward to the present day. What makes it distinctive is that, rather than trying to cover the full history of each part of what is (after all) a complex area, Hey discusses in great depth how one or more parts of the Peak District were affected by events. It is a delight to read these discussions, which put the area in context – especially the period up to about 400 CE – without getting bogged down in too much detail. This is not a typical 'book of X' but a narrative demonstrating the author's love and profound knowledge of the Peak District. The story has both bones and flesh to fill the frame. We have here a narrative linking place-names, topography and archaeology to reveal not only the change over time but also parallels with other areas of Britain with which his audience might be more familiar. We are given clear but deep descriptions of events in particular places, which allow the reader to integrate each narrative into a developing understanding.

Hey starts with a broadly based introduction, where he describes such fundamental aspects as topography and vegetation followed by their implications in terms of agrarian potential. These themes are developed further in subsequent chapters, where he never dumbs down the concepts under discussion but approaches each in such a way as to make them accessible to all. Consequently, technical terms are used as an invitation rather than to repel the novice by proclaiming the writer's expertise. Throughout, Hey wears his scholarship lightly; an educated man chatting to new acquaintances and drawing them in to share his own delight.

The first four chapters are, in many respects, standard history. Chapter 5, 'Improvement and enclosure', covers more than the usual ground, for his 'Peak District' contains Sheffield, Saddleworth and various other areas not normally included in the designation. This gives a depth to the discussions which is normally lacking when writers confine themselves within the National Park boundaries. This explains what happened prior to the creation of the Park, resulting in some parts being excluded and (naturally enough) it is here that the politics start to show. Chapter 6 takes us across the Grouse Moors from the introduction of guns into what we now call field sports, their impact upon vegetation and wildlife, and the huge amounts of money involved in 'shoots'. Whilst there are obvious links between field sports and the Right to Roam movement, nevertheless, in some respects, the last two chapters sit a little oddly. That said, Hey sets the record straight on a number of important aspects of such things as Kinder Scout and the legend of mass trespass. These discussions have considerable value, which is not lessened by his own long-term support of the Ramblers' Association to which reference is made in the Preface. It is in these last chapters that Hey's politics really stand proud, and there can be no objection to that. Do we not all write under the influence of our personal views? The casual reader will gain a greater understanding of both landscape history and the impact of resource exploitation whilst being handed a framework for reading the landscape. And those of a more academic bent will feel confident that Hey's facts are reliable (and quotable). Although there are no footnotes, the book has a useful bibliography and index.

JENNIFER S. HOLT
Rossendale

DAVID SHORT (ed.), *An historical atlas of Hertfordshire* (University of Hertfordshire Press, 2011). xv + 201 pp., 30 figs. £25.

The University of Hertfordshire Press (like the historians of its host University) has an excellent record of publishing volumes of local and regional history which meet the needs both of academic historians and of an interested public. This recent addition is no exception, offering excellent value for a large-format and colourfully illustrated, stoutly produced paperback, with a brief but insightful introduction on historical atlases by Nigel Goose with an excellent bibliography of the genre. Local historical atlases have tended to fall at one of two ends of a spectrum. At one end are those more academic publications which set themselves a historical agenda, covering all the main thematic areas across time, and then seek to provide maps which illuminate those themes, even if the data available for mapping some concepts are often elusive, requiring careful historical evaluation. At the other end are those (generally aimed at a wider public) which start from mappable data, not attempting to cover all topics, and leave the reader to draw wider thematic conclusions. This particular volume falls somewhere in the middle. It is organized thematically, covering in turn boundaries, buildings, communication routes, demography, early settlements, industries and work, landscape, religious buildings and religion, social issues, towns and villages, war and civil unrest, but as the alphabetical ordering of that list suggests, it imposes no particular chronological model of county development on those subjects (after an introductory section on the physical landscape and the origins of the county), and some of the individual topics selected, such as icehouses, City of London coal tax markers or medieval and Tudor graffiti, reflect the enthusiastic knowledge of particular researchers. There are 82 separate sections, mostly consisting of two pages with one map, and the text tends to summarize the topic and the lessons to be learned from the map for the general reader, rather than evaluating the sources and reliability of the data being mapped. Nigel Goose manages to get two maps each to illustrate his sections on Tudor and Stuart population and on straw-plaiting and hat-making in the nineteenth century, as does Nigel Agar for agricultural trades. The longest sections, however, are those on the county's garden cities and new towns, which together get an unrivalled ten pages. The 51 contributors are an impressive mixture, with heritage professionals and local historians rubbing shoulders with leading figures in landscape and local history and historical geography such as Tom Williamson, Evelyn Lord and Hugh Prince.

It has to be confessed, however, that this is not an atlas designed to please the agricultural historian. Agar begins his section on agriculture in the nineteenth century by noting 'Although agriculture has been practised in Herefordshire since Neolithic times, the first century for which we have really detailed information is the nineteenth', and this controversial view seems reflected in the volume as a whole. There is no systematic coverage of settlement history or types after the Anglo-Saxon period (not even in Domesday), apart from a section on abandoned settlements, and no attempt to map patterns of landholding: even the location of major estates can only be deduced from the discussions of buildings and landscape features. There is a section on markets and fairs, though it only maps markets established up to the sixteenth century, but it offers no analysis of the agricultural produce marketed. The sections on landscape address woodlands (mapping woodland with over 200 swine in Domesday), rabbit warrens, dovecotes, parks and 'great gardens' (two sections on the latter two topics), but only the modern sections on parliamentary enclosure, orchards and agriculture in the nineteenth century reflect directly on farming practices: even the last-named section simply illustrates parishes with more than 60 per cent arable or more than 60 per cent pasture from the 1836 tithe commutation data. The chapter on mills deals entirely with mills up to 1400, predominantly those in Domesday. There is a section on malting and brewing, focused on Ware's role as a malting centre for London and nationally, but nothing in the text indicates the source or date of its map of malthouses and breweries. The map accompanying the section on watercress-growing is dated to around 1900, but is classified by the type of bed structure used in growing, not in relation to other farming types. Agar's and Goose's sections noted above throw some light on dealers in corn, hay, malt and cattle and the spread of the straw industry in the mid-Victorian period, but there is no further consideration of agricultural produce, processing or trading; the other industries covered are technologically interesting ones such as bell-founding and papermaking, not the standard cloth, leather and metal trades. The texts on medieval roads/bridges and on turnpike roads refer occasionally to agricultural goods: an account of the origin and numbers of wagonloads of grain passing through Colliers End in 1632 is described as 'probably the first ever traffic census', but both these sections and that on rivers and navigations are either silent about the goods carried or refer to produce from East Anglia moving through to London, rather than the county's own output. The only author really to address agriculture is Goose, both briefly in his discussion

of population trends after 1500, and at slightly more length in his introduction, where he confirms 'the "fame" of the county for tillage, and its essentially agrarian economy for much of its history', but, sadly, despite its many other virtues, this volume does little to reveal that agrarian economy or society.

JONATHAN BARRY
University of Exeter

RICHARD HOYLE (ed.), *The farmer in England, 1650–1980* (Ashgate, 2013). xvi + 358 pp., 51 figs., 28 tabs. £80.

Farming, as readers of the *Review* will readily appreciate, is a very broad church. Irrespective of environment, location and soil type, the practice of the craft and science of farming will be determined by many complex and even contradictory factors. Family background, patterns of inheritance, method of tenure, availability of capital and the existence or otherwise of suitable heirs are among the many elements concerned. A man of 60 with no immediate family may take a very different view of the next ten farming years than his neighbour with a brood of sturdy sons keen to follow in his footsteps.

As Richard Hoyle shows in his admirable introduction to the present volume, the 'farming ladder' was occupied by all sorts, yet our ability to see them as a community and to assess their success or otherwise in overcoming the elements or coping with periods of depression is often obscured by the absence of good-quality source material. For earlier periods farm diaries, memoranda and accounts (often chance survivals) are frequently little more than things of threads and patches, giving tantalizing glances of income and expenditure but casting little light on real profits and losses and other elements of business activity. The problem is partially illustrated in Joyce Burnette's chapter where she makes a brave attempt to apply sophisticated econometric analysis to a range of accounts as a means of assessing seasonality of agricultural employment between 1740 and 1850.

The reality is that for all the voluminous sets of extant nineteenth-century farm accounts, only the data collected by the Farm Management Survey from the mid-1930s onwards allows for a detailed view of the sectoral advance or decline of farming as a whole. Until more recent years the general body of farmers, irrespective of their level of agricultural education, have been at best reluctant keepers of records. Suspicious of officialdom and sceptical of the claims of 'science', the bulk of the pre-twentieth-century farming community tended to farm much as their fathers had farmed before them. Of course, they kept a close eye open to the main chance and in following trends in prices not infrequently adopted rotational and cropping measures wholly unsuited to the circumstances of their farms. If the price was right they followed it, but otherwise the efforts of landlords and their agents to cajole or even coerce them into change were often met with dour scepticism.

There were, of course, exceptions and to the extent that contributors to this book offer a series of essays on noteworthy individuals, its title might better be 'Some farmers in England, 1650–1980'. At the peak, as it were, of the farming pantheon stood the genuine innovators, men like James Mason (1824–1903) and Rex Paterson (1903–1978), creative thinkers whose innovative approach towards their craft was instrumental in stimulating various significant developments in agricultural science. Yet, as Peter Dewey takes pains to point out, Mason's ample wealth enabled him to sustain the considerable farming losses occasioned by his experiments, while Paterson, John Martin tells us, brought skills to his calling from outside the farming world. Meanwhile, the capitalist nineteenth-century farmers described in detail by John Broad and Susanna Wade-Martins, were hardly typical of the ordinary run of husbandmen. On the other hand, in common with Hoyle's late seventeenth-century English farmers, the former would probably have attributed some of their success to a flexible approach to cereal cropping policy. Flexibility, adaptability and sheer toughness undoubtedly characterized those denizens of the uplands of the north west described by Hilary Crowe while similar qualities were required of the Lancashire smallholders of the eighteenth century who, Andy Gritt writes, played so important a role in the agrarian and industrial economy. Somewhat earlier, Lancashire was the home of the remarkable Quaker farmer, Sarah Fell, who successfully managed her customary and freehold lands with a sharp eye open for entrepreneurial opportunities. Her activities are considered by Jennifer Holt, while Nicola Verdon contributes further to the gender debate by elegantly outlining the life of Louise Cresswell who ran a substantial farm in Victorian East Anglia and wrote extensively of her experiences.

In sum, this book comprises a series of interesting and sometimes intriguing snapshots of individual farmers from the sixteenth century onwards. But as Richard Hoyle readily admits, it is not, nor could it ever have been, a comprehensive portrait of 'the farmer'. Perhaps a final chapter based on returns from the Farm Business Survey would have given us a glimpse of the economic and social condition of the farmer in 1980? This would have provided some sort of conclusion or epilogue to a volume ending rather abruptly with

Philip Conford's essay on the organic pioneer Robert Stuart (1900–1980). It would, moreover, have laid the foundation for a study of the alarums and excursions, triumphs and traumas of the past 30 years of the agricultural world to which historians should soon be turning their interest. Professor Hoyle might care to reflect upon this, perhaps in discussion with the inimitable and evergreen Ted Collins, to whom the present work is affectionately dedicated.

R. J. MOORE-COLYER
Llanrhystud and Malmesbury

RICHARD DAVIES, ALAN PETFORD and JANET SENIOR (eds), *The diaries of Cornelius Ashworth, 1782–1816* (Hebden Bridge Local History Society, Occasional Publications, 2011). viii + 368 pp., 43 illus. £19 + £3 p. & p. via www.hebdenbridgehistory.org.uk.

Rural domestic workers, with a foot in agriculture as well as manufacture, lay behind the rise of West Yorkshire as the major wool textile region of industrializing Britain. Cornelius Ashworth (1751–1821), living at Walt Royd, Wheatley in Halifax parish, was one such, although he was not a typical farmer/handloom weaver. Following an early marriage to the widow of a propertied family he was unusual in that his wife had inherited the farm (16 acres with farmhouse and seven additional cottages) for her lifetime. The Ashworths were therefore ratepayers and Cornelius played a role in the administration of his township. Through his wife's family he also had close London connections and step children (though no issue of his own). He was also unusual in keeping a diary. Four volumes of everyday observations have survived covering two separate years of the 1780s, a year or so of 1809, and just over a year 1815–1816. They are here the subject of careful (and for the first time complete) transcription, indexing and analysis by three experienced researchers of the Hebden Bridge Local History Society. It is published by the Society, on high-quality coated paper with both black-and-white and colour illustrations, with the aid of bequests and subscriptions that have rightly recognized the unique value of this, albeit intermittent, record of daily life at the cutting edge of the first industrial revolution.

The book starts with a thorough and knowledgeable introduction to Ashworth's various occupations, their routines and technologies, his religious practice, travel and the economic and social conditions of Halifax parish at this time. Footnotes point the reader to a wealth of complementary information and potentially puzzling entries in the diaries are thereby clarified. Nigel Smith's exemplary indexes to places, persons and subjects complete what is a thorough context for the diaries themselves. It even includes a glossy copy of J. F. Myers' Map of Halifax Parish, 1835, tucked into a sleeve in the back endpaper. Students will find it instructive to trace Ashworth's perambulations.

In the mid-1780s Ashworth records when he carried each piece of cloth to market, as well as the amount he wove each day. His output was just less than half a piece of 30-yard kersey per week but sometimes he wove twice that amount. Shifts to weaving different sorts of double worsted cloths are recorded and the diary shows Ashworth weaving into the twilight hours and before dawn. He was also involved in building, quarrying, labouring and hop dealing. By the time of the later diaries weaving is no longer mentioned. Farming and social events become more prominent, including the Ovenden enclosure of 1817. Throughout there is intermittent but useful mention of prices for farm produce, animals, and labour, much about oats, cows, harvesting and water furrowing. Ashworth was a reticent recorder with little time for sentiment but two things stand out: his faith and his preoccupation, on a daily basis, with the weather.

Whether entirely new to the economic and social history of this part of Yorkshire or already an expert, this book has much to offer. It will be very useful for those wishing to understand: the industrialization process; domestic textile manufacturing and hand weaving; small scale mixed farming; multi-occupations; the importance of seasons and climate, familial ties; the central importance of the evangelical revival in this part of Yorkshire; and the everyday lives of relatively lowly people living in a period of economic and social transformation.

PAT HUDSON
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BRIAN BONNYMAN, *The third duke of Buccleuch and Adam Smith. Estate management and improvement in enlightenment Scotland* (Edinburgh University Press, 2014). x + 218 pp., 7 figs. £45.

This important volume is a valuable addition to the growing, but still small, field of detailed empirical historical research into estate management in Scotland. As such, it should attract a wide audience, not least because it combines a detailed study of one of Scotland's great estates with a fascinating analysis of how the management and policy of that estate was influenced by the intellectual ferment of the Enlightenment, centred in nearby Edinburgh. This book is built upon a wide range of sources, but central to the study are the Buccleuch papers, one of the premier archival collections for landed estates history in Britain. This

collection has been neglected by historians in the past, heightening interest in this volume, which is in addition handsomely supported by maps and images.

The Buccleuch estates remain the largest private landed estates in Scotland, and this book traces their eighteenth-century history; a formative period where they underwent significant change under the rubric of Improvement, led by key personalities of the day, as well as unknown, but wildly influential estate managers. The central figure under consideration is the third duke of Buccleuch, who oversaw his vast patrimony through a period of revolutionary change. He was guided through this by his tutor, Adam Smith, the great political economist, and one of the joys of this volume is the way in which it exposes the intellectual networks that made later eighteenth-century Scotland such an exciting and challenging place to be. Although much has been written on the intellectual history of the period, this book is the first attempt to examine the process by which the insights of contemporary political economy were applied to the management and improvement of a landed estate. As such, it will be of great interest to readers concerned with agricultural and improvement history, landed elites and estate management, and Enlightenment thought and its application.

The book is divided into six substantial chapters, which although broadly thematic, also slot roughly into the overall chronological span of 1746–1812. They cover roughly five decades of upheaval and reform in the management and personnel of the estate, the purpose and design of its leases, the nature of agriculture and other economic activities such as forestry and fishing and the management of the family's 'interest', social and political. As well as this, the reader will be rewarded with a detailed insight into the education and training of a young nobleman in the mid-eighteenth century. For the third duke of Buccleuch, this meant having Adam Smith as a personal tutor and being accompanied by him on a Grand Tour of Europe. It was a long-standing and rewarding friendship, and although Smith took on no official role on the estates, his influence on the duke's thinking is beautifully teased out here.

At the core of this book lies the tension between personality and land, the opportunities and restrictions of Improvement, and the limits of idealism. The author embeds these tensions in a series of discussions; on the theory and practice of Improvement and how it was instituted and by whom; the 1707 Union project and its perceived benefits, as defined by the landed classes; debt, consumption and estate finances; and the political and governing power of families such as the Buccleuchs, their close family connection, the Argylls, and friends and colleagues, such as Dundas. Crucially, this picture of power and influence in nuanced with a study of the patterns of resistance to Buccleuch power, especially to the programme of Improvement being rolled out across the lowland and upland estates, within and without the estate management.

One of the heroes of the book is William Keir, one of the Buccleuch estate managers and a man who was fundamental to the design and execution of Improvement on the estates. He faced opposition from his senior colleagues in the management, and from the populace affected by his lease re-structuring plans. Tenants formed 'combinations', there was fence breaking and rioting on the estates and as a consequence a tightening up of the policing of behaviour. This is not a story of a smooth transition to modernity, but one of tension, conflict and deep social and economic complexities. The third duke was a man dedicated to his role as a 'public-spirited patriot'; he supported thinkers and inventors and he believed his improvements would benefit the national economy. This volume paints a complex picture with an admirably light touch; it deserves its place in a prestigious publishing series and makes a key addition to a wide range of historical and intellectual fields.

ANNIE TINDLEY
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BONNIE WHITE, *The Women's Land Army in First World War Britain* (Palgrave Macmillan, 2014). ix + 207 pp., 6 illus. £55.

In their striking uniforms of khaki breeches, overcoats and boots, the appearance of Land Girls in the latter part of the First World War aroused much contemporary comment, some amusement, and a large degree of consternation. The Women's Land Army has also been well-served by historians. Peter Dewey's research in the 1980s sought to calculate the contribution of the WLA to First World War agriculture vis-à-vis other forms of substitute labour. Other work, by Pamela Horn, Susan Grayzel, Gill Clarke and Cecilia Gowdy-Wygant, has seen the WLA as a symbol, amongst other things, of wartime patriotism, personal liberation and rural rejuvenation. Is there anything else to be said about an organization that figures so heavily in public and academic consciousness? Bonnie White's new book shows that the answer is a resounding yes.

The Women's Land Army in First World War Britain is the most comprehensive history of the origins and development of the organization to date. It is based upon an extensive trawl of the national archives housed at Kew and Edinburgh, of personal testimonies found in

the Imperial War Museum, and local records deposited in repositories around the country. The sheer breath of research, and a critical reading of the sources, permits a rather different history of the WLA to emerge. It was a body whose inception was far from smooth. Emerging from a patchwork of organizations that were set up to encourage women into land work, the WLA was formed against a backdrop of administrative mismanagement, lack of co-ordination and initial government indifference. From its formal inception at the beginning of 1917 the WLA was not an independent body and the different layers of bureaucracy led to operational confusion at both the local and national level. The WLA was therefore distinguished by a degree of conflict and tension, which hindered its efficiency in recruiting, training and placing women into farm work. By July 1917 the organization had placed only 2000 additional women on farms, with 2200 in training centres. Although a national organization, the WLA in Scotland differed in its orientation, operation and outlook from the WLA in England and Wales, highlighting the importance of understanding regional variations.

The book also critically explores a number of other important themes. What motivated women to join the WLA? Traditionally it has been painted as a patriotic act, to assist the war effort, but here we are shown that this argument is incomplete. Individual motivations differed. Sometimes women joined to experience new work opportunities, and many cited working outdoors and with animals as key. Others believed they were taking part in a scheme of national importance. Some young women, stymied by the restrictions of domestic service, saw that the WLA offered a degree of freedom. Thus although the initial vision of the WLA was of a body of well-trained, educated, disciplined middle-class women from towns and cities, the reality was more complex. Recruits increasingly came from a variety of social, economic and educational backgrounds, and the training they received was mixed and often rudimentary. How did women fare once placed on farms? Again, the picture is complicated. The Land Girls had to negotiate several relationships, with farmers, farmers' wives, other farm workers, Group Leaders, Welfare Officers and other Land Girls. All could be fraught. Some girls took their work more seriously than others. Some farmers were critical of the abilities of women, others were more welcoming. Male labourers could sneer at the work performed by women, but they were also won over by their perseverance. The challenges faced by Land Girls were therefore not simply due to prejudice, but were also connected to local farming practices, fears over conscription if women were used as substitute labour, and concerns of national and local leaders to convey a particular image of women agricultural workers that allayed concerns over gender and class relations.

In terms of the organizational history of the WLA I doubt if this book could be bettered. Individual readers may find some gaps. For me, Chapter 4 on the WLA in England and Wales would have benefited from greater assessment of local and regional demands within and between these nations. The use of personal testimony in this chapter, whilst illuminating in many respects, also caused some confusion as some of the women quoted, like Edith Airey, who worked on a farm in her native Suffolk for the first six months of the war, are discussed as being members of the WLA, when the organization did not yet exist. This might sound niggardly, but it raises questions about whether non-WLA workers experienced similar or different conditions. Some further investigation of the available statistical data would also have helped to assess the significance of WLA in terms of the broader history of agriculture and women's work in the early twentieth century. These criticisms should not detract from the success of the book, however. It is by far the most thorough and critically refreshing account of the WLA in the First World War and should be read by anyone with an interest in the Great War, women's work and agricultural labour.

NICOLA VERDON
Sheffield Hallam University

BRETT MIZELLE, *Pig* (Reaktion Books, 2012). 224 pp., 117 illus. £9.99.

Admiration, pity, fear, fascination, disgust, love: humans have a complicated relationship with most other animals, and pigs are no exception. It is presumably this complexity that has prompted Reaktion Books into commissioning their animal series to examine the historical role of animals and their significance in the worlds of trade and imagination, art and science. It is, they claim, 'a new kind of animal history'. The series now has over 60 titles from albatross to wolf, including chickens and ducks, discussed in 2012 in this *Review*, and pigs, the title under review here.

Brett Mizelle has assembled a wonderful collection of pig images, from Greek vases and Roman statues, through medieval manuscript illustrations to film and television stills, to illustrate his book. He begins with an account of the wild boar and its domestication, speculating on whether, given the behaviour of wild pigs, it was a treaty between consenting parties in their mutual self-interest. He goes on to examine the interactions between pigs and people throughout

history, touching on classical myths, medieval pig executions, and the different attitudes to pigs of Moslems and Jews on the one hand and Christians on the other. One of the constant themes of the book is the tension between the small scale and the industrial scale, both in pig rearing and in pigmeat processing. The chapter on the pig in the Americas contrasts the slaughter industries of Cincinnati and Chicago with home-killing traditions in the southern states of the USA, and much of the chapter on the modern pigmeat industry is set there too, comparing traditionally raised pigs favourably with the intensively farmed product. The remaining half of the book is concerned with what pigs do apart from providing something to eat. They hunt truffles and work as entertainers. In Australia there are pig races. There are now more Vietnamese pot-bellied pigs in the USA than in Vietnam since they became popular as pets. Their genetic similarity to humans makes them useful as experimental animals and sources of transplant organs, but also means that they can be sources of medical problems. There is a fascinating chapter on the linguistic and metaphorical role of pigs, and another on pigs in art and literature, from the medieval Testamentum Porcelli to Miss Piggy on television. The final chapter is concerned with the problems caused by feral pigs.

Does this approach constitute a new kind of animal history? And if it does, is it an improvement on the old kind of animal history? Its exploration of mythology and religion, images and literature – the pig of the human imagination – enables the author to make a powerful case for what he calls our 'occlusion of the real experiences of pigs' as the pig industry has changed in the last 50 years to move from the cottage and mixed farm pig to the pig as a component in a vertically integrated meat production business. But the reader looking for a discussion of why these changes have occurred, for some analysis of the developments (in feed formulation, genetics, biosecurity, capital intensification, supply chain integration and market concentration) that have combined to produce them, might be better advised to follow up the extensive and varied references listed in the final 30 pages of the book.

PAUL BRASSLEY
University of Exeter

BERNIE ECCLESTON, *Pumps, pipes and purity: the turbulent social history of providing the public with enough safe water in the Thirsk district and North Yorkshire from 1875* (Bernie Eccleston, 2012). 405 pp., 73 figs. £17.50.

Pumps, pipes and purity is the conflict-filled story of the development of mains water in a rural Yorkshire district. From the moment the Thirsk Water Company was created in 1878, the water question spiralled into a series of battles between commercial interests, landowners, public authorities, sanitary officials and ratepayers. This account follows the water company and neighbouring local authority suppliers through the years up to their absorption into the Ryedale Water Board in the 1960s. It is a detailed and well-researched work, published by the author. Focused on local archival sources, it also draws on histories of public health and water politics in Britain and addresses a significant rural gap in this literature.

Thirsk had much in common with other rural and semi-urban areas during this period. Eccleston sets his study in the context of national policy, assessing the local implications of key government measures in water and sewerage. He highlights tensions between central and local government, exacerbated by permissive regulations, and between local government tiers. Fragmentation remained a key feature of the water industry until amalgamation policies took a firm hold in the 1960s and '70s. The long-term significance of the 'beneficiary principle', enshrined in 1870s public health legislation, is evident here. Placing the financial burden for local services on the parishes that benefited from them ensured highly localized water infrastructures and discouraged cooperation across governance boundaries until after the Second World War. The vagaries of local government obligations could be exploited. The 'quasi-urban' district of Thirsk itself – part of a Rural District Council – resisted pressures to adopt 'urban' sanitary powers for as long as possible.

This account demonstrates vividly that pollution was not just an urban problem. Eccleston examines the politics around recurring outbreaks of disease caused by unreliable water sources, inadequate sewerage and ineffective water treatment. Northallerton had the worst typhoid mortality rates in the country in the early 1890s. The villages of Boltby and Thirlby, threatened by *B. coli*, boiled their water for a whole year, as late as 1963. Informed by the work of Chris Hamlin and others, Eccleston suggests that sometimes the best course of action was unclear to authorities; at other times, cost-cutting was the main priority. He shows that ideological debate over public and private ownership of water supply was only one element in a complex arena, where powerful individuals – local officials, engineers and landowners – could influence events over several decades.

Despite the difficulties, this is also a story of rising domestic and agricultural demand in these areas during the twentieth century. New housing from the 1940s, with water closets, fixed baths and water

heaters, introduced changes in demand that were only dimly anticipated by water providers. In agriculture, mains water brought new dependencies, with farmers fashioning ad hoc piped connections. Cattle and dairy farmers, once connected for 'occasional use … in dry seasons', became increasingly reliant on constant supply from the 1930s for water troughs and dairies, and, later, for irrigation. Eccleston shows the kinds of challenges the Ministry of Agriculture and farmers faced in trying to increase production at a time of public expenditure curbs. The post-war picture was one of repeated disruptions to supply, with more than one family forced out of dairying when lack of water for cooling and hygiene prevented them from meeting Milk Marketing Board standards.

But this was not a simple question of rising demand. Significant pockets of resistance to mains water (and its related costs), from public authorities and landlords, were part of the problem for those promoting new water schemes. Diverse modes of provision continued into the 1950s and beyond, even within individual villages, with continued use of private rams, village pumps and wells, standpipes and water carts, alongside water mains. Sewerage was even slower to develop. Eccleston highlights the work of Women's Institutes nationally in campaigning for better rural sanitation in the 1940s, protesting at earth closets, bucket lavatories and shared facilities. Drawing on census records, he estimates that two thirds of rural Thirsk households still used outside privies in 1951. Further localized research into the politics of household amenities and everyday life would enrich this picture.

The book is readable in style. Each chapter ends with a useful summary of sources and suggestions for further research. It contains photographs, maps, tables and an index. An epilogue considers the (public) regional water authorities in the 1970s and Yorkshire Water (privatized in 1989) during its controversial first decade. It is not a light read. Its length and in-depth coverage of conflicts that were repeated over time and across different parts of the district make for some repetitiveness, and can obscure the main developments. It provides, however, a multitude of fascinating insights into the transformation of an agricultural district, which will be valuable for future studies of rural provision and daily life.

VANESSA TAYLOR
University of Greenwich

ROBERT NEWSON, PETER WADE-MARTINS and ADRIAN LITTLE, *Farming in miniature. A review of British-made toy farm vehicles up to 1980* (Old Pond Publishing Ltd, 2013). 360 pp., 970 illus. £49.95.

As the story goes, toy manufacturers realized the potential for playing at farming in the aftermath of the First World War. With a dip in consumers' enthusiasm for lead soldiers and all things military, the London-based company Britains launched its *Home Farm* for Christmas 1921, beginning with a horse-drawn tumbrel. By the mid-1930s, one could buy a *Model Home Farm* set featuring 'a nice assortment of Animals, Sheep, Pigs, Cows etc., Farm People, Horse Plough with Driver, and Four-wheeled Farm Waggon (sic) with Driver'. Toy tractors joined Britains' range only from 1948, by which time the attractions of what the authors of *Farming in Miniature* refer to as 'carpet farming' (p. 64) were well established. Later cohorts of children had combine harvesters and crop sprayers to play with, as well as plastic churns and hay bales to load and stack.

Farming in Miniature presents a catalogue of the toy and scale-model farm vehicles made in Britain during the period *c.*1920 to 1980. Before then, the market depended on wooden or tinplate toy wagons from Germany, or more modern models from the United States; after 1980, some British brand names survived, but most toy manufacture had moved overseas. The study will eventually fill two volumes, the content organized alphabetically by maker's name. Most of these miniature vehicles were meant to be played with, raising obvious questions about the attraction of agricultural themes for children in an increasingly urbanized society. Lone Star marketed a *Farmer's Boy* series of tractors and implements from 1978 to 1979, though one assumes it wasn't just farmers' boys who bought them.

There were some interesting connections to the makers of full-size machinery. Ferguson – always innovative in its marketing – brokered an arrangement with Airfix, who produced models of Ferguson tractors to be given away by salesmen. Chad Valley, maker of wooden and die-cast tractors, branched out with *To Market* (early 1950s), a board game with little Ferguson playing pieces: players landed on squares carrying promotional messages for the brand, such as 'Hydraulic control prevents damage from hidden obstacles – go forward 3'. Links with machinery firms also led to models aimed more explicitly at adults: Denzil Skinner advertised for business in *Farm Mechanization* magazine in the early 1950s, showcasing its expertise in making 'perfect miniatures' for 'display and demonstration'.

The book includes a few novelty tractors: Die Casting Machine Tools (DCMT) created a clockwork *Tricky Tractor* in 1949, which did stunts, and a subsidiary of the firm produced squeaky vinyl tractors for babies in

the late 1960s. But model tractors were rarely generic. There were lots of model Fergusons, Massey-Fergusons, Fordson Majors, and a few David Browns. The colour of these vehicles – such a distinctive feature of branding in agricultural machinery – could be surprisingly varied in their interpretation for the toy market. Airfix's Ferguson tractor came in a rather random range of colours, apparently reflecting the difficulties of sourcing plastics in the late 1940s.

Some striking features emerge from this overview: large numbers of toy tractors in the late 1940s and early 1950s were driven by toy land girls; trailers hauling timber were clearly very popular; old-fashioned horse-drawn wagons and hay carts were the mainstay of many manufacturers' catalogues well into the 1960s. Most farm toys before and after the Second World War drew on traditional forms of country life rather than reflecting changes in agricultural practice, and working horses persisted long after they had disappeared from most farms. By the 1960s, however, toy farms were embracing technical development and modernity, and motor vehicles and implements became more of a focus. From the 1970s, Britains employed a consultant for their farm models who spent the rest of his time working for the Agricultural Development Advisory Service.

The collectors' market has inspired most publications on the subject, and this volume is also aimed primarily at that specialist readership, providing a well-illustrated guide to variations in models produced, and reproducing images of packaging and trade catalogues where available. Most of the book is devoted to the technical and manufacturing history, with only brief excursions into reflection on the phenomenon of 'farming in miniature' and the ways in which it did and did not relate to contemporary agriculture at a scale of 1:1. But one of the problems in studying the history of toy farms has been access to adequate source material. With its companion volume (which will cover the remaining manufacturers, from Dinky to Wend-al), *Farming in Miniature* offers the first thorough survey of what was marketed and when, opening up opportunities for historians to take a closer look at this aspect in the popular representation of agriculture, prominent in the lives of so many children as they were growing up.

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