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Sustainable Agriculture in the Middle Ages: The English Manor*

By JULES N PRETTY

Abstract

Manorial estates survived many centuries of change and appear to have been highly sustainable agricultural systems. Yet this sustainability was not achieved because of high agricultural productivity – indeed it appears that farmers were trading off low productivity against the more highly valued goals of stability, sustainability and equitability. These were promoted by the integrated nature of farming, the great diversity of produce, including wild resources, the diversity of livelihood strategies, the guaranteed source of labour, and the high degree of cooperation.

THERE can be no doubt that the manorial estates of medieval England were extremely long-lived. They survived centuries of change, adapting only in small ways whilst retaining their major characteristics. It was a system of agriculture that appears to have been highly sustainable. Today, understanding what makes agricultural systems sustainable is a key concern of agricultural development. But there are methodological and practical problems. In particular, it is difficult if not impossible to ascertain whether a system is sustainable until it has stood the test of time.

One approach being currently pursued attempts to identify those key features or components which facilitate the capacity of an agroecosystem to withstand the effects of countless shocks and stresses whilst maintaining the desired level of output. Here an agroecosystem is defined as an ecological system modified by humans to produce food, fibre and other products, and hence contains a wide range of both biophysical and socio-economic components. Each such agroecosystem is maintained by the human beneficiaries, who value the system according to present productivity, future security, and how well the resources are distributed. If these desired objectives are not met, and people starve or natural resources are severely degraded, then the system may not survive.[1]

TABLE 1
Definition of four properties of an agroecosystem

Productivity: the output of valued product of the agroecosystem per unit of resource input
Stability: the constancy of production of the agroecosystem in the face of small disturbing forces arising from the normal fluctuations and cycles in the surrounding environment
Sustainability: the ability of the agroecosystem to maintain production when subject to stress or shock. Stresses and shocks have the potential of causing declining trends in production or even collapse
Equitability: the evenness of distribution of the production of the agroecosystem amongst its inhabitants

Persistent agroecosystems, such as the manorial estate, allow the maintenance or enhancement of the long term productivity of the resource base, together with the generation of adequate stocks and flows of food and income, so as to meet basic needs. But in practice this implies a trade-off between four central agroecosystem properties – productivity, stability, sustainability or equitability (Table 1). Once identified these four properties can be used as the means to classify the valued goals of an agroecosystem.

As a result of the complex interrelationships within a system, these properties are

* I am very grateful to Gordon Conway, Edward Barbier and E J T Collins, together with two anonymous referees, for their valuable comments and suggestions.

[1] *Food 2000. Global Policies for Sustainable Agriculture.* Report to the World Commission on Environment and Development, 1987, pp 3–5. G R Conway, 'The Properties of Agroecosystems', *Agric Systems*, 24, 1987, pp 95–112.

closely linked. The capacity to withstand shocks and stresses may, for example, necessitate some undesired reduction in productivity, stability or equitability. Alternatively communal access to natural resources may set limits to the total possible level of productivity. Such explicit or implicit trade-offs have continually been made throughout the history of agricultural development.

During the era of the manorial estate agricultural productivity was very poor. Quite clearly farmers must have valued more than just productivity. This paper explores some of the reasons for the low productivity, and argues that sustainability, stability and equity were all encouraged at the expense of productivity. Integrated farming and diversity promoted stability; diversity of the whole system together with varying livelihood strategies enhanced sustainability; and equity was maintained by a high level of cooperation. Finally some of the shocks and stresses which seem likely to have played a role in the eventual collapse of the manorial agroecosystem are described.

I

A fundamental feature of the manorial agroecosystem was the low agricultural productivity. In order to compare cereal productivity and stability, the yield data of fourteen manors belonging to the Bishop of Winchester for the period 1283–1349 were analysed. During this time records exist for a large number of consecutive years where the standard acre is known to have been in constant use (Table 2).[2] Wheat returned the greatest number of seeds per seed sown, but the best productivity per hectare was achieved by barley. Although the gross yields of wheat and oats were approximately equal, once the seed for the next sowing was removed, wheat was more productive by some 85 kg/ha. By contrast, oats were notably more stable for both measures of yield. High productivity, it appears, was associated with low stability.

TABLE 2
Summary of yields of three cereals grown on fourteen manors of the Bishop of Winchester, 1283–1349. (Manors are Alresford, Beauworth, Bentley, Cheriton, Downton, Farnham, Hambledon, Ivinghoe, Rimpton, Sutton, Taunton, Wargrave, West Wycombe, and Wield)*

	Wheat	*Oats*	*Barley*
Productivity			
Gross yield (kg/ha)	515	530	755
Net yield (kg/ha)	385	300	540
Stability			
Coefficient of variation (%)	38.8	31.3	39.9
Productivity			
Seeds/seed sown	4.0	2.3	3.5
Stability			
Coefficient of variation (%)	36.9	33.6	37.3
Number of data (kg/ha)	704	699	637
Number of data (seed ratio)	751	730	681

* *Source: see text, n.3.*

The best gross yields achieved in a single harvest on any of the Winchester estates were 1800, 1200 and 3000 kg/ha for wheat, oats, and barley. However, poor yields were frequent, sometimes falling to as low as 50–100 kg/ha. The individual manor with the best overall yields, Ivinghoe, was also the most variable; yet even here wheat yields

[2] Cereal yields are usually expressed in manorial accounts as the ratio of seeds harvested to seed sown, probably because several different sizes of acre were in common use, A Jones, 'Land Measurement in England, 1150–1350', *Ag Hist Rev*, XXVII, 1979, pp 10–18. But where the standard acre is known to have been in use, it is also possible to calculate yields per hectare. Manorial yield data usually exclude the tithe of between one fifteenth and one ninth (usually one tenth) of cereal, which was removed whilst the crop was still in the field. Until the sixteenth century the standard or Winchester bushel weighed 64 tower pounds. One tower pound equals 349g, thus one bushel is taken to equal 22.39 kg; see R E Zupko, *A Dictionary of English Weights and Measures*, Wisconsin, 1968, pp 25–27, 133–137. R E Zupko, *British Weights and Measures*, Wisconsin, 1977, pp 77–79. R D Connor, *The Weights and Measures of England*, 1987, pp 149–155. The accounting year began and ended at Michaelmas (29 September) and hence manorial accounts can be defined by either year. In this paper all dates of yields refer to the year of harvest; for example all the transactions and events recorded in the account for September 1300–September 1301 are denoted as having occurred in 1301.

only averaged 700 kg/ha.[3] But compared with other regions of the country these yields were not especially poor. The most productive region may have been north-east Norfolk, where mean gross yields for all these crops were over 1000 kg/ha, but in Sussex, Oxfordshire, Hertfordshire, Kent, Essex, south-east Norfolk, and the Isle of Wight, they rarely exceeded 8–900 kg/ha.[4]

Because manorial records refer to demesne harvests, assessment of tenant cereal yields is almost impossible. But the accounts for two Hertfordshire manors in 1371 recorded both the area of cereal cultivated for each of ten tenants together with the tithes paid: assuming a tithe of one tenth, Stern calculated that tenant wheat and dredge productivity was less than fifty per cent of that of the demesne.[5]

Livestock productivity was also low. Milk production from cattle was just 550–685 litres per year on well managed estates, and pigs, farmed principally for meat, were long-legged, bristly and smaller than wild boars. Sheep were primarily farmed for milk, wool, and manures, ewes yielding between thirty and fifty litres of milk per lactation of 200 days. On average, fleeces weighed about 500 grams in the thirteenth to fourteenth centuries, which contrasts unfavourably with modern long-wools that produce fleeces weighing some three to five kilograms. Ewes were expected annually to produce one lamb, but in practice anything from fifty to ninety were lambed per 100 ewes – this is approximately equal to modern hill sheep grazing on unimproved pastures. The average survival rate of lambs in southern England was between 70 and 80 per cent, though this could fall to less than 20 per cent in a very bad year (Table 3). Moreover, because of the extremely high variability in rate of survival, flock sizes were unlikely to remain stable from year to year.[6]

TABLE 3
Lamb survival rates on three manors, 1283–1349*

	Annual Survival of Lambs (%)	*Minimum Value (%)*	*Coefficient of Variation (%)*
Crawley, Hampshire	74.2	17.1	75.6
Kingsbourne, Hertfordshire	78.4	26.3	90.3
Meopham, Kent	80.4	–	–

* N S B Gras and E C Gras, *The Economic and Social History of an English Village (Crawley, Hampshire) AD 909–1928*, Cambridge, Mass, 1930, pp 410–15. Stern, *op cit*, pp 344–53. Mate, 'Medieval Agrarian Practices', *op cit*, p 25.

II

Crops and Cropping Practice

An important compensation for the low productivity of individual elements of the system was the range of arable, garden and orchard crops cultivated and livestock raised (Table 4). Such variety between sectors of the estate or within sectors of production helped to reduce the risk of complete failure; for example plentiful wild resources in a year when crop harvests are poor, or a poor wheat crop being offset by a good harvest of oats.

[3] J Z Titow, *Winchester Yields*, Cambridge, 1972, pp 40–120. Coefficient of variation equals standard deviation of mean/mean yield × 100. A low coefficient of variation denotes low variability about the mean and thus high stability; high variability equals low stability.

[4] B M S Campbell, 'Arable Productivity in Medieval England: Some Evidence from Norfolk', *J Econ Hist*, XLIII, 1983, pp 388–391. P F Brandon, 'Demesne Arable Farming in Coastal Sussex During the Later Middle Ages', *Ag Hist Rev* XVII, 1971, p 131. D V Stern, 'A Hertfordshire Manor of Westminster Abbey (Profits, Yields and Weather), PhD thesis, Kings College, University of London, 1978, pp 203–4. M Mate, 'Profits and Profitability on the Estates of Isabella de Forz (1260–92)', *Econ Hist Rev*, 2nd ser, XXXIII, 1980, p 332. M Mate, 'Medieval Agrarian Practices: The Determining Factors', *Ag Hist Rev*, XXXIII, 1985, pp 23–27.

[5] Stern, *op cit*, p 149.

[6] R Trow-Smith, *A History of British Livestock Husbandry to 1700*, 1957, p 122, 127. J Wiseman, *A History of the British Pig*, 1986, p 6. M J Stephenson, 'Wool Yields in the Medieval Economy', *Econ Hist Rev*, 2nd ser, XLI, 1988, pp 368–373. E A Atwood and H G Evans, *The Economics of Hill Farming*, Cardiff, 1961, p 99.

TABLE 4
Produce from a typical manorial estate*

Source	*Produce*	*Source*	*Produce*
Arable Crops		Cattle	Draught power, milk, cheese, butter, curds, some meat, leather, horn
Wheat (spelt, club, bread)	Bread, ale		
Oats (cultivated and wild)	Bread, pottage, livestock feed, ale	Horses	Draught power, leather
Barley (hulled, naked)	Ale, bread, livestock feed	Poultry (chickens, geese, swans, peacocks)	Eggs, meat
Rye	Bread	Pigeons and doves	Meat, manures
Peas, beans, vetches	Whole plant for human and livestock food	Bees	Honey, wax
		Rabbits	Meat, fur
All cereal straw	Livestock feed, thatching		
Orchard and Garden Crops		*Natural Resources*	
Apples	Fruit, cider	Deer	Meat, manures
Pears, cherries, figs, walnuts, damsons, plums	Fruit and nuts	Wild boar	Meat
		Birds	Meat
		Fish – from fish pond, river, sea	Meat
Vines	Wine	Hares	Meat, fur
Flax	Linen	Oak and beech trees	Acorns and mast for pigs, timber
Hemp	Rope and linen		
Herbs	Seasoning, medicines, dyes	Other trees and shrubs	Nuts, berries, fruits, timber, browse, fuelwood
Leeks, onions, borage, mustard, peas, beans	Vegetable foods	Ferns, bracken, sedges	Thatch, bedding, litter
		Nettles	Linen
		Osiers, reeds	Baskets, fish traps
		Holly, thorns	Threshing flails
Livestock		Peat	Fuel
Pigs	Meat	Herbs	Medicines, vegetables
Sheep, goats	Wool, milk, manures, some meat, skin for parchment	Grass	Hay
		Grass turves	Roofing, fuel

* Lord Ernle, *English Farming. Past and Present*, 6th edn, 1961, pp 6–30. Gras and Gras, *op cit*, pp 33–53. H S Bennett, *Life on the English Manor. A Study of Peasant Conditions, 1150–1400*, Cambridge, 1937, pp 75–96. G W Johnson, *A History of Gardening*, 1829, pp 36–43. J Harvey, *Medieval Gardens*, 1981, pp 163–180; E M Veale, 'The Rabbit in England', *Ag Hist Rev*, V, 1957, pp 85–90.

Several different species and varieties of each cereal were cultivated, each with important agronomic characteristics. Spelt wheat grains, for example, are protected by awns, which confer a high degree of resistance to pests and diseases, and tough glumes that make them more difficult to thresh. But bread wheat became increasingly common, with its looser more easily threshed ear and suitability to clay soils. Oats were preferred on poor acid soils, particularly where summers were both wet and cool. There were at least five cultivated forms, including pillcorn or polscorn with husks which did not adhere to the grain. Spring and winter varieties of both barley and rye were common, though of all the cereals rye remained the least cultivated. Hulled six-row species of barley predominated, namely the lax-eared nodding bere of berecorn and the dense-eared erect type, but an early ripening variety known as haste or haste-bere was also cultivated.[7]

Rotations of these crops and fallowing helped maintain the biological fertility of

[7] M Jones, 'The Development of Crop Husbandry' in M Jones and G Dimbleby, eds, *The Environment of Man: The Iron Age to the Anglo-Saxon Period*, BAR Brit Ser 87, Oxford, 1981, pp 106–108. F J Green, 'Plant Remains' in C M Heighway, A P Garrod and A G Vince, 'Excavations at 1 Westgate St, Gloucester, Appendix 5', *Mediev Archaeol*, 23, 1979, pp 186–190. F J Green, 'Iron Age, Roman and Saxon Crops: The Archaeological Evidence from Wessex' in M Jones and G Dimbleby, *op cit*, pp 132–143. G Beresford, 'Three Deserted Medieval Settlements on Dartmoor: A Report on the Late E Marie Minter's Excavations', *Mediev Archaeol*, 23, 1979, p 143. J E T Rogers, *A History of Agriculture and Prices in England 1259–1793*, Vol II, 1259–1400, Oxford, 1866, pp 173–77. *Middle English Dictionary*, eds, R E Lewis, J Reidy, S M Kuhn and H Kurath, Michigan, 1957–88 (cont), *passim*.

the soils and enhanced stability. The anonymous author of *Husbandry* recommended cultivation of both autumn and spring crops, because 'it may happen that the winter sowing takes well and the spring sowing fails' or vice versa. The variation in rotation patterns throughout England was great and fallowing regularity varied according to local conditions. In Sussex the best soils were cropped continuously, and in Norfolk arable was fallowed only once every ten years; but marginal land, such as in the Kent marshlands, had to be fallowed for at least two years after each wheat crop. In general, legumes were uncommon until at least the thirteenth century, though again the practice varied according to location. In Sussex and Norfolk, in the first half of the fourteenth century, legumes were sown on 15 to 30 per cent of the arable, whereas on the Winchester manors they had risen to only 8 per cent by 1345.[8]

Although arable crops were usually sown separately, the practice of mixed cropping of two or more crops together in the same field was also common. The most widespread mixtures were barley with oats, wheat with rye, and one of the cereals with a legume (Table 5). The mixtures were probably intended as smother crops, in which strong competition between the two different species helped to outcompete weeds. Examples of regional variations include bulimong in East Anglia and brotcorn in south and mid-England. On some manors many mixtures were used: on the estates of Crowland Abbey only wheat and oats were sown as pure grain after the mid-fourteenth century, the remainder of the land being sown with various mixtures of barley, oats, wheat, rye and legumes.[9]

TABLE 5
Contemporary Middle English, Latin and French terms for mixtures of crops*

Wheat + Rye	*Mancorn, Maslin, Mongcorn, Mestilion, Mastylon, Menglyd*
Barley + Oats	*Drage, Dragium, Dredge, Mixtil, Mixtylium*
Wheat + Vetch	*Frumentum vescosum* or *vessetum*
Oats + Peas and/or Vetches	*Bullimong, Bulimong, Brotcorn*
Wheat + Barley + Rye	*Beremancorn*
Wheat + Barley	*Beremancorn*

* *Middle English Dictionary, op cit, passim.* Lamond, *op cit, passim.* Rogers, *op cit*, Vol I, pp 221–2. Gras and Gras, *op cit*, pp 35, 353–7. *New English Dictionary on Historical Principles*, ed J A H Murray, Vols 1–10, Oxford, 1888–1928, *passim.*

The author of *Husbandry* also defined expected yields of various crop combinations. For example, the yield ratio for monocropped spring barley should have been eight seeds per seed sown, and for monocropped oats four; a mixture of the two in equal parts was expected to yield six. Although these values are rather higher than those documented in the manorial accounts, they imply that the author recognized no productive advantage in cultivating mixtures of crops, suggesting that one of the reasons for using mixed crops was to reduce the risk of complete failure.[10]

Between 1283–1349 several of the other Winchester estates cultivated both mancorn and drage: compared with their individual constituents both mixtures show some interesting differences in productivity and stability (Figure 1). Mancorn productivity is exactly an average of the returns of rye and wheat, but is markedly less stable. Drage however is as stable as monocropped oats and as productive as barley. Sometimes

[8] *Anonymous Husbandry*, in E Lamond, ed, *Walter of Henley's Husbandry, together with Anonymous Husbandry, Seneschaucie and Robert Grosseteste's Rules*, 1890, pp 70–71. Brandon, 'Demesne arable farming', pp 123–126. B M S Campbell, 'The Regional Uniqueness of English Field Systems. Some Evidence from Eastern Norfolk', *Ag Hist Rev*, XXIX, 1981, p 21. Mate, 'Medieval Agrarian Practices', p 30. B M S Campbell, 'Agricultural Progress in Medieval England: Some Evidence from Eastern Norfolk', *Econ Hist Rev*, 2nd ser, XXXVI, 1983, p 33. J Z Titow, *English Rural Society*, 1969, pp 41–2.

[9] Rogers, *op cit*, Vol II, pp 173–7. F M Page, *The Estates of Crowland Abbey. A Study in Manorial Organisation*, Cambridge, 1934, pp 118–119.

[10] *Anonymous Husbandry, op cit*, pp 70–73.

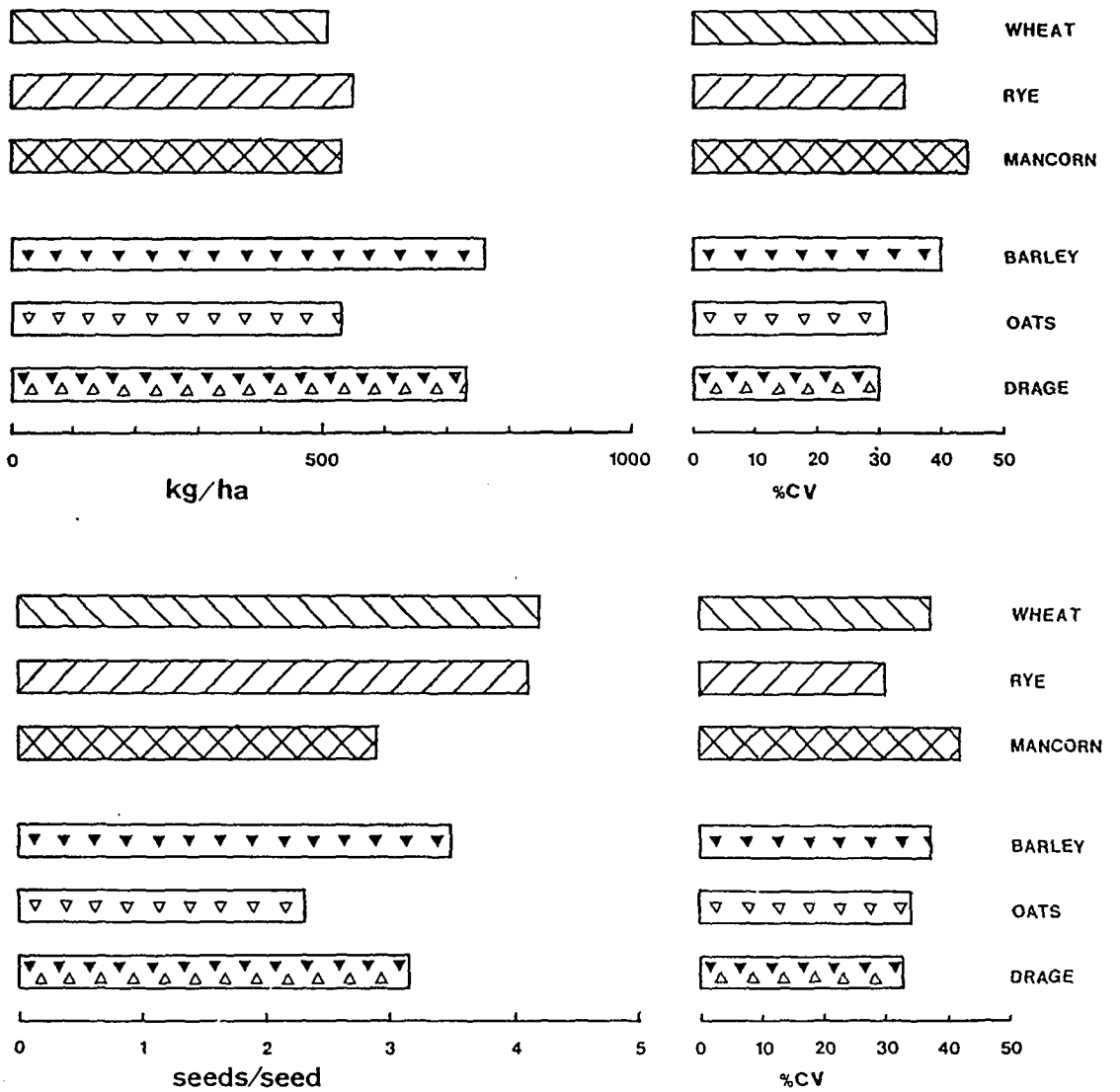


FIGURE 1
Productivity and stability of mixed crops compared with their individual constituents, grown on Winchester manors, 1283–1349

the mixtures yielded more than either of the individual constituents: 770 kg/ha for maslin in Norfolk and 1000–1300 kg/ha for drage at Crawley manor. On other occasions mixtures performed poorly – winter barley with wheat produced an average of only 500 kg/ha at Crawley; or on average in Oxfordshire drage returned over 900 kg/ha, about half-way between the individual returns for barley and oats. But none of the harvest records details the relative proportions of each crop in the final yield.[11]

Crop Complementarities

A particularly valuable complementarity between crops was the way that they

[11] Gras and Gras, *op cit*, p 353. Campbell, 'Arable Productivity', p 391.

responded differently to stresses and shocks. These responses can be followed by analysing yields after a large departure from the average. Those returning to normal quickly after a deviation, whether positive or negative, suggest a high level of resistance, whereas a slow return indicates low resistance. Yield indices, as percentages of long-term mean yields per hectare, have been calculated from data for wheat and oats grown on the fourteen Winchester manors between 1283–1349. Incidence of key years, taken as those when the yield was more than one standard deviation below or above the average, varied between crops and between locations.

The aggregated responses after key years for wheat and oats on five of the manors are illustrated in Figures 2 and 3. After poor harvests, oats returned to normal more rapidly than wheat. Nonetheless six years after the deviation oats were still below average at four of the manors. Following a very good harvest, oats were again advantageous, returning more slowly than wheat, though at two manors the responses are characterized by a ramp with no return. In this case high resistance, represented by yields returning quickly to the average, may not be a valued property of a particular crop.

Unravelling the patterns of year-to-year relationships is complex – there were many constraints to productivity, as described below, and it would appear that no single factor was responsible for high or low yields. However it is possible to envisage some positive feedback mechanisms: a poor wheat grain and straw yield could have resulted in poorer livestock condition, fewer manures, and low future wheat yields. Here it must be assumed that given a limited resource, farmers chose to manure wheat fields rather than oats, and thus loss of manures would have had no impact upon later oat yields. Or a weed smothered crop could increase the likelihood of weed attack the following year; but the feedback is complicated by differences in local farming practice: if the crops were rotated the residual effect in one particular field would impact on a different crop. In a wheat-oat-fallow-wheat rotation, low wheat yields following a universally poor year would have to be explained, at least partly, by a residual negative impact arising from the field that was under fallow.

What is clear, though, is that oats were both more stable and sustainable than wheat, advantages which may have been recognized by the medieval farmers. Oats were commonly cultivated on colonizing manors, particularly where the new land was marginal, and also were the principal crop on the marsh manors in Kent and the Fens.

Crop–Livestock Interactions

The relationship between crops and livestock was a primary feature of the mixed approach to manorial agriculture. Stability was enhanced by the integrated use of resources and great diversity of products, though at the probable expense of productivity. Livestock produced valued manures, which were critical in maintaining soil fertility. The value of manure was recognized in the widespread practice of folding sheep overnight in pens on arable land. But this practice may still have been inadequate, and evidence suggests that probably no more than 30 per cent of arable land was manured by animals. On fifteen Norfolk demesnes in the later fourteenth century an average of 15 per cent of the arable was folded annually, and a further 13 per cent received off-farm manures; and in Kent only 10 and 15 per cent was composted and sheepfolded. Even potential losses through leaching were recognized, Walter of Henley indicating that 'manure wastes in descending' (*fens gastent en descendant*).[12]

[12] Campbell, 'Agricultural Progress', p 36. Mate, 'Medieval Agrarian Practices', p 23. *Walter of Henley, op cit*, pp 20–21.

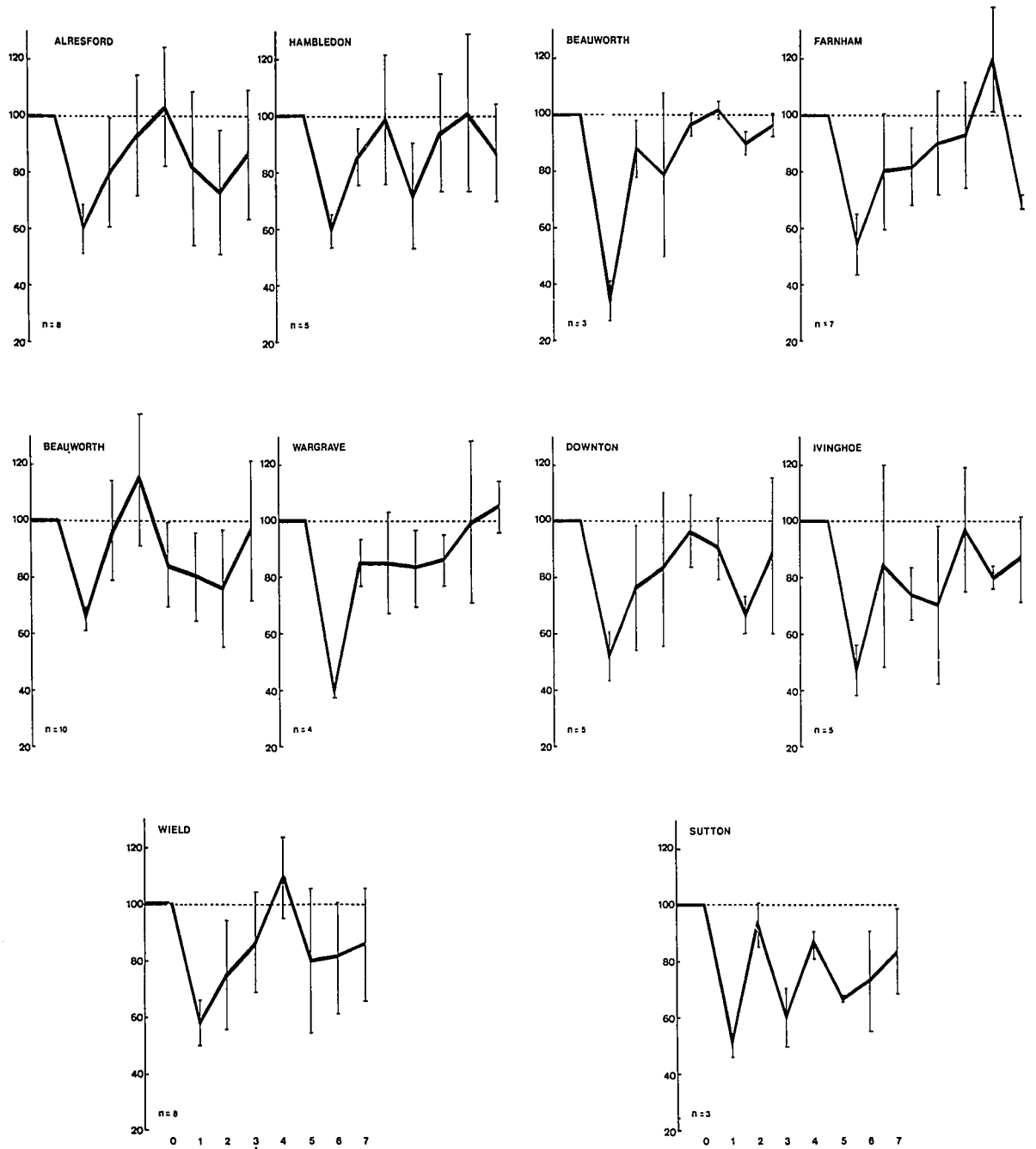


FIGURE 2
Responses of wheat and oats after negative key years

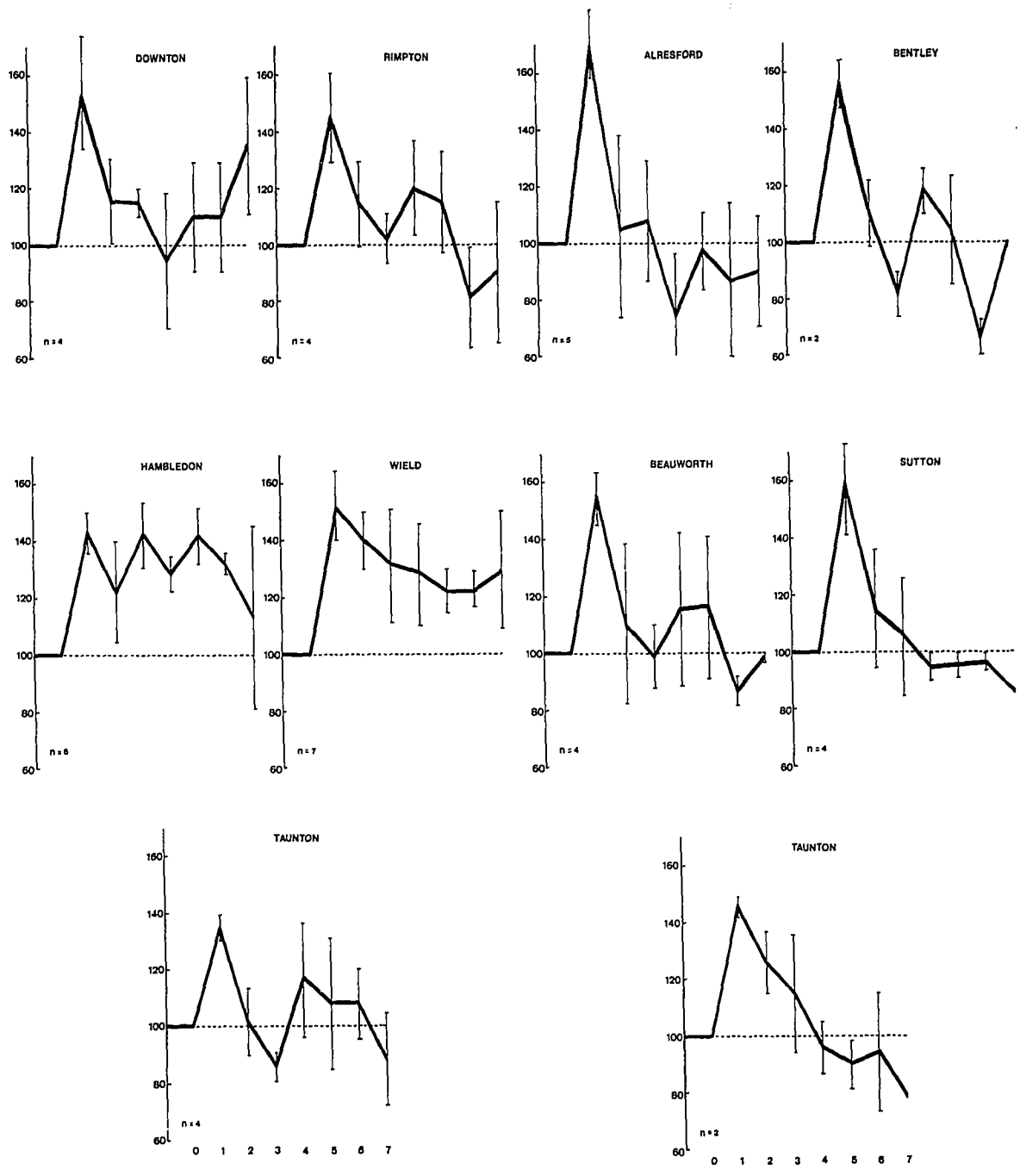


FIGURE 3
Responses of wheat and oats after positive key years

Apart from livestock manures, other important sources of fertilizer included pigeon manures, dead leaves, deer droppings, chalk and lime (marl), crushed shells and seaweed, ash from burnt turfs of grass, and human wastes. Marling was common practice on clay soils and, even though it required a high labour input to transport the chalk and lime from often distant locations, it could certainly enhance productivity: oats on non-marled land at Ebony manor in Kent yielded 1230 kg/ha, but a dramatic improvement to over 1900 kg/ha was reported following addition of marl.[13]

Livestock productivity in turn was probably limited mainly by the availability of feed, though the further factors of dietary preference plus cost of upkeep appear to explain the enduring dominance of oxen as draught animals over horses. Langdon indicates that an important trade-off was made between productivity per unit of time or area and productivity per unit cost. Thus horses were more costly to keep and required between six and twenty times more oats than oxen, which could be maintained mostly on straw and hay (Table 6). In addition, though oxen had a shorter lifespan and worked more slowly, they were more reliable and less liable to fall sick. In the eleventh century 95 per cent of demesne work animals were oxen; yet by the fourteenth century the numbers of horses had only risen to about 30 per cent of work animals. Even in regions where horses were relatively common, very few demesnes employed only horses for work; and those that did so appear to have cut the size of plough teams from eight or nine to five or six animals, thus saving on costs rather than capitalizing on potential speed of work.[14]

The high demand for hay also brought about higher rents for meadows compared with arable land, and during times of arable expansion and pressure upon natural resources even poor pasture commanded high prices. In addition, money paid by farmers for the cutting of fodder from trees and the feeding of pigs upon acorns and beechmast was always an important source of income for owners of woodlands.[15]

TABLE 6
Productivity and costs of upkeep of oxen and horses on 77 manors, 1250–1350*

	Oxen	*Cart Horses*	*Plough Horses*
Speed of ploughing (ha/day)	0.1–0.4	–	0.3–0.5
Speed of harrowing (ha/day)	0.4	–	0.8
Speed of hauling small cart loads†	x	2x	–
Average demesne life (years)	5.1	7.0	5.5
Costs‡ (shillings/animal/year)	7.2	23.7	10.2
Consumption of oats (kg/year)	61	1190	362

* J Langdon, 'The Economics of Horses and Oxen in Medieval England', *Ag Hist Rev*, XXX, 1982, pp 31–40. J Langdon, *Horses, Oxen and Technological Innovation. The Use of Draught Animals in English Farming from 1066 to 1500*, Cambridge, 1986, pp 158–165.

† x is nominal value for speed

‡ Costs include feed, maintenance and depreciation.

Key Constraints to Productivity

Although diversity and integrated use of resources helped to offset the apparent disadvantage of low productivity, several key constraints to productivity also boosted one or more of the other three system properties.

On many manorial estates individual holdings of arable land were not consolidated into one portion, but split into several small strips widely dispersed across the

[13] Ernle, *op cit*, p 10. D Roden, 'Demesne Farming in the Chilterns', *Ag Hist Rev*, XVII, 1969, p 16. Campbell, 'Agricultural Progress', pp 33–36. Mate, 'Medieval Agrarian Practices', p 23.

[14] From Langdon, *ibid*, pp 27–46, 86–96, 124–127 and 'Economics of Horses and Oxen', pp 32–45. Ernle, *op cit*, pp 13.

[15] M M Postan, *The Medieval Economy and Society*, Pelican Economic History of Britain 1, Harmondsworth, 1972, pp 66–67. W O Ault, *Open Field Farming in Medieval England*, 1972, pp 35–37. C R Young, *The Royal Forests of Medieval England*, Leicester, 1979, pp 114–117.

TABLE 7
Productivity of open and enclosed fields in 116 parishes in England, 1801*

	Open parishes (kg/ha)	*Enclosed parishes (kg/ha)*	*Yields from open as a % of enclosed*
Wheat	1300	1650	78.8
Oats	1990	2500	79.6
Barley	1800	2190	82.2

* From M Turner, 'Agricultural Productivity in England in the Eighteenth Century: Evidence from Crop Yields', *Econ Hist Rev*, 2nd ser, XXXV, 1982, p 500.

open fields. The reason for this apparently inefficient system of the scattering of strips may have rested on a trade-off between productivity and stability. Although farmers incurred greater costs in time spent travelling from one strip to another, the risk of complete crop failure in a given year was reduced by both the spatial separation and the mixture of land with varying fertility.[16] Turner has shown that cereals cultivated in open fields were some 20 per cent less productive compared with those grown in enclosed fields at the beginning of the nineteenth century (Table 7). Although agricultural technology had advanced greatly by this time, this productivity loss must represent a measure of the value accorded to both a stable and equitable system of property rights. For enclosed and open fields to have coexisted for so many centuries, farmers must have valued more than just productivity.

Most agricultural activities were highly labour intensive, largely because there existed few opportunities for significant substitution. One hectare of cereal, for example, probably took two-and-a-half man-days to plough and five man-days to reap and bind, and one of meadow two-and-a-half man-days to mow.[17] In order to insure against labour scarcity, all tenants, whether free or not, were under varying obligations to work on the demesne at certain set times of the year, mainly for ploughing, weeding, reaping, mowing, threshing and carrying manures. However, the lord could choose either to accept payments in lieu of services or to oblige their completion, depending upon the number of tenants and how much of the demesne was being directly farmed. In addition some innovations adopted during the manorial period increased labour productivity rather than yields. For example, as soon as water-mills were established, despite the requirement for greater capital investment compared with labour intensive hand querns, they rapidly spread across the country and, together with windmills, released labour for other farming activities.[18]

Pests, diseases and weeds must have had a major impact on productivity. Although pest control was rudimentary, the records reveal some practices that may have restricted losses. The anonymous author of *Seneschaucie* recommended that sheep be kept away from snails, which could infect them with parasitic liver flukes. Sometimes payments were made by the lord or village council for the capture of rats and moles; arsenic was used to control invertebrates; and some livestock disease, particularly sheep scab, was controlled by the application of mercury, sulphur, copper, tar or bitumen compounds.[19]

However it is impossible to assess quantitatively the degree of infestation and the effect on yields. Archaeological evidence does indicate a prevalence of some weeds: mayweed, a typical associate of cereals, was commonly found in medieval deposits, appearing to increase in prevalence from the Roman period onwards. Several times during the fourteenth century low wheat yields in Surrey were attributed to attacks

[16] D McCloskey, 'The Persistence of English Common Fields', in W N Parker and E L Jones (eds), *European Peasants and Their Markets*, Princeton, New Jersey, 1976, pp 113–119.

[17] B A S van Bath, *The Agrarian History of Western Europe AD 500–1850*, 1976, pp 183–184. Bennett, *op cit*, pp 104–6.

[18] van Bath, *ibid*, p 71.

[19] Rogers, *op cit*, Vol I, p 33, 461, Vol II, p 429. *Seneschaucie. op cit*, pp 96–97.

of mildew: bread wheat was susceptible to attack by birds and fungi. Documents also recorded poor harvests due to abundant poppies and thistles. Losses of livestock to diseases could be substantial, often rising to several hundred cattle and several thousand sheep in a bad year. Annual sheep losses were on average 30 per cent, whereas today they range typically from 2 to 5 per cent. Foxes and wolves were also economically significant pests. A consequence of reductions in livestock numbers was depletion in manure supply, which would clearly have had an important impact upon crop performance.[20]

Climate, though, was one factor beyond the control of farmers. During the manorial era the climate was characterized by the medieval warm epoch, which lasted from about AD 950–1000 to AD 1300. Lamb has used a wide variety of evidence to describe the changes in temperature and rainfall during the whole year and certain key seasons. From the late seventh century the year-round wet and cold conditions began to give way to drier and warmer summers and markedly colder winters; building up to a period of remarkable warmth, when summer temperatures during 1250–1300 were almost 1°C warmer than in 800–1000. Total rainfall declined and also shifted from summer to the rest of the year, so that summers during 1250–1300 were some ten per cent drier than during the late Anglo-Saxon era. Temperature declined after 1300 until the coldest phase since the last ice-age was reached during 1500–1700.[21]

These long-term changes in climate influenced the distribution and type of crops grown and their potential productivity. Vineyards were relatively common in the south and east of England, with more than seventy known to have existed between AD 1000–1300. The limit of cultivation was increased by at least 100 metres in altitude compared with before AD 800. The probability of crop failure on marginal land was also lower: when summer temperatures are low the chance of failure is very high, yet higher temperatures result in a disproportionate decline in the probability of failure. But this summer warmth may have also caused a small decline in productivity. Temperate cereals yield more in cooler summers; coefficients calculated for the relationship between wheat productivity and combinations of temperature and rainfall suggest that yields may have been 1 to 7 per cent lower during the medieval warm epoch.[22]

Although many manorial accounts contain references to weather conditions, correlations between patterns of weather and crop yields are poor. But there are several possible biases in the data: the impact of weather is highly heterogeneous, the Winchester manors geographically widespread, and references in accounts were often made to excuse items of high expense or years of low income. For instance, dry summer weather was apparently used to explain greater than usual costs of repairs to ploughs.[23]

In general, though, extremes of wet weather were usually associated with low wheat yields, with 1315 and 1316 probably

[20] Jones, 'Development of Crop Husbandry', p 111. M Mate, 'Agrarian Economy after the Black Death: the Manor of Canterbury Cathedral Prior, 1348–91', *Econ Hist Rev*, 2nd ser, XXXVII, 1984, p 349. Mate, 'Medieval Agrarian Practices', p 25. W H Long, 'The Low Yields of Corn in Medieval England', *Econ Hist Rev*, 2nd ser, XXXII, 1979, pp 465–469. M L Ryder, *Sheep and Man*, 1983, p 448.

[21] H H Lamb, 'The Early Medieval Warm Epoch and its Sequel', *Palaeogeog, Palaeoclim, Palaeoecol*, 1, 1965, pp 13–37. H H Lamb, 'Britain's Changing Climate', *Geog J*, 133, 1967, pp 448, 456–458. H H Lamb, 'Climate from 1000 BC to AD 1000', in Jones and Dimbleby, *op cit*, pp 56–60.

[22] M L Parry and T R Carter, 'The Effect of Climatic Variations on Agricultural Risk', *Climatic Change*, 7, 1985, pp 100–109. Beresford, *op cit*, p 144. L M Thompson, 'Weather Variability, Climatic Change, and Grain Production', *Science*, 188, 1979, pp 535–541. J L Monteith, 'Climatic Variation and the Growth of Crops', *Quart J R Met Soc*, 107, 1981, pp 761–769.

[23] J N Pretty, 'The Stability of the Common-Field System: A Study of Thirteenth and Fourteenth Century Yields and Prices', MSc Thesis, Imperial College of Science and Technology, University of London, 1981, pp 37–44. J Z Titow, 'Evidence of Weather in the Account Rolls of the Bishopric of Winchester 1209–1350', *Econ Hist Rev*, 2nd ser, XII, 1959, pp 360–408.

TABLE 8
Some selected weather conditions and yields of wheat, oats and barley (kg/ha) recorded on the Winchester manors*

Year	*Weather Conditions*	*Wheat*	*Oats*	*Barley*
1315	Wet all year	320	510	690
1316	Wet all year	330	460	630
1292	Wet all year	500	530	620
1339	Wet autumn, dry summer	290	410	910
1346	Wet autumn, dry summer	390	460	750
1325	Wet autumn, dry summer	630	510	820
1344	Wet winter, dry summer	690	550	1000
1331	Wet winter, dry summer	440	470	600
1327	Summer drought	580	620	770

* Titow, 'Evidence of Weather', *passim*. Titow, *Winchester Yields*, pp 40–120.

the clearest examples (Table 8). Wet weather at the time of sowing could lead to poor yields, even if the following summer was dry, as in 1339 and 1346. By contrast the spring sown oats were less affected by poor weather, and even the conditions of 1315–16 had little effect on oat yields in the Winchester region. In Sussex excessive rains or drought at the time of sowing were also more likely to cause a failure of wheat than of oats, barley or rye.[24] However, there are anomalies: in both 1334 and 1344 dry summers followed wet winters, yet in the former yields were high and in the latter low; and in the drought year of 1327, when wells and marshlands dried out, yields were above average.

However fewer cold summers may have indirectly contributed to the economic importance of pigs. Acorns and beech mast were a valuable source of food for pigs and it appears likely that both oak and beech were more productive during the medieval warm epoch. The key to successful fruit production appears to be a long warm growing season, which favours the laying down of flower buds and tends to be followed by abundant seed in the next year. But during cold summers most acorns fail to mature or remain small. In the warmer parts of Europe heavy crops occur at three- to four-year intervals, yet in the colder regions this period more than doubles. The difference between success and failure is substantial: beech mast years may be up to ten times as productive as poor ones, producing up to 1500 kg/ha, and abundant oak years can result in 2000–5000 kg/ha of acorn production.[25]

[24] Brandon, 'Demesne Arable Farming', p 134.

III

Given these constraints on productivity, people on manorial estates were less concerned with maximizing agricultural productivity than with securing an adequate livelihood through stable food production, income-earning activities and ownership of, or access to, resources to offset risk and meet contingencies. The pursuit of these sustainable livelihood strategies meant in turn that the family household valued more than just the productivity of the agroecosystem.

Food and Income Sources

For a family to achieve at least the basic needs of subsistence the size of landholding was of primary importance. But it seems likely that few peasant families survived entirely upon the produce grown on their land. Postan has calculated that some 50 per cent of the peasant population had holdings too small to maintain even a bare minimum of subsistence during the twelfth to thirteenth centuries. On single estates the

[25] E W Jones, '*Quercus* L. Biological Flora of the British Isles', *J Ecol*, 47, 1959, pp 187–199. M W Shaw, 'The Reproductive Characteristics of Oak', in M G Morris and F J Perring (eds), *The British Oak*, Berkshire, 1974, pp 162–181. B O Nielson, 'Beech Seeds as an Ecosystem Component', *Oikos*, 29, 1977, pp 268–271.

proportion could be much greater: more than 85 cent of tenants each farmed less than four hectares on a Winchester manor in the mid-thirteenth century; and, further north, between 30 and 40 per cent of tenants in Lancashire, Yorkshire and Northumberland at the same time had less than two hectares each.[26]

Thus although crop and livestock production formed the basis of this highly persistent agroecosystem, numerous smallholders must have supplemented their diet or income from other sources, or faced starvation. Two critical sources of supplementary food were wild resources and crops cultivated in the kitchen garden. These gardens could be very diverse, and by the thirteenth and fourteenth centuries royal and monastery gardens were known to cultivate 200–250 species of food, herb, and ornamental plants. Those with multiple uses were especially favoured, such as the sweet bay with ornamental flowers, medicinal berries, and leaves for flavouring.[27]

Income generation was an important strategy exploited by the rural poor. Many smallholders were also skilled craftsmen, practising their trade as blacksmiths, turners, and carpenters during the slacker winter months. Some peasants were employed full-time on the manor, and others were communally employed on a regular part-time basis as mole-catcher, cow-herd, barber, stock-brander, shepherd, or swineherd. Cottage craft industry, often dependent on natural resources, was also common: nettles were made into linen; osiers and reeds into baskets; wood was cut and carved for household items or made into tools; wool was spun, woven and dyed; leather tanned; and ale brewed from malted cereal grain. Peasants living near forests probably had greater opportunities for supplementing income: many were employed in the charcoal industry, the mining of iron and coal, glassmaking, pottery, rope-making from tree bark and wood cutting. These activities were also easy to leave temporarily when agriculture demanded immediate attention.[28]

Natural Resource Management

The economic use of wild resources was sustained by management practices and penalties designed to prevent serious long term degradation. Recognition of such potential economic benefit is highlighted first in the Codes of Ine of the late seventh century, which demanded that a fine of sixty shillings be imposed upon anyone cutting down a tree large enough to shelter thirty pigs, and later when the Normans carried out the Domesday survey. In this survey woodland size to the south-east of a line stretching from the western borders of Norfolk to Hampshire was recorded in terms of the number of pigs it could support: *silva ad x porcos*, *silva de x porcis* or just *silva x porcos*, in other words 'there is wood for x swine'. Some entries were very detailed, suggesting a precision in the measure of quality of woodland resource. Thus from the values recorded it is impossible to calculate size of woodland. The survey also distinguished between exploitable and non-exploitable resources within the same woodland, using the terms *silva infructosa*, 'infertile woodland', and *fertilis per loca*, 'fit for pig feeding in a few places'.[29]

Woodlands were also used for generating income during hard times. At one manor

[26] Postan, *op cit*, pp 145–7. Titow, *English Rural Society*, pp 76–7. E Miller and M J Hatcher, *Medieval England: Rural Society and Economic Change 1086–1348*, 1978, pp 54–5.

[27] Johnson, *op cit*, pp 36–43. Harvey, *op cit*, pp 28–29, 168–180.

[28] Postan, *op cit*, pp 147–50. J Birrell, 'Peasant Craftsmen in the Medieval Forest', *Ag Hist Rev*, XVII, *1969*, pp *91–107*. Ernle, *op cit*, pp 28–30.

[29] B W Clapp, H E S Fisher and A R J Jurica (eds), *Documents in English Economic History*, 1977, p 76. H C Darby, *Domesday Geography of Eastern England*, Cambridge, 1952, pp 179–182, 362–4. H C Darby and I B Terrett, *Midland England*, 1954, p 434. Darby and E M J Campbell, *South East England*, 1962, p 699. Darby and I S Maxwell, *Northern England*, 1962, p 438. Darby and R W Finn, *South West England*, 1967, p 377. Trow-Smith, *op cit*, p 83.

in Hertfordshire the largest sales of wood coincided with years of poor agricultural performance. Before 1303 wood sales were limited to controlled lopping and wind-blown trees, but misuse of the capital resource then led to a serious depletion of oak and beech trees. Pig numbers also fell from 1300, and completely disappeared from the estate by 1363. The Duchy of Cornwall carefully conserved its woodlands, using them principally as a source of building materials on the manors. Nonetheless woodland was cleared to raise capital during times of financial crisis, as in 1359 when some ten to forty-five hectares were felled at Liskeard manor in order to service the Black Prince's costly preparations for war.[30]

Apart from the Norman laws designating many forests as exclusively royal hunting grounds, from which peasants were prohibited, most regulations corresponding to use of resources were formulated locally. Manorial courts produced by-laws: fine-tuned regulations capable of taking account both of the quantity and quality of resources available, and the demand for their use. These regulations, or by-laws, covered a wide range of activities and potential resource uses, almost all of which required the purchase of a licence (Table 9). Hunting and fishing supplied valuable supplementary sources of meat, though fishing was often permitted only during daylight, so that the total catch could be checked by other members of the village. Wild birds were an important part of the diet: those consumed at medieval feasts might include species of bustard, crane, curlew, finch, gull, heron, lark, mallard, partridge, pheasant, pigeon, plover, quail, snipe, swan, teal, thrush, and woodcock.[31] Nonetheless there were many references to the activities of poachers, and punishments for illegal use were usually strictly enforced.

[30] Stern, *op cit*, pp 196–201. J Hatcher, *Rural Economy and Society in the Duchy of Cornwall 1300–1500*, Cambridge, 1970, pp 184–186.
[31] W E Mead, *The English Medieval Feast*, 1931, pp 32–39.

TABLE 9

By-laws and management measures designed to prevent long-term damage to village resources*

Activity	*Management Measure*
All hunting, gathering and collecting activities	Licences required
Pig feeding	Nose-rings to discourage deep-rooting Fines for owners of destructive pigs Pannage season limited to protect tree saplings Elected swineherd responsible for any damage
Cattle grazing	Stocking rates limited
Trees	Regulation of cutting and selling All villagers permitted to carry own firewood only Heavy fines for possession of woodcutting tools without licence Lopping of oak, beech, apple prohibited Replacement trees should be planted every year
Hedges	Require regular repairs
Fencing and gates	Compulsory around gardens to prevent livestock escaping and causing damage
Reeds and rushes	Mowing controlled Gathering permitted for own use only, not for sale off manor
Manures	Not to be sold off manor Should remain on meadows
Fishing	Permitted only during daylight
Hunting and bird-snaring	With licence only
Watercourses	Should be regularly cleaned Pollution by human wastes, animal offal and hemp or flax residues prohibited

* From W O Ault, 'Open Field Husbandry and the Village Community – A Study of Agrarian By-Laws in Medieval England', *Trans Amer Philos Soc*, 55, 1965, *passim*. *Walter of Henley*, *Anonymous Husbandry*, *Seneschaucie*, in Lamond, *op cit*, *passim*. Wiseman, *op cit*, pp 1–6.

As economic resources trees represented long-term investments that received special protection to ensure sustained productive returns. Wood collection was carefully controlled: Walter of Henley stated that

wood should only be sold 'without loss or destruction' and the phrase 'by hook or by crook' derived from the way that wood could be collected from trees – only by knocking off or pulling down. Sometimes the lopping of trees producing food for livestock and humans, such as oak, beech, and apple, was completely prohibited. Such control is critical because there is considerable delay from germination to the productive stage: acorn yields are negligible for at least twenty years and will not be abundant until the tree reaches at least forty years of age. Even then year to year production is very variable: in this century good yields occur every six to ten years, moderate ones at intervals of three to four years and complete failure during the remainder. But even in a district experiencing widespread failure of seed, abundant production over limited areas still occurs, allowing a certain amount of exploitation whilst limiting the resource degradation elsewhere.[32]

Feudalism and Cooperation

Some of the manorial agroecosystem's success was achieved as a result of the guaranteed source of agricultural labour. Two groups of tenants predominated, the unfree villeins bonded to the lord for life and required to perform work on the demesne and serve in manorial offices, and the freemen with fewer labour obligations. The freedom of villeins was restricted in marriage, migration, education, buying and selling property, brewing, milling, and baking; and perhaps most importantly in the eyes of many commentators, they had no rights under common law against their lords. The lord could lawfully evict at will and take all a villein's possessions upon death. Thus the unfree have usually been represented as both highly oppressed and dependent upon their lord's whim and favour.

However Hatcher's re-examination of lordship and villeinage at many manors suggests that customary local practices were sufficiently powerful to take precedence over common law. Evictions were actually rare, and a tenant defaulting on services or rent received several warnings and small fines before the landholding was removed. Tenancies and goods usually passed to heirs, and lords were commonly satisfied with a small fine or tax set by custom. Furthermore these customary payments were often inelastic over long periods of time, and not subject to market forces.[33]

The security and rights of villeins did change as a result of fluctuations in the availability of labour and land. When labour was scarce or land abundant peasants were under greater oppression; but when labour was abundant, or land scarce personal freedom increased. If poverty rather than freedom were to be taken as a measure of well-being, then landless freemen probably suffered the worst economic hardship, and of course customary practice, in granting security to the villeins, denied the landless access to land. Moreover freemen were frequently willing to trade personal freedom for a measure of economic security by taking up unfree tenancies.

Thus a relationship appears to have existed between access to land and freedom. When increasing population coupled with shortage of land forced up arable rents, this resulted in villeins paying far less for their land than free tenants. Landlords sought to change unfree tenancies to free, and thus receive greater economic returns. Lords then used this money to hire the landless to work on the demesne. But when the population declined during the fourteenth century,

[32] *Walter of Henley, op cit,* pp 6–7. Bennett, *op cit,* pp 231. Young, *op cit,* p 125. P D Goodrum, V H Reid and C E Boyd, 'Acorn Yields, Characteristics and Management Criteria of Oaks for Wildlife', *J Wildl Manage,* 35, 1971, pp 523–527. Jones, '*Quercus*', pp 187–199. Shaw, *op cit,* pp 162–181.

[33] J Hatcher, 'English Serfdom and Villeinage: Towards a Reassessment', *Past & Pres,* 90, 1981, pp 6–10.

lords attempted to reinstate feudal practices to safeguard labour supply. To the peasants the cost of freedom was higher rents; the benefit of serfdom was security.

Nonetheless all peasant livelihoods were characterized by continual economic stress: notably in the form of rents, entry fines for new tenancies, marriage fees, death duties, payments for use of the lord's pastures and woodlands, tithes to the church, occasional royal taxes, licences and fines for transgressions against by-laws. The total paid in fees by a peasant household was probably 25 to 50 per cent of gross income.[34] Yet under conditions of severe hardship this flow of goods from peasant farmer to lord was reversed. Lords often granted allowances of grain to the poor and sick, provided free shelter and remitted fines. Food relief was distributed to the poor of Hampshire manors, taxes reduced in failed harvest years at Dry Drayton, housing repaired and tenants excused rents on the estates of John of Gaunt, and a proportion of the tithes sent to the almoner for relief of the poor on the Westminster manors. On many manors entitlement to glean cereal grains from the arable fields after the harvest was restricted only to those with no source of income, including the very young and old. Usually about a week was allocated for this activity before the livestock could be released to graze the stubble.[35]

There was also significant cooperation between peasants on each manor. In his introduction, Walter of Henley reflected the tone of medieval farming by quoting the French proverb, 'who has a good neighbour has a good morrow'. Such cooperation is clearly illustrated by life on the manors of Halesowen in the West Midlands. From 1271–1349 the transactions between villagers fell into three categories. First villagers traded ale, cereals, hay, livestock, and wood, and hired out livestock, ploughs, harrows, and carts. Secondly, they provided support and mutual help for each other, particularly through crop and plough-team sharing arrangements. Peasants lent grain, livestock, tools and household utensils to needy neighbours, though these arrangements were more common between small and middle landowners. Thirdly, communal decisions were taken against individuals who had attempted to overconsume or underinvest in the communal resources – in particular those who had encroached onto the common wastes, had over-used the commons, over-gleaned the fields, or had neglected their obligations to maintain roads, ditches, hedges and gates.[36]

Despite the social hierarchy of the manorial system it can be seen that there was a relatively high degree of equitability amongst the landholding farmers. Scattering of individually-owned strips of land in the large open fields ensured a share of both good and bad land. In most regions costs and benefits were proportional to landholding: in consequence the larger landowners paid more towards the wages of village herdsmen, upkeep of fencing and general repair, but were also able to graze more animals on the commons than the smallholder, and received a greater share of the hay from the meadows.

Cooperation in the form of common consent was also a principal feature of the manorial courts. These assemblies were convened so that decisions on farming practice could be made, by-laws framed and enforced, manorial officers appointed, and civil actions heard. All tenants, regardless of size of landholding or status, were obliged to attend the manorial court. The landless, though, could not attend and consequently had little voice in village affairs. The court's authority was enforced by a committee or jury of freeholders and villeins, and presided

[34] Titow, *English Rural Society*, pp 80–93. Postan, *op cit*, pp 139–141.
[35] Titow, *English Rural Society*, p 96. M McKisack, *The Fourteenth Century 1307–1399*, Oxford History of England V, 1959, pp 343–4. Ault, *Open Field Farming*, pp 29–31.
[36] *Walter of Henley*, *op cit*, pp 4–5. Z Razi, 'Family, Land and the Village Community in Later Medieval England', *Past & Pres*, 93, 1981, pp 10–16.

TABLE 10

Portraits of shocks and stresses and their role in the decline of the manorial agroecosystem*

Stresses and Shocks	*Impacts or Responses*	*Stresses and Shocks*	*Impacts or Responses*
Population growth (to approximately 1300)	Increasing demand for food, especially from urban areas Declining rural labour wages Increasing demand for tenancies Declining average landholding size Increasing specialization in wheat at expense of oats and barley	severe rains; pests and disease; drought (1315–21)	Severe famine Human mortality 10–15% above normal
		Agricultural recession plus Black Plague (1348 onwards)	Population decline
		Population decline	Desertion of villages, especially solely agrarian Arable land abandoned
Arable expansion (to approximately 1300)	Increasing gross agricultural production Declining woodland, pasture and marshland responses Growing scarcity of meadows Growing conflicts between agriculture and forest sectors Loss of system components that acted as buffers for rural poor	Shortage rural labour	Increasing wages for landless labourers Falling land values Increasing legislation to strengthen feudal labour system Increasing incentives to tempt tenants to stay, including granting permanent tenancies and permitting enclosure
Greater competition for fewer wild resources, plus	Agricultural recession 1315–21 (crop failure, livestock deaths)	Increasing opportunity for employment	Move from generalist to specialist livelihoods, notably bands of harvesters, artisans

* These responses have been compiled from many sources. Those that are recognizable for advocating or analysing one particular stress, impact or response include G Ohlin, 'No Safety in Numbers: Some Pitfalls of Historical Statistics' in R Floud (ed), *Essays in Quantitative Economic History*, Cambridge, 1974, pp 73–75; H S Lucus, 'The Great European Famine of 1315–17', *Speculum*, 5, 1930, pp 7; C Dyer, 'Deserted Medieval Villages in the West Midlands', *Econ Hist Rev*, 2nd ser, XXXV, 1982, p 33; I Kershaw, 'The Great Famine and Agrarian Crisis in England, 1315–1322', *Past & Pres*, 59, 1973, pp 3–50; C R Young, *op cit*, pp 142–8; Ernle, *op cit*, pp 11–12.

over by the lord's steward. The meeting elected the jury, who judged civil disputes, and manorial officers such as bailiffs, constables, overseers, ale-tasters, and woodwards. These posts were mostly filled by richer tenants. The principal duty of the officers was to ensure that the standards of farming were maintained in accordance with decisions made at the assembly; all tenants contributed, therefore, to the choice of crop rotations, the setting of dates for ploughing, sowing, reaping and the post-harvest release of livestock onto the arable fields.[37]

[37] Ault, *Open Field Farming*, pp 58–9. Miller and Hatcher, *op cit*, pp 94–106. Z Razi, 'The Toronto School's Reconstitution of Medieval Peasant Society: A Critical View', *Past & Pres*, 85, 1979, p 147.

IV

Sustainability, stability and equitability in the manorial system thus appear to have been promoted at the expense of productivity. But despite its persistence, the manorial agroecosystem did decline and eventually disappear. What then were the key stresses and shocks that promoted decline?

There are many plausible theories explaining the decline in direct farming, which began during the late thirteenth and early fourteenth centuries. They include, for example, rapid population growth; severe reduction in population due to outbreaks of the plague; the decline of cereal yields due to soil exhaustion; an increase in peasant

resistance to feudalism; the advent of a commercial spirit in landlords; the rise of a money economy; the increasing non-agricultural population in the towns; the increasing profitability of sheep farming due to the elevated demand for wool in Flanders; and finally the consequences of conflict with France during the Hundred Years War.

Taking two of the most likely of these stresses, population growth and agricultural expansion, it is possible to construct the generalized system responses (Table 10). Some of these responses became in turn other stresses and, combined with the serious shocks of the agricultural crisis of 1315–1321, may have set in motion the series of economic and social responses which so completely changed rural conditions that a return to large scale direct farming of demesnes by lords could no longer be envisaged. Not only was the system no longer sustainable, but in the long run productivity increased and equitability declined as open fields were enclosed and communal sharing arrangements discontinued.

But this portrait describes a generalized picture, and does not take account of regional variations and exceptions. Some of the most interesting questions that now arise concern the special buffers and their critical inter-relationships that enabled the manorial agroecosystem to survive the cumulative impact of stresses and shocks at some locations, whilst at others it fell into decline.



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The Woodland Economy of Kent, 1066–1348

By K P WITNEY

Abstract

This article traces the development of the woodland economy of Kent from the later Anglo-Saxon period until the Black Death. It describes how in the woodlands close to the coast, the navigable Rother, or London, the mounting demand for fuel, at home and cross-channel, so enhanced the value of coppice that it came to displace the much less profitable use of the woods for pannage and cattle pasture; while at the same time diverting colonization into the central core of The Weald, where heavy loads were almost undisposable. Although the Black Death caused a serious slump in the wood market the effects are still observable in the distribution of the woodland today.

Of the many studies that have been made of the early land system of Kent relatively few have dealt with the woodlands. They have tended to focus upon The Weald to the neglect of the smaller, but more accessible, northern forests and heaths which had their own place in a design that cannot properly be understood without them. At the time of Domesday Book a great part of the county, perhaps a third, or even more, was tree clad, and while by the thirteenth century the proportion had fallen, it was by far less than might have been expected from the growth in population. By then the value of most of the woodlands had soared and in some places compared to that of the very best arable land. No account of the medieval economy of Kent is complete if it ignores this extensive source of wealth, derived from the poorest of soils. To understand the development, the part played in it by water communications and its own impact on the course of settlement, it is necessary to consider the distribution of the woods, their varying character and the different uses to which they were put. The outcome may seem paradoxical. As in the years following the Conquest the population grew, and land hunger with it, it was the remotest areas of forest – the Wealden fastnesses themselves – that were cleared and cultivated, while those that were most accessible, nearest to the coast, the towns, and the old established settlements, survived, as mostly they still do today.

I

In the eleventh century by far the largest of the forests was The Weald, which formed the inland core of south-east England. This was mainly an obdurate clay country with oak as the climax vegetation; but there was some good, if ill-drained, land on the flood plain of the Medway and its tributaries and along the fringes of the Rother; and some sandstone on the hills towards the Sussex border, producing a more varied tree cover and occasional patches of open heath.[1] There was also, already, a light scattering of settlements,[2] mostly on the more open and fertile river terraces. Bounding The Weald to the north, but distinguishable from it in early records, was a belt of woodland – the Chart[3] – along the line of what geologists call the Greensand Ridge and stretching

[1] L Dudley Stamp ed. *The Land of Britain: The Report of the Land Utilisation Survey of Britain*, Part 85, *Kent*, 1943, pp 574, 591; and S W Woolridge and Frederick Goldring, *The Weald*, 1953, pp 133–36, 149.

[2] Gordon Ward, 'The List of Saxon Churches in the Textus Roffensis', *Archaeologia Cantiana*, XLIV, 1932, pp 35–39; and 'The List of Saxon Churches in the Domesday Monarchorum and the White Book of St Augustine's', *Arch Cant*, XLV, 1933, pp 60–89.

[3] W de G Birch, *Cartularium Saxonicum*, 3 vols, 1885–93, nos. 191, 343, 370; and K P Witney, *The Jutish Forest*, 1976, pp 8–9.

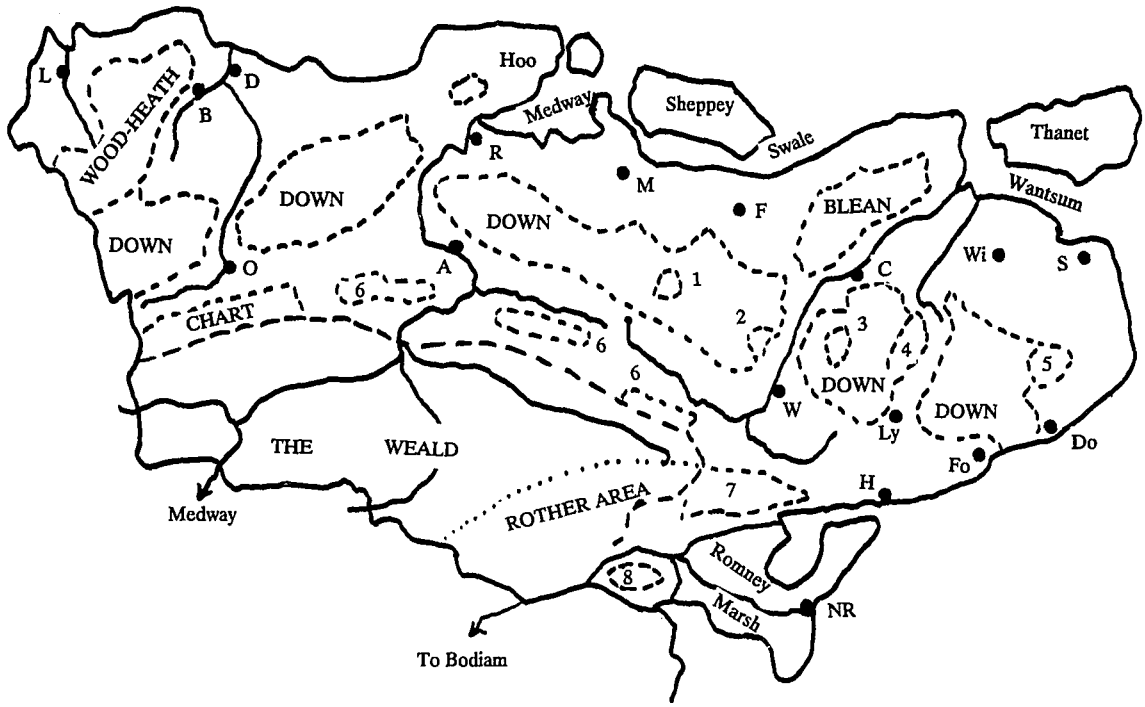


FIGURE 1
Woodlands in Kent, *c* AD 1100
Lesser Forests: 1, Oakenpole; 2, King's Wood; 3, Buckholt; 4, Hardres; 5, Singledge; 6, Chart (ext); 7, Sibersnoth; 8, Isle of Oxney.
Towns and Manors: A, Aylesford; B, Bexley; C, Canterbury; D, Dartford; Do, Dover; F, Faversham; Fo, Folkestone; H, Hythe; L, Lewisham; Ly, Lyminge; M, Milton Regis; NR, New Romney; O, Otford; R, Rochester; S, Sandwich; W, Wye; Wi, Wingham.
The coastline is drawn approximately as in Anglo-Saxon times.

uncleared from the Surrey border well beyond where Sevenoaks now stands, with a number of large fragments further east towards Ashford. The woods here stood on thirsty sand soils which produced as much birch as oak and some beech.[4] To the north-east a tongue of clay forest – which we shall call *Sibersnoth* from the most important of its early components[5] – reached out from the main body of The Weald to mask a segment of Romney Marsh.

In north Kent, the Downs, with their thin, flinty clay overlying chalk, were thickly scattered with woods along their entire length and carried certain larger areas of forest, some of which, like Buckholt (near Petham) and *Haradun* (Hardres) are mentioned in pre-Conquest charters[6] and others like Oakenfold (or Oakenpole) south of Teynham and King's Wood in Wye (now Challock Forest) in later records. The woods along this ridge, which formed the backbone of Kent, contained some oak but as much beech and hornbeam, together with a variety of trees, yew, whitebeam, maple and alder, of less economic value.[7] To the north of the

[4] Stamp, *Land of Britain: Kent*, pp 593, 608.
[5] F R H Du Boulay, 'Denns, Droving and Danger', *Arch Cant*, LXXVI, 1961, pp 75–87, in particular 87; and J K Wallenberg, *The Place-Names of Kent*, Uppsala, 1934, pp 473–74.
[6] For example, Birch, *Cart Sax*, nos 141, 247, 248; and J K Wallenberg, *Kentish Place-Names*, Uppsala, 1931, pp 34, 61.
[7] Stamp, *Land of Britain: Kent*, pp 599–601.

Downs there were two sizeable tracts of poor, but contrasting, soils which had been largely left to woodland: the barren heaths and pebble beds on the threshold of London around Hayes and Chislehurst, and the oak forest of Blean which clad the 'bottomless' clay to the north and west of Canterbury, lying between it and the coast.[8] The arable areas in Kent were still at the time of Domesday Book confined mostly to the rich lands to either side of the Downs or in the river valleys that breach them; and of these only Sheppey, Thanet and the far north-east were not within easy reach of extensive woodlands of one kind or another.

Custom and tenure in The Weald had diverged from that in north Kent (the *uplands* in local idiom). In the early days of the Kentish Kingdom the woodlands had been divided between those belonging to the king, and used also by his menial tenants, and those owned by the warrior class of the *ceorls*; a division reflected in such surviving place-names as King's Wood or Kingsnorth (*cyninges snade*) on the one hand and Minnis (from *in gemennisse*, i.e. land owned by the folk in common) on the other.[9] The old royal woods had since mostly devolved on the manorial lords as demesne, and the remainder on their freehold tenants. In the uplands the two forms of tenure were closely intermingled. It seems, however, that the Chart woods fringing The Weald had been mostly in royal ownership, while the main body of The Weald itself had been divided into a number of great commons to be used for the autumn pannaging of swine by the folk of the various provinces of the Kingdom, predecessors of the Domesday Book lathes.[10] From the eighth century on the commons had come to be parcelled out into numerous separate swine pastures, or dens, between the manors that were developing in north Kent.[11] This did not convert them into demesne, and as squatters' settlements came to be established there they were treated as freeholds; but since the prime purpose of the dens was still held to be pannage, the mast-bearing trees, oak and beech, were protected by ancient custom. Of this the manorial lords were supposedly the custodians. They had, however, converted it into a property right which they were seeking to extend to the other standard trees and even to the undergrowth. Around this a whole complex of Wealden custom developed, based on the extraordinary dichotomy that the soil was held to belong to the settlers but the trees growing on it to the lords, who controlled the pannage.[12]

II

Historically, any account of woodland use must begin with pannage. Indeed if the Kent Domesday were to be taken at face value it would seem that in the eleventh century little else mattered. This was not so; but the simplest, if rough and ready, way of sizing the woods belonging to the various manors was through the number of swine they catered for. There was a defined season for pannage, extending from the autumnal equinox, when the acorns were ripe, until Martinmas (11 November) when the bulk of the animals were killed and salted down for winter food.[13] Custom in Kent decreed that one swine out of every ten pannaged should be surrendered to the manorial lords,[14] and the Kent Domesday enters these dues with meticulous care, from the 500 received (in a good year) by Wrotham manor to the ones and twos received by others.

[8] *Ibid*, pp 593, 597–98, 602.
[9] Birch, *Cart Sax*, no 426; and Wallenberg *The Place-Names of Kent*, pp 237, 416, 562.
[10] Witney, *Jutish Forest*, pp 31–64.
[11] *Ibid*. pp 78–103.
[12] N Neilson, 'Introduction' to *The Cartulary and Terrier of the Priory of Bilsington, Kent*, Oxford, 1928, pp 1–39; and Du Boulay, 'Denns, Droving and Danger'.
[13] W Somner, *A Treatise of the Roman Ports and Forts in Kent*, Oxford, 1693, pp 112–13.
[14] *Ibid*.

Pannage was a much more important facility for the husbandmen than for the lords. Sheep were kept for their wool and milk, oxen for traction and cows principally to breed them (any more being extravagant in scarce winter fodder). In all these cases meat was no more than a by-product, whereas pigs were reared solely to be eaten and were the most prolific of animals. A sow could be expected to farrow twice a year with six or seven piglets to the litter.[15] Of these some would be killed young for lack of winter feed, but by choice the males would be kept, castrated, and sent to pannage in the following year before being slaughtered at Martinmas. Most of the animals driven into the woods in autumn were thus *hoggasters*, or yearlings.[16] In the ordinary way a husbandman might have one or two breeding sows, which would be serviced by boars belonging to the lord or perhaps to a wealthy neighbour: more would be kept by those within easy reach of The Weald, with its wealth of pannage, and away from the coast where herrings provided a plentiful and cheap alternative source of protein.

The total pannage dues recorded by Domesday Book for the whole county amounted to just under 7350, but there were a few gaps; for instance Teynham manor, which had Wealden dens near Headcorn,[17] was for some reason omitted from the survey altogether. A truer figure would be around 7500, implying herds ten times that size. But these were only the animals pannaged by the husbandmen: the lords' own beasts did not contribute to the dues and the Kent Domesday gives no tally of them. Their number was almost certainly small. Pig's meat formed a lesser part of the lords' diet than that of the husbandmen, and their requirements for porkers, if not for sucklings, must largely have been satisfied through the pannage dues. Even in the thirteenth century, when those had usually been commuted for money, the lords seem to have kept relatively few pigs of their own. Thus at Bexley the Archbishop appears normally to have maintained only two sows with some 30 pigs, or piglets;[18] and at Elham the number of sows varied from one to three, with anything between fifteen and thirty-five *porcelli*, or little pigs.[19] There were rather more in some other manors, like Eastry, where in 1269/70 the demesne stock consisted of 2 boars, 6 sows, 22 yearlings and 46 piglets,[20] but this seems to have been unusual. By then, too, the lords had largely abandoned the practice of sending their own swine into the woods, preferring to keep them in tiled styes where they were corn fed.[21] All considered, 10,000 is the most generous estimate that can be made of the number they pannaged in the eleventh century.

The Kent Domesday qualifies its figures of pannage dues by saying that they were for years when the trees were *fructuosae*. The acorn crop might sometimes fail, but it was more dependable than beech mast, which ripens only in warm summers, on average about one year in three.[22] Oaks were therefore the prime pannage trees, and the larger the better; which meant that for this purpose The Weald far exceeded in value all the other woods and forests. This is clearly shown by the dues. Manors in Holmesdale, bordering The Weald, received, size for size, twice as much as manors to the north of the Downs; yet all the larger of those, from Lewisham as far to the east as Faversham and Westgate, Canterbury,

[15] Dorothy Oschinsky, ed. Walter of Henley, *The Husbandry*, Oxford, 1971, ch 17.
[16] For *hoggasters*, see Du Boulay, *Medieval Bexley*, Bexley, 1961, pp 53 with n 4.
[17] Witney, *Jutish Forest*, p 251.
[18] Du Boulay, *Medieval Bexley*, p 10.
[19] J E T Rogers, *A History of Agriculture and Prices in England*, 1866, I, pp 46–7.
[20] M M O'Grady, 'A Study of Some of the Characteristics of the Holdings and Agriculture of Eastry Manor, East Kent, from *c.* 1086–1350', unpublished M.Phil. thesis, University of London, 1981, Table 3.10, p 284.
[21] F R H Du Boulay, *The Lordship of Canterbury*, 1966, p 215.
[22] Du Boulay, 'Denns, Droving and Danger'.

owned Wealden dens,[23] despite the presence of much nearer woods. Bexley, on the wooded heaths of the north-west, had nevertheless been given five dens around Hever on its formation in 814, and Bromley five near Edenbridge in 862.[24] Milton Regis (by Sittingbourne), by far the largest manor in Kent, nearly twice the size of any other, had numerous dens around Marden,[25] but still received less in pannage than the Holmesdale manors of Wrotham and Wye. It seems that in the eleventh century something like three-quarters of all the pannage in the county was derived from The Weald, much of it over distances of twenty miles or more. Transhumance was always a major feature of the Kentish agrarian economy.

Although pannage was taken in a small and desultory way in the northern woods, it was only to the east of Canterbury that distance from The Weald began to tell and nearer woods were used in preference. There were a number of manors here, like Chislet, Wickhambreux, Barham, and Elham, which enjoyed substantial pannage dues but are not known to have had Wealden dens, making use instead of the neighbouring forests of Blean and Hardres, as others like Folkestone did of the more scattered Downland woods.[26] In the far north-east, the most open country in Kent and the furthest from The Weald, the dues dwindled almost to nothing: only ten were recorded from Thanet and just over fifty for the whole of the large Lathe of Eastry (closely equivalent to the present Dover district). Yet a remarkable, and apparently contradictory, feature of the manors here, places like Minster in Thanet, Eastry, and Northbourne, was that they owned a scattering of dens in the south-eastern Weald where the Rother flows out of the forest into Romney Marsh, some like Hensill in Hawkhurst parish being as much as forty miles away, far beyond any reasonable herding range.[27] These dens, however, seem to have been served from outlying stock farms on the marsh itself. The earliest example of such an arrangement appears in a charter of 724, by which Minster was granted land near Ham Street on the Marsh, evidently as sheep pasture, with four dens (including, it seems, Tenterden) close by in the forest hinterland.[28] The stock farms could conveniently be reached from the north-eastern manors by water, along the coast and up the Rother, and it seems that the animals must have been out-stationed, with the wool and carcases shipped back, by the same route, together with timber from the dens. There could have been no problem in curing the carcases since Domesday Book shows that salt panning was a major industry on the marsh.

The records are too sparse to show how common it was for the lords to out-station their swine in this way and 'make a larder' of their carcases; but we know, for instance, that it was the practice on the Westgate dens (around Sissinghurst);[29] and for the north-eastern manors it must have been a necessity if the pannage was to be of value at all. Herds might be replenished overland, but to drive the swine back over distances of thirty to forty miles, only to slaughter them on arrival would have been to lose what had been gained in fattening them. Such arrangements could only have been made for demesne stock, and even so would hardly have been worth making except as part of a larger design: they were not of a kind in which the husbandmen could share and would not, therefore, be reflected in the dues. This is not to say that the tenants in north-east Kent kept no pigs; we know in fact from a survey carried out at Langdon

[23] Witney, *Jutish Forest*, pp 217–56.
[24] Birch, *Cart Sax*, nos 346, 506; and Witney, *Jutish Forest*, pp 219–20.
[25] Witney, *Jutish Forest*, pp 240–42.
[26] 'Inquisitions Post Mortem', Folkestone, in *Arch Cant*, III, 1860, pp 255–64.
[27] Witney, *Jutish Forest*, pp 272–75.
[28] *Cart Sax*, no 141; and Wallenberg, *Place-Names of Kent*, pp 355–56.
[29] Du Boulay, 'Denns, Droving and Danger'.

in 1273 that they did;[30] but these would have been 'grass swine', fattened as best might be about the homesteads, for instance on stubble after the harvest. Grazing on stubble was a poor substitute, to which however even those husbandmen who were better placed would have to resort in years when the acorn crop had failed.

It seems, if these calculations are right, that in a normal year towards the close of the eleventh century the number of swine pannaged in the Kentish Weald would have been around 60,000 allowing for demesne stock, an average of rather less than one for every three acres. Granted that The Weald was not uniformly tree clad, it is clear that in most years it had a superfluity of mast. From the lords' standpoint pannage by itself had become a wasteful undertaking, giving only a poor return. We know that in Athelstan's reign (925–39) a full-grown pig was worth 10*d*[31] and that towards the end of the twelfth century this had risen only to 1*s*,[32] which we may take as the prevailing value at the time of Domesday Book; but the bulk of the herds consisted of *hoggasters*, which in later years, when the dues had been converted to money, were valued at only half as much as mature animals.[33] It is unlikely, therefore, that the 7500 or so swine which the lords received in a normal season from all the woodlands in Kent were worth in sum more than £250 and probably less. This amounted only to some 5 per cent of their total income, and that in years when the trees were *fructuosae*. It is true that even when the acorn crop had failed the lords were not entirely deprived of profit, since a due known as *danger* was then imposed on the Wealden settlers[34] for the privilege of not having swine quartered upon their land. This must account for the otherwise inexplicable entry in the Domesday survey of Kennington manor (near Ashford) that it had 'as much woodland' as rendered 'from pannage 40 swine or else 54½*d*' – a sum well below the value of the beasts, even assuming the great majority to have been *hoggasters*.

It is probable that by the time of Domesday Book pannage in Kent was already well past its peak, and understandably there was a rapid decline thereafter. A simple calculation will show that even when the Wealden dens were in full bearing their value to the lords in pannage (of itself) would have averaged less than ¼*d* an acre; which may be compared, for instance, to the 1*d* an acre, with some payments in kind and a few services besides, customarily charged on upland tenants for their arable land[35] and even that was not a truly economic rent. Whatever margin of error we allow in our calculations the conclusion is still clear. If the woodlands were to be preserved it would be for other purposes than pannage, or only where the soil was so irremediably poor that nothing better could be done with it. The husbandmen who used the dens might wish otherwise; but throughout The Weald it was the lords, as owners of the trees, that were in control of the situation.

III

Woodland pasture for cattle played a much more important part in the early agrarian economy than might be gathered from the Kent Domesday, which makes only a single direct reference to it – at Nackington on the edge of the forest of Hardres. Although less nutritious than marsh, meadow, and fescue grasslands there was a great deal more of it

[30] S Campbell, 'Some Aspects of the Social and Economic History of the Manor of Adisham *c* 1200 to the Dissolution', unpublished M.Phil. thesis, University of Kent, 1981, pp 199–200.

[31] 'Iudicia civitatis Londiniae' in Dorothy Whitelock (ed), *English Historical Documents*, I, 1968, pp 387–91, in particular p 388.

[32] D L Farmer, 'Some Price Fluctuations in Angevin England', *Econ Hist Rev*, 2nd ser, IX, 1956, pp 34–43.

[33] Du Boulay, *Bexley*, 53 with n 4; and 'Denns, Droving and Danger', p 81.

[34] Du Boulay, 'Denns, Droving and Danger'; and D Clarke and A Stoyle, *Otford in Kent*, 1975, Appendix C, p 265.

[35] J E A Jolliffe, *Pre-Feudal England: The Jutes*, 1933, pp 33–39; and Du Boulay, *Lordship of Canterbury*, pp 164–81.

to spare. It is mentioned in a number of pre-Conquest documents. For instance, we hear in 805 of the *Hridra leah*, or cattle glades, near Petham,[36] apparently in Buckholt forest; in 724 Minster was granted a right to pasture in Blean, Buckholt and Oxney ('the ox enclosure');[37] and a description of Brabourne manor *c* 993 speaks of a hollow way going 'up over the down' to a minnis and cowherd's wood.[38] Most of the early examples come from north Kent; and Alan Everitt has shown, from the concentration on the Downs of place-names containing references to oxen, and less often cows, or ending in such elements as *steall* (stall) and *stoc* (stock), how much cattle pasture must have featured in the development of this area,[39] which had little to tempt the cultivator. Indeed he treats the woodland vaccaries, together with the more open stretches of chalkland used for sheep, as the distinguishing characteristic of the Downland economy up to the Conquest and for some time after – though just how long after is a question we shall need to consider.

The nature of the northern woods made them more suited than The Weald to this purpose. Acorns are harmful to cattle, and even for summer pasture, as this was, oak woods were better avoided. Although there was a scattering of oaks in the northern forests it seems that only in the Blean and in a few small patches elsewhere, for instance in Hardres and, judging from the name Oakenpole,[40] did they predominate. Elsewhere the mixed tree cover and frequent glades had the beneficial effect of opening out the woods for grazing cattle. Most important of all, these woods were also close to the early settlements and larger manors. As cattle were rarely kept for their meat it was not a matter, as with pigs, of sending them to be fattened for a season prior to slaughter. It was only in the intervals between ploughing and harvest that the oxen could be spared for any time from the homesteads, and even then there was often carting of one kind or another to be done. They had to be pastured within good reach. So too had the relatively few cows while they were in milk. These were expensive animals to maintain, when milk could be got more economically from the wool-producing ewes. Dairy herds were a rare luxury which only the wealthier lords could afford, and usually better pasture than woodland was provided for them, preferably salt marsh, such as the *cyninges cua lond* (king's cow land) mentioned near Graveney in 814.[41]

Propinquity is therefore enough to explain the contribution made by the Downland woods, irrespective of their other advantages. The northern dip-slopes of the Downs reached close to the populous areas of Thameside and along the Swale, and even in the north-east, where they declined into open, gently undulating wolds, the fringe of woodland along Watling Street between Dover and Bridge was within usable reach of such large manors as Wingham, Eastry and Northbourne. On the other side, the vale of Holmesdale was dominated by the Downs along its entire length, and there were few sizeable manors which did not have their own pastures *super montem*;[42] while those in the river gaps and the Elham valley were hemmed in by woodlands. In Holmesdale use could also be made of the Chart and in north-west Kent of the heaths around Chislehurst and Hayes, though these were lesser resources. The chief drawback of the porous chalk and sand soils was a scarcity of watering places. On the Downs, however, there were a number of shallow ponds, some still remaining and others identifiable by the element *sol* appearing in

[36] *Cart Sax*, no 322.
[37] *Ibid*, no 141; and Wallenberg, *Kentish Place-Names*, p 323.
[38] 'Liber de Hyda', in Whitelock (ed) *Eng Hist Doc*, I, pp 531–36, in particular p 533.
[39] Alan Everitt, *Continuity and Colonisation: the evolution of Kentish Settlement*, Leicester, 1986, pp 141–80, in particular p 142.
[40] Wallenberg, *Place-Names of Kent*, p 275.
[41] *Cart Sax*, no 323.
[42] See for example H E Mühlfeld, *A Survey of the Manor of Wye*, New York, 1933, pp xxi–xxv.

old place-names, of which Sole Street in Crundale is an example. Everitt believes that some 100 of these can be found throughout the area, together with similar names ending in 'pool' or 'mere'.[43]

It would, however, be a mistake to overestimate the importance of the northern woods as cattle pasture in comparison to their other uses for fuel and, to a lesser extent, timber and pannage. Nevertheless, taking all into account, most of these woods must still in the eleventh century have been seriously under-utilized. With the great expansion of population that followed, such a wasteful use of land could not possibly be allowed to continue. There was now a pressing demand not only for more arable but for every other resource, to which the woods had to make a fitting contribution if they were to survive. That meant systematic management.[44] By the thirteenth century coppice with standards had become prevalent throughout most of the northern woods, and their value as cattle pasture then depended on the cycle of cutting. On the one hand coppice improved the grazing by opening up the woods, but on the other cattle are destructive of young shoots and so had to be fenced out of the newer growth. Thus an account of 1263 shows that 150 acres of the Reinden woods above Folkestone, of which thirty acres were cut each year, accommodated only nine cattle,[45] confined presumably to the plots of fifth-year growth. Where there was a longer, ten- or twelve-year cycle, as at Wye, most of the woods would be open to cattle and the pasture might be worth six or seven times as much, though the fuel value of the woods was seriously reduced.[46] At Reinden the pasture was said to yield 6*s* p.a. (8*d* being charged on each head of cattle) to give an average of just under ½*d* an acre for the wood as a whole. The corresponding figure at the time of Domesday Book would have been rather less than a mite.[47] In contrast to this we learn in 1313 (that is fifty years later, after continuing inflation) that pasture in the Melcompe Wood at Wye, consisting of large timber with undergrowth cut on a ten-year rotation, was worth as much as 7½*d* an acre,[48] for which the Domesday equivalent would have been around 1½*d*. We may take these as extremes produced by different systems of coppicing, on short and long cycles.

The determinant was the ease with which heavy wood loads could be disposed of. At Folkestone, from which they could be transported by sea and so at minimum cost, the fuel value of the woods mattered above all else and pasture was merely a trivial bonus; whereas at Wye, at a distance from navigable waters and where loads could only be carted laboriously overland, it was the other way round, the object being to extract the best possible value from the pasture with some fuel for local use as an extra. Indeed to describe the practice here as 'coppicing' is somewhat misleading when what was really being done was to cut back the undergrowth periodically to improve the pasture, the wood itself being in the nature of a catch crop. The treatment was not always as effective as this. There was one wood at Wye where the pasture was worth only 2½*d* an acre (Domesday equivalent around ½*d*) because the undergrowth was mostly thorn and thistle, and another where the return was only fractionally better because of the density of the trees.[49] The conditions here can have been little different from those of the woodlands of the eleventh century and the contrast in value is illuminating.

It seems that in most of the northern woods the balance of use lay somewhere

[43] Everitt, *Continuity and Colonisation*, p 169.
[44] For medieval woodland management in general see Oliver Rackham, *Trees and Woodlands in the British Landscape*, paperback edn 1981, pp 66–95.
[45] 'Inquisitiones Post Mortem', *Arch Cant*, III, 1860, pp 255–64.
[46] Mühlfeld, *Manor of Wye*, pp xxi–xxv.
[47] M M Postan, *The Medieval Economy and Society*, Harmondsworth, 1975, pp 253–77.
[48] Mühlfeld, *Manor of Wye*, pp xxi–xxv.
[49] *Ibid.*

between that of Folkestone and Wye, depending upon accessibility and the domestic needs of the manors, but that mostly the woods were sufficiently near embarkation points or the principal centres of population – London being an especially powerful magnet – for fuel to have become the prime consideration. We return to this later. The point to be made now is that with the rapid growth of population few of these woods could have survived without coppicing, and then only on land so poor or steep that virtually nothing could be done with it; and that even with coppicing it was their fuel more often than pasture value, together with the reserve of timber in the standard trees, that preserved them. Although these might sometimes be secondary considerations, as at Wye, the additional contribution they made could be crucial.

IV

Timber was always in less demand than fuel; and although its importance grew with time it seems that nowhere, except in the south-eastern Weald, was it ever much more than an incident in the woodland economy. The pre-Conquest charters make only a glancing reference to it. The Kent Domesday does not even do that. It refers only, on ten occasions, to 'small' wood, which was presumably coppice; once to *silva infructuosa*, i.e. wood not bearing mast, which from the context was clearly used for fuel; and twice to alder groves, which supplied wicker and wattling. There must at this time have been more than enough timber to be had locally for the taking except in the open country of the north-east where, problematically, the demand was swelled by ship building. Later, as coppices spread, some system was introduced by allowing the growth of selected standards, mostly of oak, which would be felled on reaching a suitable size for use;[50] but the records show nothing that could be described as plantation. Even in the north-east the needs could be best satisfied by cheap water transport from the high woods of The Weald surrounding the Rother.

A variety of trees went into the making of wagons, implements, like ploughs and yokes, and such simple furniture as there was, but these were still relatively minor requirements and easily met. Much the largest demand was for oak used in framing and roofing buildings. Oliver Rackham has shown that for this purpose large numbers of small timbers were taken, usually as whole trunks, most of them no more than six to nine inches in diameter, and that even in the roofs of cathedrals the majority had a diameter of less than fifteen inches. For these young oaks would be chosen. Bigger posts from older trees were used for only a few special purposes, of which Rackham mentions pedestals for the windmills[51] that began to appear at the close of the twelfth century. Surprisingly, it is only when he comes to the Tudor period that he says anything about shipbuilding, although substantial timbers were certainly needed in medieval times, and well before, for the keels of the larger sea-going vessels, constructed on Scandinavian models,[52] together with quantities of oak for planking and strakes. Boat building was carried out all along the coast but the demand must have been especially great among the shipwrights of the Cinque Ports which, with the two Ancient Towns of Rye and Winchelsea, were at the height of their prosperity in the late thirteenth century.

The spread of coppicing in the northern woods still left a number of ancient trees standing there, singly or in small groups. The Hundred Rolls of 1274 tell, for example, of certain 'great' trees which had been

[50] Rackham, *Trees and Woodland*, pp 72–4.

[51] *Ibid*, pp 73–7. This first mention of a windmill in Kent occurs temp. Richard I at Monkton: see Frank W Jessup (ed) 'Introduction to *Kent Records, XV, Calendar, Kent Feet of Fines*, Ashford, 1956, Appendix II, p cxxv.

[52] Gwyn Jones, *A History of the Vikings*, Oxford, 1973, pp 182–94.

plundered from Blean forest by the royal escheator and were valued at the high sum of 5*s* 9*d*[53] each. But there cannot then have been many of them, and such heavy loads would have been particularly difficult to transport overland. In Kent it was The Weald that had much of the largest legacy of stout oak timber, and in the hinterland of Romney Marsh, though only there, this was readily transportable by water to serve not only the major ports but the needs of the wealthy manors in the open arable countryside of north-east Kent, which were otherwise most difficult to meet. It was an ideal link, and one apparently long established.

The first mention of this traffic is in a charter purporting to date from 949, but believed to have been constructed some fifty years later, which in describing the lands owned by Reculver opposite and on Thanet speaks also of *ceolulfing tune sud be wealde*, said to be kept for repair of the church (the old Abbey building).[54] The place is Chilmington in Great Chart parish,[55] close to where the Wealden forest merged into that of *Sibersnoth* and only six miles from the deep inlet on Romney Marsh which opened out at Hythe – the *Genlida* referred to in 830.[56] The reference is obviously to timber supplies which must have been carried along this route, since it would have been far too costly to cart them the great distance to Reculver overland. In this case the connection was not commercial but proprietorial, and so it appears to have been for most of the large north-eastern manors. It is probable that the grant of dens to those like Minster, Ickham, Eastry, Northbourne, Wingham and St Martin's, Dover – all of which are known to have had some close to the Rother[57] – was designed from the beginning to satisfy their needs for wood as well as for pannage; and by the thirteenth century that had become the chief consideration. By then, too, we are given figures of relative transport costs, of which good examples occur in the accounts of Eastry, with its six dens near Hawkhurst and Benenden.[58] These show that whereas it cost 7*s* to move 140 logs from its dens to the water, close as that was (Small Hythe was one of the havens used) a load of 100 tree trunks and 1000 logs could be shipped out to sea and all the way up the coast to Sandwich for as little as 10*s*, with some addition for wharfage.

The lords were often able to reduce the costs still further by requiring the Wealden settlers, as a condition of tenancy, to fell the trees, fashion them on site, and deliver them ready for use at a convenient embarkation point. The arrangements are seen in their most perfect form in the records of Northbourne manor, which had dens near Tenterden. The occupants of these were required each year to provide 100 timbers, exactly 13 feet in length, with similar precise obligations for the supply of boards and rafters;[59] while certain of the upland tenants had to hire a ship to fetch them to a point near Deal, off-load them and cart them to the hall, some three miles away.[60] *Averagia*, or carrying services of one kind or another, were a feature of the obligations imposed on husbandmen in north Kent, but this was a remarkable manifestation of the custom.

V

Of the handful of small woods entered in the Kent Domesday five were said

[53] 'Rotuli Hundredorum' sub *Boctune*: see Robert Furley, *A History of the Weald of Kent with an Outline of the Early History of the County*, 2 vols, Ashford, 1871 and 1874, II, p 149.

[54] *Cart Sax*, no 880. On date, see Nicolas Brooks, *The Early History of the Church of Canterbury*, Leicester, 1984, pp 232–36.

[55] Wallenberg, *Kentish Place-Names*, p 284.

[56] *Cart Sax*, no 396.

[57] Witney, *Jutish Forest*, pp 272–75; Du Boulay, 'Denns, Droving and Danger'; and *Domesday Book: Kent*, Philip Morgan (ed), Chichester, 1983, p 4.

[58] O'Grady, 'Eastry Manor', Table 4.13, p 303.

[59] W Somner, *A Treatise of Gavelkind, Both Name and Thing*, 2nd edn, 1726, p 22.

[60] G J Turner and H E Salter (eds), *Register of St Augustine's Abbey, Commonly Called the Black Book*, 2 pts, Oxford, 1915 and 1924, I, p 79.

specifically to be kept for fencing (*ad clausuram*). No doubt what was chiefly meant by this was the supply of wattled hurdles or posts to be interlaced with flexible rods, taken mostly from alders.[61] There was always a great demand for movable, or easily removable, barriers of this kind, not only for sheep folds but also to mark or bar off plots of land when crops were growing. There were at this time few permanent hedgerows, partly because in Kent the custom of *gavelkind*, under which partible inheritance was combined with the right freely to buy, sell or lease land, caused a constantly shifting kaleidoscope of land-holdings, partly because the joint use of ploughs necessitated a general opening up of the arable when the harvest was in. It seems that even the large and usually stable demesne fields were rarely hedged off. A clear indication of this is the introduction in most of the Archbishop's manors of a special ploughing service known as *graserthe*, described in the Wingham custumal of 1285 as having been imposed because the tenants' cattle had been wont to stray on to the demesne during the 'open season' (*tempore aperto*), and could not well be prevented from doing so.[62]

With so general a need for fencing it may be wondered why the Kent Domesday enters only such a small handful of woods used for the purpose, and why four out of the five of those should have been in the north-east, beyond Canterbury, as were three of the other six *parvae silvae* or *silvae minutae*. Given that the survey is often erratic in the choice of which assets to record and which not, the inference is that fencing was particularly in demand in this area, or that there was something about the character of these woods that picked them out, or both. In this rich arable countryside, fringed with marsh on which large flocks of sheep were kept, the demand for hurdles and fencing must certainly have been unusually large, while at the same time the scarcity of woodland called for its conservation. It seems likely that these woods were among the earliest of those systematically managed as coppice, for which in the eleventh century there was still little need throughout most of the county, where underwood was abundant.

There was another requirement for fencing which had only just begun to appear at the end of the eleventh century but grew rapidly thereafter. This was to enclose deer parks. It was a Norman development, associated with the introduction of fallow deer.[63] Domesday Book mentions only a single park in Kent, created by Odo of Bayeaux in the Trenley woods near Wickhambreux; but at some time in the twelfth century the Clares established a huge chase on the eastern side of Tonbridge, still traceable in the North and South Frith woods. The pales of this park, many miles in length, are frequently mentioned in preambulations of the Lowy (or juridical liberty) of Tonbridge carried out in 1259 and 1279.[64] By then a number of other parks, though none approaching this in size, had been created by the lords in different parts of the county; thus the Hundred Rolls of 1274 mention them at Bexley, Westwell, Aldington and Lyminge[65] and there were others, for instance at Folkestone.[66] The effect on the woods themselves was generally deleterious since deer are highly destructive of undergrowth; but the requirements for paling increased the demand for coppice, some of which might be grown in protected plots within the parks themselves, the remainder of which tended to develop into

[61] Rackham, *Trees and Woodland*, p 73.
[62] Canterbury Cathedral MS, E 24, fo II. See also Du Boulay, *Lordship of Canterbury*, pp 170–71.
[63] Rackham, *Trees and Woodland*, pp 142–48.
[64] John Harris, *The History of Kent*, 1719, pp 320–1; and V W Dumbreck, 'The Lowy of Tonbridge', *Arch Cant*, LXXII, 1959, pp 138–47.
[65] 'Rotuli Hundredorum' *sub* hundreds of Ruxley, Calehill, Bircholt (Franchise) and Lonongborough; see also Furley, *Weald of Kent*, II, pp 134, 137, 141, 151.
[66] 'Inquisitiones Post Mortem', *Arch Cant*, III, 1860, pp 243–4.

open woodland with some value for its timber.[67]

It is significant that the only tree, apart from oak, mentioned as contributing to the value of the park at Folkestone when it was surveyed in 1263 was hawthorn. This had a special use in the construction of dykes, work that was gathering pace during the latter part of the eleventh century as innings mutiplied all along the marshland fringes of the county. Tree branches, some three to four inches in diameter were used for the framework around which the banks were built, and hawthorn brushwood for the thick mattress laid to protect them before they were finally compacted.[68] The hawthorn, which favours open sites, was far from easy to get in the quantities required and the best expedient was to grow it along already established dykes, which the roots then served to consolidate. It remains a feature of Romney Marsh; and ancient thorn trees still line surviving embankments on the Wantsum marshes, such as the Gilling Drove at Chislet. The demand for other wood for the framework, and for groins and sluices, could be considerable; so that in 1253/4 we learn of 50 acres of woodland at Rainham which was worth only a mark (around 1½*d* an acre) because it had been much wasted for the 'making' of a marsh.[69]

VI

In the old settled country of north Kent the primary demand on the woodlands had always been for fuel, the county having little peat. It was required for every form of heating and cooking, for baking, and for making malt for the ale that was drunk in great quantities. We learn from the Lyminge custumal of 1286 that one large, horse-drawn, wagon-load of faggots was needed to produce a *summa* (8 bushels) of malt; that 48¾ *summas* were required each year for the Archbishop's own use on this manor; together with 72 large, or 144 small, cart-loads of wood for other purposes.[70] Lyminge was a larger manor than most, though no longer at this time among the very largest, and the supplies catered not only for the Archbishop and his retinue on their periodic visits but for his resident full-time staff and for whatever ale (and loaves) were given to his tenants when working for him, mostly at harvest. Nevertheless this was a considerable toll on the demesne woods. We do not know what were the needs of the tenants themselves, or of the alehouse keepers and village bakers, or the size of the demand in the towns, but the combined requirements must have been considerable.

Also substantial was the fuel used for producing salt, an essential commodity for cheese-making, curing fish and preserving the carcases of animals slaughtered at Martinmas for winter food. Indeed, where fuel is mentioned in the pre-Conquest documents it is almost always for supplying the coastal salt pans. Some idea of the scale of use is given in a charter of 732 which shows that a pan at *Sandtun* near West Hythe needed 120 wagon loads of wood a year to distil the brine.[71] Domesday Book records nearly 140 pans in Kent, but gives no particulars of what they consumed, because they were farmed to salters[72] who seem to have been left to find the wood themselves. Judging by the rents received by the lords the pans varied greatly in size. Some, like the 47 at Chislet, were certainly very small. All we know is that the lords' total receipts came to some 130*s*; that the largest pans paid around 2*s* 6*d* each; and that if these compared with the one at *Sandtun* in 732 then the total quantity of fuel needed by all would have been around 6250 wagon-loads

[67] Rackham, *Trees and Woodlands*, pp 142–48.
[68] Clare T Lukehurst, 'The Chislet Levels: A Transformed Landscape', in K H McIntosh (ed), *Chislet and Westbere: Villages of the Stour Lathe*, Ramsgate, 1979, pp 28–31.
[69] 'Inquisitiones Post Mortem', *Arch Cant*, III, 1860, pp 243–44.
[70] Cant Cath MS E 24, fo 66.
[71] *Cart Sax*, no 148.
[72] R V Lennard, *Rural England 1086–1135: A Study of Social and Agrarian Conditions*, 1959, p 224.

a year, or the equivalent. This is a minimum, and one moreover that takes no account of an extraordinary assemblage of 100 pans near Rye, which were worth all those in Kent together. If these used wood it must have been brought down the Rother from the Wealden forest to either side of it and the county boundary; but the area around Rye, unlike Romney Marsh in general, appears to have been rich in peat with which the pans here may well have been fuelled.

As salt was a necessity we should expect demand to have kept pace with the growth in population and the annual toll on the Kentish woodlands to have risen to at least 25,000 loads by the close of the thirteenth century. In fact, there was a fourfold increase in output at Chislet, a manor where comparison is possible because, exceptionally, Domesday Book states the payment by the salters not in money but in kind (representing no doubt a fixed proportion, perhaps a tenth, of the product). It amounted then to 50 *summas*, reckoned for this commodity at four bushels each.[73] Two hundred years later, when the pans had been reduced in number but enlarged in size, the figure had risen to just over 800 bushels.[74] The impact made on the woodlands by this industry was felt all the more acutely because it was overwhelmingly concentrated on particular stretches of forest. Although the marshes on Thameside and the Medway estuary would have served for salt production as well as those in east Kent – and appear to have been more used for the purpose in Roman and prehistoric times[75] – Domesday Book records only two pans there. At that time most of those in Kent itself were on the Wantsum estuary, which was surpassed by Romney Marsh only when the Rye group is taken into account, and an important contribution was also made by the eastern section of the Swale. These were the best dairying areas in the county and closest to the great fisheries, the Wantsum having the particular advantage that it lay between the major fishing port of Sandwich and the thriving market of Canterbury. But the crucial advantage, enjoyed by all, was that they backed upon extensive forests, the Romney levels on The Weald and *Sibersnoth*, and both the Wantsum and Swale on Blean, the first also making some use of Hardres. Fuel must always have been the major element of cost in salt production.

The early charters dealing with the pans provides some insight into the conditions of the woods before the Conquest. Instead of conveying defined plots of woodland they either make an allowance for fuel, as for *Sandtun*, or else, more commonly, grant rights of entry into large forests like Blean at stipulated times of the year, or for a stipulated number of wagons, or both. Thus a charter of 863 tells us that the ownership by Mersham manor of a pan near Faversham carried with it the right to send two wagons into Blean over a period of four weeks following Pentecost.[76] The conveyance of Ickham manor in 785/6 was accompanied by lavish rights in both Blean and Hardres,[77] intended to meet domestic needs as well as to service salt pans (*sealterna steallas*, the vernacular term from which Seasalter takes its name).[78] In Hardres alone the allotment was 100 wagon loads a year, in addition to which a small cart was allowed to ply there at any time. None of this suggests any systematic husbandry but that forests still within the king's charge were simply culled for undergrowth or blown wood. Although some control was maintained over the use of the woods most accessible to the pans and the main population centres, there was

[73] R E Zupko, *A Dictionary of English Weights and Measures*, 1968, p 5.
[74] *Black Book of St. Augustine's*, I, pp 96–7.
[75] Alec Detsicas, *The Cantiaci*, Gloucester, 1983, pp 170–1; and A Miles; 'Salt-Panning in Romano-British Kent', in K W de Brisey and K A Evans (eds), *Salt: the Study of an Ancient Industry*, Colchester, 1975, pp 26f.
[76] *Cart Sax*, no 507.
[77] *Ibid*, nos 247, 248.
[78] Wallenberg, *Kentish Place-Names*, p 69.

still – as yet – little suggestion of any real shortage.

We do not know when in Kent coppicing began to be seriously practised, but Domesday Book shows that by then it had been introduced not only in the north-east but at places around Canterbury. Specific mention is made of *silvae minutae* at two places on the outskirts of the city, a small plot of 16 acres at Nackington and a much larger one of 100 at Horton (near Chartham). Nothing is said in these cases about fencing, and the object is much more likely to have been to provide fuel. That seems unquestionably to have been the purpose of the 1000 acres of *silva infructuosa* which we learn was leased to the burgesses for 24*s* p.a. Where exactly the wood was we do not know, but probably in Blean. The entry is particularly informative because it shows that at this time the value of coppice, in an area where woods were plentiful but also heavily drawn upon, was around ¼*d* an acre – much the same return, it seems, as from Wealden pannage or cattle pasture in the northern glades, and (to set the matter in perspective) about a quarter of that from the poorest arable land. The inference is that the demand for fuel was still purely local, and that although in the more populous areas some prudent management was beginning to be needed there was not yet such a shortage as to drive up prices. Other than around Canterbury and in the north-east the only reference to 'small wood' in the Kent Domesday is at Newington by Sittingbourne, and that for fencing. This does not, of course, mean that some coppice may not have existed elsewhere, but, if so, little value seems to have been attached to it.

Over the hundred years or so following Domesday Book the records are too sparse for us to know what had been happening to the woods; but when the darkness lifts in the thirteenth century we find that the situation had been transformed. The value of the woods had risen far beyond that of any other type of land, and the price of salt had been carried up with it.[79] By then, as we have seen, coppice had become widespread throughout the accessible woodlands of the north, most of it no doubt consisting of quick growing hazel, though Oliver Rackham has shown that a variety of other woods, including chestnut, might be used, often in a somewhat casual intermixture.[80] The Wealden woods around the Rother were every bit as valuable as those in the uplands, but here the ownership of the undergrowth, as distinct from the 'great' oaks and beech, which were indubitably the property of the lords, was contestable, and increasingly worth contesting. Thus we hear in 1333 of an action taken by a certain James de Echynhamme, who occupied land near Benenden, against his overlord, the Prior of Christchurch, for forcible entry on to the property to remove the underwood.[81] We do not know the upshot of this case, but other records show that in general the densmen were successful in asserting their claims, leaving the lords to profit from the timber trees and fuel from their profusion of lop and top. In this area the issue was important, but the further away from the Rother the less so it became, because the Medway was not navigable until it left the forest. The value of the wood was rapidly reduced by the cost of carting it over the foul Wealden droves.

The increase in value of the northern woods is well illustrated in a series of *Inquisitiones Post Mortem* carried out in Henry III's reign following the death of powerful tenants-in-chief of the king like Richard Clare and Hamo Crêvequer. Among these surveys was one conducted in 1263 at Eltham.[82] Here there were 200 acres of woodland in demesne which were worth 57*s* a year in the sale of undergrowth, or close on 3½*d* an acre, rather less than the

[79] For thirteenth-century salt prices in Kent see Rogers, *History of Agriculture and Prices in England*, II, pp 410–12.
[80] Rackham, *Trees and Woodlands*, p 80.
[81] Furley, *Weald of Kent*, II, pp 331–32.
[82] 'Inquisitiones Post Mortem', *Arch Cant*, IV, 1861, p 311.

contemporary leasehold value of medium quality arable land but still four times as much as had been got in 1086 from the *silva infructuosa* near Canterbury, allowing for the intervening inflation. This was an excellent return on soils so heathy and poor as to be virtually uncultivable; and it is matched by other surveys of Downland woods on soils which were equally intractable as eg at Nashenden behind Rochester.[83] There is little doubt that much of the underwood from Eltham was going to London, as that from the neighbouring manor of Bexley was certainly doing, providing a tenth of its income; and it shows the relative cheapness of water transport that although Bexley was only fifteen miles from London along Watling Street, one of the best roads in England, the supplies were nevertheless shipped through Erith or Dartford.[84] The influence of the London market extended well down the Thames; so that we hear from the Hundred Rolls of 1274 of the disposal there of 200 *ligna* (probably logs, for burning) from Oakenpole Wood on the Downs behind Teynham.[85]

There were woodlands in east Kent far more profitable than these, including the Reinden woods above Folkestone, which we have already mentioned to illustrate the decline in the use of cattle pasture caused by coppicing on a short cycle.[86] The obverse of that was the extraordinarily high profit derived from the coppice itself, the annual return from the 150 acres at Reinden being 120*s*, or 9½*d* an acre, whereas in this manor the best of the demesne arable was worth only 8*d*. Moreover the standard oaks interspersed with the coppice here contributed another 20*s* in pannage and what little was left as cattle pasture 6*s*, to give a total value of nearly 1*s* an acre. The manor also had 41 acres of broom and furze which were cut every seventh year and were said then to have been worth 7*s* an acre. A great part of the profit must have come from sales to the growing municipalities across the Channel. The Wealden woods on the Rother were also open to that lucrative traffic, so that we hear in Edward III's reign of 'very many merchants – as well of our Kingdom of England as of the parts of France, Flanders, Zealand and Eastland, and elsewhere' entering the port of Winchelsea and plying up the Rother as far as Bodiam in search of firewood. Reading, Maytham and Newenden are mentioned as the other havens frequented for this purpose, and we are told that the men of Cranbrook also had a strong interest in the sales, from which they claimed to derive the greater part of their yearly support.[87]

Even away from the Channel coast we find figures comparable to those at Folkestone, as in 1262 at Eastling (although that was a very small wood).[88] An excellent indicator of the soaring value of these woods is the investment policy of the great lords, who consistently bought up the best plots of land that their freehold tenants might be constrained to part with, sometimes to keep themselves but often to lease out for much higher returns than the previous custom-bound rents.[89] The development of this policy is well illustrated at Chartham, a Christchurch manor in the Stour valley, which included a share of Blean forest on one side and of Buckholt on the other. Meadow land along the river had always been the most sought after, but at the beginning of the thirteenth century Christchurch was already purchasing as much woodland as arable and by the end of it more; and the wealthier of the freeholders

[83] *Ibid. Arch Cant*, III, 1860, p 250.
[84] Du Boulay, *Bexley*, pp 14–5; and *Lordship of Canterbury*, p 217.
[85] 'Rotuli Hundredorum', *sub* Teynham Hundred; see also Furley, *Weald of Kent*, II, p 148.
[86] 'Inquisitiones Post Mortem', *Arch Cant*, III, 1860, pp 255–64.
[87] Furley, *Weald of Kent*, II, pp 335–36.
[88] 'Inquisitiones Post Mortem', *Arch Cant*, III, 1860, p 252.
[89] See for example, R A L Smith, *Canterbury Cathedral Priory: A Study in Monastic Administration*, 1943, p 117.

were also speculating in this highly profitable market.[90] In this manor entry fines for the purchase of woodland, which in the early part of the thirteenth century were already higher than for arable land, had by the end of the century become as high as for meadow, a remarkable indication of value, enhanced no doubt by proximity to Canterbury.[91] The Archbishop for his part was creating protected reserves in the more extensive of his woods, at Bexley in the north-west, Oakenpole and Petham on the Downs, Whitley in the Chart near Otford, and in *Sibersnoth*.[92] He seems also to have taken particular care to conserve other of his demesne woods within easy reach of the coast. The largest of those belonging to Wingham, 296 acres at Woolage Green, directly on Watling Street with Dover only six miles away,[93] remained virtually intact until after the Second World War and is still plainly marked out by tree belts.

Increases of value of the magnitude described, far exceeding the general rate of inflation since Domesday Book, were not confined to Kent. They were an inevitable consequence of the great expansion of population, coupled with the growth of the towns, which at one and the same time enlarged the demand for fuel, and made inroads into the supply as land hunger led to the clearance and cultivation of more and more marginal land.[94] In Kent the circumstances were peculiarly propitious. It started with a glut of woodland; in the east the extensive innings and recovery of land from the sea provided a major outlet for settlement on Romney Marsh, while in the west colonization was diverted into the one large area of forest, the Wealden basin of the Medway and its tributaries, where the trees were of little value; thus relieving the pressure on the profitable outer belt of woods. These, it seems, produced far more fuel than was needed locally; but nowhere were the surpluses more easily disposable, up the Thames, along the coast or across the Channel. In the thirteenth century and up to the Black Death these woods were a source of wealth comparable to the coalfields of the nineteenth century and the oilfields today, with the added advantage of being constantly renewable.

VII

Although from the time of the Jutish settlement some encroachment had been made on the northern woods, by feeling out the areas of better soil, relatively little impression had been made on them prior to the Conquest, because there had been little need. Much of the old-cleared land which the Jutes inherited from Roman times was of excellent quality and it seems that for some time not even all of this was fully exploited. If, as it appears, the earliest of the settlements are marked out by the land units known as *sulungs*,[95] and if the distribution of those is compared to the picture presented by Domesday Book, the chief development shown during the interval had been a steady filling-out of the originally neglected parts of Holmesdale, accompanied by the clearance of the better ragstone soils on the central and eastern sections of the neighbouring Chart.

The open, seaward section of the Downs between Dover and Deal had been well settled from early times, but clearance had spread further inland where in 1086 only a few scraps appear to have remained of the ancient forest of Singledge (around Whitfield) mentioned in eighth-century charters.[96] Small footholds had been established at other places along the Downs,

[90] A M Langridge, 'The Tenantry of Chartham from *c* 1200 to *c* 1550', unpublished MA thesis, University of Kent, 1982, pp 34, 63–4.
[91] A M Langridge, 'The Population of Chartham from 1086 to 1600', *Arch Cant*, CI, 1984, pp 217–44, especially pp 224–26.
[92] Du Boulay, *Lordship of Canterbury*, p 217; and 'Denns, Droving and Danger'.
[93] Cant Cath MS E 24, fo 1.
[94] Postan, *Medieval Economy and Society*, pp 16–28.
[95] K P Witney, 'The Period of Mercian Rule in Kent, and a Charter of AD 811', *Arch Cant*, CIV, 1987, pp 87–113.
[96] *Cart Sax* nos 190, 207.

where almost all the parish churches of today had predecessors entered in the *Domesday Monarchorum* or *Textus Roffensis*, although most of these seem to have been diminutive and many, like Paddlesworth above Lyminge, to have originated as no more than woodland chapels.[97] Here and there, as at Meopham, sizeable manors had developed where the chalk hills declined into the fertile loess soils fringing the Thames; but higher up it is very rarely that we find settlements of any consequence. Domesday Book records ten plough teams at Cudham but much more typical were places like Wichling, Frinsted and Hastingleigh where the teams varied from one to three. The origin of these trivial manors is obscure, but most probably began as squatters' settlements, either in woods belonging to the folk of the surrounding communities, or sometimes in royal and demesne woods where they were tolerated because more could be extracted from the settlers in rents than the under-utilized woods were at that time worth.

During the twelfth century, as the increase in population began to make itself felt, but before the woods had acquired their later value, this process of attrition appears to have gathered pace. It seems, for instance to have been this period that saw the development of the small satellite settlement of Chartham Hatch at one end of Blean[98] and the establishment of a few woodland holdings around Strode and Bleangate at the other,[99] and also the beginnings in the Chart woods, as an off-shoot of Otford, of what was to become the market town of Sevenoaks.[100] These assarts were variously described. At Gillingham they were called *ferthings*,[101] but in later manorial records they were mostly entered as 'new lands'. They so appear at Eltham, where they amounted to some 250 acres[102], and at Kennington, where they included, for example, *Bochangre* (i.e. 'beech hanger'),[103] evidently on the Down scarp. Small patches of 'new land' occasionally occur even in the north-east, where woods were scarce, as at East Studdal on the margin of what remained of the forest of Singledge.[104] A good indication of encroachment on demense woods is the presence of *inlands*, i.e. holdings sited on the lords' own property, but remote from the manorial halls around which such holdings generally clustered (as the term implies). The assarts at Strode and Bleangate were of this kind, and in Wingham manor we find 150 acres of *inland* distributed throughout the wooded southern fringe around Womenswold with another 50 acres around Oxenden nearby.[105] Individually these holdings were unusually small but by the close of the twelfth century the woodlands were becoming increasingly frayed. It was at that point that the steep rise in their value began decisively to tip the balance against further clearance.

The lords were well able to protect their demesne woods in the north when the need arose, and it was these woods, rather than those belonging to their freehold tenants (in Lyminge manor Park Wood and West Wood rather than Rhodes Minnis)[106] that stand out clearly today. In The Weald the lords' interests were different, but in the Rother area just as great. Although their concern here was restricted to the mast-bearing trees, with their timber and lop and top, all of those belonged to them, to take or leave standing as they pleased. The problem on the far outposts of the dens was how to protect this property. Over most of The Weald it hardly mattered, since the assets were barely realizable, but around the

[97] Gordon Ward, 'Saxon Churches in Textus Roffensis' and 'Saxon Churches in Domesday Monarchorum'; and Everitt, *Continuity and Colonisation*, pp 156–8.
[98] Langridge, 'Population of Chartham', p 221.
[99] *Black Book of St. Augustine's*, I, p 103.
[100] Du Boulay, 'The Assembling of an Estate: Knole in Sevenoaks *c* 1275 to *c* 1525, *Arch Cant*, LXXXIX, 1974, pp 1–10.
[101] A R H Baker, 'Open Fields and Partible Inheritance on a Kent Manor', *Econ Hist Rev*, 2nd ser, XVII, 1964, pp 1–23.
[102] 'Inquisitiones Post Mortem', *Arch Cant*, IV, 1861, p 311.
[103] *Black Book of St. Augustine's*, I, p 236.
[104] *Ibid*, I, p 71.
[105] Cant Cath MS E 24, fo 9, 10.
[106] *Ibid*, fo 65.

Rother it came to matter a great deal. In earlier times, when there was a superfluity of pannage and the trees had not yet acquired their later value, the lords had been indulgent to settlement because it caused little loss, and what there was could be more than made up by the dues imposed on the squatters; that extraordinary complex of forest customs – *danger*, *lef-yeld*, *gate-penny*, *scot-ale*, *summer-hus* and the rest – which started as compensatory payments for interference with pannage, or relief from it, or were a form of enforced hospitality when the lords or their agents held courts in the forest, known as *parrocks*, to apportion pannage.[107] But once the settlements had gained a hold it was difficult to prevent their expansion; nor, at such a distance, was it possible effectively to restrain illicit felling. As during the thirteenth century the value of the woods mounted, the densmen were intent at every opportunity on rifling them,[108] partly no doubt to clear more land for cultivation but mostly, it seems, to dispose of supplies to shipmen plying along the Rother. In the face of this constant, more or less surreptitious, destruction, the lords were driven to a series of compromises, by which, for instance, the occupiers of certain Eastry dens were allowed one tree for each taken by the Prior of Christchurch, while on the Charing den of *Helesden* (Cranbrook Common) the Archbishop was content with a third of the trees and elsewhere with the oak and beech.[109]

Already by the end of the century the difficulties of enforcement were becoming so great that the lords were prepared to sell out their rights in certain of the dens and concentrate on the protection of the remainder, now known as *drof-dens*.[110] Thus in 1285 the Abbot of Battle, lord of Wye manor, made over to the occupants of twelve of his dens in Hawkhurst and Cranbrook parishes all rights to the trees growing on them in return for substantial rents and for converting one other, Angley, into a park.[111] But even with this reduction, protection was difficult and was becoming more urgent as reserves were constantly eaten into. There were numerous court cases, such as those taken by the Archbishop before the justices of Oyer and Terminer in 1309/10 which showed that more than 600 trees had been illegally felled on eight of his *drof-dens*. Just how extensive the depredations could be is revealed in an associated account of proceedings against the tenants of 120 acres in Rolvenden parish who were said 'by force of arms' to have felled no fewer than 326 oaks and beech to the loss by the archbishop of 119 marks (nearly £40).[112] The disputes continued with mounting bitterness until the Black Death, with its immense mortality, knocked the bottom out of the wood market and led to the wholesale abandonment by the lords, for very moderate rents, of rights for which it was no longer worth the struggle to enforce.[113]

At the other end of The Weald, around Tonbridge, where difficulty of disposal had made the trees almost worthless, but where some good land was to be found along the river terraces, clearance had begun long before, with little hindrance from the lords, who could expect more from agricultural rents than the meagre returns on pannage. The Kent Domesday shows that already in the twenty years between the Conquest and the taking of the survey there had been considerable colonization here; manors owning dens to either side of Tonbridge and throughout the Wealden basin of the Medway having increased well beyond normal in value. By the thirteenth century

[107] Somner, *Ports and Forts*, pp 112–13; Neilson, *Priory of Bilsington*, pp 2–39; Du Boulay, 'Denns, Droving and Danger'; Witney, *Jutish Forest*, pp 173–78.
[108] Furley, *Weald of Kent*, II, pp 195–205.
[109] Neilson, *Priory of Bilsington*, pp 17–21; and Du Boulay, 'Denns, Droving and Danger'.
[110] Neilson, *Priory of Bilsington*, pp 19–20.
[111] Furley, *Weald of Kent*, II, pp 199–201.
[112] *Ibid*, II, pp 203–04.
[113] Du Boulay, 'Denns, Droving and Danger'; Witney, *Jutish Forest*, pp 183–86.

this had become a well-settled countryside, from which the old forest regime and the customs revolving around it had almost vanished. The Archbishop had been the major landowner here, yet of the 50 or so *drof-dens* he was maintaining in The Weald in 1285, none was situated to the west of Horsmonden parish, which itself had only one.[114] The greater part of his lands in this area had been assigned as knights' fees, mostly to the Clares of Tonbridge, so effectively passing out of his control; and of those he kept the most important, Penshurst, sited on good workable soil at the junction of the Eden and the Medway, was being converted into arable and meadow.[115] But perhaps the most revealing light on the progress of settlement is cast by two perambulations of the Lowy of Tonbridge carried out in 1259 and 1279 and which traversed some thirty miles of countryside, moving at almost every point from one well-established holding to another.[116] As the settlements multiplied and pannage dwindled, the clusters of dens belonging to manors of north Kent were beginning to be grouped into manors themselves, if still treated as subordinate, and sometimes with names – Cowden Lewisham, Otford Weald (alias Penshurst Halimote) – betraying their origins.[117] The prime example was Tonbridge itself which was no longer treated as a congeries of outpost lands held from northern manors, but had developed into a fully fledged manor in its own right, one of the largest in Kent and a favourite residence of the Clares. Everywhere along the line of the Medway and its tributaries, with their spread of alluvium, other manors were forming, with holdings cutting back into the surrounding woods, unhindered except where the lords had converted those into park or chase, which increasingly was becoming the use made of land too poor to repay even the labour of clearance.

As, in the western Weald, the dens were gathered into the emergent manors and the links with upland Kent were severed, so did the great annual transhumance of swine die away. But in the east, where the *drof-dens* were too valuable to be released by their parent manors, and the lords' control over the woods had its ultimate justification in pannage, the movement of the herds continued, if merely as a makeweight. It was only when the demand for fuel slumped with the onset of the Black Death in 1348/9, and the wood rights were sold, for what they were worth, to the densmen, who had no wish to see strangers' swine quartered on their lands any longer, that the movement finally petered out, so bringing to an end a whole era of Wealden history which had begun centuries before with the Jutish conquest. And there were other changes afoot in The Weald; in the east the establishment by Edward III of cloth weaving at Cranbrook and neighbouring places[118] and in the west the rediscovery of the iron deposits, which were to give a renewed value to the woods, although not until the introduction of large furnaces in Tudor times.[119] The whole economy of the forest was changing.

VIII

Whatever the future might hold, the period we have been studying had enduring effects on the development of Kent and its landscape, the framework of which has rightly been described as medieval.[120] Nowhere is this more marked than in the distribution of the woodlands, fixed virtually in the pattern left by the coming of the Black

[114] Witney, *Jutish Forest*, p 170 (map).
[115] *Ibid*, pp 167–69.
[116] Harris, *The History of Kent*, pp 319–21: Dumbreck, 'Lowy of Tonbridge'.
[117] Witney, *Jutish Forest*, pp 214–16.
[118] Furley, *Weald of Kent*, II, pp 321–31.
[119] E Straker, *Wealden Iron*, 1931, pp 26–59.
[120] A M Everitt, 'The Making of the Agrarian Landscape of Kent', *Arch Cant*, XCII, 1976, pp 1–31.

Death. The drastic fall in population devalued the woods, but it also meant that there was no longer any serious shortage of arable land. The woodlands of the north, which throughout the period of acute land hunger had been saved by their great profitability and the diversion of settlement to the western Weald and the newly-inned marshes, continued to be so by the poverty of their soils and mere inanition until, as the population began again to pick up, such innovations as hop-growing gave a renewed value to the coppices on the Downs and elsewhere.[121] The rediscovery and exploitation of the iron fields of the High Weald had little or no effect on the extent of the woodlands there, though it did on their character by speeding the replacement of standard trees by the coppice needed to make charcoal for the furnaces[122] – the same development that had accompanied the growth of the salt industry centuries before. Throughout Kent, if the distribution shown in the Land Utilisation Survey of 1943[123] is compared to our knowledge of that in 1086, and indeed in much earlier times, the only significant difference is the clearance of The Weald along the line of the Medway and its tributaries – and even that had been largely accomplished by the mid-fourteenth century. For the rest, all the ancient forests and woods – Blean, Hardres, Buckholt, the Chart, *Sibersnoth*, King's Wood in Wye, Oakenpole, the Chislehurst heaths and so on – stand out clearly, together with the scattering of smaller woodlands along the length of the Downs.

It is impossible to study any aspect of the early agrarian economy of Kent without becoming impressed by the close integration of all; a discriminating balance of use, not only between the various types of woodland in their different settings, but between those and the arable, the upland pastures, the marsh innings and *forelands*, the fisheries and salt pans. No mere succession of expedients could have produced such a well-ordered whole. The great variety of soil and terrain in Kent encouraged selectivity, and the long coastline and deeply penetrative estuaries enlarged the scope for it. That such full advantage should have been taken of the opportunities owed much to the initial land system of the Jutes but even more perhaps to the percipience of the church lords who by the time of the Conquest had acquired between them a larger stake in this county than in any other, owning more than half of it with estates scattered throughout every part. This gave the durability of ownership necessary for consistent policies to be followed and the means of applying them with the utmost flexibility across the face of the county. There is no better illustration of this, or of the pressures induced by the great growth of population after the Conquest and the means taken both to cope with and profit from it, than the woodland economy as it had developed during the thirteenth and early fourteenth centuries.

[121] Stamp, *Land of Britain: Kent*, pp 591, 601.
[122] Straker, *Wealden Iron*, pp 109–40.
[123] Stamp, *Land of Britain: Kent*, p 592 (map).

Sand into Gold: the Evolution of the Foldcourse System in west Suffolk, 1200–1600*

By MARK BAILEY

Abstract
This study charts the evolution of field-systems in north-west Suffolk during the later Middle Ages, a period often overlooked by historians of the subject. The whole area comprised extensive open fields in the thirteenth century, but thereafter two distinct and divergent field systems emerged from this common ancestor. On the light soils of Breckland, K J Allison's classic foldcourse system had evolved by 1600 from a more fragmented and flexible medieval predecessor. On the loamier soils, an informal medieval foldcourse system disappeared with the gradual spread of piecemeal enclosures. Such differences are explained in terms of the changing structure of landholding, the influence of lordship, and environmental factors. The evidence suggests that commonfield systems could undergo important – but hitherto unsuspected – institutional changes in the fifteenth and sixteenth centuries: changes which were germane to the seventeenth-century improvements in agrarian productivity recently advocated by some historians.

THE main features of East Anglian agriculture in the late sixteenth and early seventeenth centuries are well documented. Not only was overall production rising, but it had become locally specialized to a large degree.[1] In part, this specialization had been facilitated by the spread of enclosures across former medieval open fields during the fifteenth and sixteenth centuries. This enclosure movement was so widespread that in 1573 Thomas Tusser described Suffolk as 'severall' countryside, and Reyce wrote of 'manifold enclosures, severed with so many deep ditches'.[2] This area was known as the stock-raising or 'wood-pasture' region, where farmers produced 'mutton and biefe, corne, butter, and cheese of the best'.[3] Yet the enclosure movement did not encompass all of East Anglia, for it bypassed the eastern and western fringes of Suffolk and the light soils of Norfolk. Here the medieval open fields remained more-or-less intact until at least the seventeenth century, and some parishes were not enclosed entirely until Parliamentary enclosure itself.[4] These distinctive open areas constituted the 'sheep-corn' districts of East Anglia, where the manure of large sheep flocks turned the blowing sands into profitable barley land.[5] In general, this distinction between the sheepcorn and wood-pasture regions is useful and valid, although Overton has warned that these

*I am indebted to Bruce Campbell for his detailed criticism of this paper, and to Duncan Bythell and Alan Davison for reading an earlier draft.

[1] J Thirsk, 'The Farming Regions of England', in J Thirsk, ed, *The Agrarian History of England and Wales*, IV, Cambridge, 1967, p 41; M R Postgate, 'Field Systems of East Anglia', in A R H Baker and R A Butlin, eds, *Studies of Field Systems in the British Isles*, Cambridge, 1973, pp 284–7; C G A Clay, *Economic Expansion and Social Change: England 1500–1700*, p 107.

[2] T Tusser, *Five Hundred Points of Good Husbandry*, Oxford, 1984, p 135; F Hervey, ed, *Reyce's Breviary of Suffolk*, 1902, p 14. See also R A Butlin, *The Transformation of Rural England c1500–1800: a Study in Historical Geography*, Oxford, 1982, p 44, and Clay, *Economic Expansion*, pp 117–8.

[3] Tusser, *Husbandry*, p 135; Thirsk, 'Farming Regions', pp 41, 46–9; Postgate, 'Field Systems', p 289.

[4] B A Holderness, 'East Anglia and the Fens', in J Thirsk (ed), *The Agrarian History of England and Wales*, V, i, Cambridge, 1984, pp 205–7.

[5] Thirsk, 'Farming regions', pp 42–6; D MacCulloch, *Suffolk and the Tudors*, Oxford, 1986, pp 28–30.

divisions should not be accepted uncritically.[6]

Pasturing and cropping arrangements on these open fields were organized according to a complex and peculiar system known as the foldcourse.[7] A foldcourse represented the exclusive right to erect a sheep fold on the fallow areas of the open fields, although many foldcourses also enjoyed grazing rights over other areas, such as permanent pastures. Hence communal grazing rights over the fallow arable were not extensive, as they were in the Midland three-field system, but were restricted to the owners of foldcourses. For a period after the harvest, known as shack, villagers possessed some grazing rights over daytime fallows, but at all other times access to the majority of pasture grounds was restricted to the carefully specified and delimited foldcourses. Communal cropping patterns were necessary to ensure that large, compact blocks of fallow arable were made available to each foldcourse, but the very nature of the system dictated that the cropping unit was the shift rather than the field.[8] Ownership of these foldcourses was a seigneurial monopoly, and the rights of tenants were strictly limited. The only concession granted to tenants was an allowance to keep a few sheep in the lord's fold, known as a cullet right, and even their cattle had to be kept in a communal herd. Consequently, 'sheep farming was the business of big men . . . the lords who were exploiting the privileges of the foldcourse . . . dominated the scene': a statute of 1533 even described them as 'covetous sheep farmers'.[9]

This brief summary is actually a description of the classic foldcourse system of *c*1600 based on Allison, whose work is an outstanding pioneer study of a difficult subject. Its prime objective is to describe the agrarian system which prevailed before the 'new Norfolk husbandry' emerged in the later seventeenth century, and is regarded as the definitive work on foldcourses.[10] The only substantial criticism to be levelled at Allison is whether his classic foldcourse model did in fact exist in all sheep-corn villages: Simpson, for example, has pointed to some subtle but significant local variations in foldcourse operation.[11] This issue certainly requires further research, as indeed does the glaring question of the foldcourse system's historical evolution. Hardly any work has been undertaken on how or when this foldcourse system emerged, which is surprising when one considers that the movement towards enclosure in the fifteenth and sixteenth centuries – and its attendant social tensions – is comparatively well documented in East Anglia.[12] What happened to the foldcourse system during this same period? Was Allison's classic model operating in *c*1300: if not, what agrarian system pre-dated it, and when did it eventually emerge?

The scope of this article is geographically limited, but its findings should have general relevance to most of East Anglia: indeed, it would complement Campbell's pioneering

[6] He argues that farming practices were not always uniform within these areas, and that 'while the sheep-corn and wood-pasture divisions provide some basis for a regional division they are an inadequate characterization of *farming* regions'; M Overton, 'Agricultural Regions in Early Modern England: an Example from East Anglia', University of Newcastle upon Tyne, Department of Geography Seminar Papers, 42, p 23. See also below, n 66.

[7] The basic works on foldcourses are K Allison, 'Sheep Corn Husbandry of Norfolk', *Ag Hist Rev*, 5, 1957, pp 12–31; A Simpson, 'The East Anglian Foldcourse: some Queries', *Ag Hist Rev*, 6, 1958, pp 87–96; Postgate, 'Field Systems', pp 313–22.

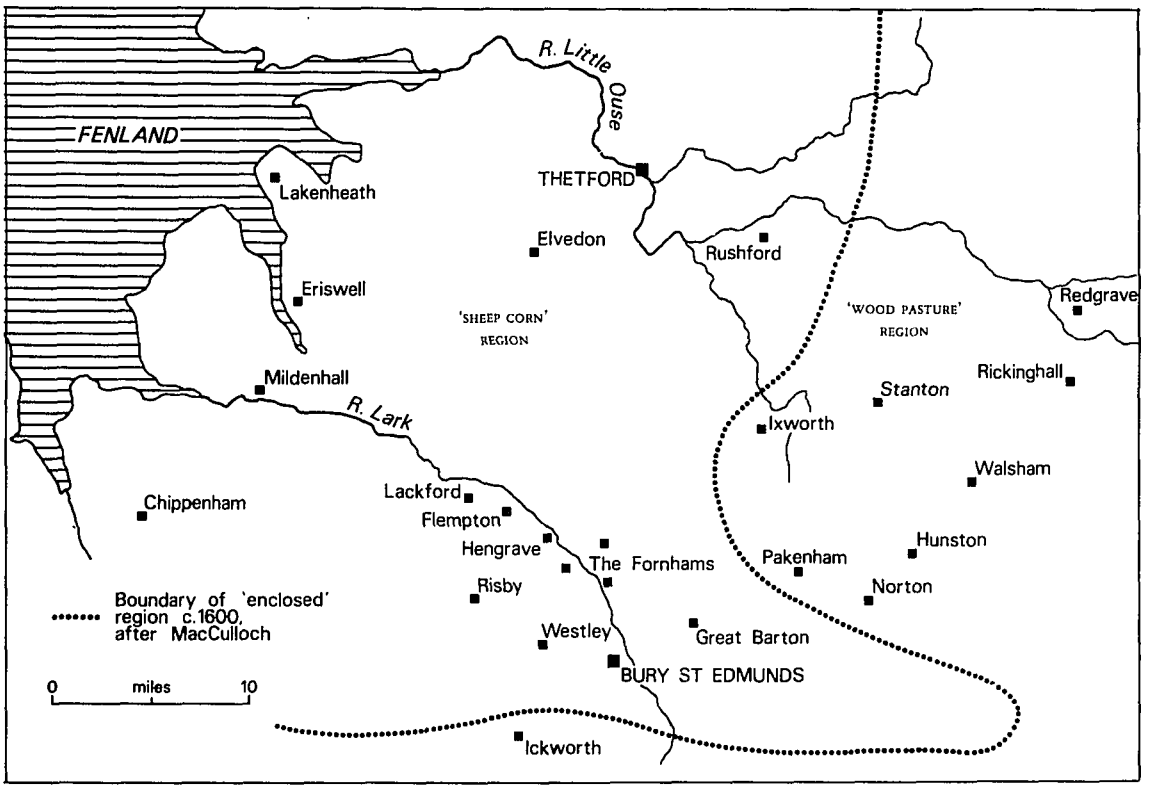
[8] In the Midland three-field system, crop rotations were based on furlongs and fields, and, because these were relatively constant features, the system itself possessed a relative permanence. In contrast, crop rotations in East Anglia were normally applied by shifts, a shift being a group of lands cropped alike in any one year. Shifts were in no way constrained by field or furlong divisions, for they regularly transcended such boundaries, and consequently the 'field'-system was relatively impermanent. See Postgate, 'Field Systems', pp 296–300.

[9] Simpson, 'Some Queries', pp 181 and 184.

[10] Allison, 'Sheep Corn Husbandry', p 99.

[11] Simpson, 'Some Queries', pp 87–90. See below, n 89.

[12] Postgate, 'Field Systems', pp 287–90. For general trends, see J Cornwall, *Revolt of the Peasantry 1549*, 1977, pp 11–28; S K Land, *Kett's Rebellion: the Norfolk Rising of 1549*, Ipswich, 1977, pp 8–9.



MAP I
North-west Suffolk in the later Middle Ages

work on the region's late medieval field-systems.[13] Its focus is a small area of north-western Suffolk which straddles the poor sands of Breckland and the heavier loams of high Suffolk (Map 1). In the fourteenth century much of this area comprised extensive open fields. A few enclosures of both arable and pasture land did exist, but cumulatively did not constitute a substantial proportion of the overall area of any one village. Yet by *c*1600, much of the heavier land in the eastern and southern portion of the study area had become enclosed, whilst the lighter land in and around Breckland remained largely open. In fact, the distinction between these 'open' and 'enclosed' villages is not always as clear as historians have sometimes suggested, for some 'enclosed' villages also possessed sizeable areas of open fields.[14]

The exact chronology and extent of enclosure on the loams of west Suffolk awaits documentation, and is a subject dealt with only fleetingly here. There are, in fact, three issues central to this discussion. First, why did an area of extensive open fields in *c*1300 give rise to two widely divergent field-systems by *c*1600?: on the one hand, a landlord-dominated foldcourse system on open fields in the sheep-corn region, and, on the other hand, an enclosed wood-pasture region. Secondly, were there any

[13] B M S Campbell, 'The Regional Uniqueness of English Field Systems? Some Evidence from Eastern Norfolk', *Ag Hist Rev*, 29, 1981, pp 16–28.

[14] A point which lends credence to Overton's reservations about a strict delimitation between agricultural regions in East Anglia, see below, p 55.

substantial changes in cropping and pasturing arrangements on these open fields during the fifteenth and sixteenth centuries? In other words, was there a historical evolution of the foldcourse system as monumental as the onset of enclosure in the wood-pasture region? Thirdly, what determined whether a village's fields remained open or became enclosed? Differences in soil type are acceptable as a broad explanation, but they do not satisfactorily explain why one village retained its open fields whilst its neighbour became enclosed. Did the existence of foldcourses act as a bulwark against enclosure?

The findings of this local investigation may, in fact, prove to have wider implications. Bruce Campbell has emphasized the importance of lordship in explaining regional differences in field systems, an oft-neglected topic which can be profitably explored here.[15] Similarly, much of the literature on agricultural development, and on the evolution of field-systems in particular, has concentrated almost exclusively on improvements and changes which occurred in periods of population growth. There has been little research into the structural changes in farming arrangements and field-systems during periods of demographic decline, such as the later Middle Ages. Did the peculiar social and economic conditions of the fifteenth century effect any significant changes in field layout and organization, changes which could form the basis of more productive field-systems in later centuries?

I

In order to throw light on these neglected aspects of East Anglian agrarian history, more detailed research is necessary on the variety and evolution of local field-systems. Fortunately, enough is already known about the pre-industrial field-systems of Breckland to justify some general observations on the development and evolution of foldcourses.[16] This research has established two main points about Breckland's foldcourse system. First, the system of *c* 1600 operated locally in a very similar fashion to the East Anglian model described by Allison.[17] The second point to emerge, however, is that Breckland's *medieval* foldcourse system was much more flexible and variable, and in some significant respects operated differently from its seventeenth-century successor. Indeed, it was also rather different from the agrarian arrangements employed on open fields elsewhere in medieval East Anglia.[18]

It is important to stress that there were many basic similarities between Breckland's medieval foldcourse system and Allison's model of *c* 1600. For instance, in both periods the manorial lord possessed the exclusive right to create folds, and also controlled the foldcourses' day-to-day operation.[19] Yet the differences are of greater interest. Communal cropping was practised in medieval Breckland, but was more flexible over both time and place than the shift system of the seventeenth century which Allison described. For example, documents from the early modern period describe in considerable detail both the location of shifts and the cropping rotations imposed on them, because the shifts themselves were applied with relative consistency and rigidity. However, such descriptions are less

[15] Campbell, 'Regional Uniqueness', pp 27–8.

[16] For the field-systems of medieval Breckland, see M Bailey, *A Marginal Economy? East Anglian Breckland in the Later Middle Ages*, Cambridge, 1989, pp 40–85; for the early modern period, see Postgate, 'Field Systems', pp 300–3; and M R Postgate, 'The field systems of Breckland', *Ag Hist Rev*, 10, 1962, pp 80–101.

[17] As we shall see, the variations between local foldcourse systems were greater in the Middle Ages than in the early modern period. By the mid-seventeenth century, it is reasonable to argue that the East Anglian foldcourse system had largely matured. It is this later and standardized foldcourse system which is described by Allison.

[18] Arrangements in medieval Breckland may have been flexible when compared to arrangements in later centuries, but they were still relatively formal in comparison to other areas of medieval East Anglia. For instance, few communal controls operated over the medieval open fields of eastern Norfolk, an area of relative freedom and individualism, B M S Campbell, 'Population Change and the Genesis of Common Fields on a Norfolk Manor', *Econ Hist Rev*, 2nd ser, XXXIII, 1980, pp 174–5.

[19] Bailey, *Marginal Economy?*, pp 72–4, and 76.

common in medieval documents because individual shifts were more impermanent and prone to be broken down or changed after a short period, especially in periods of high demand for grain. The tendency towards a less formal shift system was particularly evident in villages on the edge of Breckland, where a more complex field-layout and a more fragmented manorial structure did little to facilitate strict communal cropping arrangements.[20]

Perhaps the most significant difference between the medieval foldcourse system and its successor was in the nature of fold ownership, for in the Middle Ages there was no evidence of a seigneurial monopoly. Folds could belong to free and unfree peasants alike, and in some villages the total number of peasant-held folds outnumbered those belonging to the demesne. Peasant folds appeared in two basic forms. Temporary folds for a limited period (normally up to a year), obtainable by seigneurial licence and usually confined to the tenant's own arable land; and permanent folds, the right to which was attached to land or a tenement and was consequently protected by custom.[21]

The existence of peasant folds in the Middle Ages has certainly been acknowledged by historians, although their extent and number in Breckland has patently been underestimated.[22] The presence of so many peasant folds can only imply that the medieval foldcourse system operated in a more fragmented and flexible manner than did the model described by Allison. The comparative rigidity of Allison's system is clearly illustrated by the example of Holkham in 1590, where the entire village was neatly divided between four compact, seigneurial foldcourses.[23] Organizing communal shifts to accommodate these was a relatively simple task compared to arrangements in medieval villages, where the numerous small, dispersed, and fragmented peasant folds served to disrupt and undermine any such orderly or rigid format.

The greater fragmentation in the medieval system may help to explain some of the queries raised by Simpson concerning Allison's model. Simpson chastised Allison for his ambiguity on the question of who received the benefit of the fold's manure: essentially, Allison implied that all of the fallow arable lying within a foldcourse would be manured, regardless of ownership, whilst Simpson believed that it would be concentrated on the lord's demesne land.[24] The evidence from medieval Breckland indicates that there is no ambiguity here, for both interpretations are correct: demesne flocks were folded across all the open fields on the coarse soils of central Breckland, although in villages on the edge of the region the same flocks tended to be concentrated more on the demesne arable.[25]

It would appear that – even in the seventeenth century – there were subtle local differences in the organization of foldcourses, a discovery which adds weight to Overton's point about the variations in farming practices within apparently distinctive 'regions'.[26] These differences were even greater in the Middle Ages, when it would be wrong to assume that an 'East Anglian foldcourse system' operated in a uniform or standardized format throughout the region. Campbell makes a similar point by arguing that the foldcourse system proper, such as existed in Breckland, should be distinguished from the right of 'liberty of fold', which was commonly found throughout

[20] Compare, for instance, the description of shifts in Elveden in 1616 with the medieval evidence: Postgate, 'Field Systems', p 300, and Bailey, *Marginal Economy?*, pp 58–9. For the flexibility of medieval shifts during high demand for grain, see *ibid*, pp 208, 216–7.

[21] Bailey, *Marginal Economy?*, pp 67–8, 70–2.

[22] Compare, for instance, H L Gray, *English Field Systems*. Cambridge Mass., 1915, p 342, and Postgate, 'Field Systems', p317, with Bailey, *Marginal Economy?*, pp 68–9.

[23] Allison, 'Sheep Corn Husbandry', p 17.

[24] Simpson, 'Some Queries', p 89–90.

[25] Bailey, *Marginal Economy?*, pp 82–5. Similarly, the physical delimitation of many peasant foldcourses was restricted to the fallows of their owner's own arable land.

[26] See above, n 6.

medieval East Anglia and was not necessarily connected with foldcourses.[27] Hence, compared with the early modern period, a variety of flexible foldcourse and folding systems operated on East Anglia's open fields; and, furthermore, in Breckland a much greater proportion of folds was in the hands of peasants.

II

This brief comparison demonstrates clearly enough that the fifteenth and sixteenth centuries must have represented a crucial period in the evolution of the classic foldcourse system described by Allison. It also implies that whilst some villages underwent piecemeal enclosure, those villages which retained their open fields *also* experienced significant changes in agricultural organization. In Breckland, such changes were undoubtedly facilitated by the disappearance of the highly fragmented medieval landholding structure, and the gradual extinction of the smallholder. From the mid-fourteenth century, there was a slow but certain tendency in Breckland towards larger holdings, culminating in the creation of vast estates within three to four centuries. Ultimately, this resulted in a severe depopulation of the region, sometimes to the extent that whole villages were deserted, but at the same time it facilitated the imposition of a more rigid system of exploiting the land.[28] It is not coincidental that the foldcourse system assumed its most rigid and discernible form in the seventeenth century, after almost three centuries of systematic engrossment and rural depopulation.[29] The dwindling numbers of smallholders, and the attenuation of their common rights, were central to the evolution of the foldcourse system described by Allison.[30]

Although the emergence of a new landholding structure provided a framework within which a more standardized and rigid foldcourse system could develop, an important factor in the foldcourse's development was a gradual change in seigneurial attitudes to sheep farming. It is obvious from the nature of thirteenth-century fold ownership that peasants possessed more substantial and secure rights in the medieval foldcourse system than did their seventeenth-century successors. Prior to *c*1300, Breckland landlords often took only a limited direct interest in large-scale sheep farming. As a consequence, they were prepared to extend both permanent and temporary fold rights to a select band of peasants.[31] Hence sheep farming in many thirteenth-century Breckland villages was concentrated into the hands of the peasantry. However, two main changes had occurred by the late sixteenth century. First, the overall scale of sheep farming had increased appreciably, and, secondly, the vast majority of sheep were now owned by landlords rather than the peasantry.[32] It seems logical to presume that such drastic changes were only possible through a significant (but gradual) reorganization of

[27] Campbell, 'Regional Uniqueness', pp 22–6. Liberty of fold was fairly common throughout East Anglia, and referred to the lord's monopolistic right to fold his own land. This concept is distinct from foldcourses, which were largely confined to the region's lighter soils, and which encompassed a wider range of rights and communal cooperation.

[28] G E Mingay, *Enclosure and the Small Farmer in the Age of the Industrial Revolution*, 1968, pp 26–31; Holderness, 'East Anglia', p 207; Bailey, *Marginal Economy?*, pp 51–4.

[29] For the gradual disappearance of the smallholder in Chippenham, on the south-western tip of Breckland, see M Spufford, *Contrasting Communities: English Villagers in the Sixteenth and Seventeenth Centuries*, Cambridge, 1974, pp 66–71.

[30] Likewise, East Anglia's fragmented manorial structure, which had seriously undermined the imposition of strict communal controls in agriculture in the Middle Ages, was gradually rationalized after the Black Death by the purchase and absorption of subsidiary manors within individual villages. Some commentators have regarded this as an important prerequisite to improved farming, J Spratt, 'Agrarian Conditions in Norfolk and Suffolk 1600–1650', *Bull Inst Hist Res*, 15, 1937–8, p 114.

[31] For speculation as to why Breckland lords in particular were prepared to allow such a high degree of alienation, see Bailey, *Marginal Economy?*, p 72.

[32] For the growth of the sheep population in this period, see M R Postgate, 'An Historical Geography of Breckland', unpublished London MA thesis, 1960, p 147; Thirsk, 'Farming Regions', p 43.

the foldcourse system in the fifteenth and sixteenth centuries.[33] But is there explicit evidence from Breckland that the 'classic' system, as described by Allison and Postgate, was the product of centuries of evolution?

Little is known about the exact operation of Breckland's foldcourse system before the thirteenth century, but the right of foldsoke was certainly established at Domesday. During the twelfth century, traditionally a period when landlords took little direct interest in their demesne lands, it is reasonable to suppose that Breckland peasants were allowed to erect folds on a wider scale in lieu of their lords.[34] As long as the demesne arable still received enough manure to keep it in good heart, then alienating folds was acceptable. To ensure this, and because few thirteenth-century Breckland landlords kept many sheep themselves, the demesne foldcourses were normally stocked with the sheep of peasants who did not possess their own folds. Indeed, this was compulsory in most villages.[35] There appear to have been few – if any – formal restrictions on the number of peasant sheep in the lord's fold, although cumulatively each fold could not exceed a certain size.

From the fourteenth century, however, there is ample evidence that landlords sought to claw back these earlier concessions, and slowly reassert their theoretical monopoly of fold ownership. Inevitably, this movement coincided with a growing seigneurial interest in sheep farming; for instance, Bury St Edmunds Abbey did not begin large-scale rearing on many of its manors until the early fourteenth century, and the Cluniac priory at Thetford greatly increased its operations in the fifteenth.[36] The initial expansion of seigneurial flocks was achieved without any significant structural changes to the informal medieval system, for landlords were able to increase their own activities simply by squeezing out the peasantry. For instance, there were 599 sheep recorded in Culford in the Lay Subsidy of 1283, of which only 0.8 per cent were demesne-owned, yet by the mid-fifteenth century Bury Abbey had established a farm of over 2000 sheep there. At Lakenheath, where the Priory and Convent of Ely *had been* active and prodigious sheep rearers since an early date, they increased their share of all sheep in the village from 40 per cent in the 1300s to around 70 per cent by the 1460s.[37]

The rising importance of seigneurial flocks in Breckland was a gradual process, and to a large extent was precipitated by the general demographic decline of the fourteenth and fifteenth centuries. As there were now fewer peasants to use the demesne folds for their stock, landlords simply began to fill them with their own sheep. For instance, it had always been compulsory for unfree peasants without their own folds to place their sheep in the lord's fold. But because the scale of peasant sheep farming had become so large by the thirteenth century, many Breckland villages needed separate communal folds, or *falda de collecte*, to accommodate them all: only in the smaller villages were peasant sheep actually folded with the demesne flock.[38] By the fifteenth

[33] Of course, the extent and timing of changes in the foldcourse system varied from village to village according to intensely local factors. The main manor in Sturston, in Norfolk Breckland, was held by an aggressive landlord in the late sixteenth century, and its foldcourse system probably conformed to Allison's model from this period. Yet in Lakenheath, for instance, monopoly of fold ownership was not achieved until the eighteenth century, Bailey, *Marginal Economy?*, pp 75–6.

[34] Although one reference in Domesday Book indicates that alienation had occurred in some villages at an even earlier date: in 1086, landholders in Risby 'belonged to the fold', '*excepto uno quia faldam habet per se*', *Little Domesday Book*, f 356b.

[35] On the Bishopric of Ely estates in 1251, the sheep of unfree peasants '*debent iacere in falda domini*': Cambridge University Library EDC G3/27, ff 146 (Bridgham), and 150 (Feltwell).

[36] H E Hallam, *Rural England 1066–1348*, 1981, p 51; Bailey, *Marginal Economy?*, pp 290–1.

[37] Bailey, *Marginal Economy?*, tables 3.7 (Culford); 4.15 and 5.7 (Lakenheath).

[38] At Lakenheath before the Black Death, some peasants had to place their sheep '*in falda domini de collecte*', and the manor also employed a 'village' shepherd as distinct from those working on the demesne. CUL EDC 7/15/II/Box 1/9 m 26; EDC 7/15/1/4. *Collecte* folds were also common in East Norfolk, and were used to tathe the demesne land: however, the Lakenheath *collecte* flock was patently folded on peasant land, Campbell, 'Regional Uniqueness', p 23; Bailey, *Marginal Economy?*, p 83.

century however, references to communal folds disappear from manorial records, presumably because they had now been absorbed into the demesne folds. To some extent this made sense, because depopulated villages simply had fewer peasant-owned sheep, and therefore less need for a separate fold. Yet by absorbing the former *collecte* folds, landlords were at once able to expand their own flocks and reduce those of the peasantry.

It might be tempting to regard the decline of peasant sheep farming simply as a consequence of changing economic and demographic conditions. However, some landlords accelerated the process by deliberately restricting peasant operations, so that after the Black Death temporary fold licences were seldom granted to peasants on the Bury Abbey estates. In other cases, landlords committed overt infringements on peasant rights, and Bury Abbey sometimes retained peasant-owned foldcourses for their own use when the land to which they were attached had been escheated into its hands.[39] This fervent seigneurial interest in sheep farming still requires a proper explanation, but many landlords probably regarded sheep as their best defence against declining agrarian revenues in the fifteenth century. Wool prices were certainly depressed in this period, but sheep rearing was not labour intensive, and – compared with arable farming and collecting rents from an obstructive peasantry – it was administratively simple.

By these methods, manorial lords gradually tightened their control of local sheep farming, and in the process increased the size of their own flocks. The extent and timing of this movement varied from manor to manor, but the important point is that it was accommodated within the existing, rather informal, foldcourse system: there is no evidence of any major structural changes before the mid-fifteenth century. However, in the ensuing century or so, rising agricultural prices encouraged landlords to increase production still further, and this could only be achieved by rationalizing the medieval foldcourse system. Landlords were certainly successful in raising output, for the sheep population of the sheep-corn areas grew rapidly in this period.[40] As a result, a real distinction between corn growers and sheep farmers emerged, and a new class of capitalist flockmasters was created. Most notable amongst these were the Townshends of Raynham, the Fermours of East Barsham, and the Heydons of Baconsthorpe, whose wealth and success is well documented.[41] Yet such vast pastoral operations inevitably conflicted with the interests of arable farmers, the smallholders and tenantry. Indeed, historians have argued that these extensive pastoral activities were only made possible because the foldcourse system was inherently exploitative: they argue, somewhat blandly, that landlords 'used' the foldcourse system to invade peasant rights, or that the foldcourse system 'encouraged' landlords to specialize in large-scale sheep farming.[42] In this light, the foldcourse is seen as some powerful and iniquitous force, a servant ready to satisfy the rapacity of its seigneurial master. Whilst there is some truth in this, it is also important to stress that the flockmasters shaped the classic foldcourse system just as much as the system shaped their fortunes.

Evidence for this is patchy, but clear nonetheless. After the mid-fifteenth century, the continuing growth in seigneurial flocks was largely due to seigneurial

[39] Which happened at Risby immediately after the Black Death, West Suffolk Record Office Bury St Edmunds E. 3/15. 13/2. 11, and at Fornham in the fifteenth century, WSROB E. 3/15. 7/2.10.

[40] Postgate, 'Historical Geography', p 147. K Allison, 'Flock Management in the Sixteenth and Seventeenth Centuries', *Econ Hist Rev*, 2nd ser, XI, 1958, p 99.

[41] A Simpson, *The Wealth of the Gentry*, Cambridge, 1961, pp 182–4; Land, *Kett's Rebellion*, pp 8–9; A Fletcher, *Tudor Rebellions*, 2nd edition, 1973, p 71.

[42] This view of the foldcourse system is explicit in many works. See, for instance, S T Bindoff, 'Kett's Rebellion', *Historical Association Pamphlet G12*, 1949, pp 8–9; Fletcher, *Tudor Rebellions*, pp 71–2; Cornwall, *Revolt of the Peasantry*, p 15; Land, *Kett's Rebellion*, pp 8–9.

aggression rather than rural depopulation. By this time, swollen demesne folds were becoming an intolerable strain on the medieval system, and some rationalization, or further restriction of peasant rights, was necessary if growth was to continue. The ancient peasant right to place a (theoretically) large number of sheep within the seigneurial fold was increasingly inconvenient to a landlord seeking to expand his own operations. Once landlords became committed to rearing their own flocks on a large scale, they no longer had any pressing need for peasant sheep to be folded on the demesne, and a move to reduce the scale of peasant sheep farming was bound to occur sooner or later. In some places – as we shall see – this resulted in flagrant abuse of the system. In others, landlords were content to impose formal restrictions on the number of sheep each tenant could keep in the lord's fold. This was essentially the 'cullet' right described by Allison, but here it is contended that this first appeared – in Breckland at least – around the fifteenth century, and that in earlier centuries peasants could theoretically keep an unrestricted number of sheep in the lord's fold.

There is explicit evidence that the 'cullet' restrictions described by Allison *were* a product of the fifteenth and sixteenth centuries. At Mildenhall in 1465 the court recorded that all residents had agreed with the lord to keep a certain number of sheep '*pro tenura sua pro porcione terrarum suarum*', and thereafter men were amerced for pasturing sheep '*extraneos de Culiett*'.[43] At Flempton in the mid-sixteenth century, the manorial lessee was in dispute with a group of tenants over common rights in the village, which resulted in the tenants' conviction at the Star Chamber for various 'riotts and misdemeanours'. At this stage of the proceedings the manorial lord, Sir Thomas Kitson, offered to mitigate their sentences if they accepted certain demands over common rights. One such demand was an agreement on cullet sheep, whereby the tenants would only be able to place a specified number of sheep in the lord's fold. Hence it was agreed that John Stapleton 'shall yearly . . . have and use the feed and goeyng of 6 sheep or any less number in and with the flock'.[44]

The tightening of cullet rights was only one aspect of the general movement to impose restrictions on grazing rights for peasant sheep. Tenants in some villages were stripped of their right to keep any sheep at all. For instance, sheep rearing had been an important source of income to the inhabitants of Chippenham in the thirteenth century. However, fifteenth-century manorial courts repeatedly questioned the right of peasants to hold folds, and in the 1540s the demesne lessee even tried to deny tenants their right to have cullet sheep in the lord's fold. The lessee must ultimately have been successful, because in the seventeenth century every sheep in the village belonged to the manorial lord.[45] In other villages, landlords even prohibited the lessees of the demesne arable from keeping their own flocks. John Drury leased certain lands with a foldcourse in Risby, but the fold itself was stocked with sheep belonging to the landlord. Despite this, Drury had to supply hurdles for the fold and to pay the wages of the resident shepherd each year. His only benefit in this agreement was the right to tathe the flock over his arable land, and the meagre concession 'to have goinge in the seid flocke during the said ferme fourtie sheep'.[46] Naturally, the wool profits from the flock, a considerable sum, accrued to the landlord himself.

The development of a more formal foldcourse system from the mid-fifteenth century also involved a general tightening

[43] WSROB E. 18/451/5, courts held July 1465 and 1476.

[44] WSROB 449/3/4 m 7. Of other tenants, Gregory Brette was allowed four sheep, Francis Frank one, and John Norkard eight.

[45] M Spufford, *A Cambridgeshire Community: Chippenham from Settlement to Enclosure*, Occasional Papers, Dept of Local History, Leicester University, 20, 1965, pp 20 and 44; Spufford, *Contrasting Communities*, pp 63–4.

[46] WSROB 449/2/579.

of cropping and pasturing arrangements. The earlier system of numerous folds and highly flexible shifts was ideal for ensuring that as many of the medieval smallholdings as possible received manure. Yet such a fragmented and informal foldcourse system was inherently obstructive to large-scale sheep and grain farming. However, as holdings were engrossed, as subsidary manors were bought up, and as the landholding structure was rationalized, so individual landlords came to enjoy greater coercive power over local farming practices: as a consequence, they found that they could increase agricultural output by imposing stricter controls upon the system of cropping and pasturing. There is not one explicit reference to shifts in the extant fourteenth- and fifteenth-century court rolls of Lackford and Flempton, but in the mid-sixteenth century the lord secured a legal agreement with the villagers that they 'shall keep shifts in Sowing of their lands there and shall not sow the same lands out of Shift or Order to the annoyance of the Sheeps Course'.[47] This does not mean that shifts were absent in the Middle Ages: the suggestion is that the sixteenth century saw greater interest in imposing a more rigid shift system. At Elveden in 1612 farmers agreed 'to plow the arable londs . . . according to shift, *as have been accustomably used for twenty years last past*'.[48] The cropping system at Elveden had evidently undergone significant restructuring in the late sixteenth century, a change aimed at maximizing the area available to the lord's expanded flocks. Indeed, the same document explicitly notes that ploughing out of turn was 'to the prejudice and hurt of the lord's flock'. This represents a much more carefully structured and standardized use of arable land than had existed in the Middle Ages.[49]

This rationalization enabled landlords not only to keep more sheep, but also to grow more grain through the development of brecking. The practice in Breckland of cropping arable land at different levels of intensity (as infield, outfield or breck) has been described by Postgate, but it was not until the sixteenth century that this system really matured. A distinction between infield and outfield was evident in the Middle Ages, but *true* brecks – ie, occasionally tilled heathland – were rare and small.[50] Large-scale brecking was not practised extensively until the sixteenth century, and the reasons for this seem obvious. First, there was not enough manure to cultivate large areas of heathland in the Middle Ages, in contrast to the later period when there was a much larger sheep population. Secondly, peasant grazing and litter rights on the medieval heaths presented a formidable obstacle to its large-scale cultivation, so that the attenuation of these was an important prerequisite to brecking.[51] The standardization of foldcourses, and the development of brecking, allowed the simultaneous expansion of both grain and sheep farming.

The wealth of extant documentary evidence relating to the sixteenth-century foldcourse system is largely due to the increase in legal disputes about its operation, and this growth in litigation is a sure indication that the system was undergoing significant changes. The disputes concerned a number of issues, but were all seeking to extend/clarify seigneurial rights, or to rationalize the system. The importance

[47] WSROB 449/3/4 m 5.

[48] Ipswich and East Suffolk Record Office HD 1538/212 (my italics).

[49] Indeed, there are a number of documents from around 1600 which contain highly detailed descriptions of the size and composition of each shift. This in itself suggests an increased formalization of the cropping system. It is not coincidental that there is very little explicit evidence of the operation of shifts from the Middle Ages, when the system was much less formal.

[50] Compare Postgate, 'Field Systems of Breckland', with Bailey, *Marginal Economy?*, pp 62–5.

[51] The general nature of peasant rights on the medieval heaths are described in Bailey, *Marginal Economy?*, pp 55–6.

placed by landlords on controlling foldcourses is reflected in one case from the late sixteenth century, where two manorial lords both claimed to possess foldcourse jurisdiction over the same village. Such a conflict was always possible, simply because East Anglian villages often contained more than one manor, although normally one of the landlords was designated 'chief lord' and therefore assumed overall responsibility for regulating communal farming practices.[52] However, the village in question, Rushford, was unusual because it straddled the Norfolk/Suffolk border, and a dispute arose over foldcourse jurisdiction on the parish's Suffolk side. It was argued that because the dissolved Thetford priory had held a number of foldcourses in (Suffolk) Rushford at various times in the fifteenth century, then the successors to its land must be chief lords there. However, it was established that these had not been *seigneurial* folds, but were either alienated folds or held on leasehold, and therefore the priory's rights – and hence those of its successors – extended no further. This was sufficient to establish that Rushford college was the chief lord of the village's Suffolk sector and so possessed full jurisdiction over foldcourses there.[53]

Most of the legal records concern the direct activities of landlords against tenants. There were numerous attempts to extend the capacity of seigneurial folds beyond customary limits, often by amalgamating and enlarging demesne folds. Hence it was noted that the Monkhall and Stanes flocks in Rushford 'for diverse years past have been united into one'.[54] Yet the expansion of demesne folds often necessitated a radical restructuring of existing pasture arrangements. In some celebrated cases this entailed flagrant or even violent abuse of communal rights. At Sturston and Narford (Norf) in the late sixteenth century, rapacious landlords enclosed the commons, seized foldcourses, and evicted tenants in order to expand their own sheep rearing activities.[55]

On the whole, however, the violent methods employed at Sturston were rare and most landlords attained the same end gradually, through generations of attrition and litigation. There were two main objectives of this litigation: to attenuate peasant sheep-rights in the evolving system, and to refine all other cropping and pasturing arrangements so that greatly enlarged seigneurial foldcourses could be accommodated. Much of this legal action was successful; landlords possessed the wealth and resources to win court cases, and in any event were merely trying to reassert a legitimate monopoly which had been 'temporarily' alienated by their medieval predecessors. They suffered few legal reversals against tenants, although in one notable case at Eriswell the demesne lessee unsuccessfully disputed a tenant's right to erect a fold.[56]

The swollen foldcourses of the sixteenth century were inevitably accompanied by constant overstocking of communal pastures and heaths with seigneurial flocks.[57] This represented perhaps the most persistent abuse of customary practices, and it was not uncommon for landlords to then enclose these pastures, legally or otherwise, and subsequently prevent villagers from using them. The tenants of Flempton and Hengrave enjoyed intercommoning rights on the parish boundaries at Dunsfield, but in the mid-sixteenth century Thomas Kitson secured the use of this ground 'in severalty and discharged of all common'.[58] Similarly, Ixworth heath provided permanent pasture for both the manorial flock and the villagers' cattle, but had become so overstocked by the late sixteenth century that it was

[52] For chief lords, see Bailey, *Marginal Economy?*, pp 73–4.
[53] Gonville and Caius College, Cambridge, Add Ms 740/785, ff 55–8.
[54] IESRO HD 1538/212, document dated 1612.
[55] K Allison, 'The Lost Villages of Norfolk', *Norfolk Archaeology* 31, 1955, p 136, and 'Sheep Corn Husbandry', p 25.
[56] Bailey, *Marginal Economy?*, p 75.
[57] The evidence for swollen flocks and the problems they created is documented in Allison, 'Sheep Corn Husbandry', pp 22–7. See also Thirsk, 'Farming Regions', p 43, and Postgate, 'Field Systems', p 319.
[58] WSROB 449/3/4 ff 3–4.

'lesse profitable to eyther lord or tenant'. Consequently the lord, Sir Daniel Norton, skilfully negotiated the right to enclose 100 acres for the exclusive use of his sheep flock, 'without the lest denyall or interuption of any of the said tenants'.[59]

Landlord enclosure of common pastures was a source of friction between East Anglian lords and their tenants in this period. But social friction also arose from the obstruction of foldcourses by tenants, and some legal action sought to protect foldcourse owners from such infringements. Tenants sometimes enclosed their own land, thus denying access to the foldcourse, which happened in a well-known dispute at Westley in the late 1540s.[60] At Elveden in 1538 a group of villagers had moved the boundary stones of a foldcourse, thus illegitimately gaining access to over 100 acres of land. Sir Richard Fulmerston, the new lessee of the foldcourse, was well aware of this infringement, but 'hath no extents, rentalls, deeds ne other writings' to vindicate his case. In the event it took a lengthy commission of inquiry to establish his rights.[61]

Further examples of tenant abuse of the foldcourse system can be found throughout East Anglia in the sixteenth century, and could be interpreted as aggressive and gratuitous attacks on seigneurial rights.[62] Yet in the light of evidence presented here, such actions could be construed more as frustrated outbursts at the long-term erosion of *tenant* and communal rights. Frustration of this kind almost certainly contributed to the smouldering discontent behind Kett's Rebellion in 1549, and most observers acknowledge that the revolt drew support from the sheep-corn regions of East Anglia.[63] Was Breckland involved in the events of 1549? Fletcher believes not, on the basis that there were no hundredal representatives from Breckland among the rebel signatures at Mousehold Heath.[64] Yet this evidence may be misleading, for there is much to imply that Breckland inhabitants did participate: the rebellion started at Wilby on Breckland's Norfolk edge, the huge Castle Rising camp established a bridgehead in Breckland (at Thetford) before moving to Norwich, and the agitator John Chandeler claimed that the rebellion had the support of 7000 men from Bury St Edmunds and north-west Suffolk.[65] Yet whatever the contribution of Breckland to the events of 1549, and whatever the strength of popular feeling about the abuses of common rights, the average farmer could ultimately do little to prevent the agrarian changes around him: any obstructive activity amounted to little more than teething trouble in the evolution of the foldcourse system.

III

Taking East Anglia as a whole, enclosure of common pastures generated far more friction between lords and tenants than did the piecemeal enclosure of arable land. This is an important point, and the reason is simply that peasant farmers were themselves behind much of the early enclosure of arable land in central districts of East Anglia. More research is necessary before we can establish exactly how far this movement had developed in our period, but Map 1 indicates the traditional area of 'enclosed' villages at the end of the sixteenth century. Yet it would be wrong to assume that *all* of these village lands had become enclosed, or that there was no enclosure in the predominantly

[59] WSROB E. 7/14/403.
[60] D MacCulloch, 'Kett's Rebellion in Context', *Past & Pres*, 84, 1979, p 52.
[61] IESRO HD 1538/212.
[62] Postgate, 'Field Systems', p 320.
[63] MacCulloch, 'Kett's Rebellion', pp 53–4; J Cornwall, 'Kett's Rebellion in Context', *Past & Pres*, 93, 1981, p 161. See also MacCulloch, *Suffolk and the Tudors*, pp 289–314.
[64] Fletcher, *Tudor Rebellions*, p 75.
[65] J Cayton, *Robert Kett and the Norfolk Rising*, 1912, p 49; MacCulloch, 'Kett's Rebellion', p 53; Cornwall, *Revolt of the peasantry*, pp 206–7.

'open' villages.[66] There had been a few hedged enclosures in Breckland since at least the thirteenth century, as, for instance, in Fornham where fourteen acres of demesne land lay in *Nethercroft*.[67] Furthermore, there were some attempts to enclose open fields in Breckland, for at Elveden in the early sixteenth century there were 'three newe closes bene nowe severally inclosed'.[68] In the main though, the cumulative importance of enclosures on the coarse sands of central Breckland was slight: only in the villages on its periphery, where soil quality was higher, did the movement make any real impact. For instance, on the edge of Norfolk Breckland at Feltwell 18 per cent of demesne land lay enclosed by the late sixteenth century.[69] In fifteenth-century Mildenhall there were some attempts at piecemeal enclosure by peasants, although at Great Barton this movement was not evident until the next century. Hardly any documentary evidence of enclosure exists at Barton until 1518, when it was recorded that the vicar had 'newly enclosed one piece of land with hedges', which heralded a spate of enclosure over a small area of Westwall field.[70]

Documentary evidence for enclosure is more plentiful from villages on the heavier soils, but statements about its exact chronology must await detailed research. At the moment, all that can be stated with confidence is that references to enclosure appear more frequently after the late fourteenth century; that the movement was essentially piecemeal; and that by *c*1600 much of high Suffolk was enclosed. Within these general parameters, the rate of change varied, and was certainly slowest in villages closest to Breckland. Ixworth parish straddles both loam and coarse sand, and by *c*1600 contained a roughly equal mixture of open and enclosed fields. In 1627, 64 per cent of the demesne arable lay 'open in ye field', and yet 'the remainder . . . are contained in eight great pieces, composed of many small pieces formerly, now lying together'. Piecemeal enclosures continued here throughout the seventeenth century, with the final touches applied by parliamentary enclosure in 1807.[71]

To the south and east of Ixworth, the wave of enclosure had engulfed much larger areas of open field by *c*1600. A survey of Ickworth in 1665 reveals a patchwork of hedged enclosures, and the remnants of only a small area of open field: yet the village's medieval field-system is evoked by references to 'Ickworth Little field' and 'Ickworth Great Common field'.[72] Walsham-le-Willows was patently an area of extensive open fields in the fourteenth century, but by 1577 around three-quarters of the village had been enclosed and laid down to grass. A few small parcels of land had been enclosed at a relatively early date, for in 1368 one rood of enclosed villein land was described in a land transfer. However, the main surge of activity occurred in the late fifteenth century, when there were numerous presentments for digging ditches and raising hedges.[73] At Norton there was considerable activity at an earlier date, especially in the 1430s and 1440s. The court either presented tenants explicitly for creating enclosures ('*x fecit unum inclausum*'), or for not allowing other tenants access to their land during the shack period (1 August – 2 February).[74]

[66] See above, n 6 and 14.
[67] British Library, Add MS 34689, f 6.
[68] WSROB J515 f 45.
[69] Postgate, 'Historical Geography', p 115.
[70] Mildenhall, WSROB E.18/451/4; Barton Magna, WSROB E. 18/151/1, courts held December 1518 and July 1524.
[71] WSROB 2753/16/39 f 53; Postgate, 'Field Systems', p 287; C Paine, 'Ixworth, west Suffolk: a Study of a Small Market Town in the Seventeenth Century', duplicated, WSROB, 1972, ch 5.
[72] O Rackham, *The History of the Countryside*, 1986, p 129.
[73] K M Dodd, (ed), *The Field Book of Walsham-le-Willows*, Woodbridge, 1974, p 43; WSROB HA504/1/7 m 8; D Dymond, 'The Parish of Walsham-le-Willows: two Elizabethan Surveys and their Medieval Background', *Proceedings of the Suffolk Institute of Archaeology and History*, 33, 1974, pp 204–8.
[74] WSROB 553/1–4. References to 'shack' regulations are the best indication that some form of communal agriculture was practised in Norton at some stage. I am indebted to David Dymond for allowing me access to his transcripts of the Norton (Littlehaugh) court rolls.

Whilst it is obvious that the enclosure movement advanced further in some villages than in others, and that its exact timing varied from village to village, the reason for these differences is less obvious. An answer to this might also provide a key to understanding why the 'common ancestor' of open fields eventually gave rise to two entirely different field-systems by *c* 1600. Soil quality and landholding structure were probably important factors, as was the nature of local lordship: enclosers in one village might have met with greater seigneurial resistance to their activities than those in another. All of these elements require further investigation, but it would be interesting to speculate on one other possible explanation: the diverse character of the medieval foldcourse system.

We have established that during the fifteenth and sixteenth centuries, a more rigid and clearly defined foldcourse system evolved in Breckland. What is less apparent, and what has received little attention from historians, is that the contemporary enclosure movement in the wood-pasture region actually extinguished an earlier, informal foldcourse system from the loams of high Suffolk. In the Middle Ages foldcourses had operated over the open fields of a number of villages situated well inside the wood-pasture region delimited in Map 1. Domesday Book records foldsoke in Pakenham and Stanton, and a peasant fold was still nominally employed in Stanton in 1424.[75] Sokemen living at Hunston in the 1180s were entitled to erect a fold for a small fine, there were possibly two folds in Hepworth in the 1280s, and a fold-right was attached to a peasant tenement in Rickinghall.[76] There were also folds in medieval Norton, Redgrave and Walsham.[77] It is clear, therefore, that the evolution of a more formal foldcourse system in some villages was paralleled by its extinction in others.

To what extent can this phenomenon be explained by local differences in the medieval foldcourse system? Was the system which had operated in, say, fourteenth-century Norton and Walsham significantly different from that operating in Breckland, and does this difference help to explain its subsequent disappearance? There is little explicit evidence available, but from information recorded in court rolls it appears that the system of folding employed on Walsham's open fields was less rigid than that operating in central Breckland at the same time. In medieval Walsham, peasants had access to both temporary and permanent folds, although the latter were less common than in many Breckland villages. By the 1330s only two (small) permanent peasant folds remained, since three others had been systematically purchased by Ixworth Priory.[78] However, permanent folds were less important to Walsham's peasantry than the right to erect temporary folds, a right which was frequently exploited in the 1330s and 1340s when demand for manure was high. The exact number of folds varied each year, although in 1335 there were as many as 960 sheep in nine temporary folds, charged at *6d* per score. Most of these sheep belonged either to the fold owners themselves, or to freemen.[79] It is significant

[75] *Little Domesday Book*, ff 361b and 364a; WSROB 574/60.

[76] R H C Davis, ed, *The Kalendar of Abbot Samson of Bury St Edmunds and Related Documents*, Camden Society, 3rd ser, 84, 1954, pp 46 and 125; W Corbett and T Methwold, 'The Rise and Devolution of Manors in Hepworth, Suffolk', *Proc Suff Inst Arch*, 10, 1900, pp 37 and 41.

[77] For Norton and Walsham, see below, n 79 and 87; Redgrave, BL Add MS 31970 f 77.

[78] WSROB HA 504/1/3 mm 20 and 23; 504/1/4 m 10. Presumably the Priory was seeking to expand its sheep farming activities in the early fourteenth century. See also above, n 73. I am grateful to Ray and Jean Lock for allowing me access to their transcripts of the Walsham courts.

[79] WSROB 504/1/3, mm 19, 20, 23, 24, 28; HA 504/1/4, mm 10, 13, 15, 16, 21, 22, 24–31, 34. The startling increase in Walsham's sheep population in the 1330s is difficult to explain precisely. There is evidence of increased flooding in fen pastures around this time, which may have encouraged the transfer of sheep to higher, drier grounds; see M Bailey, '*Per Impetum Maris:* Natural Disaster and Economic Decline in Eastern England, 1275–1348', in B M S Campbell, ed, *Before the Black Death: Essays in the Crisis of the Early Fourteenth Century*, Manchester, forthcoming.

that after the Black Death very few temporary folds were granted by the lord.

These temporary folds appear to have been the peasantry's only source of sheep manure. In Walsham, as in Breckland, customary tenants who did not possess their own fold were required to place their sheep in the cullet fold each night.[80] However, the demesne and cullet flocks were folded strictly on demesne land, and the lord was a jealous guardian of this monopoly. This is a significant variation from arrangements in central Breckland, where demesne and cullet flocks were folded on all land, irrespective of its ownership.[81] The confinement of manorial flocks to the demesne is clear from a number of Walsham court rulings after the Black Death. For instance, in 1388 two peasants persuaded a shepherd to remove their sheep from the cullet flock during the summer. When this was discovered by the authorities, the lord attempted to sue them for the loss of eight acres of manure on the demesne, valued at two shillings per acre. Similarly, in 1383, the manorial shepherd was amerced for illegally using the lord's fold to manure three roods of peasant land.[82]

Sheep were essential to maintaining soil fertility in central Breckland, and as a consequence ranged over much of the open fields there. In contrast, sheep in Walsham were folded primarily on the demesne, and on the land of the few peasants who were prepared to pay for the right. In high Suffolk, where soil quality was higher and the area of permanent pasture more restricted, sheep featured less prominently in the local economy than in Breckland. In the Subsidy Returns of 1283, for example, there were under four recorded sheep per taxpayer in Walsham, as opposed to at least twenty in most Breckland villages.[83] As a consequence, communal cropping arrangements, which in Breckland were designed to create compact areas of fallow arable for sheep, were much less formal in Walsham. Walsham possessed a loosely controlled commonfield system, which in many respects was similar to that operating in eastern Norfolk: shack regulations applied, but no communal rotations are discernible from the records.[84] Where Walsham *differs* from eastern Norfolk is in the number of permanent and temporary peasant folds operating on the open fields. Their existence *must* have necessitated some informal cropping agreements over certain areas of the fields, although – being a predominantly peasant arrangement – the manorial documents remain silent on the matter.

Whilst Walsham's rather informal foldcourse system was partly due to the relative unimportance of sheep in the village, it also owed something to the village's complex manorial structure, and the tendency for manorial jurisdiction to transcend parish boundaries regularly: both of which undermined attempts at strict communal agriculture.[85] The greater emphasis on individualism in Walsham's agricultural arrangements, and the lack of any real seigneurial interest in large-scale sheep farming, militated against the development of more formal foldcourse arrangements in the fifteenth and sixteenth centuries. Given that Walsham's soils were inherently suited to good grassland and mixed arable farming, then enclosure was much the more likely development.

A similar picture emerges from Norton, although there the restrictions on peasant

[80] WSROB HA 504/1/3 m 23; 504/1/7 m 15; 504/1/8 m 10.
[81] Bailey, *Marginal Economy?*, pp 81–4.
[82] WSROB HA 504/1/9 m 1; HA 504/1/8 m 8.
[83] E Powell, *A Suffolk Hundred in the Year 1283*, Cambridge, 1910, pp xxx–xxxi.
[84] Campbell, 'Regional Uniqueness', pp 26–7.
[85] In eastern Norfolk, an area of very limited communal farming practices, medieval landholdings were small and the manorial structure was highly fragmented. Where lordship was more prominent, for instance in north-west Norfolk, communal farming practices were more evident, B M S Campbell, 'The Complexity of Manorial Structure in Medieval Norfolk: a Case Study', *Norfolk Archaeology* 39, 1986, pp 225–61. This general correlation applies to our study area: the greater complexity of manorial structure on the loams of high Suffolk, where villages lay closer together, must have undermined attempts at communal agriculture compared with villages in central Breckland. See Bailey, *Marginal Economy?*, pp 67 and 83–5.

sheep farming were apparent even earlier. The 1380s and 1390s were decades of widespread foldcourse abuse in north-west Suffolk, but there is no evidence of any illegally erected folds in Norton during this period: there was, on the other hand, some piecemeal enclosure, and – significantly – widespread damage to corn by cows.[86] The decline of sheep farming in Norton, and the disappearance of its foldcourse system, is confirmed by some fifteenth-century evidence. A rental of 1451–2 recorded that three tenants held foldcourses in Norton. In fact, the rental was merely recording a theoretical right to erect folds, because an account of 1424 had noted that all of these foldcourses were now defunct, presumably due to the spread of enclosures.[87]

IV

This paper has touched upon a whole range of important social and agrarian developments, but its main aim has been to broach difficult aspects of the foldcourse system, a complex and often confusing subject. As a result, it might have raised more questions than it has answered, but hopefully some useful points have emerged. Historians have long been aware that increased regional specialization in the fifteenth and sixteenth centuries sharpened the distinction between the sheep-corn and wood-pasture areas of East Anglia. By taking an area of north-west Suffolk, this article has tried to describe the dual changes in agrarian organization which made this development possible; the evolution of a more rigid and clearly defined foldcourse system on the sandy soils of Breckland, and the spread of piecemeal enclosures on the heavier arable land of 'high' Suffolk. By 1600, a transitional zone between open and enclosed villages had emerged, though its boundary was less distinct than that implied in Map 1.[88]

Most studies of foldcourses have concentrated on the system in its mature form, and, indeed, Allison's model was constructed from documentary evidence dating mainly from the period 1550–1650. The aim of this article has been to explain, for Breckland at least, how and why this mature system evolved from a more flexible and informal predecessor. It is suggested that the complex manorial structure of thirteenth-century villages, the large number of fragmented smallholdings, and the domination of sheep farming by the peasantry, could only have been accommodated within relatively informal cropping and pasturing arrangements. However, the progressive amalgamation and engrossment of holdings, and the growth of seigneurial sheep farming at the expense of the peasantry after the late fourteenth century, provided a powerful stimulus for change. The peasantry's exclusion from large-scale sheep farming, and the emergence of a new class of aggressive flockmasters, were central to the breakdown of the medieval foldcourse. In its place emerged a more standardized, landlord-dominated system, but a system capable of producing both more wool and more grain than had previously been possible.

We should resist attempts to describe the foldcourse system as if it operated in some standardized form throughout East Anglia. Local nuances and peculiarities were prominent in the Middle Ages, although as the system evolved and matured, so they became less pronounced.[89] Furthermore, the

[86] WSROB 553/57.
[87] WSROB HD 530; 553/26 and 28.
[88] Overton, 'Agricultural Regions', p 23.
[89] Simpson's article on the foldcourse was designed to draw attention to evidence from some villages which did not correspond entirely with Allison's classic model, Simpson, 'Some Queries', pp 87–90, and above, n 11. This article argues that such discrepancies were the norm, and that their existence in no way invalidates the basic features of Allison's model. In general, as local foldcourse systems evolved, so the differences between them became less pronounced. What Simpson's work emphasizes is that local foldcourse systems evolved at different paces, depending on various local factors, and that extant documentary evidence can only 'photograph' these systems at varying levels of maturity.

evidence presented here, emphasizing the foldcourse's evolutionary nature, provides a context in which many of the sixteenth-century disputes over foldcourses can be understood. The dominant features of sixteenth-century agriculture in the sheep-corn region are vividly and accurately described by Allison and Simpson: the expansion of seigneurial foldcourses, the extinction of shack, and the attenuation of other communal rights. The tendency has been to emphasize these as sources of social friction and rural depopulation, but this article has tried to stress the other side of the coin.[90] Such events should not be viewed simply as the inevitable social and economic by-products of a peculiar agrarian system, for at the same time they were shaping and creating the very system that Allison describes. The frequent litigation over foldcourses in the sixteenth century reflects a system in rapid transition.

To describe the evolution of the foldcourse, and to document the spread of enclosures in the fifteenth and sixteenth centuries, is a relatively simple task. It is much more difficult to establish exactly why, from the common ancestor of open fields, some East Anglian villages developed the rigid foldcourse system whilst their neighbours became enclosed. This article has considered the differences between medieval foldcourse systems, and speculated as to their influence upon subsequent developments. In eastern Norfolk, where fold rights existed in the Middle Ages but not foldcourses, the influence of lordship on farming arrangements waned dramatically from the fifteenth century. Fold rights in 'high Suffolk' villages, such as Walsham and Norton, were more extensive than in eastern Norfolk, although lordship still tended to be rather fragmented and the area was inherently suited to mixed husbandry: hence in the fifteenth century, landlords were more tolerant of enclosure and less committed to a foldcourse system. Consequently, we may conclude that the existence of foldcourses in the Middle Ages was not in itself sufficient to ensure their survival and evolution into the early seventeenth century. It is evident, therefore, that lordship could have a significant local influence on field-systems, an influence which did not necessarily wane with the decline of 'feudal' lordship.

This study of west Suffolk's field-systems may also prove to have wider implications. It has been argued by some economic historians of the early modern period that the greatest advances in grain yields and agrarian productivity were made during the eighteenth century, advances which were closely related to the enclosure movement.[91] However, recent research has suggested that substantial gains in productivity are discernible from the seventeenth century, and – by extension – that considerable technological advance was attainable within commonfield farming systems.[92] If this revision is correct, then two speculations which run contrary to popular opinion are justified. First, that enclosure was not an essential prerequisite for agrarian progress and secondly, by extrapolating backwards, that medieval commonfield systems were capable of sustaining significant rises in agrarian productivity.

The evidence from west Suffolk provides a context for any speculation. It shows that the decision-taking environment within commonfield systems could change significantly between the thirteenth and the seventeenth centuries, and with it the capacity for increasing productivity. The rather informal and flexible foldcourse system which operated in medieval west

[90] Allison, 'Lost villages', p 135; 'Sheep Corn Husbandry', p 25.

[91] For instance, M Turner, 'Agricultural Productivity in England in the Eighteenth Century: Evidence from Crop Yields', *Econ Hist Rev*, 2nd ser, xxxv, 1982, pp 489–510; N F R Crafts, *British Economic Growth during the Industrial Revolution*, Oxford, 1985, p 44.

[92] R C Allen, 'The Efficiency and Distributional Consequences of Eighteenth-Century Enclosure', *Economic Journal*, 92 1982, pp 937–53; R C Allen, 'Inferring Yields from Probate Inventories', *Jnl Econ Hist*, 48, 1988, pp 117–23.

Suffolk, the small and fragmented nature of peasant holdings, and the large number of participants in this system, all presented immutable, institutional, barriers to progress. Thereafter, changes in both landholding structure and communal regulations created a rather different decision-making environment in the seventeenth century, changes which presaged an increase in agrarian output. The implication of these findings is clear: the fifteenth and early sixteenth centuries represent a crucial period in the evolution of commonfield systems in East Anglia, and perhaps elsewhere. Historians may overlook this period at their peril.

Notes on Contributors

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MALCOLM THICK is a Tax Inspector. A graduate of Queen's University, Belfast, he did some years of postgraduate research at Oxford and qualified as a teacher in 1974. He has contributed the chapter on 'Market Gardening' to volume V of the *Agrarian History of England and Wales*. An article on the role of root crops as food for London's poor in the period 1550–1650 will be published in May 1990 and a paper read to the 1989 Oxford Symposium on Food and Cookery will appear soon. At the moment he is engaged on a detailed study of the market gardeners at the Neat Houses in Westminster in the seventeenth and eighteenth centuries.

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Garden seeds in England before the late eighteenth century: I. Seed growing

By MALCOLM THICK

Abstract

The innovation and diffusion of commercial garden seed production in England forms the core of this paper, the first of two on garden seeds. Following some remarks on seed production in the three centuries before 1600 the nature, process and adoption of the innovation in agriculture that seed production represented is examined. It is concluded that Dutch immigrants in the sixteenth century and their descendants played a vital role in the initial introduction and subsequent spread of garden seed growing in England. The long continuity of production in some areas was determined by local soils and climates, as well as favourable social and institutional circumstances. Contemporary estimates of prices and costs show that garden seed growing was sometimes highly profitable, although uncertainty of yield and foreign competition could bring about losses. Using evidence from probate inventories, the way in which seed production was assimilated into farming at Sandwich is reviewed, and the paper also covers garden seed imports in the period.

In *The Agrarian History of England and Wales*, V, Joan Thirsk has shown that, between 1640 and 1750, the production of many new crops and livestock flourished while traditional agriculture was depressed, Garden seed growing was one aspect of the 'Variety, diversity, and unique specialization', which were characteristics of the period. The innovations in crops and livestock each made different demands on labour, land, capital and enterprise and it was only where their particular requirements were well matched to local conditions, and the requisite skills were known or could be acquired, that the innovations could take hold. Peculiar elements which shaped the development of garden seed production and marketing include the important role of foreigners in the process of innovation, technical difficulties and uncertainties of production balanced by the possibility of high profits, competition from imports, dependence on a retail market subject to fashion, and the emergence of seed growing from another innovation – market gardening.[1]

This study overlaps the agricultural depression between 1640 and 1750, dealing mainly with the period 1600 to the late eighteenth century. It is divided into two parts: the first, below, concentrates on garden seed growing, beginning with a brief survey of production and trade before 1600. The nature and course of the innovation and diffusion of seed production in the seventeenth and eighteenth centuries will be considered, and the regions where seeds were produced examined. The paper will also cover techniques of production; how seed fitted into existing agriculture; costs, profits and risks to the individual grower; and competition from imported seeds. The discussion will concentrate on vegetable seeds: these formed the bulk of English output and little information on the commercial production of other garden seeds has so far come to light. The second paper will cover the trade in garden seeds, concentrating on London retail seedsmen. The topic will be examined against the background of major changes in retailing in the late seventeenth and eighteenth centuries.

A trade in garden seeds of sorts existed in the three centuries before 1600. Most

[1] Joan Thirsk, (ed), *The Agrarian History of England and Wales*, V, 1985, chapter 19, and p 587.

seeds were purchased at fairs and markets, although in the sixteenth century London shopkeepers began to stock them. Seeds were bought by gardeners employed to tend the monastic and royal gardens created for herbs, flowers, fruit, vegetables and recreation. The gardeners of the richer inhabitants of London, many of whom produced surplus produce for sale, or leased the gardens from their owners, undertaking to provide a pleasant garden while at the same time making a living from selling the produce, also needed seeds, as did many humble folk in town and country who kept gardens to grow a few vegetables for themselves. The early trade in seeds was limited by transport difficulties, the narrow range of plants in cultivation and the poverty of most gardeners. The seeds of leeks, onions, and coleworts, major elements in the diet of the people, were most commonly bought and sold.[2]

Two merchants who met at Huntingdon in 1296 formed a partnership to supply leek seed to Scotland by packhorse. Several journeys were made before the partnership split up. We must suppose others traded in seeds on a similar scale. Merchants purchased their seeds from home or abroad, although evidence of English producers is thin. Some seed did come from the surpluses of monastery gardens: Brother John, gardener at Beaulieu Abbey, in 1269 had leek seed worth 20*d* and onion seed worth 22*d* for sale. Onion seed by the hundredweight was shipped through east coast ports from the Low Countries in the early sixteenth century.[3]

Royal gardens, monasteries and colleges purchased onion and leek seeds in large quantities: the Rotherhithe Palace gardener in 1354 bought 12lb of leek and 12lb of onion seed; in 1341 Queen's College gardener in Oxford paid 4*s* 11*d* for leek, onion, and garlic seed; the monastery at Sion bought 9lb of onion seed in 1490. Other vegetable seeds were obtainable: the Rotherhithe Palace gardener bought 3 gallon of 'vegetable seed' for 7*s* in 1354 and the gardener at the Abbot of Westminster's manor of La Neyte bought lettuce, savory, borage, chervil, and violet seeds in 1327.[4]

Most gardeners, however, probably still grew their own seeds, either from poverty or the lack of a reliable supplier. John the Gardener in his fourteenth-century treatise on gardening suggested that onions standing for seed should be propped up with ash forks. They would be ripe by Lammas and the seed was to be harvested and dried on a cloth. Thomas Tusser in 1573 still assumed that, in looking after the kitchen garden:

> Good huswifes in sommer will save their own seedes, Against the next yeere, as occasion needes.

Significantly, in view of the absence of a comprehensive seed trade, he continued,

> One seede for another, to make an exchange,
> With fellowlie neighbourhood seemeth not strange.[5]

I

In discussing the nature of the innovation in seed growing and its diffusion, paucity of data is a problem. Seed growing was an occupation of ordinary men and women, copied from each other and not from gentry pioneers: as such, few records of individual endeavour remain. Unlike another intensive crop, tobacco, it did not arouse political controversy and generate official and legal records. Mark Overton has described the problem thus: 'the limitations of the historical record inevitably impose an element of

[2] J Harvey, *Mediaeval Gardens*, 1981; Teresa McLean, *Medieval English Gardens*, 1981*a*

[3] Harvey, *op cit*, pp 72, 79; McLean, *op cit*, p 27, chapter 7; J E T Rogers, *A History of Agriculture and Prices in England from 1259 to 1793*, Oxford, 1866–1902, I, p 223, II, p 594, III, pp 206, 555, 559, 565, IV, pp 275, 277; Dr H J Smit, *Brennen tot de Gerschiedenis van den hande met England Schotland, en Ierland*, 86, The Hague, 1942, pp 385, 523, 694.

[4] McLean, *op cit*, pp 81, 107–8, 116; Rogers, *op cit*, I, p 223, III, pp 206, 559, 565.

[5] McLean, *op cit*, p 205; Thomas Tusser, *Five hundred points of good husbandry*, Oxford, 1984, p 121.

pragmatism on any analysis of innovation in early modern England. While theory may help in prompting questions it is impossible for some of the most important to be answered'. In this study the data are too scattered and incomplete for a formal enquiry into the process of innovation and diffusion using the methods of geographers, sociologists, or economists to be worthwhile. Some attempt will, however, be made to answer the questions posed by the theories of innovation: the work of others who have studied agricultural innovations in the early modern period has shown what questions can be answered, what factors are likely to be of importance, and how far theory can be applied.[6]

The innovation with which much of this paper is concerned was the regular production of garden seeds as a cash crop by farmers and gardeners, using techniques brought from the Low Countries. Most producers were concentrated in a few areas particularly favourable to growing, which, in consequence, gained a reputation for garden seeds. As the introduction has explained, commercial seed growing was not new to England in the seventeenth century. This, however, does not mean that the expansion of production, concentration of output in a few areas, and regular growing of garden seeds by market gardeners was not an innovation for, 'an innovation [may] be intrinsically new or it [may] only be new to the setting in which we find it'. Similarly, an innovation may involve merely producing the same product in a different way. Thus the adoption of garden seed growing in the market garden areas discussed in some detail below was an innovation.[7]

Most garden seed growing was undertaken by market gardeners. It was a development from market gardening, itself an innovation: commercial gardeners adapted their production in response to a changing economic environment. Protestant refugees from the Low Countries were major innovators in market gardening, and were also responsible for innovations in English garden seed production. The Low Countries were growing garden seeds for export to England in the sixteenth century and the techniques for growing seeds were known to the Dutch immigrants. Arriving in England from the middle of the sixteenth century, they established communities, mostly in towns in southern and eastern England. Many were textile workers but vegetable gardeners and farmers also came, introducing the crops and intensive techniques of their native lands.[8]

Immigrant gardeners made a significant contribution to food production at Norwich, Sandwich, and Colchester before the end of the sixteenth century. At Norwich in 1575 the Strangers' production of vegetables was 'grete succor and sustenaunce for the pore'. The vicar of St Clements, Sandwich, took tithe of Dutchmen's gardens from 1570. Some Strangers moved from Sandwich to Colchester; by 1584 over 1000 Dutch people lived there and gardeners amongst them produced root vegetables for sale.[9]

The strong demand for cheap, filling, root vegetables from the ever-increasing population of London caused both the Sandwich and Colchester gardeners to export some of their produce to the capital, notably in the years of grain shortage in the 1590s. The profits to be made in London markets greatly stimulated gardening in the

[6] Joan Thirsk, 'New crops and their Diffusion: Tobacco-growing in Seventeenth-century England' in (eds) C W Chalklin and M A Havinden, *Rural change and urban growth, 1500–1800*, 1974; L A Brown, *Innovation Diffusion, A New Prospective*, 1981, pp 3–11; Mark Overton, 'The diffusion of agricultural innovation in early modern England: turnips and clover in Norfolk and Suffolk, 1580–1740.' *Trans Inst Br Geogr* NS 10, p 206.

[7] L A Brown, *op cit*, p 2.

[8] *ibid*, pp 1–4; A M Lambert, *The making of the Dutch landscape*, 1985, p 181; Smit, *op cit, loc cit; A H E W*, V, 11, pp 505–506.

[9] L F Roker, 'The Flemish and Dutch Community in Colchester in the Sixteenth and Seventeenth Centuries', M A London Univ, 1963, p 84, *State Papers Domestic, Elizabeth*, vol 20, no 49; William Boys, *Collections for an History of Sandwich*, Canterbury, 1792, p 340.

London suburbs in the early seventeenth century, providing stiff competition for Sandwich and Colchester growers because they were further from the capital than the new gardeners of Fulham, Chelsea, or Bermondsey. This competition led the Sandwich and Colchester gardeners to turn to seed production, for which demand was growing and which, by reason of their skills and locations, they could exploit.[10]

II

The chronology of garden seed growing from the seventeenth century in the three main growing areas of England will be outlined before turning to a detailed consideration of the innovation. Specialization in garden seeds appeared first at Sandwich. Low Countries' gardeners who settled there from the middle of the sixteenth century developed local strains of beans, peas, radish, and carrot, some of which were sent to London as seeds along with other garden seeds. Just when the area began to send seeds to London is difficult to determine but production was under way early in the seventeenth century. The Sandwich Carrot was recognized for its excellence in 1610, and in the 1630s large quantities of peas and beans were grown there by the Dutch, possibly for seed. Some Dutchmen's probate inventories of that time list other vegetable seeds, although not in as large quantities as are found later in the century.[11]

Production is well documented after 1650. The Duke of Bedford's gardener purchased 'Sandish pease' in 1658; a leading London seed retailer advertised the seed of the Sandwich radish, pea, and bean in about 1677; and seedsmen's lists in the 1690s and 1720s included varieties of Sandwich seeds. Very little evidence of shipments of vegetable seeds to London from Sandwich by sea has been found in the second half of the seventeenth century (apart from beans and peas, some of which may have been for seed), but by the third decade of the eighteenth century shipments were numerous and large. Between midsummer 1737 and 1738, 20 quarters of seeds were sent to London; 17 were sent in a similar period in 1740/41; and ten quarters in 1741/2. These shipments were described in the Port Books simply as 'seeds'. Canary seed, however, the only other type of seed frequently shipped, was clearly distinguished in the books, so the 'seeds' shipments must have been garden seeds.[12]

By 1749 Sandwich was the place whence, 'the Seedsmen in London are furnished with the greatest Quantities of their Seeds'; by 1792 'The seeds of vegetables, and other useful plants, which grew there in the highest perfection . . . were conveyed at an easy expense by the hoys to London, and from thence disseminated over the Kingdom.' In the 1790s seeds were the fourth most important export from Sandwich after corn, grain, and flour. In 1805 Sandwich grew radish and spinach seed and kidney beans for London seedsmen. At that time Sandwich seeds and vegetables supplied Canterbury and Dover markets but the high price of corn had caused 'only some part of the grounds formerly applied to the use of gardening [to] remain so at present'. J C Loudon mentions Sandwich as a seed growing area in the 1820s although he dwells more on Thanet production.[13]

No evidence of garden seed growing before the Civil War in the Colchester area

[10] PRO, E190 646/9, E190 594/9; Corporation of London, City Reportories, 33, f 74, recto, Samuel Hartlib, *His legacie*, 1651, pp 8–9. Thomas Fuller, *Worthies of England*, 1662, p 77.

[11] G Scott-Thomson, *Life in a noble household, 1641–1700*, 1937, p 24. William Folkingham, *Feudigraphia*, 1610, p 42, Kent AO, PRC 10/71, PRC 10/72, U269, E.2.

[12] G Scott-Thomson, *op cit*, p 241, J Harvey, *Early gardening catalogues*, 1972, pp 66–74, Kent AO, U269, E21. Stephen Switzer, *Country gentleman's companion*, 1732, pp 54, 58, PRO, E190/670/8, E190/713/19, E190/713/12, E190/717/8, E190/718/1, E190/719/1.

[13] Thomas Read, *A new description of Gloucestershire, Hampshire, the Isle of Wight, etc*, 1749, p 411. Boys, *op cit*, 1792, pp 742–3, 788. John Boys, *General View of the Agriculture of the County of Kent*, 1805, pp 105, 111. E Hasted, *Historical and Topographical Survey of the County of Kent*, Canterbury, 1800, vol X, p 168. J C Loudon, *An Encyclopaedia of Gardening*, 1824, p 1069.

has been found, despite garden vegetable production by the Dutch there in the sixteenth century. Annual totals of vegetable seeds shipped from Colchester (usually to London) from the 1660s indicate a sizeable trade and well established production:

1664: 43 cwt of carrot seed and 5¼ cwt of garden seeds
1676: 8 cwt of carrot seed, 4½ cwt of turnip seed and 121 cwt of garden seeds,
1700: 8 cwt of carrot seed.[14]

In the market gardening area between Chelmsford and Colchester, centred on Kelvedon, seed-growing grew substantially in the eighteenth century and continued to expand in the nineteenth century. In 1942 the area was still a major seed growing area with probably the most favourable growing conditions in Britain.[15]

The Vale of Evesham, an area of market gardening from at least the second half of the seventeenth century, sent seeds to other parts of the country through the port of Gloucester in the late seventeenth century. Six bags of seeds from Gloucester reached Bristol in 1679, 10 cwt in 1690 and a ton in January 1700. Several large consignments of seeds to Gloucester from Bristol in 1678 are puzzling; maybe these were seeds needed by the vegetable gardeners of the Vale which either could not be produced locally or were not as economic to produce as those grown for sale. By the third quarter of the eighteenth century the main markets for Evesham seeds were the Midland towns of Stafford, Lichfield, Leicester, and Nottingham. Onion seed was sent regularly to London in the early nineteenth century and carrot seed raised for the London market in the 1820s. Evesham, however ceased to be a major seed-growing area in the nineteenth century.[16]

Some other market gardening areas, upon establishing a reputation for particular vegetables, went on to produce the seed of those vegetables for London seedsmen: eighteenth-century seedsmen sold Windsor peas and beans, Deptford onion seed, Battersea cabbage and asparagus seed, and London leek and radish seed. Likewise, individual gardeners and farmers outside the main producing areas produced garden seed for the market. One such was the Shrewsbury grower Richard Gardiner, who produced garden seeds in the 1590s and was a pioneer of commercial gardening in that town. In the 1660s kitchen gardeners near London produced cabbage seed for sale in the capital and in 1716 John Mortimer found farmers making good profits near London and other large towns growing carrots for seed. In the 1770s some London seedsmen were supplied with vegetable seeds by gentlemen's gardeners as well as by commercial producers.[17]

III

Commercial seed-growing is a complicated business. A prospective seed producer must recognize the exacting soil and climatic conditions favourable to seed-growing in general together with any special requirements of particular plant species and have a practical knowledge of plant breeding in order to prevent cross-fertilization. He must know and judge when to sow, transplant and harvest the crop, how to overwinter

[14] *AHEW*, V, 11, pp 505–506. K H Burley, 'The Economic development of Essex in the later seventeenth and early eighteenth centuries', PhD, U London, 1957, Table XXXI, p 278.

[15] *VCH, Essex*, vol 11, pp 476–80. L S Stamp, *Land Utilisation Survey of Britain*, part 82, Essex, 1942, p 429, 440–1, *AHEW*, V, 11, p 215.

[16] PRO, E190 1 250/4, E190 1 253/14, E190 1 251/15. W Pitt, *General view of the Agriculture of Worcestershire*, 1813, p 135. R W Sidwell, 'A Short History of Commercial Horticulture in the Vale of Evesham', *Vale of Evesham Historical Society Research Paper*, II, 1969, p 45. J C Loudon, *op cit*, p 1075.

[17] Oxon CRO, DIL XXVI/4; Loudon, *Encyclopaedia*, p 1052; D Lysons, *The Environs of London*, IV, 1796, p 576; Switzer, *op cit*, p 21; Richard Gardiner, *Profitable instructions for manuring, sowing, and planting of kitchin gardens*, 1599. n.p.; Richard Weston, *Tracts on Practical Agriculture and Gardening*, London, 1773, p 4; R Sharrock, *The History of the Propagation and Improvement of Vegetables*, Oxford, 1660, p 33; John Mortimer, *Whole Art of Husbandry*, 1716, vol I, p 201.

biennial species, and how to dry and store the seed to prevent deterioration.[18]

A detailed description of vegetable seed growing, particularly valuable because of its early date, is Richard Gardiner's 'Profitable Instructions' of 1599. The book was written by a philanthropic market gardener and textile merchant of Shrewsbury in an effort to encourage kitchen gardening and seed growing. In the passage quoted below Gardiner guides the reader through carrot seed production. Having selected the best carrots from the main crop in September and transplanted them, well spaced, to new beds:

> Then have you nothing to doe with them untill about the last of Aprill, at which time they will bee growne about a yard in height: then you have neede to take care of them, for the winde will easily breake them by the ground: then must you prepare some kinde of packe-threed, or lynen threed to set about them as a girdle, about two foote high from the earth as neede shall require by the growing of the branches: gird some higher then other some. Then shortly after you must have stakes in a readines, and as the Carrets must stand one against the other in the bed: so likewise the stakes must stand one against the other, to everye foure Carrets two stakes. The stakes must bee a yard and a half above the ground, and a sure holde within the earth for danger of winde: then must you prepare packe-threed or other threed to goe from stake to stake all the length of the bed, one course of lynes must be about two foote high, and another course of lynes must bee neere the top of the stakes, so that there must be two courses of lynes on the utter side of the stakes on both sides the bed. Then must you have crosse lynes, . . . as the Carrets branches doe grow they must be somewhat tended to keepe them in good order within the lynes: this being done about the last of August, the Carret seedes will begin to bee ripe, and as they doe change to some browne colour, so to bee cut from time to time, untill the last bee sufficiently ripe about the first of October: Then place the Carret seedes as you doe cut them on a Chamber floore to drie, & when they be drie, beate the seedes out with small staves, or best with the edge of a lath, and cleanse them from the composte or refuse (as you finde best by experience) with ridle and sive.

Gardiner favoured transplanting plants to be saved for seed, a method Sharrock regarded as usual. He realized the value of selection, his carrots being chosen for shape, size, and colour. He was proud of his closed 'cabbage' lettuces, which had been perfected after several years of selection.[19]

The mystery of commercial seed growing could pass easily amongst the Dutch gardeners for they were in a close community, bound by nationality and religion as well as by the hostility of many English neighbours. Sandwich, at the end of a short sea crossing, was an entry point for many of the refugees who then joined other communities or formed new settlements. Gardening, and with it seed production, spread from Sandwich to Colchester by such a migration.[20]

Knowledge of new techniques, gardening and seed-growing included, was quickly gained from the Dutch by English husbandmen and gardeners. The suburban root producers of London learned their business in the early 1600s, probably from Dutch who moved to Surrey from Sandwich and began gardening there. Certainly the Dutch gardeners in Surrey caused great interest at the time. Gardeners were, in any case, in no position to be secretive for many worked in populous suburbs and, at certain times of the year employed men, women, and children as casual labourers.[21]

Regular vegetable seed production for the market was not an activity recommended to gentlemen in books on husbandry until late in the eighteenth century. Richard Gardiner's 'Profitable Instructions' of 1599 was the only English book before 1773 to give detailed instructions on raising seed on a commercial scale. Most books on

[18] R A T George, *Vegetable Seed Production, 1985*, provides a good introduction to the complexity of seed-growing.

[19] Richard Gardiner, *op cit*, 1599; 'Richard Gardiner's "Profitable Instructions 1603", (ed) Dr Calvert', *Trans Shropshire Arch & Nat Hist Soc*, Series II, 4 1892, pp 214–2; Richard Weston, *op cit*, pp 3–13.

[20] L F Roker, 'The Flemish and Dutch Community in Colchester in the Sixteenth and Seventeenth Centuries.' M A London, vol 14, 1963, p 84; W J C Moens, 'The Walloon Church of Norwich: its registers and history,' *Huguenot Society of London*, I, 1887–8, pp 17–18, 27; Boys, *op cit*, p 743.

[21] Samuel Hartlib, *His Legacie*, 1651, pp 8–9; Thomas Fuller, *Worthies of England*, 1662, p 77; *A H E W, V, II, p 519;* J Norden, *op cit*, p 207; Corporation of London, City Reportories, 33, f.74, recto; Folkingham, *op cit*, p 42.

gardening, envisaged gentlemen (or their gardeners) saving their own seed each year and included instructions to that end, without going into the complexity of commercial production. Unlike the spread of clover-growing in Wales, or tobacco in Gloucestershire in the seventeenth century, gentlemen did not experiment with seed growing, or produce seeds for sale, and so played no part in diffusing the innovation in the seventeenth and early eighteenth centuries.[22]

The most important agents of diffusion of commercial seed production were thus Dutch immigrants who brought their knowledge of gardening with them from the Low Countries. They in turn influenced English husbandmen to take up gardening and, in some cases, seed-growing. For the innovation, however, to become an established part of agricultural production soil and climate had to be favourable, as did social and institutional conditions, quite apart from the obvious dictates of demand, production costs, risks and profits.

IV

Favourable soil and weather are crucial to successful seed growing and largely determined where it was adopted in England. Good growing locations have relatively low average rainfall but sufficient to ensure full maturity of plants, together with a relatively dry and warm summer and autumn to facilitate ripening and harvesting and to help to prevent plant diseases. Light winds during the harvest increase the yield by minimizing seed shedding and also help to prevent cross-fertilization by wind-blown pollen. Mild winters preserve biennial crops which have to be overwintered in the soil. In addition to these general considerations, individual vegetables require particular levels of temperature and sunlight to trigger flowering and seed setting.[23]

Soils with a relatively high water-holding capacity but not overwet in winter are best for seeds: a medium loam is ideal. Uniformity of soil promotes a similar quality in seeds. The ground must be suitable for spade cultivation, planting and transplanting, particularly in winter. The soil should be of medium fertility; too rich a soil causes over-tall stems which bend and lodge.[24]

The three major areas of English seed production measure up well to the exacting criteria of soil and weather for successful production. The heart of the Essex seed-growing area is a 'flat, fertile apron of uniform boulder clay which disintegrates . . . into a deep fine medium loam'. Essex is relatively dry, with temperatures moderated by the sea. It is today considered to be the best area of England for seed growing which is why seeds have remained of local importance for so long. The Vale of Evesham has 'liassic clay subsoils . . . lightened by alluvial gravel and sand, ideal for those who worked with the spade', level of surface and well-drained. The micro-climate of this part of Worcestershire is favourable to seed-growing 'its earliness, sunniness, and windlessness have been extolled by many writers'. Kent is also one of the dryest and sunniest counties in England. William Boys summed up the soil and climate of Sandwich thus; 'the land being light, sandy, and fresh, is very good for producing most sorts of seeds, and the Ground being pretty low, the Seeds do not often receive a Blight, as in many other places.'[25]

Successful innovation requires favourable social and institutional conditions; producers must be willing and able to take up a

[22] Richard Weston, *op cit*, p 3–13; Joan Thirsk, 'New crops and their Diffusion', *op cit*; Frank Emery 'The mechanics of innovation: clover in Wales before 1750' *Jnl Hist Geog*, 2, I, 1976, pp 35–48; Richard Gardiner, *op cit*.

[23] George, *op cit*, pp 32–3, 44.

[24] *LUS*, part 82, Essex, 1942, pp 440–1; George, *op cit*.

[25] *LUS*, part 82, Essex, 1942, p 428; *LUS*, Part 68, Worcestershire, 1944, p 432; *A H E W*, V, I, p 167; Read, *op cit* p 411.

new crop and fit it into existing patterns of agriculture. At Colchester and Sandwich neither the Dutch gardeners nor their English imitators appear to have encountered any difficulty in renting land; no doubt their landlords were impressed by the high rents which garden land could command. In any case the Dutch were invited to settle in both towns. Kent, with its high proportion of freeholders and enclosed land, and a weak manorial structure, was a county well placed to adopt new crops with a minimum of institutional restraint.[26]

Many of the Dutch arrived in households of ten or twelve persons and so were already organized in social units suited to small, intensively-worked farms and gardens. As a group linked by nationality and religion they would have been able to establish the close cooperation necessary for successful vegetable seed growing where, because of the dangers of cross-fertilization, it is vital to ensure that neighbouring farms do not grow crops of related species.[27]

Dutch immigrants did not directly promote seed production or gardening in the Vale of Evesham. It has been suggested that the techniques of gardening there may have originated in the monasteries at Evesham and Pershore and that an influx of gentry who created private gardens after the Civil War also stimulated commercial gardening. The area was well fitted in terms of social organization, land tenure, and existing agriculture to adopt new crops. Joan Thirsk and J M Martin have shown how the area took to tobacco growing and market gardening.[28]

The Dean and Chapter of Westminster held a good deal of land in the Vale let out on life-leaseholds which gave good security of tenure to tenants and encouraged subletting. As a result, holdings tended to be small and scattered, tenants had freedom to farm as they wished, and poor gardeners could rent small plots of land. The tenant-right enjoyed by Evesham gardeners in the nineteenth century may have developed from this early security of tenure. Dr Martin found that gardeners in the Vale in the eighteenth century were usually poor; many owned or leased houses and gardens but had little in the way of movable goods. Many gardeners were part-timers, being also labourers, petty tradesmen or craftsmen. The 1861 census showed that gardening was a family trade: many offspring of gardeners remained, as adults, in their households and employed garden labourers were few. The opportunity for self-employment offered by gardening fostered rapid population growth in the area after 1750.[29]

In Pershore and Ripple, both early gardening areas of the Vale, scattered hamlets had access to abundant commons and emphasis on animal husbandry on farms in the area provided a source of dung for the gardeners. In short, the Vale of Evesham contained all the preconditions for the adoption of market gardening by its poorer peasantry, and for gardeners to take advantage of a rising demand for garden seeds.[30]

V

Profits to individual growers are difficult to determine. Accurate figures are not available and contemporary estimates rarely complete. Richard Gardiner published his retail prices for seeds in 1599 but we have no yields for seeds at that time. When mid-twentieth-century average yields are applied to his prices gross returns per acre are as follows: £56 for carrot seed; £186 13*s* 4*d* for cabbage seed; £26 5*s* per acre for turnip seed. Eighteenth-century evidence for yields

[26] *A H E W*, IV, pp 62–3; Boys, *op cit*, p 742.
[27] A W Ashby, 'Seed growing in Essex', *J R A S E*, 1913, pp 150–1; D L Rickwood, *Norwich Accounts for Strangers Customs*, Norfolk Record Society, XXXIX, 1970, pp 81–2; Boys, *op cit*, pp 740–1.
[28] J M Martin, 'The Social and Economic Origins of the Vale of Evesham Market Gardening Industry', *Ag Hist Rev*, vol 33, pt 1, 1985, pp 41–50; Thirsk, 'New crops and their Diffusion'; *A H E W*, V, I, pp 167–8.
[29] Martin, *op cit*, pp 42, 45–6.
[30] Martin, *op cit*, pp 46–7.

shows that they could equal or exceed those of the present century: John Mortimer in 1721 told of a man in Essex who had received £100 for 10 cwt of carrot seed harvested from one acre of old orchard dug up in order to grow seeds, a yield twice the modern average.[31]

Mortimer found farmers near London selling carrot seed to seedsmen for between £5 and £12 per hundredweight: a gross return of from £25 to £60 per acre with modern average yields. The earliest complete estimates of the economics of seed growing are Richard Weston's of 1773. For an acre of lettuce seed he calculates costs and returns as follows:[32]

Digging	£2 1*s* 0*d*
Seed	2*s* 0*d*
Hoeing	£1 2*s* 0*d*
Transplanting	8*s* 0*d*
Rent, tythes, dung, top dressing and cleaning the seed	£4 7*s* 0*d*
Total	£8 0*s* 0*d*
Yield, 113½lb @ 6*s* per pound	£34 1*s* 0*d*
Net profit	£26 1*s* 0*d*

Weston's costs and returns for an acre of onions for seed:

Digging	£2 0*s* 0*d*
Planting	£1 0*s* 2*d*
Bulbs	£9 1*s* 6*d*
Hoeing and earthing	£1 0*s* 0*d*
Stakes, string and cleaning seed	£1 15*s* 0*d*
Rent, tythe and dung	£3 0*s* 0*d*
Total	£17 16*s* 8*d*
Yield, 756 lb @ 1*s* 6*d* per pound,	£56 14*s* 0*d*
Net profit	£38 17*s* 4*d*

As Mortimer and Weston were both writing of seed production with approval, their figures are optimistic. Weston's yield of 6 ¾ cwt per acre for onion seed is very high, double that averaged in England in the 1940s. Weston's figures ignore the overheads of an arable farm or market garden as a whole, such as rent for fallow land or depreciation of draught animals and tools. On the other hand his costs presuppose seed-growing by gentlemen. Outgoings on a family farm or garden were lower as much less wage labour was employed. With all their imperfections, the estimates above do show that it was possible, at times, to make considerable profits from garden seeds. Joan Thirsk has shown that similar sums were possible from tobacco, a crop which, in its need of particular soil and climatic conditions, and large labour input, bears comparison with seed production. Market gardening, of which seed-growing was an extension, was also renowned in the seventeenth and eighteenth century for the high profits per acre which could be achieved by dint of much dung and labour.[33]

In comparison with the returns from seed growing, an average thirty-acre farm in the early seventeenth century is estimated to have made £14 10*s* net profit and a one hundred-acre arable farm in the first half of the eighteenth century might make £35 3*s* 8*d* a year profit on gross receipts of £302 3*s* 8*d*. Clearly both the intensity of seed production and the possible profits were far above the general run of farming, and seed-growing must have been attractive to family farmers and gardeners.[34]

Seed-growing, however, was a risky business. Yields in a growing area could vary greatly from year to year because of weather and incidence of plant disease. Even in the twentieth century average yields of garden seeds are given with caution because of annual variations. Gardeners might fall foul of birds and other pests which could destroy much of the crop. Cross pollination might render the crop useless and fermentation in harvested seeds drying in large heaps could cause sterility. Risks were spread by devoting only a small part of the total acreage of the farm or garden each year

[31] Gardiner, *op cit*; 'The Production of seed of root crops and vegetables', *Imperial Agricultural Bureaux, Joint publication number 5*, Aberystwyth, July 1943, p 18.

[32] Weston, *op cit*, pp 9, 11; Mortimer, *op cit*.

[33] Weston, *op cit*, Mortimer, *op cit*; Thirsk, 'New crops and their Diffusion', pp 84–7; *Imperial Agricultural Bureaux*, *op cit*, p 18; *AHEW*, V, II, p 521.

[34] Weston, *op cit*, *AHEW*, IV, p 653; V, II, pp 88–9.

to seed production. With some vegetables it was possible to grow the crop to maturity before deciding whether to harvest it for sale then or let it flower and run to seed.[35]

Fluctuations in yields made profits uncertain, the more so as prices received by producers could vary independently of yields. Mortimer's estimate of carrot seed prices of between £5 and £12 per cwt is an indication of the range of fluctuations commonly experienced. Weston sometimes sold onion seed to merchants at twice the price he used for his exercise in business economics, and he commented on the general variations in price he experienced. Profits were also unpredictable because many garden seeds will germinate after several years of storage. Thus prices to producers depended not only on the annual harvest and overall demand but also on stocks held by seed merchants. As seeds were easily imported, foreign harvest fluctuations added to price volatility at home.[36]

Some growers were nonetheless drawn to seed-growing by potentially good profits. Others tried seeds as a way of supplementing falling income during the long depression of grain prices. Garden seeds were one of the new crops at this time which enjoyed some success under such conditions.[37]

Large potential profits were a consequence of the demand created by the steady increase in all sorts of gardening in England. The scale and sophistication of formal gardens created for the gentry and aristocracy developed from the intimate, intricate, Tudor gardens to the vast landscaped parks of the eighteenth century, when, for a time, English garden design was considered *à la mode* by all Europe. At the same time more and more households had gardens, so that in the 1660s John Worlidge found 'scarce a cottage in most of the southern parts of England, but hath its proportionate garden, so great a delight do most men take in it'. The great expansion of market gardening for fruit, vegetables and flowers, and of nursery gardening for trees, flower roots and shrubs further contributed to the demand for garden seeds.[38]

Flower seeds, of which little evidence of commercial production has been found, were nevertheless demanded by the creators of pleasure gardens and sold by seedsmen whose lists of wares contained ever more varieties. No doubt many such seeds were still saved by gardeners for their own use or to give away. Some well-to-do Dutch immigrants in the early seventeenth century swapped plants and flower seeds with other gentlemen gardeners. Gentlemen and others who grew and bred flowers for pleasure formed florists' societies in the seventeenth and eighteenth centuries where seeds could be exchanged. Many flower seeds and roots were imported from the Low Countries and elsewhere throughout the period. Some gentlemen's gardeners and nurserymen raised flower seeds for sale, the nurserymen tending to specialize in particular varieties.[39]

VI

Probate inventories of some seventeenth and early eighteenth century Dutch farmers and gardeners at Sandwich have survived: too few to support statistical analysis, these records nevertheless give an impression of the agriculture of the Dutch at Sandwich, including seed growing. The inventories

[35] George, *op cit*, pp 44–5, *Imperial Agricultural Bureaux*, *op cit*; Stephen Switzer, *An account of seeds*, 1731, pp 48–52; A W Ashby, 'Seed growing in Essex', *J R A S E*, 1913, p 150–1, 153; George, *op cit*, p 44; Read, *op cit*, p 411.

[36] Gardiner, *op cit*; Primrose McConnell, *The Agricultural Notebook*, 1953, p 186; R Weston, *op cit*, pp 9, 13; Mortimer, *op cit*.

[37] *A H E W*, V, II, pp 533–589.

[38] Miles Hadfield, *A History of British Gardening*, 1985, chaps 2–5; John Worlidge, *Systema Horti-Culturae*, 1677, p 176; *A H E W*, V, II, pp 506–532.

[39] B Townsend, *The Complete Seedsman*, 1726, pp 38–42; *Evening Post*, no 1962, Feb 20–24, 1722; Ruth Duthie, *Florists' Flowers and Societies*, 1988, pp 13–24; Ruth Duthie, 'Introduction of plants to Britain in the 16th and 17th centuries by strangers and refugees', *Pro the Huguenot Soc*, XXIV, 5, 1987, pp 406, 409–11; Richard Bradley, *A General Treatise of Husbandry and Gardening*, 1726, vol I, p 287–99.

indicate that most of the seed-growers were farmer-gardeners.[40]

Apart from horses, the Dutch farmer-gardeners at Sandwich kept modest numbers of livestock; one or two cows and a few pigs are listed in most inventories. They were primarily arable farmers, with between 20 and 35 acres each under crops. Most space was taken up with conventional field crops of wheat, barley, beans and peas but the rest of their produce was labour intensive and labour efficient, reflecting the nature of the farmers' households. Like the first Dutch settlers in the sixteenth century, they were 'families' of kindred and servants, pools of adult labour available the year-round. Flax was frequently the most valuable single item in an inventory, often found in the form of dressed flax or linseed. It was usually harvested before corn, and dressing added value and used family labour. Canary seed, a speciality of this part of Kent, was another valuable crop. It was harvested after corn, again making good use of available labour. Patches of teasels, spade cultivated and hand weeded, took two years to mature. If they were dried, cut, and mounted on frames for use in cloth finishing by family members yet more labour could be absorbed. Cloth production itself was occasionally combined with gardening.[41]

The most labour intensive crops of all were garden vegetables, sold fresh or grown for seed. They were cultivated with spades, hoes, and other hand tools. Sometimes certain pieces of land were set aside for gardening, otherwise the vegetables formed a part of the arable rotation. These vegetable gardens grew crops throughout the year, inventories taken in January or February list few crops in the fields outside the garden grounds. From the few inventories taken during the spring and summer we can see that garden crops occupied only a small area of total arable: 5 of William Nazer's 24 acres of growing crops in April 1721 were under 'gardenware'.[42]

Appraisers of the inventories sometimes vaguely described the contents of gardens as the 'seed or crop', possibly because the decision to let vegetables stand for seed rather than be harvested for the market could be left until well into the growing season. Only rarely is a list of harvested seeds found, such as that in the inventory of Jacob Stamper, taken in late October 1729. Stamper also had in store beans, peas, and linseed. The presence in some inventories of fine scales, balances and weights, essential for measuring seeds is an oblique sign of seed production.[43]

The intensive arable farming of the Dutch at Sandwich bears many similarities to that of parts of the Netherlands at the same time where commercial gardening was on the increase and canary seed and flax were well established. Sir Richard Weston, in his travels in Brabant and Flanders saw intensive arable production which would have been no mystery to the Dutch at Sandwich.[44]

VII

English garden seed producers throughout the period had to fight with imports for a share of the domestic market for garden seeds. Seeds took up little cargo space and

[40] Canterbury DIO, PRC/10/72/21; PRC/10/72/246; PRC/10/71/211; PRC/10/71/251; PRC/10/67/265; PRC/10/68/142; PRC/10/57/6; PRC/10/5725; PRC/10/60/111; PRC/10/65/202; PRC/11/54/154; PRC/11/57/55; PRC/11/59/248; PRC/11/76/85; PRC/11/49/74; PRC/11/80/142.

[41] Boys, *op cit*, pp 140–1; J C Loudon, *Encyclopaedia of Agriculture*, 1825, pp 846–854, 870–1.

[42] Canterbury DIO, PRC/11/76/85.

[43] Canterbury DIO, PRC/11/49/74, Stamper's listed seeds were:

radish	£1 4s
canary seed	£35
turkey beans	£3 4s
thyme seed	£3 5s
cucumber seed	£2 12s
lettuce seed	£1 7s
other small seeds	£1 7s
hysop seed	£2 8s

[44] Jan de Vries, *The Dutch Economy in the Golden Age, 1500–1700*, 1974, p 154; H Van der Wee, 'The agricultural development of the Low Countries as revealed by the tithe and rent statistics 1250–1800', pp 11–12, in *Productivity of Land and Agricultural Innovation in the Low Countries (1250–1800)*, ed, H Van der Wee and E Van Cauwenberghe, Leuven, 1978; R Weston, *A Discours of Husbandrie Used in Brabant and Flanders*, 1650.

were cheap to import. Almost all English seed merchants in the period traded from London and so could choose seeds shipped round the coast from English growers or those from abroad. William Harrison wrote in the 1570s that during his lifetime people used to 'make their provision yearlie for strange new seeds out of strange countries from whence they have them abundantlie'[45]

Statistics of garden seed imports confirm Harrison's remarks. Onion seed was frequently imported: a hundredweight was landed at Hull in September 1541 and £770 worth passed though the Port of London at customary values in 1565. Between October 1599 and the following September the London port books recorded imports of seeds and drugs valued at £594 15*s* 4*d*. Surviving port books for London between then and 1640 all record annual imports of seeds at values of up to £2180, with average annual values of between £300 and £500. Houghton recorded total imports of 6138 lb of garden seed between 29 October 1682 and 1st February 1683. In 1773 seedsmen were still 'obliged to import large quantities from Flanders'.[46]

The Low Countries were a frequent source of garden seeds. In 1568 the *Cock* of Bruges carried a barrel of 'all manner of seeds' to London and in the same year the *Samson* of Bruges brought 50 lb of garden seeds. A search for strangers in 1546 revealed two Flemings in St Katherine's Ward in London: the father and son had lodged there for three weeks 'tarrying sale of garden seeds and other things'.[47]

Garden seeds came, however, from many countries throughout the period; in 1564 onion seed was imported from the Netherlands, Germany, France, and Spain. In a short introduction to a pamphlet published in 1732 a seedsman mentioned garden seed imports from Italy, Turkey, Egypt, France, Portugal, Holland and Brazil. Contemporary seedsmen's list display the diverse origin of garden seeds. A printed list of the 1670s advertised Strasburgh, Spanish and French onion seed, French leek seed, and among the salads, Spanish radish, Roman, Arabian, and Savoy lettuce, Dutch and Russian cabbage, and French choux, melon, and sorrel. Sometimes, no doubt, these names described types of vegetable rather than the origin of the seeds but in many cases they indicate the country of origin.[48]

Some foreigners established well-organized seed gathering businesses. Wild broccoli seed was gathered each year around Naples for export. Cauliflower seed was re-exported by Italian merchants in the late seventeenth century having come from 'Candia and other Levantine parts'. English residents abroad looked for new varieties of vegetables to recommend both to friends and seedsmen and the Crown and nobility sent gardeners on plant and seed gathering expeditions to foreign parts.[49]

Some seed was imported because it was consistently of better quality than that grown in England. Spanish onion seed and Eastland flax seed were far better than seed saved in England. In the 1720s 'The French Spawn is in great Request amongst Mushroom Raisers' and Cos lettuce seed was 'also called the Brasil, Versailles, etc., on account of some extraordinary good Seed, which has some Years been brought from thence'. A correspondent in The Hague in 1749 told

[45] William Harrison, *The description of England*, (ed) Georges Edelen, New York, 1968, p 264; Brian Dietz, (ed), *The Port and Trade of London: Documents*, London Rec Soc, 1972, pp 63, 78; Harvey, *Early Nurserymen*, p 31; T Donelly, 'Arther Clephane, Edinburgh Merchant and Seedsman', *Ag Hist Rev*, XVIII, 2, 1970, p 154; Switzer, *op cit*, p 21.

[46] BL, Lans.Mss, 8 fol 75; PRO, E190/11/1&3; A M Millard, 'The Import Trade of London, 1600–1640, PhD, Univ London, 1956 vol 3; John Houghton, *A Collection for Improvement of Husbandry and Trade*, (ed) R Bradley, 1727, p 161; Richard Weston, *op cit*, p 5.

[47] Brian Dietz (ed), *Port and Trade of London*, pp 63, 78; Harvey, *Early Nurserymen*, p 31.

[48] PRO, SP, 12/35/37; Switzer, *Country gentleman's companion*, pp 1–24; Harvey, *Early Gardening Catalogues*, pp 66–7.

[49] Switzer, *Country gentleman's companion*, pp 1, 19; Nicholas de Bonnefons, *The French Gardener*, trans J Evelyn, 1658, pp 166–7; East Sussex RO, RF 15/25; Harvey, *Early Nurserymen*, pp 28, 31; B Henrey, *No Ordinary Gardener: Thomas Knowlton, 1691–1781*, 1986, pp 38–9; Hadfield, *History of British Gardening*, pp 79–81.

a Hertfordshire gentleman, 'A lover of gardening here tells me that the best method with the cantaloupes is to get the seeds from Spain every year because using those that grow in a colder climate takes a good deal of goodness out of the fruit.'[50]

The precise long term effects of imports on domestic production can only be surmised. Commercial production of garden seeds in the Low Countries was well established in the early sixteenth century and imports may then have accounted for a large proportion of total supply. They were certainly an important reason for the concentration of seed merchants in London, the main port of entry for foreign seeds. The appearance of growers in Kent and Surrey may, by providing new domestic sources of supply, have eaten into the market hitherto enjoyed by imports.

VIII

Seed-growing was adopted in favourable areas in the seventeenth and early eighteenth centuries without the agents of diffusion common to some of the other 'new crops' of the period. It was not a gentry-led innovation, stimulated by landowners encouragement to their tenants or by the demonstrations and experiments of gentlemen. Neither was it spread by books, pamphlets or correspondence. Instead, the initial innovators were Dutch immigrants. Thereafter the diffusion must have been by word of mouth and personal observation, helped by the receptiveness of the majority of the potential adopters – market gardeners. Gardeners were practical and enquiring people. They ran high cost businesses, subject to changes in taste and eating habits, and so were used to trying new crops and new production techniques. One writer, recognizing the skill of farmer-gardeners near London, advised 'country farmers, to send their sons they design to breed in their own way' to them, 'or at least take some servants that have been thus bred'. Small wonder, then, that seed-growing as a commercial venture was absorbed by the horticultural community.[51]

The major part played by Dutch immigrants in the development of garden seed growing is yet another example of the way in which they brought the agriculture of the Low Countries to England in the period. Immigrants from the Low Countries introduced, or revitalized, commercial gardening in many parts of England from the mid-sixteenth century onwards. They pioneered the bulk production of roots as cheap food for the poor, first around Norwich and other East Anglian towns and then, at the turn of the sixteenth and seventeenth centuries, around London. Outside gardening, the Dutch demonstrated to farmers in East Anglia the potential of roots as animal fodder, and they may, by spreading gardening, have indirectly shown farmers in the seventeenth century the advantages of careful soil preparation.[52]

Once established as a regional speciality, garden seed production had a tenacity greater than most of the new crops tried in the seventeenth century: seed-growing remaining important in Essex and Kent into the present century. The favourable climate and soils in these areas, together with good profits, were no doubt most responsible for this longevity. With a similar combination of ideal conditions and profitability another regional speciality, liquorice, was cultivated for centuries at Pontefract.[53]

The size of net profit per acre from seed-growing was such that, although in most cases forming only a small part of total

[50] Switzer, *Country gentleman's companion*, pp 14, 22; Herts RO, 68819.

[51] *AHEW*, V II, pp 530–2.

[52] Overton, *op cit*, pp 209–10; Paul Glennie, 'Continuity and Change in Hertfordshire Agriculture, 1500–1700, II, Trends in crop yields and their determinants,' *Ag Hist Rev*, 36, 1988, pt II, pp 149–52, 155; *AHEW*, V II, p 505.

[53] W G R Paterson, (ed), *Farm crops*, III, 1925, pp 247–9; *VCH, Essex*, II, pp 476–80; *LUS*, part 82, Essex, 1942, pp 429, 440–1; *AHEW*, V II, pp 493, 523–4.

output, it made a significant contribution to total income. When produced alongside fresh garden crops and other intensive crops such as flax, madder, liquorice, or teasels, seeds contributed to the high incomes from small farms and gardens marvelled at by some seventeenth-century writers and borne out by the prosperity of the Dutch growers at Sandwich.[54]

High profits were subject to a consumer demand not, in the main, dominated by necessity but by taste and fashion: many retail customers were gentlemen or others lower on the social scale who nonetheless had money to spend on non-essential goods. In the increasingly hectic retail markets of the late seventeenth and eighteenth centuries, many consumer goods and luxury foods competed with garden seeds both for the spare pounds of the gentry, and the few shillings a year available to the more modest inhabitants of London and provincial towns. The wholesale and retail trade in garden seeds will be discussed in the second part of this essay.

[54] *AHEW*, V II, pp 512, 521, 543–4; In eighteen gardeners' inventories from Sandwich, the total value of movable goods in ten was over £100, and in four over £200.

Notes and Comments

ANNUAL GENERAL MEETING, 1989

The 38th Annual General Meeting of the Society will be held at 9 am on Tuesday 3 April 1989 at Trinity and All Saints' College, Horsforth, Leeds. Nomination forms for officers and members of the Executive Committee should be returned to the Secretary no later than Wednesday 28 March 1990.

CONFERENCE ON THE HISTORY OF AGRICULTURAL SCIENCE AND EDUCATION

A one-day Conference on the above theme jointly organized by the British Society for the History of Science and the Institute of Biology History Group will be held at Rothamsted Experimental Station, Harpenden, on Saturday 12 May 1990. Further details and a booking form are available from Dr Keith Vernon, Centre for the History of Science, Technology and Medicine, Department of Science and Technology Policy, The University, Manchester, M13 9PL.

HISTORICAL DATA ARCHIVE PROJECT

This project aims to investigate the existing stock of machine-readable historical data files with the intention of producing a bibliographic guide for the use of the research community. All those with such data are requested to contact the project co-ordinator; Sheila Anderson, Cambridge Group for the History of Population, 27 Trumpington Street, Cambridge CB2 1QA, Telephone 0223-33194. E-Mail SJA13@UK.AC.CAM.PHX.

INDEX TO THE *REVIEW*

Members of the Society will receive with the next issue, at no additional charge, a copy of the consolidated index to the *Agricultural History Review*, volumes, 1–35, 1953–1987 inclusive, which has been prepared for the Society by Ms Lorna Smith. This volume consists of 76pp, and is printed and published in the same format and cover as the *Review* itself. Additional copies are available from the Treasurer of the Society, and on sale more widely at the price of £12, including postage and packaging. Members may wish to draw to the attention of others the existence of this valuable research aid, and ensure that institutions and libraries taking the *Review* by direct purchase also buy this index volume.

RURAL HISTORY DATABASE

The Institute of Agricultural History at the University of Reading has recently embarked upon a major new project: the establishment of the Rural History Database. This involves the transfer onto computer of more than 30,000 references to articles, books, and theses on British and Irish rural history, which will become accessible via the Joint Academic Network (JANET). It will include the bibliographic lists, which have been a regular feature of the *Review*, as well as the mass of additional bibliographic information which has been collected by the Institute during the past two decades. Testing the system is currently under way. Information about the Rural History Database can be obtained from Dr Raine Morgan, Institute of Agricultural History, University of Reading, PO Box 229, Reading, RG6 2AG.

The Diary of James Warne, 1758*

By G E MINGAY

Abstract

James Warne farmed near Wool, between Dorchester and Wareham in Dorset. His was evidently a medium-sized farm, combining dairying with some arable, and Warne kept a diary which has survived for only the one year, 1758. The unusual detail of the diary throws a good deal of light on his farming activities, including visits to local markets and his frequent concern that the best use should be made of his wagons and teams. Most interesting, perhaps, are the casual manner in which he hired his farmworkers and the problems he experienced in disciplining them. Warne's periodical lending and borrowing of money also provides confirmation of the importance of the local network for private financial transactions which was available to the rural community before the full development of the banking system.

'We fetched in y^e^ last of our Wheat', wrote James Warne on 21 August 1758, 'blessed be God in very good order.' This pious farmer – he was a regular churchgoer and sang in one or another of the local churches every Sunday – also invoked God's blessing two weeks later when, on 6 September, he sowed turnips in a field that he had already dressed with 30 loads of ashes. 'When y^e^ ashes was spread, I had it harrow'd 1 time, then I sow'd y^e^ turnip seed and harrow'd it again once more after twas sow'd. I hope God will bless my endeavour and send me a good crop.'

James Warne farmed near Wool in south-eastern Dorset, within a few miles of the English Channel, an area noted for its dairy pastures and sheep. He was born on 17 April, 1726, the son of Joseph Warne, who rented a substantial farm (paying for it a rent of £200) at Bovington, to the north-west of Wool. The farm at Bovington was in the hands of the Warne family for at least three generations, descending in turn from Joseph Warne to his son James, the author of the diary, and from him to his son in turn. James Warne, however, did not succeed to the tenancy of Bovington until 1793, when he was already sixty-seven, and a large part of his farming career, twenty years of it to be precise, was spent at Woodstreet farm, which lay on the opposite side of Wool. This farm was situated about a mile to the south-east of Wool and some five miles west of Wareham, the nearest market town of any size, and it lay some eleven miles east of Dorchester, the county town. For a farmer Warne was probably unusual in his literary interests – on 17 April he spent a shilling at Wareham Fair on a book entitled *The Art of English Poetry*, and he himself wrote a number of poems in the form of acrostics on a variety of family and local subjects.[1] The diary which he kept for the year 1758, when he was aged thirty-two and was farming at Woodstreet, has survived,[2] and for its date is the most detailed and interesting document of its kind that the writer has been privileged to examine.

Like his father, James Warne evidently farmed on a substantial scale, employing both farm servants and day labourers, and keeping as many as nine horses, which were generally employed less in cultivation than in hauling his carts and his wagon, transporting produce or seed, as well as ashes, dung or river mud, and bringing to the farm other

* I am indebted to Mr Hugh Jaques and his staff at the Dorset County Record Office for kind assistance in my examination of James Warne's diary.

[1] Dorset RO, D 527/1.
[2] Dorset RO, D 406/1.

materials used as soil dressings. He owned a large number of dairy cows, some of which were let out, and others were milked in his own dairy at the farm. Indeed, we find him on 4 March 1758 making a purchase of 26 dairy cows for the sum of £130 8*s*, a large amount to lay out at one time. Some of his cows were managed on the Dorset dairy system, which Dr Pamela Horn has described.[3] In Dorset the practice was for the farmer to entrust his dairy to a specialist dairyman, hiring out the cows at a fixed price which varied with the quality of the pasture and the value of the produce, and the system was already well established by the beginning of the eighteenth century.[4] We find James Warne negotiating for the rent of his distant 'dairy of 12 cows at Piddle' (possibly Puddletown, or perhaps Piddlehinton or Piddletrenthide), and on 5 April he came to the point of signing an agreement with a dairyman. Warne had already noted in his diary that a neighbouring farmer had let his dairy of 60 cows for as much as £3 each, and it is clear that he was intent on expanding his own herd. Near the end of the year, on 2 December, he discussed the following year's arrangements with his dairyman, who, he noted, was as willing to milk thirty cows as he was twenty, 'if we can suit ground for 'em'.

A good deal of Warne's time in 1758, and that of his men, was devoted to making a weir and the ancillary arrangements necessary for watering his meadows, a practice popular locally for ensuring an early bite of grass for the livestock in the spring. His pasture lands not only supported his dairy and sheep but also provided a valuable source of surplus ryegrass seed and 'cowgrass' seed. The latter was all 'bespoke' by 18 March, when he had orders for his whole supply of between 400 and 500 lbs, which he sold at 7*d* a lb; and on 19 April his wagon, pulled by five of his horses, carried a load of ten quarters of ryegrass seed to a 'Farmer Brimes' near Blandford, a distance of more than ten miles from Woodstreet. The arable was evidently a minor part of Warne's farming, although on 18 November he notes sowing 19 bushels of wheat seed in a field of just under five acres, and he had calculated on the previous 16 May that the yield of his wheat was about 12 bushels an acre, a rather modest return for the period. This five-acre field was the source of some difficulties with his reapers, since its name was 'Buckshill Six Acres', and the reapers evidently expected to be paid for the supposed six acres; but when on 23 August Warne and one of the reapers, Robert Phillips, measured the ground it was found to be only 4 acres 3 roods and 28 perches, 'and R.P. was very uneasy y^t I did not pay him for y^e full 6 acres'. The rate of pay for reaping, incidentally, was 4*d* per man per acre. The mowing of his meadows also gave rise to a similar difficulty: 'my Mowers are displeas'd because I measur'd it'.

An active, energetic and businesslike man himself, Warne was often annoyed by the slowness of his men when engaged in carting. On 27 September he had cause to complain about the carts not setting out until nine and working only until one; and on 8 December he ruefully recorded that two of his carts, with six horses, had brought up only four loads of gravel and one load of 'clots' (presumably either cow manure or clay), and carried away four loads of sand and dirt, 'and brought up y^e Chaff from Dairy Barn, a brave day's work. I'm provok'd to see how slow they are.' While his men proceeded on their tasks in this leisurely fashion, Warne himself was riding about the neighbourhood, visiting his father and friends and attending the local markets and fairs, noting carefully the prices that were being given. He recorded on 18 March that wheat at Wareham was fetching 6*s* 6*d* a bushel, and barley 25*s* a quarter, while ryegrass seed was at 9*s* and 10*s* a quarter.

[3] Pamela Horn, 'The Dorset Dairy System', *Ag Hist Rev*, XXVI, 2, 1978, pp 100–107.
[4] *Ibid.*, p 100.

On 22 April he went off to Wareham market to sell his butter and 10 pints of kidney beans (for which he received 3*d* a pint), as well as some bunch peas and black-eyed peas (at 2*d* a pint). At this market Warne 'ventured my Chance for a packet of Dr Axford and a Silver Punch Ladle he gave w^{ch} was got of a man of Wareham'. On 9 June he received a visit from a shopkeeper of Bere Regis, who had come some six miles to the farm in order to buy a pig: 'gave me 40*s* for it, but was a good pig'. Later in September he was sending off sheep to be sold at Weyhill fair, and earlier in the month, on 12 September, he himself had set off at three in the morning to sell 80 sheep at Wilton fair, and was satisfied to record that he had sold them all by seven for 16*s* each.

I

Accidents to livestock, and their illnesses, were constant problems for James Warne, as of course for every farmer – one of the aspects of eighteenth-century farming that has been rather neglected by historians. Accidents with horses, as we know from other diaries, were remarkably frequent, and sometimes, as James Warne suspected on one occasion, were due to the driver's carelessness or bad temper. On 21 November he found his young mare, Whitefoot, with an injury

> in y^{e} side of y^{e} face under y^{e} eye. There is a round hole broke into y^{e} bone 2 or 3 inches deep. I think twas wth a punch of y^{e} whip, but if so he denies it and s^{d} she fell against y^{e} Post coming out of ground but I can't perceive how such a hole sh^{d} come if she did fall. He pretended he did not know of y^{e} hole til some of 'em saw her bleed at nose.

Veterinary medicine was practised locally by a Dr Barrett, although sometimes Warne relied on the advice of another farmer or treated the complaint himself. On 14 April he sent for Dr Barratt to see a sick cow: he was happy to record that the Doctor 'broke y^{e} Bladder under her Tongue, rak'd her and let her blood, and y^{e} cow done very well again'. However, when on 23 May Warne found another of his cows to be sick he took matters into his own hands: 'Saturday y^{e} Dairyman saw y^{e} Cow I bo^{t} at Blandford piss Blood and it continued Bad so I rode to Beer and got some red wine and Dragons Blood and gave her, and since dinner carr'd her some Toast and Ale.' The cow not responding to these ministration, Warne was obliged to ask a farmer of Affpuddle, John Gould, to ride the six miles from the other side of Bovington 'to come and see my cow, w^{ch} he did in y^{e} AN [afternoon] and gave her a Drench and we hope she'll recover'. On 17 August Warne noted some trouble with his sheep, the fleas being busy, and accordingly 'tis difficult to keep 'em free of magots'. On 16 October he took steps to protect his fifteen calves from the fatal complaint known as 'Kill Calf', a precaution which involved a somewhat horrifying procedure known as burning and strapping. He so treated his '15 calves and Bleeded 'em all. We 1st bled 'em in y^{e} Neck then burn a hole wth a red hot iron in y^{e} dew flap and put in a tan leather strap and Tye both ends together so they are done. This is to prevent y^{e} Kill Calf in w^{ch} we lost 1 yesterday and lost 1 before.' On the same day Warne made an agreement with his father that his calves should be kept at Bovington, 'where they never dies of Kill Calf', and in exchange he would keep some of his father's two-year-old beasts.

II

We know from inventories and other sources that eighteenth-century farmers frequently lent and borrowed money, often having at the same time both loans outstanding and debts which they owed.[5] An informal network of credit existed through which farmers and others with a surplus of funds could lend money out locally, at

[5] See BA Holderness, 'Credit in English Rural Society before the Nineteenth Century with special reference to the period 1650–1720', *Ag Hist Rev*, XXIV, 2, 1976, pp 97–109.

interest, while those who were sufficiently credit-worthy could borrow for meeting a shortage of cash, to provide working capital or to finance large transactions. It is perhaps surprising that the importance of this ready availability of credit has been largely ignored in historians' discussions of the farming developments of the period, and of course it has particular relevance to the expansion of agricultural output and changes in methods and land use, as well as the ability of small landowners to meet the costs of enclosure. The working of this credit network is well exemplified in James Warne's diary. On 6 March, for instance, Warne had paid back to him a sum of £20 which has owed on a personal bond, and again on 8 November he received £15 (together with interest), part of a sum of £30 which was outstanding. At other times, when short of cash, we find him borrowing money. On 5 September he borrowed £10 from his father, and on 19 October some friends visited him at his house and offered to lend him money: 'I don't know whether ab^{t} Xmas I m^{t} not have 40 or 50£ of 'em'. On 20 December, however, he made up his mind to borrow from a Mrs Knapton of East Lulworth the sum of £60 'on my own Note of hand and I am to give her 4 per cent for it'. This was, incidentally, a very moderate rate of interest, lower than could then be obtained on a mortgage of land.

III

But perhaps the most interesting aspect of the diary is the light it throws on relations between the farmer and his employees, and particularly the problems of managing men who were so independent as to ignore orders and take themselves off without permission. Warne's labour difficulties of 1758 began on 6 June when he had 'some words' with his man 'R.L.' over taking Sundays off without permission: 'He went to Coomb (Coombe Keynes, two miles away) last Sunday and y^{e} Sunday before without my Leave w^{ch} he said he w^{d} not ask on a Sunday to go home for his Shirt'. Later in June, on the 26th of the month, there was a further dispute with this man, when Warne became so angry as to strike him. It looked as if the fracas might end in the man's leaving, as 'RL was so affronted last n^{t} y^{t} he ask'd me if I w^{d} pay him and he w^{d} be gon for he w^{d} not bide to be Beet. But on my reprimanding him he took it into Consideration and went to Cart as usual.' On the 13th of the following month Warne had trouble with another of his men, one called Daniel Cobb. Cobb had refused to help milk the cows when ordered to do so, and went off 'out of y^{e} way and did not, but being come back before they was done I bid him ag^{n} and on his refusing it laid him on with a little hazzle stick and He got a^{nor} [another] but did not strike me. Mr Fish and Mr Geward p^{td} us.' On the next day, 14 July, Cobb again refused to help milk. 'I told him if he did not he sh^{d} not Eat, nor w^{d} not let him, but Thrust him out of door and footed his Arse. He seem'd displeas'^{d} at y^{t} and w^{d} go away if I w^{d} pay him, but on my threatening to have him before a Justice he went and milk'd and made no more ado ab^{t} it.' However, matters came finally to a head on 4 August when Cobb left the farm for good after another disagreement. 'Twas because I found fault wth him for penning y^{e} Sheep so soon last N^{t} for twas not 7 by my watch when he pen'd 'em.' Warne paid the man no wages when he left and so expected 'he'll fetch a warrant for me', but there is no mention in the diary of this development arising.

In the autumn Warne had fresh difficulties with a new servant, one John Antle, a young man of nineteen, whom he encountered on the road while taking sheep to Weyhill Fair. Warne agreed with Antle for him to come to Woodstreet, paying him four guineas for the period between 9 October and next old Michaelmas day. Antle soon got himself into scrapes. First, on 29–30 October, he absented himself for two days to visit Puddletown Fair. 'I saw him at Puddletown', Warne recorded. 'He staid there to

see y^{e} fair, but I was not very well pleas'd wth him.' On the following day Warne recorded that Antle (perhaps because of his activities at the Fair) had 'piss'd a bed Saturday night and Sunday morn before he went home for the Sunday. He made up y^{e} beds in y^{e} Garret but y^{e} Maidens had a Suspicion and found it out yesterday before he came home.' On 20 November Antle, after threshing half a bushel of oats, walked out of the barn and did not come back for his dinner. 'I must question him ab^{t} this', Warne noted. And on the next day he duly did so, but Antle 'w^{d} give me no Ac^{t} so I set him to fill [load] dung today instead of threshing'. Yet again on 27 November Antle absented himself without leave, going to visit friends at Possham [unidentified] and not returning at all that night. He eventually returned about two on the following day, and so in the evening Warne made up his mind to discharge him: 'I p^{d} him 6*s* 1½*d* and bade him be gone and so he pack'd up his things and departed b^{t} w^{d} have staid.'

There were difficulties that same autumn with another of the farm servants, one named George. George it was whom Warne suspected of injuring the mare with his whip; and before that, on 3 November when the ground was so wet that the cart wheels became stuck in the ruts, George had been responsible for damaging a dung cart. 'I told him after Dinner he sh^{d} go to Threshing or Take his Wages and go along but he s^{d} he sh^{d} go to Threshing and I talk'd wth him for twill not to do to have so many things broke.'[6] Subsequently, on 22 November, Warne gave George notice to find himself another place by St Thomas's day, 21 December. Three days later George went off to Blandford 'to see ab^{t} a place, but did not hire himself'.

On the 27th of that month both George and another man, Tom Hodges, absented themselves without permission, George going to his home, and Hodges to see a spectacular outbreak of fire at Bloxworth, some six miles from Woodstreet. Then, on 11 December, both men were in trouble again, this time for disregarding instructions. Hodges was ordered to carry mud from the nearby river Frome, but instead accompanied George in carting rubble. 'They had 2 carts and 4 horses', Warne noted irefully, 'and other 5 horses staid in stables all day. Such dutiful Serv'ts have I!' During the next few days there were more difficulties in getting the men to cart mud, which was evidently an unpopular task. Warne himself helped to fill the carts in order to encourage his men, and it seems that George consented to assist. 'He was afraid if he did not work I sh^{d} not pay him and did not refuse going.' The carting of mud was also the cause of Tom Hodges' almost deciding to part company with Warne. On 15 December, after having refused to cart mud on the previous few days, Hodges appeared at the farm with his father. Warne 'reprimanded him pretty much. I told him if he w^{d} go to Mud cart and do what I had for him to do and behave as he ought, he might go to work, but he s^{d} that he w^{d} not go to mud cart, but his F^{r} chid him and he consider'd of it and went with Geo. and T. Hunt and y^{e} Dairyman.'

It might be thought that Warne was perhaps a harsh taskmaster; but if this was so it does not seem to have given him a bad reputation as an employer, for certainly he had no difficulty in finding men to work for him. On 12 February, a Sunday, Warne was scandalized to have a man call from Briantspuddle (six miles away) to ask for mowing work, and the same Sunday he saw Farmer Willshear of Grange going by, driving cows and calves for the morrow's Dorchester Fair. 'See how y^{e} Sabbath is regarded!' Later in the year he was in negotiation with a man to work as a farm servant, one who was also prepared to make lime. At first no agreement was possible for

[6] The clumsiness of the labourers in handling implements was a matter of complaint by Arthur Young, who emphasized the need for strength and durability in farm equipment.

the man asked for the year's pay as much as £15 12*s*, 'w^{ch} is 6*s* a week all y^{e} y^{r} round'. Warne counter-offered £15 and a shilling a load for all the lime he should get, but eventually he settled on the man's original terms. Then on 16 December a Shepherd Coks of Bere came and agreed with Warne for his son, Luke, to come to work on the farm from the following Tuesday till Michaelmas for the sum of 45*s* 6*d*. On the next day, again a Sunday, 'One Homer of Rogershill, a young man, call'd. He hear'd I wanted a Serv^{t} and before we went to Church Jos. Applin of Shitterton call'd to ask for work. I'm like to have work folk a plenty', Warne commented with some glee. It is interesting that both Roger's Hill and Shitterton are near Bere Regis, at some six or seven miles from Woodstreet, though much nearer to Turners Puddle, where Warne had gone to live in a new house built for him by his landlord in May 1758. (He returned to live at Woodstreet again four years later.)

IV

Warne was evidently a man of some importance in his neighbourhood, and was chosen for Overseer of the Poor, although from his diary it does not appear that this proved a very onerous office. Indeed, the only difficult case which he had to deal with in the year of his diary was that of Anny Hunt. This woman, pregnant and near-destitute, came before Warne and his fellow Overseer and was eventually persuaded to swear, though very loath to do so, that a certain Joseph Alner was the father of her unborn child. She begged of Warne and his colleague that she should not be taken up, 'and wept bitterly but she c^{d} not prevail. Her fear was y^{t} y^{e} Child w^{d} be took from her and sent to y^{e} foundling Hospital.'

As an individual, James Warne comes across from his diary as honest, fair, pious and frank. He certainly showed a necessary firmness in dealing with the frailties of his workpeople. As a family man he was clearly proud and fond of his wife and children, noting on 3 December that 'yesterday was 7 y^{r} ago I and my dear Spouse was married since w^{ch} God has been pleas'd to bless us with 4 sons'. During much of the autumn of 1758 Mrs Warne, Nanny as she was called, suffered from some prolonged illness, pronounced to be a cold when it first appeared, and she kept within doors. She was still unwell on 26 December, the day when Warne usually gave a feast for some people from Bere whom he supplied with turves for fuel. On this Boxing Day, however, 'Nanny continuing ill we had only a cold ham and bread and cheese and butter and what ale and cyder they w^{d} drink w^{ch} pleas'd most of 'em very well. They brag'd mightily on y^{e} cyder [of his own making] and drank very heartily of it.'

As a farmer Warne appears as knowledgeable and efficient, or at least, as efficient as his men would allow him to be. His mode of hiring men appears to have been entirely casual and haphazard, and he seems to have made no use of local hiring fairs. The frequent difficulties he had with his men may well have been quite commonplace, and the reader of the diary obtains a strong impression of farmworkers that, so far from being deferential and fearful of losing their employment, were self-willed, careless of orders, undisciplined and obstreperous when corrected. Certainly Warne's diary supports Young's strictures on the carelessness of the labourers in handling animals and equipment,[6] and the difficulty of introducing anything smacking of novelty in the face of their negligence and indifference. Warne kept himself well informed of market prices and he had a wide acquaintance with the landowners and farmers of the neighbourhood. Whether he tried to be technically progressive is impossible to say from the evidence of only one year's record.

[6] The clumsiness of the labourers in handling implements was a matter of complaint by Arthur Young, who emphasized the need for strength and durability in farm equipment.

Probably he farmed well up to the standard of the district, but there is no mention of his consulting the farming manuals of the period, nor, despite his daily travels over a wide area extending to some ten or twelve miles from his farm, is there any indication that he was interested in travelling further afield to observe the practices of other farmers. However, he was certainly far from being the darkly ignorant, suspicious and mendacious type of backward farmer also castigated by Arthur Young[7]. Rather he gives the impression of being receptive to new ideas, and with his concern for the more economical working of the land he was a good example of the substantial, well-educated, forward-looking and cost-conscious farmer of his day, the type of man who contributed in his own small sphere to the contemporary progress of English agriculture.

[7] Arthur Young, *General View of the Agriculture of Oxfordshire*, 1809, pp 35–6.

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On Estimating the Extent of Parliamentary Enclosure

By JOHN R WALTON

Abstract
Chapman argues that the acreages presented in the summaries of enclosure acts and awards are often inaccurate. True acreages may be estimated by summing the apportionment acreages for each award. This procedure, applied to a 10 per cent sample of English and Welsh awards, yields a total parliamentary enclosure acreage which appears to indicate that Turner's estimate, based on summaries, is too small. However, this conclusion is reached without reference to the margins of error associated with sample statistics. In a data-set exhibiting a high degree of variation such margins of error will be substantial. Hypothetical estimates, based on acreage data sampled from the Tate 'Domesday', indicate that Turner's figure probably lies within conventionally-acceptable confidence limits for Chapman's sample. A tolerably accurate estimate of the acreage enclosed by parliamentary act is only likely to be available when Chapman's procedure has been extended to the remaining 90 per cent of enclosure awards.

In his recent work on parliamentary enclosure, John Chapman provides convincing evidence of inaccuracy in earlier estimates based on summary information given in the acts and awards.[1] The detailed award apportionments emerge as the only secure source of evidence about the acreages and character of land affected by the parliamentary method, and the only legitimate basis for making inferential estimates of acreages affected by pre-parliamentary enclosure.[2] In this comment, I do not question the advantages of estimates based on summed apportionment acreages. Indeed, I share Chapman's belief that these hold the key to an understanding of the true extent of parliamentary enclosure. But I am not convinced that the method which Chapman favours has brought such an understanding as close as he appears to believe.

Chapman's study involves abstracting the full details of every individual allotment from a 10 per cent sample of all English and Welsh enclosure awards. In order to ensure that the sample is representative of the full range of enclosure acreages and types, it is drawn separately for each county, or group of adjacent counties in the Welsh case. This results in a total of 535 sample awards for England and 24 for Wales, allotting 768,450 and 123,639 acres respectively. Inflating each of these figures by multipliers calculated by dividing the total number of enclosure awards in each country by sample size for each country produces suggested aggregate parliamentary enclosure acreages of 1.18 million for Wales and 7.67 million for England. Correction for spurious enclosures and old-enclosed land exchanged under the terms of some awards gives a parliamentary enclosure acreage for Wales of 1.17 million acres, and a total for England in the range 7.25 to 7.35 million acres, as compared with Turner's English act- and award-based estimate, derived from data contained in

[1] J Chapman and T M Harris, 'The Accuracy of Enclosure Estimates: Some Evidence from Northern England', VIII, *Journ Hist Geog*, 1982, pp 261–264; J Chapman, 'Some Problems in the Interpretation of Enclosure Awards', *Ag Hist Rev*, XXVI, 1978, pp 111–112; J Chapman, 'The Extent and Nature of Parliamentary Enclosure', *Ag Hist Rev*, XXXV, 1987, p 25.

[2] J R Wordie, 'The Chronology of English Enclosure, 1500–1914', *Econ Hist Rev*, 2nd ser, XXXVI, 1983, pp 483–505; J Chapman, 'The Chronology of English Enclosure, a Comment', and reply by J R Wordie, *Econ Hist Rev* 2nd ser, XXXVII, 1984, pp 557–562.

Turner's edition of Tate's 'Domesday', of 6.79 million acres, and earlier estimates in the range 6 to 6.5 million acres.[3] In other words, according to Chapman, Turner underestimates the extent of English parliamentary enclosure by about half a million acres, or by between 6.8 and 8.2 per cent of the true figure.

Surprisingly, Chapman offers his sample estimates without reference to the size of the errors associated with them. Were he merely interested in estimating the mean size of parliamentary enclosures then this omission would be serious enough. Sample means are usually accompanied by some statement of confidence, derived by estimation of the standard error of the mean. The omission is even more serious where, as in this case, the sample mean is multiplied by population size (for this, effectively, is what Chapman's method entails) to give a global estimate of the total acreage enclosed. In these circumstances, even quite modest standard errors of the mean would inflate to substantial aggregate errors associated with the estimation of the total acreage. There is thus a possibility that Chapman's suggested acreage total for England has associated confidence limits which would embrace Turner's much smaller estimate.

Since Chapman gives no information on the standard error or standard deviation of his sample values it is not possible to estimate exact confidence limits for his particular sample. Nevertheless, other data provide some basis for assessing their likely magnitude. Standard error is inversely proportional to the square root of the sample size and directly proportional to standard deviation. In this case, because the sample is large, the net contribution of sample size to the size of the standard error is slight.[4] Unfortunately for Chapman, the influence of the standard deviation is unlikely to be as negligible. Despite significant errors in its individual acreage estimates to which Chapman has drawn attention, it seems reasonable to presume that the information given in the Tate 'Domesday' encapsulates the true range of variability, if not necessarily the true absolute magnitude, of the acreages affected by individual enclosure awards. A cursory glance through that volume reveals such tremendous variability in these acreages as to suggest that samples would be associated with large standard deviations and, in consequence, large standard errors. In Devon alone, enclosures range from the 22 acres of Yalberton Tor to the 20,000 acres of Exmoor.

One may give these speculations more concrete form by closer scrutiny of the Tate 'Domesday' and the work by Michael Turner which derives from it. If I am correct in supposing that the acreages affected by individual parliamentary enclosure awards were about as variable as the 'Domesday' suggests, then it follows that a representative 10 per cent sample of 'Domesday' enclosures should give a good indication of the size of the confidence intervals associated with Chapman's acreage estimates.[5] In addition, we can also compare Turner's total enclosure acreage, derived by aggregation of all the 'Domesday' act or award figures, with the acreages estimated by inflation of my sample

[3] Chapman, 'Extent and Nature of Parliamentary Enclosure', pp 25–28; M Turner, *English Parliamentary Enclosure*, Folkestone, 1980, p 179; W E Tate, *A Domesday of English Enclosure Acts and Awards*, ed M E Turner, Reading, 1978. The final figure which Chapman gives for Wales appears to have been misprinted and is corrected here.

[4] For useful introductions to sampling see Roderick Floud, *An Introduction to Quantitative Methods for Historians*, 1973, pp 161–183; and R S Schofield, 'Sampling in historical research', in E A Wrigley, ed, *Nineteenth-Century Society*, Cambridge, 1972, pp 146–190.

[5] In using non-random methods I have tried both to mimic Chapman's approach and to derive a sample which is more representative of the overall characteristics of the underlying population. There is a school of thought which holds that since random sampling methods provide one of the key theoretical underpinnings of standard error, then confidence estimates should only be made in respect of strictly random samples. I have sided with those who argue, on the contrary, that the use of prior information to improve the representativeness of a sample is likely to make it more secure as a foundation for inference. See, for example, T M F Smith, 'On the validity of inferences from non-random samples', *JRSS*, A, 146, 1983, pp 394–403.

acreage totals using the method favoured by Chapman. In other words, the Tate/Turner data may be used in two ways as a means of assessing the likely accuracy of Chapman's estimates. Neither of these procedures suggests that Chapman's global parliamentary enclosure acreage is necessarily close to the true figure, which remains unknown.

A 10 per cent sample of enclosures was drawn from the 'Domesday' using a method broadly comparable with Chapman's. For each county, a single digit random number identified the first member of the sample. Every tenth entry thereafter was also included. Following Turner, the award acreage was preferred to the act acreage where both were given. If neither was available, an acreage estimate was taken from the nearest entry to provide one, usually the adjacent enclosure in the listing. This randomized systematic sampling method, which has some similarities with that used on occasion by recent British census-takers,[6] provided a total sample of 539 enclosure acreages for England and Monmouthshire. Given the way the 'Domesday' data are presented, the sample would appear to be about as representative as any 10 per cent sample could possibly be with respect not only to geographical distribution but also to enclosure chronology and type.

The results of the exercise were a sample mean enclosure acreage of 1229.85 acres and a sample standard deviation of 1466.71 acres. The difference between the first figure and the sample mean for Chapman's English data (1436.36 acres for the uncorrected data, 1376.2 acres for the corrected data) might at first sight appear to vindicate Chapman's conclusion that the act and award data underestimate the 'true' acreage of parliamentary enclosure. However, the enormous size of the standard deviation, in this case even larger than the mean, counsels against the glib assumption that total acreages may be directly read from samples derived from data of this kind.

Multiplying the unrounded sample mean by Turner's population total, which, when acts affecting land in more than one county are allowed for, is 5265 enclosures, suggests a total enclosure acreage of 6,475,149. This is less by 319,280 acres or some 4.7 per cent than Turner's 'true' acreage of 6,794,429.[7] If Chapman's method is valid, which it clearly is not, then the match between this 'true' acreage and that derived from the inflation of any representative 10 per cent sample should always be exact.

Calculation of the standard error of the mean (63.18 acres) allows us to set conventional 95 per cent confidence limits for the sample mean of 1106.02 and 1353.67 acres, and equivalent confidence limits for the estimate of the total acreage enclosed of 5,823,215 and 7,127,083 acres, all figures based on unrounded data. We may observe that not only the total acreage figure suggested by our particular sample but Turner's 'true' total both fall within this range, as we would expect. We should also observe the enormous absolute magnitude of the confidence interval, which underlines the limitations and likely deficiencies of estimates based on sampling methods.

If the standard error of the mean for Chapman's sample were the same as that calculated here (and, as I have already indicated, if Chapman's sample is representative it is improbable that it could be significantly smaller) then the 95 per cent confidence limits for Chapman's corrected English sample mean would be 1252.38 and 1500.02 acres, and the equivalent confidence limits for the total acreage enclosed would

[6] Notably in the 10 per cent sample census of 1966, although some of the more esoteric information presented in recent full censuses was also collected using such procedures. See C Denham and D Rhind, 'The 1981 Census and its Results', in D Rhind (ed), *A Census User's Handbook*, 1983, pp 78–80.

[7] Turner, *English Parliamentary Enclosure*, pp 176–9.

be 6,601,273 and 7,906,627 acres.[8] It will be observed that Turner's allegedly inaccurate total, although not my attempt at estimating that total, falls within the wide span of these hypothetical but plausible confidence estimates.

In theory, such wide confidence estimates might be reduced to acceptable proportions if sample size were increased. But an acceptable error in a data-set exhibiting this degree of variation unfortunately implies a sample size not much smaller than the total size of the population, at the very least. If, let us say, we wanted to be 95 per cent certain that the total enclosure acreage estimated by inflating the sample mean lay within 100,000 acres of the true total, then, on the basis of the sample statistics already obtained, it may be estimated that such a margin of error could be achieved by consulting a 'sample' of 22,961 enclosures.[9] This is well over four times the number of parliamentary enclosures which actually occurred. Notwithstanding the many attractions of sampling,[10] in some circumstances it simply cannot provide sufficiently accurate estimates.

The implications seem clear. Chapman provides ample evidence of inaccuracies in enclosure acreages derived from act and award summaries. But the application of elementary statistical reasoning shows that we cannot identify the true figure by adopting Chapman's procedure of aggregating apportionment acreages for a mere 10 per cent of parliamentary enclosure awards. Since ESRC or its predecessor agreed to fund both the completion of the Tate 'Domesday' and Chapman's sampling exercise, it seems that at least one funding agency is persuaded of the importance of a better understanding of parliamentary enclosure, not least with respect to the acreages affected. We now know that this important truth can only be finally revealed when some historian with extraordinary reserves of stamina has been given the substantial additional resources needed to extend Chapman's analysis to the remaining 90 per cent of parliamentary enclosures, or at least to as many of those 90 per cent as the vagaries of documentary survival will allow.

[8] Calculated on the basis of 5271 English enclosures, being Chapman's adjusted total of 5341 enclosures, less an estimated 70 further awards which relate to spurious enclosures. Chapman, 'Extent and Nature of Parliamentary Enclosure', p 27.

[9] The estimate of required sample size derives from the formula

$$n = \left(\frac{Zs}{d}\right)^2$$

where n is required size of the sample, s is the standard deviation of the 'pilot' sample (1466.71), d is the tolerable margin of error at a specified level of confidence (100,000 ÷ 5,271 = 18.97), and z is the z value corresponding to the same level of confidence (1.96). See P Hammond and P S McCullagh, *Quantitative Techniques in Geography: an Introduction*, Oxford, 1974, pp 131–2.

[10] For enthusiastic advocacy of sampling see D N McCloskey, *Econometric History*, 1987, pp 49–51.

Annual List and Brief Review of Articles on Agrarian History, 1988*

By RAINE MORGAN

QUESTIONS concerning the productivity of agricultural land are discussed in a number of leading articles this year. Analysis has traditionally concentrated upon the spatial organization of land use, field patterns and cropping but Olsson (177) offers an alternative approach which focuses on the resource base and the flow of nutrients with the agro-ecosystem. In a case study Dodgshon and Olsson (63) reconstruct the nutrient 'budgets' of Scottish townships to show how productivity was raised through inputs of manure. The reason for comparatively low yields in medieval England is considered by Clark (48) who argues that the prohibitive impact of high interest rates upon land improvement was a root cause. As an antidote to the doom and gloom interpretation of the medieval economy Hogan (120) has analysed the cropping strategy, itemized furlong by furlong, in some exceptional manorial records. These reflect a remarkable sensitivity on the part of management and decision-making to crop needs, soil conditions and profits, while even in the open field environment there is clear evidence of flexibility in land use and respectable yields. The case for technological progress at this time gains further strength from Campbell's article (41) charting the advance of vetches as an integral part of cropping regimes during the thirteenth and fourteenth centuries. The innovation is linked to a rising urban demand and the intensification of mixed farming. The optimistic view is echoed in Stephenson's account (218) of fleece weights in which he shows that they compared well with the average of later centuries. And although fleece weights and flock size fell drastically at times, this was due to climatic change and disease rather than human failure. A central problem for historians concerned with the progress of post-medieval agriculture has been the lack of hard evidence on yields. A possible solution (*pace* Overton) is the sophisticated statistical manipulation of data in probate inventories and Allen (8) offers a critical review of this approach, suggesting some changes in methodology. These are applied by Glennie (86) to evidence from Hertfordshire with significant results. They suggest that a sustained rise in yields began in the 1660s or 1670s and predated the widespread use of those fodder crops with which productivity increases are usually associated. In a comparative study Goldstone (91) questions the contrast between English and French productivity levels from medieval to modern times and argues that the explanation for England's achievements lies in her peculiar regional ecologies. Thus soil, rainfall and access to markets encouraged technological innovations to diffuse while weakness of common field regulations was also a factor. The greater productivity of the average English worker in the nineteenth century is also discussed by Nardinelli (169). He contrasts the shrinkage of the English labour force where land quality was above average with the likelihood of French workers to stay put on farms ecologically less well endowed.

On the earliest, prehistoric, cultures Mithen (159) highlights the intriguing discrepancy between the frequency of animal species represented in rock art of hunter-gatherers and those in faunal assemblages. After placing images in their ecological context he is persuaded that they functioned as a communications medium rather than decoration. A collection of reports presented by Hall (97) on the results of the intensive Fenland survey underscores the extraordinary value of wetland archaeology for reconstructing the past. Revolutionary new evidence obtained during the survey's work of pioneering iron age communities and their economy is reviewed by Lane, Evans and Serjeantson (136, 72) while the discovery of previously unsuspected Saxon settlement is reported by Hayes and Silvester (109, 203). Dramatic alteration to the environment is normally associated with machinery and agro-chemicals, but Simmons (204) reminds us that it can be traced back to ancient times. This is confirmed in a number of articles. Bush (38) for

*Publications are dated 1988 unless otherwise noted. References to articles or off-prints should be sent to the Bibliographical Unit, Institute of Agricultural History, University of Reading. The Master Index containing over 30,000 classified references on British rural history can be consulted by appointment.

example reports on the first palaeological record from a wetland site on the Yorkshire wolds which shows that mesolithic peoples were causing forest disturbances as early as 8900 BP and influencing the survival of species-rich grassland communities. Similarly, Butler (39) combines the results of litho-stratigraphic investigations with the microfossil record to deduce environmental change during the neolithic on Kenn Moor, Avon. He concludes that human impact may have been responsible for an alteration to the hydrological regime, leading to more frequent flooding, a rising water table and widespread silt deposition. An inspired use of unlikely material is a continuing feature of research. Heslop (113) argues that the systematic study of beehive querns can provide a mass of detailed information on the subsistence economy and external relations of later prehistoric communities, while Testart (224) uses the experience of present-day hunter-gatherer societies to provide insights into the past. Enckell and Rundgren (71) demonstrate how the presence of the anthropochorus earthworm can be used to trace former settlement. Densities are higher among house remains than in hayfields, and higher in shielings abandoned during the medieval period than in surrounding outfields. A number of prehistorians have addressed themselves to the problem of the transition to farming. Thomas (225) in a comparative study of Britain and northern Europe calls for a broader explanatory framework embracing social processes. In his view foraging populations and early farmers co-existed for a time. Redding's explanation (186) of the transition to food production centres on the resource base: where fluctuations were least predictable, more frequent and severe, he argues, farming was favoured. Milk and wool production in the late neolithic are reconsidered by Barker *et al.* (19) while Rogers and Rogers (191) question accepted evidence of horse domestication. The presence of notching and bevelling on incisor teeth recovered from palaeolithic sites may after all be due to causes other than human control.

There is a dearth of notable articles on Roman Britain but Jones and Casey (130) discuss the use of the Gallic Chronicle of 452 as a reliable chronological framework for its demise and the Anglo-Saxon invasions. For the slightly later period Foulds (78) provides a helpful detailed guide to cartularies as a documentary source, and the value of charters is again demonstrated. Griffiths (94) for example subjects the numerous twelfth- and thirteenth-century charters relating to the lands of Margam Abbey to detailed scrutiny. They give new insights into the structure of native society, in particular the strong attachment of kin to family land and the nature of property rights. The potential of other legal records is drawn to our attention. Coroners' rolls have been used to study crime but Hanawalt (102) shows that they can also provide information on family life, the role of women and the material environment of the peasant. Walker (241) describes the manuscript pleadings protecting rights of wardship and marriage which, she notes, reveal layers of English feudal society largely invisible in other records. English wills survive in large numbers and Sheehan (200) gives an account of how they were drawn up and their practical consequences on peoples' lives. An early fourteenth-century poem and its relevance to food historians is described by Dhuibhne (60), and Claxton (50) finds fascinating glimpses into noble society at this time in some hunting tapestries. The Paston letters have been used to illustrated the degree of lawlessness during the late medieval people but as Britnell demonstrates (34) they can also tell us about agrarian conditions and the problems of estate management for smaller owners. Using manorial court records, Bonfield and Poos (29) demonstrate how customary tenants were able to fashion true strategies of inheritance once the deathbed transfer of property was developed and accepted by lords. The growth of interest in the peasant land market is reflected in Harvey's valuable methodological summary (108) of sources for its study, and in Raftis's analysis (182) of the manorial court rolls of Godmanchester. Debate over the Domesday Book regression analysis of McDonald and Snooks continues and Leaver (141) argues that it may after all be compatible with the Round theory of hidation which it sought to overthrow. On the question of continuity in the landscape Unwin (235) reconstructs the pattern of estates in Nottinghamshire before and after the conquest to show that only township boundaries survived the Norman rationalization. Field systems are being heavily researched. Nitz (173) challenges the view that the common field dates from the twelfth century and maintains that feudal authorities had been instrumental in its creation before 700 AD. The earliest documented open fields of the late Anglo-Saxon period are described by Hooke (124) who stresses our lack of certain knowledge about the chronology of developments. The distinctive long strip layout of open fields and subdivision is discussed by Matzat (156) who finds striking parallels with the German evidence, and Roberts (189) asks general questions about settlements and field systems in Cumbria. He has detected a particular type of village plan linked to long strip field cores of a possible twelfth-century origin. Fenoaltea (73) presses his case for the agricultural efficiency of common fields and denies that scattering sacrificed productivity, while Fox (79) looks into the transformation of the two- into three-field systems and the ecological consequences which inhibited change in some areas. On farming, Currie (55) documents the earliest recorded vetch crop, harvested in Wiltshire during the Romano British period and McDonnell (146) describes the history and

function of transhumance in the north. The impressive advance of commercial rabbiting after the Black Death on poor East Anglian soils is charted by Bailey (16). Landlords here were quick to direct funds into this high-growth project to off-set losses in arable farming and exploit new markets. In the past social historians have relied upon indirect evidence for consumption patterns but Dyer (67) has now exploited the records contained in manorial accounts of food and drink payments for harvest workers. These reveal that well before the Black Death there was a marked shift from lesser grains to fresh meat and wheat. In a separate article Dyer (68) highlights the tensions underlying the 1381 rising in Suffolk and shows that prosperity rather than impoverishment was causing strife.

In a wide ranging comparative study Goldstone (90) proposes that the English Revolution of 1640 was not a uniquely western crisis of capitalism or absolutism, but shared the same basic cause with Ming China and Ottoman Turkey. They, contemporaneously, suffered an imbalance in population and resources leading to breakdowns of state power. Although the early modern period is under-represented much attention has as usual been paid to questions of property and ownership. Vogel (238) explores eighteenth-century liberal conceptions of property rights and the conflict between a belief in the exclusive claims of the individual and the rights of each generation to the earth's resources. Spring (214) debates with Bonfield (28) the function of strict family settlement – whether it preserved estates or spread wealth amongst family members – and Langford's study (137) explores the relationship between landed property and parliamentary representation. The view that during the seventeenth and eighteenth centuries land was bought for more than its economic worth is examined by Allen (9): using a model of real estate which incorporates motives for purchase, the effects of strict settlement and new data on rents he concludes that land prices were not after all artificially high. The financial affairs of a Tudor nobleman are analysed by Doran (64) to deny Stone's thesis of an aristocracy in decline. Allen (7) investigates the significant growth in the productivity of agricultural labour in England during the early modern period. He argues that it flowed from a shift to the large farm and a release of manpower, benefiting markedly the economy at large. On transport, Gerhold (84) is critical of earlier attempts to measure the metropolitan carrying trade and proposes new methods of approach. In an inventory-based analysis of changing farm structure near London between 1550 and 1700 Glennie (86) highlights a move to more grain-dominated farms, despite unfavourable prices for arable producers. On livestock Gibson (85) draws upon evidence in Scottish household accounts, agricultural reports, bone remains and modern unimproved breeds to estimate the changing size and carcass composition. It has become a commonplace (*pace* Bowden) that lower wool prices from the mid-sixteenth century relative to wheat depressed sheep production. But Martin (152) uses evidence from unique flock surveys to show that grazing was extended. On enclosure Hanley (103) traces in detail the piecemeal extinction of common rights over large areas of the Chilterns and shows how commoners could delay but not prevent actions of a territorial magnate with the law on his side. In his Buckinghamshire case study of opposition to enclosure Turner (233) stresses the importance of local economic problems and argues that conflict was within rather than across social classes. The significance of the Black Act is reassessed by Broad (35) who argues that in practical terms it did not mark a major turning point in Government's or landowners' approach to dealing with organized rural crime. Bohstedt (24) confronts the view that women were prominent in food riots, demonstrating that they merely participated with other family members to defend the household economy. Bohstedt and Williams (25) also question why riots spread to certain towns and villages and not others. They maintain that in the late eighteenth-century crowd action became more sophisticated and that much depended on the degree of hardship, social and economic networks which carried information, and the social structure of localities. The ritual element in agrarian protest is explored by Seal (197) who explains how dance, drama and procession were used to convey in a non-violent way, deeply felt public hostility.

On the source material of the modern period Nicholson (172) describes the specialised large-scale maps produced by the Ordnance Survey for the military from the 1850s and Day (58) draws our attention to the new database established at the Institute of Irish Studies. This records the uniquely detailed parish accounts of Irish economy and society in the 1830s. The value of using a computer for dealing with large amounts of numerical evidence is demonstrated by Mills and Mills (158) in their census-based study of mobility, and Grigg (95) exploits the annual agricultural returns to chart regional trends in tillage. The reliability of another well used source is called into question: Allen and Ó Gráda (10) have scrutinized the quantity of evidence on grain yields collected by Authur Young and point out that the conclusions he drew from them about enclosure and on related growth in productivity were false. The study of the size of different wealth groups has been hindered by lack of solid evidence. However, Rubinstein (192) highlights a document printed in 1861 which holds potential for research. On élites in rural society Eastwood (69) tests the view that voting

was determined by deference to landlords and contends that during the 1830s Tories were having to use a more efficient political organization to gain electoral success. In another study of mid-Victorian politics the ability of magnates to hold sway due to national influence and economic muscle is demonstrated by Heesom (111).

The relationship between repeal of the Corn Laws, agricultural conditions and the exodus of British farmers is considered by Van Vugt (237). Those who left were typically small grain producers who anticipated ruin at home from import-led price falls. The tariff reductions are also discussed by Irwin (127) who provides an assessment of their welfare impact. On settlement Banks (18) argues that the use of model 'open' or 'close' parishes by historians is misconceived and supports her claim with detailed statistical analysis of some social and demographic features of West Norfolk. Adonis (2) examines the career of the third Lord Carrington and assesses his role in the liberal land reforms and Leneman (142) reviews the little known breakup of Scottish lowland estates for smallholding earlier this century. The question of pre-Famine living standards in Ireland is addressed by Mokyr and Ó Gráda (162). To overcome a lack of direct evidence they have constructed a 'subjective index of improverishment' and together with other proxies calculate that although average income may have risen after 1790 poverty deepened. A similar approach to the discussion of living standards in Britain is adopted by Mokyr (161) in another article. Instead of the usual reliance on real wage data he presents evidence on the consumption on luxury goods and concludes that the pessimists' view of little or no improvement before the mid-nineteenth century still holds. There has been much attention devoted to internal movements of population recently and Withers (251) examines the extent of directed labour mobility which was part of the system of relief following the Highland potato famine. Also on labour Jordan (131) has scrutinized census evidence for England and Wales. It is found that they give a poor indication of the numbers in work and she argues that contrary to accepted belief female unemployment was rife between 1851 and the First World War. Tracing the growth of state aid for agricultural education Richards (188) explains how it had its origin in the 'whiskey-money' fortuitously made available to county councils in the 1890s. In celebration of the Royal Agricultural Society of England's 150th year Gower (92) reviews the historical relationship between statistics and research and points to World War Two as marking a real turning point in their application and development; while Henderson (112) too addresses himself to the remarkable achievements of science in agriculture and charts the progress of events from the formal research activities of Lawes and Gilbert to present-day embryo transfer.

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Conference Report: 'Food Supply and Towns' Winter Conference, 1989

By J A CHARTRES

Neither adverse weather nor the influenza epidemic, which laid low the organizer, were able to detract from a Winter Conference of remarkable quality, held at the Institute of Historical Research on 2 December 1989. For the fifteenth occasion since the Society began the conference in 1965, the Winter Conference was run jointly with the Institute of British Geographers' Historical Geography Research Group. The theme for 1989, 'Food Supply and Towns', provided four excellent contributions for the audience of sixty.

Two members of the new Centre for Metropolitan History at the University of London, James Galloway and Margaret Murphy, began the day with a joint paper, 'Feeding the City: London's food supply, 1250–1350 – a progress report', which presented early findings from the Centre's major research project on the capital's medieval networks of supply. Basing their comments on material drawn from a database founded upon analysis of manorial accounts and Inquisitions Post Mortem collected for ten south-eastern counties, they were able to suggest some startling patterns of variation in land value and usage and significantly to rescue the IPM from its rather shady reputation as a source. Very interesting spatial patterns of arable land value appeared to be emerging from an overall downward trend, 1275–1332: clusters of high-value arable were located in east Kent, the Thames Valley, and the Nene and Welland basins of Northamptonshire, all suggestive of transport factors and London's demand as their origin. A countervailing concentration of high meadow valuations was found in the south midlands and east Kent. Though only a foretaste of future conclusions, their paper promised much and clearly demanded that students of the early modern period recast their thoughts on the 'Fisher model' of London's innovatory power.

'Feeding the industrial city: Manchester, 1780–1830', the second paper of the morning, provided a survey of the principal findings of the late Roger Scola's work through the medium of Professor Alan Armstrong (University of Kent). Though not quite complete at his untimely death, Scola's work represented one of the pioneer analyses of the food supply networks and distributive systems of a major industrializing city, aimed at contributing to the debate over standards of living and revising the perspectives of retail distribution which, when the research began in the 1960s, were still very limited. Inevitably, in presenting the extensive findings of another, the paper was crowded with information, but made clear that Scola's posthumous book – to be published by Manchester University Press in 1991 – would represent a significant addition to our understanding. Armstrong outlined the broad results of Scola's work on two quite distinct aspects of the Manchester food supply: the scale and sources of food provision, running from meat and fish through dairy produce to cereals and potatoes, stressing the regional impact of urban growth; and the organization and structure of food distribution, focusing principally on markets, both retail and wholesale, and fixed shops. Scola's analysis of the fixed shop, its locational determinants, and its spatial and social distribution in thirty-seven districts of the Manchester conurbation remained innovatory. Many of Manchester's 'middle class' districts failed to develop their 'fair share' of food retailers, since the travel costs involved were devolved onto the household servants, while in the districts of lower social strata bakers and 'mere shopkeepers' were relatively rapidly distributed down the hierarchy of roads into the side and back streets.

Immediately after lunch, the third paper of the Conference, 'Adulterations and disease: the social consequences of milk consumption in nineteenth-century London', by Peter Atkins (University of Durham), provided a series of insights into the links between fresh milk and public health issues from the 1860s to the 1930s, and identified the many ways in which the depersonalization of London's milk supply opened the door to abuses. Dr Atkins demonstrated the manifold ways in which technical progress provided new and often increasingly hazardous ways of selling Londoners water as milk. Before 1872, it was estimated that 75 per cent of the capital's supply was cut with added water and reduced substantially in cream content: flour, starch, chalk, and liquefied calf brains provided alternative sources of texture and frothiness. The catalogue of horrors continued for the rest of the century, with colouring agents, such as the vegetable dye, anatto, and other additives widespread in use in the capital, though seeming less so in the provincial towns, with the poorer districts generally most vulnerable through the small-scale sales of the corner shops. 'Rich' Kensington provided an exception to this broad pattern. Some institutional monitoring of milk quality came from the scientific

department of the Inland Revenue, which effectively became a 'chemical court of appeal' in the milk business, but no formal standards were set until the beginning of the present century. Even then, milk remained an excellent medium for the growth of bacteria and dangerous pathogens, though the slime content of Manchester's milk was estimated to have fallen from twenty-six to twelve tons per annum by 1906. The extension of the radius of supply in the pre-war years probably led to deterioration in quality, especially for the poorer districts, with producers unrepentant: Atkins cited one Yorkshire farmer who commented that 'if the Almighty had intended that there should be no manure in the milk, then he would have placed the udder at the other end of the cow'. Disease problems associated with milk changed with the nature and structure of supply, with infantile and 'summer' diarrhoea being the principal long-term hazards from milk which, according to a Lambeth survey of 1903, could contain two million bacteria per cubic centimetre if purchased from a corner shop; and five million if bought from a street vendor. Milk was also directly associated with the rising trend of non-pulmonary tuberculosis from the 1870s, and remained a major risk in the 1930s, by which time railway tankers were able to generalize the risk through bulking. Dr Atkins also indicated two new data sources for agrarian historians to consider, the Inland Revenue scientific department, and the records of local medical officers of health, in what was a striking and polished paper.

In the unenviable last slot for the day, Martin Phillips (St David's University College, Lampeter) examined 'Divisions of labour in the sphere of exchange: an examination of the organization of food supply in nineteenth-century England', a study in market systems centred upon his continuing researches on Plymouth. His study examined the generalized expectation of a trend towards increasing specialization and divisions of labour derived from the secondary literature, and raised sufficient deviations from the case-study of Plymouth to suggest the need for such models to be modified. The monthly cattle fairs or 'great markets' retained vitality in Devon and Cornwall well into the 1870s, and displayed less decline than some authorities have suggested; and the market traders of Plymouth in the 1850s were to an unexpected extent locked into fixed retail outlets in the villages of its hinterland. Phillips's study also raised questions of the linkages between markets, their traders, and patterns of unrest postulated by some scholars, and added the south-western dimension to our understanding of the local and private act processes for market improvement, rebuilding and reorganization. The conference thus ended as it had begun, with interim conclusions of current research, the final results of which will be read with considerable interest.

The day once more validated the decision, in the mid-1960s, to institute a one-day Winter Conference, and the long-term commitment of the Society and the Historical Geography Research Group to its success. The Winter Conference has consistently justified the early start in fog and frost for those of us coming from places distant from the capital. All those who attended in 1989 enjoyed a conference of considerable quality and variety, in the comfortable surroundings of the Institute of Historical Research, to whom all who attended are grateful. Sadly, Dr Peter Dewey, the organizer who had done so much to make the day successful, was ill, and thus unable to receive in person the thanks of us all.

Book Reviews

HILARY H BIRKS, H J B BIRKS, PETER EMIL KALAND and DAGFIN MOE, ed, *The Cultural Landscape – Past, Present and Future*, CUP, 1989. xv + 521 pp. Illus. £37.50.

This book is a record of the highly successful international symposium of the same title, held in western Norway in 1986. Its theme, introduced by Faegri in the preface, is that all vegetation types have been created or modified by man thus creating a cultural landscape with gradients of human impact both now and in the past. The book is divided into three sections: eleven papers on the Present and Future, eighteen papers on the Past, and twenty-three abstracts of other contributions to the symposium.

Most of the papers are concerned with land use and agriculture in Europe (including the British Isles) and bring out the wide variations in farming practice, related to climate, relief, soils and history, which exist now as in the past. This can be considered over a wide area as in the paper by Rackham or on a much smaller scale as in the paper by Indrelid but all show the need to consider the whole cultural landscape, rather than just its elements, if its ecology is to be understood. There are important papers illustrating different methods of documentation and analysis, from descriptive plant sociology to powerful new methods such as canonical correspondence analysis. Several papers consider the processes involved in landscape change, including changes in culture, population size and input of nutrients into the soil. The paper by Emanuelsson attempts to show these relationships as a model which could be of importance in explaining patterns in the cultural landscape in simple ecological terms.

The second part of the book deals with the past and largely uses the results of pollen analysis in reconstructing and understanding past cultural landscapes from 1000 to 6000 years ago. Although modern developments such as the use of pollen influx diagrams, the study of modern pollen deposition and the importance of size and location of study sites are highlighted (papers by Aaby, and Hicks) the emphasis is always on the use of these techniques to gain more and more detailed information about cultural and agricultural history. There is much of interest to archaeologists and historians of agriculture, such as the transition from hunter-gatherer to agriculturalist, the man-induced initiation of blanket bog in Connemara, changes in forest composition in Switzerland, heathlands in Denmark, Waterland in the Netherlands, upland farming in North Wales and agricultural history in the Lofoten Islands and in Greenland.

Often in books of this kind the quality of the papers is highly variable but in this case, although the papers will be of varying interest to different people, the standard is high throughout. The book is well produced and remarkably free from mistakes. One drawback which is mentioned in the introduction to Part Two is that radiocarbon dates are quoted in a number of ways; there is now an internationally accepted high-precision calibration curve (Radiocarbon 28, (2B), 805–1030, 1986, Calibration Issue), use of which would greatly simplify understanding of papers such as these, and avoid the confusion which can trap the unwary.

It has not been possible to mention all the topics covered by this splendid book but it should be read by all those interested in the development of vegetation, agriculture and landscapes, and also by those interested or involved in the conservation of these landscapes.

DAVID D BARTLEY

PAUL STARKEY, *Animal-Drawn Wheeled Toolcarriers: Perfected yet Rejected*, Friedr. Vieweg & Sohn, Braunschweig/Weisbaden, 1988, 161 pages. £9.55.

The wheeled toolcarrier was conceived in the 1950s as a means of improving agricultural practice in the developing world. Initially, France and Britain led the way but subsequently other non-European centres of research and manufacture emerged and promotional schemes were launched in many countries across Africa, Latin America and Asia. This has continued through to the late 1980s, during which time an estimated 10,000 wheeled toolcarriers have been built to about 45 different designs with a combined cost, inclusive of all research and development work, that runs into tens of millions of pounds.

Paul Starkey is an agricultural consultant whose considerable overseas experience has given him many points of contact with the wheeled toolcarrier programme. In this very detailed analysis that pulls no punches, the curtain is drawn aside to reveal that the whole business has been, well, a failure. As the title suggests, the uncomfortable truth is that the wheeled toolcarrier is a good idea that has not worked.

The principle of the toolcarrier is a wheeled frame, drawn by animals, onto which a whole range of modern attachments for cultivating, seeding and weeding can be fitted. It can even be converted into a cart. This one versatile device would replace the odd assortment of ancient, and therefore much less efficient, single purpose implements currently in use and soften up the native farmer for a follow up stage

of tractor-based mechanization. Over the years the design was perfected and in carefully organized trials on the carefully tilled soils of research stations around the world the toolcarrier was shown to be a success. Glowing reports in research journals helped to complete the rosy picture and prompt both national and international agencies to foster take-up by offering toolcarriers to farmers at heavily subsidized rates.

Down on the farm the story was rather different. There was little interest in toolcarriers and where farmers had been encouraged to try them they were nearly always discarded soon afterwards or used solely in a single purpose mode, often as a cart. The reasons were many: they were awkward and heavy to use, and the task of conversion to other operations was long and complicated; they were expensive to buy and were only accepted at all when virtually given away by the sponsoring organization; their supposed increased efficiency ignored social and cultural factors at local level. In short, the toolcarrier offered the farmer very little in the way of tangible benefits and actually reduced his level of flexibility.

How could such a mistake not just be made but continue to be made and compounded at such expense over three decades? A lingering neo-colonial approach of western countries and experts to improving Third World agriculture is a feature but there are other contributory factors: the gullibility of aid organizations; lack of communication between teams of engineers and researchers from different countries; the tendency, driven by vested interest, to always put the best gloss on research results when it comes to writing them up. Above all, the exclusion of the native farmer from almost every stage of the developmental work is seen as fundamental.

Paul Starkey is not afraid to point the finger but is equally keen to emphasise the positive benefits that will emerge in the future if the collective lessons of the experience are digested fully. This is a fascinating piece of investigative history that should be read by anyone who has ideas about teaching the Third World how to farm.

ROY BRIGDEN

KARL GUNNAR PERSSON, *Pre-Industrial Economic Growth; Social Organization and Technological Progress in Europe*, Basil Blackwell, Oxford, 1988. viii + 159 pp. £25.

No one would set out to summarize the economic history of Europe without having a message. The main message of this challenging book is that innovation is a normal feature of economic life in stable societies and that Europe has enjoyed slowly growing per capita incomes since at least 1100. Though the author recognizes that in principle productivity growth might not keep pace with population growth, he does not take the possibility very seriously. Apart from a handful of observations from a partial choice of secondary sources, he pays no attention to any evidence for long periods of stagnation in European economic history.

His confidence derives from the growth of towns. To cut a short story shorter, he takes growth in the urban share of the population of Europe to indicate rising per capita expenditures on urban goods and services, and so to imply rising standards of living. Guesses about urban ratios and other economic aggregates for the years 1100 and 1300 take precedence here over more local evidence of medieval economic performance. Since urbanization is a principal theme of European economic history between these years it is unnecessary to quibble about statistics. If a growing proportion of townsmen is indeed acceptable evidence for rising productivity, much of the argument passes muster even without reliable aggregate figures. The author does not discuss the empirical status of his hypothesis, whose reliability seems to be weakened by evidence from Africa over the last twenty years and from India in the decades before Independence. But his book gives an important new perspective from which to approach the big questions about pre-industrial economic development.

Whether the argument helps to defeat the stagnationist hypotheses of Postan and others is another matter. Estimates of urbanization between 1100 and 1300 contribute nothing to a debate about the years 1260–1349. Dr Persson does not discuss the evidence relating to urban growth in that crucial period. If his hypothesis is dependable, it could be that he has supplied stagnationists with a new twist to the old tale.

R H BRITNELL

C DYER, *Standards of Living in the Later Middle Ages: Social Change in England, c.1200–1520*, CUP, 1989. xvi + 297 pp. 4 maps, 8 figures, 19 tables. £25 (hbk); £8.95 (pbk).

Like all good textbooks, Christopher Dyer's new study of standards of living does more than survey what was already known. Even in conception it is original, since no study like it has ever been written. After an opening chapter that defines medieval England's main social categories both in the late thirteenth century and in the late fifteenth, there are three chapters on aristocratic getting and spending, two on peasants and one on townsmen. The study concludes with separate chapters on wage-earners, charitable provision for the poor and the influence of weather. It has full references to published and unpublished sources, and it is indexed.

Within the broad categories of aristocracy, peasants and townsmen, Dr Dyer pays careful attention to the

distinctions to be made between narrower social groupings. He succeeds both in discussing the main issues clearly and in presenting a rich array of historically specific evidence. The hypothetical modelling of thirteenth-century peasant budgets in chapter 5, for example, is based on facts relating to Robert le Kyng of Bishop's Cleeve in 1299–1300, and this permits an unprecedentedly careful explanation of the relevant chronological and local variables. Its value is much enhanced by the comparable exercise for 1475 accompanying it.

Perhaps the book's most valuable contribution to current debate is the input of new material from household accounts relating to aristocratic incomes and expenditure. Current wisdom tends to the view that the accumulation of properties by landowning families safeguarded their incomes in the late Middle Ages. Having raised the question whether the nobility was adversely affected by falling rents, McFarlane answered it with 'a most emphatic NO', an emphasis that effectively marginalizes the relevance of economic history for an understanding of noblemen and their ways. Dr Dyer argues that in fact most landowners did experience financial embarrassment, particularly between 1400 and 1480, though they showed remarkable resilience in adversity. He stresses the importance of accounting as an aid to sound financial strategy in hard times.

The juxtaposition of documentary and archaeological evidence is an attractive feature of the discussion of peasants, whose budgeting cannot be illustrated from anything equivalent to aristocratic household accounts. The evidence of manorial rentals relating to the size of tenants' holdings leads to disturbingly pessimistic conclusions for the late thirteenth century, partly because of our inability to make proper allowance for wage-earning and non-agricultural activities in rural society. Archaeological material, by contrast, gives a more encouraging view because of its slant towards the more durable structures and artifacts. The two types of evidence do not complement each other very smoothly, but putting them together undeniably permits a more satisfactory description of peasant living standards than any based on documentary evidence alone. The exercise also raises some interesting questions, such as the reasons for an improvement in peasant housing during the thirteenth century.

Studies of standards of living are notoriously vulnerable to the charge of ignoring any values other than materialist ones. But though Dr Dyer describes his research as 'deliberately concentrated on material things' he makes some interesting observations about the values associated with aristocratic status. He sees aristocratic life styles not simply as careless hedonism or deliberate ostentation but as a calculated balancing act in which a wide range of values were in play. His discussions of attitudes to patronage and to charitable giving are well founded and illuminating.

As an introduction to the main social categories of medieval England and their changing relative well-being between 1200 and 1520 this excellent book will guide the reader further, faster and more securely than any other.

R H BRITNELL

NICHOLAS GODDARD, *Harvests of Change: The Royal Agricultural Society of England, 1838–1988*, Quiller Press, 1989, xiii + 359 pp. Illus. £16.

The Royal Agricultural Society of England (RASE) has just completed 150 years of uninterrupted existence, and to celebrate the occasion Nicholas Goddard has written the Society's sesquicentennial history. The title of the book is intriguing. It conveys a constant theme of the work of the RASE, the role of communicator and hence catalyst of change, which in its wake produces the punning 'harvests' of change. From the outset the RASE was to be that catalyst, and increasingly the change was to be derived from the application of science to agriculture. In this we recall the motto of the Royal, 'Practice with Science'.

The origin of the RASE was a strange mixture of typical English 'clubiness' and a more practical desire to make agriculture enter the world of science, invention, and nineteenth-century modernity. In entrepreneurial England bristling with the innovation of industrialization, the post-Napoleonic Wars depression of prices did not produce a corresponding entrepreneurship in agriculture. Instead we got a call for extending agricultural protection. The early nineteenth century was a relatively barren time in England for the development of agricultural science. Waiting in the wings was the example from manufacturing industry, the application of science and capital to the objective of raising productivity. But standing in the way was the power politics of the landed interest and the Corn Laws, in conflict with the ascendant manufacturing interest and Repeal. One solution to a political impasse was to ignore it, and so the RASE was founded in 1838 (originally as the English Agricultural Society) as basically a non-political association. However, its early prominent founders, Earls Spencer and Fitzwilliam for example, were leading Whig landowners and politicians, and the politics of free trade characterized the influential if not the majority view in the early years of the Society. The founding fathers were forward-thinking politically, but their clarion call was increasingly an emphasis on the application of science, particularly chemistry, to agriculture.

Thus were the origins of the Society, and what follows in the book is a dense history of the RASE,

rich both in practical agricultural matters and interpersonal relationships. Goddard performs the task of entertaining and informing both the Society's members and academe very well. The book is both lavishly illustrated and scholarly in presentation.

We round off this review with two aspects of the work and long history of the RASE. Clearly it is/was more than simply the organizer of the annual Royal Show, but as an organ of dissemination for new agriculture the Royal is/was very important. As the shop-window of science in agriculture the Royal always had an important function to perform. But the other method of dissemination, and one which academic historians much appreciate, is the long history of the *Journal of the RASE*. On its pages there has been much basic information and controversy. For example, the *Journal* was at the heart of the dispute between J B Lawes and Justus von Leibig, the former relating his field experiments at Rothamsted and advocating additional nitrogen for successful plant growth, and the latter avowedly anti-nitrogen and pro-mineral additives. The *Journal* early on, in publishing the technical importance of chemistry to agriculture, did much to promote the application of external, non-farm inputs to farming, and one of its functions, generally to disseminate new agriculture, continues to this day. The RASE has come a long way since 1838 and now boasts a permanent site at the National Agricultural Centre at Stoneleigh to display its activities throughout the year and host its annual Show. May it flourish further still in the next 150 years.

MICHAEL TURNER

ANTHONY C RAPER, *Weyhill Fair . . . 'the greatest fair in the Kingdom'*, Barracuda Books, Buckingham, 1988. 112 pp. Illus. £15.

Anthony Raper has written an attractive, brief, popular history of one of Britain's principal fairs, Weyhill, from its prescriptive origins to its final disappearance in 1959. This is not the heavyweight product of the professional historian to set alongside Bourquelot's analysis of the fairs of Champagne, Moore's recent study of St Ives, or Edwards's work on early modern horse fairs, but is still a useful addition to historical work on an under-studied subject.

Weyhill probably had much more ancient origins than its first, thirteenth-century, charter indicates: the location of the fair site, at the meeting point of three parish boundaries and as the focus for a number of driftways, points strongly to its early date. From the first, perhaps first-surviving, charter, the fair grew and developed its long-term concentration on the sales of sheep. Owned for a period in the fourteenth century by Chaucer, the fair may have been a supplementary source for the characters of the *Canterbury Tales*. From 1599 the fair was held under the Andover charter, with a pie powder court, and remained sufficiently profitable in the 1680s to be the focus of a protracted Chancery case over its siting. For the eighteenth century, documentary detail survives for its use for hirings, as a great hop fair, and for cheese, in addition to the primary focus which remained sheep. Prosperity lasted unabated until the late nineteenth century, during which time the Fair acquired permanent shops and booths, a ghost which threatened Leadbetter the hop-merchant, and its own horse-fair song.

Decline, once commenced, was rapid: sheep sales demonstrated a downward trend from the mid-1860s, fell rapidly to the First World War, and by the 1920s the business was a shadow of the level half a century earlier. Cattle sales did better to the 1940s, though were still small, and the last attempt to revive the fair for this purpose, in 1959, was 'a dismal show'. The bulk of the ancient site is now covered with the plant and vehicle store for a large building and contracting firm.

This little book is copiously illustrated. It reproduces excellent seventeenth-, eighteenth-, and nineteenth-century maps of the Fair, together with many illustrations of its booths, weights, pens, and pleasure grounds, drawn largely from early twentieth-century photographs, and is consistently attractive if rather too light on deeper historical analysis. This amateur study serves to remind us all that the detailed history of most of Britain's great fairs remains largely unwritten.

J A CHARTRES

GUY M ROBINSON, *Agricultural change, geographical studies of British Agriculture*, North British Publishing, Edinburgh, 1988. XV + 369 pp; 63 maps and diagrams. £18.50.

This book is not a textbook of agricultural history, but a series of studies of agricultural change in Great Britain over the last one hundred and forty years: Guy Robinson argues that the current problems of farming are more easily understood if the development of agriculture is known. His book differs from that of an agricultural historian in that it is very much concerned with changing geographical distributions. His first chapter reviews changes which have taken place in agricultural geography over the last thirty years. Agricultural geographers have adopted three approaches. First they have been concerned with environmental aspects; second, they have emphasized

the role of economic forces in causing change; and third there has been interest in what is called the 'behavioural approach', where the decisions of individual farmers are studied. He goes on to discuss the major substantial interests of agricultural geographers – in agricultural decision-making, diffusion theory, government policy and the marketing of agricultural produce. The book concerns itself with those aspects of British agriculture since the 1840s, with linking chapters on broad patterns of agricultural change.

The book begins with a rapid gallop through High Farming and the Great Depression with some interesting material on the distribution of land ownership and labour employment, and the way in which contrasting regions – the claylands, the uplands, and the light soils responded to falling prices. The changes in crop and livestock distribution are charted, first by using Weaver's crop combination method, then by the more sophisticated use of Principal Components Analysis, which reveals some of the most important regional distributions in Britain and their changes. British farmers responded in various ways to the falling cereal prices of the late nineteenth century. Two of the most interesting were the growing importance of dairying and horticulture, and Dr Robinson devotes two useful chapters to the growth of these enterprises, with particular reference to their location. His chapter on horticulture benefits from his own work in the Vale of Evesham. A final chapter on agricultural decision-making completes that part of the book that deals with the period before the 1930s. In this he deals not with trends or forces but the activities of individual landlords and farmers, particularly those in the claylands, that part of the country which suffered most from depression. The Guy's Hospital Estates and those of the Duke of Sutherland are dealt with.

The rest of the book deals with the period from the 1930s to the 1980s. Here of course, government policy comes centre of the stage, and an account of legislation from the 1940s to CAP is given. But in addition, an attempt is made to show how government policies, particularly in the post-war period, have affected different parts of the country and there is a valuable account of the Less Favoured Areas policy. Diffusion theory, to which agricultural geographers have perhaps paid too much attention, is used to inform short studies of the spread of sugar-beet, maize and oilseed-rape. A useful chapter on the marketing of agricultural produce – with particularly interesting material on Pick Your Own marketing – is followed by a section on decision-making among hop farmers.

Geographers will find many parts of this book useful in teaching courses on the historical geography of British agriculture. Agricultural historians will probably find the methodology of most interest. There is an excellent bibliography, an abundance of illustrations, and an appendix detailing the statistical analyses used in the text.

DAVID B GRIGG

H F MARKS, edited by D K BRITTON, *A Hundred Years of British Food and Farming. A Statistical Survey*. Taylor and Francis, 1988. xiv + 275 pp. £40.

This volume was produced for British Food and Farming Year. It comes with a letter from the Duke of Edinburgh as patron of the event and an advertisement from the NFU Mutual Insurance Society as a major sponsor and insurer to the exhibition. The object of the volume, according to the author's and editor's preface, is to update the MAFF 1968 publication *A Century of Agricultural Statistics* and to widen its scope.

The 1968 publication cost 17*s* 6*d* equivalent to £5.80 at 1989 prices. Its successor thus is almost seven times as expensive in real terms. It would have cost the average farmer in 1968 between 2 and 3 per cent of a week's income to acquire the MAFF publication. Today's farmer would need to spend over 30 per cent of his or her week's income to acquire the present work. These calculations are made from data provided in the volume. There are no figures available to perform a similar calculation for the average agricultural historian but we may presume that such a person would equally notice that the tools of the trade were getting more expensive.

For the historian of British agriculture in the late nineteenth and twentieth centuries *A Century of Agricultural Statistics* is a valuable source. It brings together the main official series in an easily accessible form, provides the necessary information on the sources and their pitfalls and in addition provides a sound, if inevitably unexciting, commentary on the major trends and features that are revealed.

In updating these series the volume under review is performing a useful service. It is useful also to have the data converted to modern units of measurement: decimal currency, tonnes and hectares from £ *s d*, hundredweights and acres. It does not wholly replace the previous publication since, presumably for reasons of space, only a selection of nineteenth- and early twentieth-century observations are given in some cases. A more serious limitation, indeed a defect, is that for some series only a selection of observations for the 1960s and 1970s is presented so that the user has to go to the original sources in any event to complete the data set. Thus the Corn Returns Prices, one of the longest complete economic time series in

existence. The *Century* gives data from 1777 to 1966. The present volume contrives to omit observations for 1967–9, 1971, 1973–4 and 1976–9. Numbers of tractors is another example. The *Century* gives biennial observations from 1946 to 1966. The present volume presents a series with a variable period, rendering it useless for any econometric work. Some of the years chosen are ones omitted from the *Century*!

The scope is widened by the provision of material that is mainstream but was not available for the earlier volume. The volume also incorporates material for areas that were outside the scope of the previous work and additional analyses of the previous material. There is a substantial amount of financial material derived from the Annual Review and its successor and from the MAFF Departmental Net Income Calculation. In collecting this together the volume performs its most valuable service. The scope is extended to forestry and to household expenditure on food. It is useful to have this material brought together but the user would have to return to the original sources for explanatory notes since what is given here is sparse. Thus on woodland on agricultural holdings one is told that 'The statistics need to be interpreted with caution'. Well, yes – all government statistics should carry a health warning – but it would be nice to know a little more. The major innovation lies in the tables giving all the financial data at 1986 prices. This is useful but the deflators used should have appeared in an appendix.

Where the volume is really deficient is on the commentary that accompanies the data. The format of a series of short laconic paragraphs is irritating and much better use could have been made of the space. But above all the wealth of detailed comment in the *Century* is missing. The general summary of the period given in the introduction is bland and brief to the point of banality. Some of the comments in the similar section labelled 'Major Statistical Trends', are confusing if not misleading. The author and editor have done themselves less than justice here. At root the trouble is a lack of clear idea of audience. Is this an expensive glossy for the general public, a serious academic work of the genre of Mitchell and Deane, or a semi-official pot-boiler? One might have expected the text, given the stated objective, to have taken the story forward beyond the *Century* and to have modified the text of the *Century* in the light of the longer perspective now available. If that was the author's intention it has not been carried out.

The volume of material gathered together means that the book is certainly worth a place on the shelf. But the academic market warranted a cheaper and less glossy product with more words per page. Something in fact closer in appearance and content to *A Century of Agricultural Statistics*.

JOHN BOWERS

MARK CLEARY, *Peasants, politicians and producers: the organisation of agriculture in France since 1918*, CUP, 1989. x + 209 pp. 23 figs. £25.

French farmers have often been characterized as highly independent and individualistic, and yet France boasts one of the most intricate and powerful networks of cooperative organizations in Western Europe. As readers of this journal will recall, Dr Cleary is no stranger to this paradox, having published in its pages a study of peasant unions in south-west France and a most helpful review and bibliography of French agrarian history since 1750. Drawing inspiration from such scholars as Barral, Mendras and Tavernier, his present monograph focuses on the varied character, aims and achievements of farmers' associations, and analyses evidence from fieldwork and archival work conducted over the past ten years in seven carefully selected regions which include Aquitaine, the Massif Central, Brittany and the eastern Paris Basin.

After an examination of broad trends in rural demography, landownership and technical modernization, a suite of chronological chapters explores the changing character and influence of cooperatives, syndicates and farming associations during the past hundred years. Conflict between church and state was instrumental in shaping some organizations before 1914, while others were pragmatic groupings concerned with loans and mutual aid. Once the trauma of the Great War and the pain of recovery were over, agrarian syndicates experienced a decade of mounting influence, being encouraged by the state and by producers of market-orientated goods such as wheat, sugar beet and wine. During the depressed 1930s corporatist philosophy was used as a means of regulating the nation's remarkably large and internally diverse farming profession. This approach was enhanced under the Vichy regime as the virtues of the family and of peasant life and the advantages of forward-looking rural associations were extolled by Pétain and Caziot. With peace restored, the cooperative sector was enlarged to embrace both production and marketing of farm goods. In addition, the challenge of promoting the life chances and living standards of rural dwellers was grasped by farmers' associations, of which the Jeunesse agricole catholique, with its emphasis on education, was the most influential. A complex array of agricultural legislation in the early 1960s set an official seal on 'la révolution silencieuse' in the French countryside. However, decades of hope and a goodly measure of solid achievement were soon followed by disillusionment as reduced public expenditure on farming, growing

'mountains' and 'lakes' of surplus foodstuffs, and increasing intervention by the Common Market ensured that agricultural prosperity could not be taken for granted. By virtue of their long-established importance, farmers' associations continue to remain in the forefront of economic and social policy making in France.

To my mind Dr Cleary's carefully written study has two overwhelming merits. The first is a clear and penetrating understanding of the political economy of French agriculture and especially of the evolving relationship between family farmers and the central state over the past one hundred years. Throughout the discussion agricultural change is related to the gradual transformation of French capitalism. Agricultural modernization is shown to be shaped as much by political and ideological decisions as by the march of technology and changing farm structures. The second merit is a facility to complement generalization and necessary quantification with an excellent selection of case studies to reveal the aspirations and frustrations of farmers at many positions along the political spectrum and working in agricultural situations as diverse as the vineyards of Languedoc, the high pastures of the Massif Central and the rich arable fields of Aisne. Carefully reported interviews with veteran activists and studies of agricultural labourers and farming women are particularly illuminating. Two dozen maps and diagrams, a review of sources consulted in provincial archives, and a comprehensive bibliography complete this monograph which will appeal to geographers anxious to trace the context of current debates regarding the future of the European countryside, to sociologists keen to appreciate the tension between the desire for self-reliance and the necessity for cooperation to ensure economic survival, and to historians wishing to explore the complex presence of the past in the present.

HUGH CLOUT

YVONNE JACOBSON, *Passing Farms, Enduring Values: California's Santa Clara Valley*, William Kaufmann, Los Altos, Ca, (UK distrib, W H Freeman, Oxford), 1984. 240 pp. Illus. £43.95.

This is the history of a Californian landscape the Santa Clara Valley, centered on San Jose. The author, daughter of one of the Valley's orchardists, surveys its development from the oak-covered plain of hunter-gatherer Indians to an area dedicated to high technology industry and its concomitant highways and parking lots, low-cost housing and suburban shopping centres. In between these two eras in its growth the land saw the Spanish colonization of the mission period, the rancho system of the Californios under an independent Mexico, the grain cultivation of the first US settlers and, most significantly, its transformation into one of the greatest fruit-growing areas of the continent. The Santa Clara Valley became the world's largest centre for the canning of fresh fruit and the processing of dried fruit, the dried prune being its most famous product, but also specializing in apricots, cherries and pears. At the peak of production in the 1920s, 125 square miles of orchard with eight million trees, 'the largest orchard the world has ever seen' blossomed every springtime on either side of the old Spanish royal highway, El Camino Real. Forty canneries and thirty packing houses processed the Valley's output for national and international markets.

Sixty years later about 8000 acres of orchards remained. From small beginnings in aerodynamic research and development in the 1940s to missile and space programmes based on that key component of modern high technology industry, the semiconductor, the Valley gave birth to a new electronic age. For the Santa Clara Valley is Silicon Valley. The 156 square miles of the Valley floor, 32 per cent of which was classified by the USDA as Class 1 agricultural land, containing up to forty feet of alluvial top soil a million years in the making, has almost vanished under concrete, tarmac and suburban lawns.

The author has produced a very well illustrated and readable history of the beginning of fruit culture in the Valley, the role of the small family farms and their labour force, the changes in horticultural techniques and the processing and marketing of the produce. The result is a most evocative account both of a lost landscape and its rich products and of the community which worked it, living in settlements with names like Paradise, Edenvale and Sunnyvale, described by Walter Stegner in his foreward as an almost ideal Jeffersonian agrarian democracy: 'what was once as wholesome, prosperous, and egalitarian a community as the imperfect human race is ever likely to produce.' It is difficult not to share the author's eloquently expressed regret that the 'Valley of Heart's Delight' has evolved into 'the heart of Silicon Valley'.

JOHN S CREASEY

agricultural history



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PART II

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Garden Seeds in England before the Late Eighteenth Century: II. The Trade in Seeds to 1760
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Garden seeds in England before the late eighteenth century – II, The Trade in Seeds to 1760

By MALCOLM THICK

Abstract
Steady expansion in the garden seed trade throughout the period was caused by a similar increase in commercial and private gardening. In the sixteenth century, seed retailing failed to provide both the quantity and quality of garden seeds demanded. Specialist seedshops gradually developed in London in the seventeenth century and two shops are examined in some detail. Seed selling between the late seventeenth century and 1760 is discussed against a background of the rapid development of consumer goods and services at the time. The role of fashion and taste in shaping demand for garden seeds and their advertisement via the press, catalogues, books, pamphlets, and flysheets is described. The conclusion is drawn that garden seed retailing had a significant influence on the development of gardening and agriculture at this time.

THE GROWTH and development of the garden seed trade in the seventeenth and eighteenth centuries was the result of a continuous expansion in demand for seeds. Both commercial and private gardening was on the increase throughout the period. Writers in the middle of the seventeenth century, such as Samuel Hartlib, looked back on burgeoning commercial gardening in southern England since 1600; John Worlidge in the 1670s thought both commercial and private gardening had much increased in recent years, whilst Richard Bradley estimated that market gardens around London had expanded elevenfold to 110,000 acres between the 1660s and 1723.[1]

The physical expansion of gardening was accompanied, especially in the eighteenth century, by a sharp rise in the number of plants cultivated. Most new garden plants came from abroad, and although many may have initially been introduced by planthunters, botanists, and enthusiastic amateurs, numerous gardeners first came across them in the catalogues of seedsmen and nurserymen. Philip Miller, in the introduction to the fourteenth edition of his *Gardeners Kalendar* in 1765 (the first was published in 1731) explained that 'In each of the editions subsequent to the first, there have been such alterations and additions made, as were necessary to include such new plants as have been annually introduced into the English Gardens.'[2]

Frequent complaints, especially before the eighteenth century, of seed shortages and lack of opportunities to buy garden seeds indicate that seed sellers did not for many years cope with expanding demand: Richard Gardiner in 1599 thought 'the dearth of Seedes for Gardens is a great hindrance to the profit of Gardens, and a great losse to the common wealth'. From the end of the seventeenth century however, the trade went through a period of development as a growing number of seedsmen sold their wares by more sophisticated methods. The London seed shops formed a small part of the 'retailing revolution' of the eighteenth century about which much has recently been written. This paper will first examine the seed trade before the last quarter

[1] Richard Bradley, *A General Treatise of Husbandry and Gardening*, 1726, I, p 273; John Worlidge, *Systema Horticulturae*, 1677, p 175.

[2] John Harvey, *Early Nurserymen*, 1974, p 128; Philip Miller, *The Gardeners Kalendar*, 1765, p vi.

of the seventeenth century and then trace the later development of the trade against the background of the general changes taking place in retailing.[3]

I

The previous article put forward evidence that a rudimentary trade in some garden seeds operated before 1500. In the fifteenth century, provincial mercers imported seeds, such as the Salisbury merchant who brought in onion seed through the port of Southampton in 1451. Grocers and general shopkeepers in London and the provinces kept some garden seeds in stock, and seeds were probably to be found in the packs of pedlars who wandered the countryside and congregated, to the dismay of the London authorities, at Cheapside and Cornhill.[4]

At the end of the sixteenth century these pedlars had a reputation for selling seeds of questionable quality. Sir Hugh Plat wrote in 1596 of a wasted year growing asparagus because he was

> abused in the seeds, which is an ordinary practice these days, with all such as follow that way, either to deliver the seeds which they sell mingled with such as are old and withered, or else without any mingling at all to sell such as are stark naught. I would there were some fit punishment devised for these petit cosenors, by whose means many poor men in England do oftentimes lose, not onely the charge of their seed, but the whole use & benefit of their ground, after they have bestowed the best part of their wealth upon it. Cheapside is full of these lying and forswearing Huswives.[5]

Three years later Richard Gardiner was even more outraged in his condemnation of 'those which bee comon sellers of Garden seedes. I cannot omitte nor spare my minde, concerning the great and abhominble falsehoode of those sortes of people which sell Garden seedes: consider thus much, admit that all those which be decieved in thys land yearly in buying of olde and dead seedes for their gardens, had made their accompts of their losses: first their money paide for false and counterfeit seedes, their great losses in manuring and trimming their Gardens, and the rents paide for Gardens throughout this land; then consider how many thousand poundes are robbed yeerely from the common wealth by those Catterpillers'. Gardiner's reliance on pedlars in provincial Shrewsbury is understandable, but that Plat should buy from them in London suggests that reputable merchants selling seeds in the capital were few and street sellers were the usual retailers. The London merchants who did sell seeds were by no means seed specialists: garden seeds (mostly imported) were just a small part of their businesses.[6]

No doubt many garden seeds were sold locally by market gardeners with surplus stocks, although few would have been as commercially minded as Richard Gardiner who included a price list in his 1599 pamphlet on vegetable and seed growing, offering vegetable seeds retail and also wholesale – 'if any person desire to buy any store of principall carret seedes . . . to sell for reason to others, to benefit the commonwealth, I am willing to serve his turne better cheape then before is declared.'[7]

Although an increasing number of merchants selling garden seeds in London in the seventeenth century can be identified from surviving records, especially seed catalogues, the organization of the retail trade in seeds continued as before.[8] Seed merchants were still non-specialists: a London grocer was involved in court action over seeds sold

[3] Richard Gardiner, *Profitable instructions for the manuring, sowing, and planting of kitchen gardens*, 1599; Harvey, *op cit* p 70; N McKendrick, J Brewer, J H Plumb, *The Birth of a Consumer Society*, 1982.

[4] Malcolm Thick, 'Garden seeds in England before the late eighteenth century – I, seed growing', *Ag Hist Rev*, XXXVIII, I, 1990. E Power and M M Postan, ed, *Studies in English Trade in the Fifteenth Century*, 1933, vi, 'The Grocers of London, A Study of Distributive Trade', S Thrupp, pp 281, 283, 291.

[5] Sir Hugh Plat, *The second part of the Garden of Eden*, 1675, p 130.

[6] R Gardiner, *op cit*; Barbara Winchester, *Tudor Family Portrait*, 1955, pp 116–7; Brien Dietz, ed, *The Port and Trade of London: Documents*, London Rec Soc, 1972, pp 63, 78.

[7] Gardiner, *op cit*.

[8] The most comprehensive work on seed catalogues is to be found in J Harvey, *Early Gardening Catalogues*, 1972, and *idem*, *Early Horticultural Catalogues*, 1973.

by him to other merchants in 1619, John Winthrop bought seeds for the New World from another grocer in Lombard Street in 1631, and druggists retailed seeds to provincial customers in 1649 and 1652. Shops selling seeds were, however, well known in London by mid-century: Walter Blithe mentions them in 1653 and Robert Sharrock found cabbage seed growers regularly supplying 'the Shops in London' in 1660.[9]

Buying from these London seedsmen, as from all London retailers, was a slow business, either a list of requirements was sent, in the hope that the seeds could be supplied, or the customer had to travel to the capital and shop in person. In the winter of 1648/9 Theophilus, gardener to Lord Petrie at Ingatestone in Essex, went to London and spent some days going between different seedsmen and nurserymen buying seeds and plants and arranging for package and delivery back to Essex. Trade was seasonal. Seeds were harvested late in the year and sold in winter and early spring for the new season's planting. The nobility and gentry, or their gardeners, who visited London seedsmen personally did so in the winter months during the social 'season'.[10]

II

The survival of inventories of two London seedsmen, Thomas Browne and John Reynolds, taken in 1652 and 1673 respectively, enables us to see into the shops and homes of these two individuals not long before many London retailers began to adopt new selling techniques. The inventories detail businesses which were going concerns: Browne's goods were listed as part of an action for debt and although Reynolds' goods were appraised after his death, he died only four years after finishing his apprenticeship, leaving a young child – indications that his death was not preceded by a slow decline into old age. Both men lived and worked in multi-storied houses with businesses carried on from shops on the ground floors. Browne's address is unknown: Reynolds lived in the Old Jewry, a fashionable area of central London.[11]

The bulk of trading stock was kept on the ground floor behind the counters in both shops, although Browne also had some seeds in an attic. Seeds were stored in sacks and bags; Browne's appraisers came across thirty bags full of seeds in one part of his shop, and a further eighteen in another. He had empty onion seed bags of various sizes, 13 half-hundred bags, 20 quarter-hundred bags, and 30 small onion bags; perhaps he sold the seed in bulk in such bags. (The full range of Reynolds' stock can be seen in the appendix.)

The total amount of stock on hand which had to be financed depended on the size of a business and the time of the year. Arthur Clephane, an Edinburgh seedsman in the first decade of the eighteenth century, spent somewhere between £420 and £540 in a year on purchases. John Reynolds' stock was valued at about £42 but this was in early April, towards the end of the main seed selling period of winter and spring.[12]

Some seeds, such as peas and beans were sold by dry measure and Reynolds had a full set: bushel, ½ bushel, peck, ½ peck, quart, and two ½ quarts. Both men had considerable quantities of weighing equipment; large beams with leaden weights for

[9] Harvey, *Early Nurserymen*, p 4; ERO, D/DP/A171; Corporation of London RO, Mayors Court Interrogatories, MC6/389 a&b; PRO, Req 2 308/8; Walter Blith, *English Improver Improved*, 1653, p 179; Robert Sharrock, *The History of the Propagation and Improvement of Vegetables*, Oxford, 1660, p 33.

[10] ERO, D/DP/A171; M De la Quintiney, *The Complete Gardener*, translated by G London and H Wise, 1719, p ii, Stephen Switzer, *The Country Gentleman's Companion*, 1732, p ix; F J Fisher, 'The development of London as a centre for conspicuous consumption in the sixteenth and seventeenth centuries', *T RHS*, 4th series, XXX, 1948, 43.

[11] CLRO, Orphan's Inventories, Box II, Common Serjeant's Book II, fol 325b; CLRO, Mayors Court Original Bills, 89, 159; M J Power, 'The social topography of Restoration London', in A L Beier and Roger Finlay, ed, *The making of the Metropolis, London 1500–1700*, 1986, pp 200–201.

[12] T Donnelly, 'Arthur Clephane, Edinburgh Merchant and Seedsman', *Ag Hist Rev*, XVII, 12, 1970.

amounts up to one hundredweight, smaller copper scales (counter scales) for, say, two or three pounds of seeds, and fine scales with brass pans and weights for fine and expensive seeds where half an ounce or so might only be sold at a time. On Browne's counter rested his record books, the most important of which listed his customers' outstanding accounts. From Reynolds' customers' account book his appraisers extracted an alphabetical list of his debtors.

On the customers' side of the counter and on the stall in front of the shop, seeds were displayed in small barrels and boxes from which customers were served. Browne had 23 boxes and 18 small barrels for display whilst Reynolds had 3 boxes, 1 vat and 3 half-vats, and 36 small barrels. For keeping very fine seeds and flower seeds both seedsmen were equipped with flower boxes and nests of boxes, ie miniature chests of drawers. Purchases were packed in bags if large, or, to be sent some distance, sealed with leaden seals. Browne had four reams of foolscap paper and thread for wrapping smaller items. Reynolds sold only seeds but Browne could also supply garden spades, hoes, coal and tobacco, the latter displayed in two large glass jars on the counter. Neither sold any plants or tree stocks unless such items, being perishable, were not valued by the appraisers.

The shops, with their counters, display boards, tubs and boxes, probably attracted many cash customers who, because they generated no bills or correspondence, cannot now be identified. Reynolds did, however, have many credit customers. Some were commercial gardeners or nurserymen. An Essex gardener who was himself a seedseller owed him £4 3*s* 11*d*; the well-known nurseryman Captain Leonard Gurl owed £10; and two kitchen gardeners from the Neat House gardens in Westminster owed £1 10*s* and £5 3*s* 4*d* respectively. The remaining 116 debtors mostly owed between £1 and £10. The majority were gentry, styled 'Mr' or 'Mrs' in the ledger.[13]

In common with other shopkeepers, seedsmen had to finance the many debts owed to them by customers. When John Reynolds died in 1673 he was owed a total of £784 9*s* 7*d*, over fourteen times the valuation of his stock and shopfittings. To provide sufficient capital to give credit as well as purchase stocks and cover fixed and running costs, seedsmen themselves had to become debtors. Credit might come from suppliers: the Edinburgh seedsman and general shopkeeper Arthur Clephane offered to pay a London merchant in 1705 as follows, 'I will send you a bill for one half, as for the other you must allow me four months credit until I get my money from the country'. John Reynolds partially financed his debtors by himself borrowing £400 on bond from two lenders. Thomas Browne was taken to court in 1652 for non-payment of a debt of £200; probably he too had borrowed pending payment of his bills.[14]

The inventories of the private goods of the two households do not disclose luxury, but some degree of domestic comfort. Browne's kitchen was well stocked with pewter and iron ware, there were five leather chairs in one bedroom, and window curtains, books, carpets, a round table and a looking glass in what was probably the parlour. Reynolds lived and traded from a three-storey house, with at least five private rooms.

III

John Harvey, basing his comments on surviving printed trade catalogues, estimated there to have been only three major seed firms in London in 1688. In 1730 he

[13] John Harvey, 'Leonard Gurle's nurseries and some others', *Garden History*, III, 3, 1975; F W Steer, *Farm and Cottage Inventories of Mid-Essex, 1635–1749*, Chelmsford, 1969, p 144; Westminster City Library, 1049/10/Box1/3.

[14] Donnelly, *op cit.*

thought there were five such London firms, with at least a dozen in 1760, and thirty-five by the 1780s. Harvey may have understated the number of seventeenth-century firms because many, like Browne and Reynolds, issued no catalogues, although John Beale's rhetorical question in 1677 'Where are the Seeds and Seeds-men?', does suggest that such traders were few. As the eighteenth century progressed and catalogues, trade-cards, and other forms of advertising were increasingly used by seedsmen, Harvey's figures are likely to be accurate. A marked increase in specialized London firms may have occurred not long before 1760 for, in 1747, the trade was still said to be 'in few hands'.[15]

The growth in the specialized garden seed trade was paralleled by that of the associated trades of nurseryman, garden designer, and employed gardener. By the second half of the eighteenth century most provincial towns had at least one general seed, nursery-ware, and garden equipment shop and many also had general nurseries. The London suburbs by this time could boast of many large, comprehensive nurseries as well as specialist firms concentrating on just some of the increasing range of flowers, shrubs, and trees in cultivation. Throughout the eighteenth century general shops in small towns and pedlars in the countryside would have continued to sell a few garden seeds.[16]

According to Richard Campbell's *London Tradesman*, describing the economic characteristics of all trades in London at the time, in 1747 'The Seed-Shopkeeper sells all manner of Grass Seeds, Gardener's Tools, Matts, &c and some of them are Nursery-Men, and furnish Gentlemen with young Trees, both Fruit and Forest, with Flower-Roots, &c. It is a very profitable Branch'. Campbell estimated the capital required to set up as a seedsman at between £100 and £500, making the typical mid-eighteenth-century seed firm of a size similar to that of Reynolds' and Browne's businesses in the previous century.[17]

As Campbell recognized, the distinction between seedsman and nurseryman, became, in terms of retail sales, increasingly blurred in the eighteenth century as seedsmen sold seeds to nursery gardeners and nurserymen in turn sold plants and trees wholesale to seedsmen. Such an interchange allowed both traders to offer a wider range of goods to customers, although encroachment into each other's trades could lead to friction. The leading nurserymen George London and Henry Wise acidly remarked on 'Gentlemen coming to London at the Seasons of Planting, and observing often that Bundles of Trees are standing at the Seed-Mens Shops, or at least meeting with some of their printed Catalogues, in which they make large Offers of the Sale of all their Sorts of Fruit trees, Ever-greens, Flowering Shrubs, and Roots; but with what Certainty any one may depend upon the Truth of what is offered, or what Reason they should have to buy of them rather than of the Gardener, we leave them to judge; knowing very well that none of those grow in their Shops.' The garden designer and nurseryman Stephen Switzer was unpopular with established seedsman when he entered the trade in the 1720s.[18]

The growth of commercial enterprises of all sorts associated with gardening formed a small part of the general increase in, and development of, retailing and consumer services in the eighteenth century which was at the heart of what has been called 'The Birth of a Consumer society'.[19] These changes, present to a smaller extent in the late seventeenth century as consumer

[15] Harvey, *Early Nurserymen*, pp 5–7, 70; Richard Campbell, *The London Tradesman*, 1747, p 275.
[16] Harvey, *Early Nurserymen*, pp 90–106, 196–8; N McKendrick, J Brewer, and J H Plumb, *Consumer Society*, p 325.
[17] Campbell, *op cit*, pp 275, 339.
[18] Campbell, *op cit*, p 275; Harvey, *Early Gardening Catalogues*, 1972, p 29; De la Quintiney, *Complete Gardener*, p ii; Switzer, *op cit*, p x.
[19] The arguments in this and the subsequent paragraph are gleaned from the collection of stimulating articles which form McKendrick, *et al*, *Consumer Society*, 1982, where the topic is examined in depth.

expenditure in England increased, accelerated in the eighteenth century as a number of favourable economic and social conditions interacted: good harvests lowered food prices and provided more households with money to spend on other things; a larger proportion of wages paid in cash, longer working hours, and more work for women and children gave households more disposable income; prosperity in the higher ranks of society encouraged conspicuous consumption; a flexible class structure allowed people to rise up the social scale as they acquired wealth and encouraged social emulation via goods and services; and London, with its large and rapidly growing population of all social classes, acted as a centre for the sale and consumption of goods and services as well as an advertisement to the whole country of the latest novelties on offer.

Above all, the consumer society which emerged in the eighteenth century was shaped by the changing attitudes towards consumption of many people in England. Goods previously regarded by those with limited means as necessities to be purchased once in a lifetime (or even inherited), became subject to fashion and taste, discarded periodically for new models. The mass of the population, if they could afford it, aped fashions adopted by the rich, and all classes of society were increasingly willing to buy new goods, as well as new varieties of familiar commodities. Eventually there developed a general expectation that new things would constantly appear for sale (even when, in the case of new breeds of animal and plant, such novelty posed ethical and theological problems). The period saw, in short, the emergence of *fashion* as an engine for sustaining consumer demand and stimulating its growth. Seedsmen in London and elsewhere were but a small part of this changing world of buying and selling but they did, both in their responses to new demands and (of equal importance) in encouraging new fashions in gardening, play their part in the general picture.

Growing numbers of seedsmen, nurserymen, gardeners and garden designers served a continuously expanding demand from market gardeners and private pleasure gardeners. Following an estimated elevenfold increase in commercial garden acreage around London between the 1660s and 1720s, market gardening continued to expand during the eighteenth century near the capital and many other towns. Private gardens, much in fashion with the nobility after the Restoration, received further encouragement with the arrival of William III, a monarch who remodelled many royal gardens and whose enthusiasm helped to engender a fashion amongst the Whig oligarchy for large, ostentatious gardens. The taste for gardens had already spread down the social scale by the 1670s when there was 'scarce a cottage in most southern parts of England, but hath its proportionate garden, so great a delight do most men take in it'. John Lawrence wrote in 1717 of 'Gardening being of late Years become the general Delight and Entertainment of the Nobility and Gentry, as well as the Clergy of this Nation' and grumbled at the expense of some new gardens. Lawrence's book was aimed at the clergy and other gentlemen of modest means 'not to make them envy'd by Magnificence, but to make them happy, by loving an innocent Diversion'. Looking back in 1765, Philip Miller thought, 'The improvements which have been made in the art of Gardening, within fifty years past, are very great; so that we may without presumption affirm, that every part of this art is in as great perfection at this time in England, as in any part of Europe', and an early nineteenth-century historian believed that the previously slow development of gardening 'burst forth in all splendour during the eighteenth century. Never did circumstances more successfully combine for the improvement of any art, than they did for the promotion of Horticulture'. J H

Plumb has concluded that, by the second half of the eighteenth century, 'Tens of thousands of men and women, probably hundreds of thousands, were actively concerned in horticulture, eager for novelty and determined on improvement.'[20]

The increasing role of fashion in gardening was noticed by the shrewd observer of social change Bernard Mandeville who wrote in 1723, 'The many ways of laying out a Garden Judiciously are almost Innumerable, and what is call'd Beautiful in them varies according to the different Tastes of Nations and Ages. In Grass Plats, Knots and Parterr's a great diversity of Forms is generally agreeable'. Modest amateur gardeners who delighted in perfecting a narrow range of 'florists flowers' were also slaves to fashion: Mandeville observed 'How Whimsical is the florist in his Choice! Sometimes the Tulip, sometimes the Auricula, and at other times the Carnation shall engross his Esteem, and every Year a new Flower in his Judgement beats all the old ones, tho' it is much inferior to them both in Colour and Shape.' In response to this desire for novelty thousands of new plants were introduced into English gardens from abroad and many new varieties were bred. Philip Miller in 1765 thought the number of 'exotick trees, shrubs, and plants which have been brought into England within a half century past . . . nearly equal to those before known here'. The total number of plants cultivated in England is estimated to have risen from about 200 in the mid-sixteenth century to 18,000 in 1839.[21]

In responding to, and shaping, the developing demands for seeds, a most practical and important innovation employed by seedsmen (and nurserymen) was the printed seed catalogue. The earliest printed lists date from the 1670s and are single, broadside sheets, headed with the name and address of the seedsman. Seeds and plants for sale are set out in categories which, John Harvey has shown, follow a pattern established by garden writers as far back as 1500 and continued into the nineteenth century. The list of Edward Fuller, seedsman in the Strand in the 1680s, for example, is divided as follows: 'Seeds of Roots, Sallad-Seeds, Pot-herb Seeds, Sweet-herb Seeds, Physical Seeds, Flower-Seeds, Seeds of Ever-green and Flowering Trees, Sorts of Peas, Beans, etc, Seeds to improve Land, Flower Roots, Sorts of choice Trees and Plants'. At the foot of the broadsheet 'Spades, Rakes, Hoes, Reels, Lines, Sheers, Wyre Sieves, Bass Matts, and Melon-Glasses' were advertised, together with 'all sorts of Fruit-Trees, and Ever-greens; and . . . Artichokes, Liquorice, Colyflower, Cabbage, and Tarragon Plants'. This list indicates the extent to which a seedsman, operating from a shop in the Strand with no garden ground of his own, could supply plant roots bought in from nurserymen and reminds us that, as well as garden seeds, seedsmen also supplied medicinal seeds and seeds 'to Improve Land' such as clover, trefoil, sainfoin, and french furze.[22]

With time, catalogues became more elaborate and, as more seeds were advertised, larger. The broadside was superseded by the pamphlet, the earliest examples of which are from the 1720s. Not until the final quarter of the eighteenth century were prices printed in the lists and their function before that time was twofold – as an *aide-mémoire* to customers when compiling seed orders (the frequency with which catalogues are found within estate archives seems to indicate that they were kept for several years by customers until succeeded by new

[20] Malcolm Thick, 'Market Gardening in England and Wales', in J Thirsk, ed, *Agrarian History of England and Wales*, V, ii, Cambridge 1985, pp 507–8; Bradley *op cit*, p 273; Harvey, Early Nurserymen, p 75; Worlidge, *op cit*, p 175; J Lawrence, *The Clergy-Mans Recreation*, 1717, pp A3–A4; Philip Miller, *Gardeners Kalendar*, 1765 p vi; G W Johnson, *A History of English Gardening*, 1829, p 147; McKendrick *et al*, *Consumer Society*, p 326.

[21] Bernard Mandeville, *A search into the nature of society*, ed Philip Harth, 1989, pp 332–3; McKendrick *et al*, *Consumer Society*, p 326; Miller, *op cit*, p vii.

[22] Harvey, *Early Gardening Catalogues*, pp 18–19; Kent AO, U269, E 21.

editions) and as a general advertisement of the range of wares on offer to the public. Seedsmen and nurserymen elaborated on the catalogue as advertisement. In 1730 Robert Furber, a Kensington nurseryman, issued a catalogue in the form of twelve plates, 'Twelve Months of Flowers', each an engraving by a Flemish artist of a vase of seasonal blooms. Every flower was numbered with a key on each plate to allow the customer to order seeds or bulbs of the bloom required. Furber later produced a similar series on seasonal fruits. The sets of flower plates were sold at £1 5*s* plain and £2 12*s* 6*d* coloured, by subscription, with the subscribers' names engraved on a thirteenth plate, which included a dedication to the Prince of Wales and the Princess Royal. These engravings not only informed customers of Furber's stock: their sale brought profit to him and the artists who produced them. They enhanced the nurseryman's prestige, both by linking him with works of art and the Royal Family, and by persuading customers that they were in distinguished company. Pirate editions of the engravings provided further 'free' advertising.[23]

A further elaboration on the catalogue was the publication of short books of instruction on gardening by seedsmen and nurserymen which included, or were arranged around, their catalogues. Furber was also early in this field with 'A short introduction to gardening' published in 1733. Stephen Switzer, a leading self-publicist amongst the London seedsmen, produced a collection of pamphlets which ran through several editions and included 'The most expeditious Manner of raising and Propagating Foreign Sallads . . . Italian Brocoli, Spanish Cardoon, Celeriac, Finochi, &c', 'The great Improvement of Land by Grass Seeds', and, at the end, a complete catalogue of his seeds with brief sowing instructions. The first of these pamphlets was essentially a 'puff' to encourage the sale of some imported, (and probably expensive) seeds, to show 'how much these and many other Plants that grow in a Garden contribute to the making a good Dinner; how much, if moderately us'd, to Life and Pleasure itself'. The grass seeds pamphlet was one of a number issued by seedsmen to instruct farmers in such crops. Making sure the customers knew how to raise their seeds was essential to a seedsman's continuing business, for if seeds came to naught because of bad husbandry the seedsman often got the blame.[24]

A complicated web of mutual benefit could surround self-publicity books. 'The Complete seedsman: shewing, the best and easiest method for raising and cultivating every sort of seed . . . To which is added, a catalogue of the seeds, plants, etc, mentioned in this tract, and to be found in a seedsman's shop', was first published as an 84-page pamphlet in 1726. Its authorship was ascribed to Benjamin Townsend, an employee of the nurseryman Benjamin Whitmill, and the seeds in the catalogue could be purchased from the seedshop of Arabella Fuller in the Strand, who also sold the book. It was 'Recommended by R. Bradley' who appeared as the author of a second edition in 1738. In that edition the bookseller, writing that Bradley had revised the text, explained that Bradley was the real author 'the name of Mr Townsend, a gardener, being only put in to it by the author to do him a service, by bringing him into business'. Both men were dead by 1738, and the truth may be that Townsend *was* the author, the bookseller using the well known Professor Bradley's name to revitalize sales of the new edition.[25]

Seed catalogues were printed in some

[23] Harvey, *Early Gardening Catalogues*, p 15; Blanche Henrey, *British Botanical and Horticultural Literature before 1800*, 1975, II, pp 343–7.

[24] *Ibid*, II, p 346. Switzer, *op cit*.

[25] Henrey, *op cit*, II, pp 341–2.

books on gardening not directly financed by seedsmen, and favourable mentions by authors of particular seedsmen and nurserymen appeared in the text. The 1688 edition of John Worlidge's *Systema Horticulturae* contained a nurseryman's catalogue as well as those of three London seedsmen. Richard Bradley was particularly free with his commendations in print of nurserymen and seedsmen and members of those trades sometimes helped authors: ten well-known nurserymen and gardeners signed a statement in the front of Philip Miller's *Gardeners and florists dictionary* of 1724 asserting that it was 'highly useful and necessary for all lovers of gardening'.[26]

Newspapers carried advertisements for garden seeds and, although seedsmen were not as ingenious in their use of this medium as some other traders, they were quick to advertise in it. A political parody in the form of a seedsman's advertisement in 1681 suggests that they were by then commonplace in the press: as with all good parodies, it encapsulates the style of the early advertisements,

> If any Protestant Dissenter desire this Spring-time to be furnished with Sedition-Seeds, or the True Protestant Rue, which they call the Herb of Grace, or any hopefull Plants of Rebellion let them repair to these famous French Gardiners, Monsieur F. Smith, Msr L. Curtis, and Msr B. Harris, where they may have not only of all kinds which grew in the Garden of the Late Keepers of the Liberty of England; but much new variety raised by the Art and Industry of the said Gardeners, with directions in print when to sow them, and how to cultivate them when they are raised. You may also have there either green or pickled Sallets of Rumors and Reports far more grateful to your Palate or over a Glass of Wine, then your French Champignons, or mushrooms, Popish Olives, or Eastland Gerkins.[27]

The preoccupation in the eighteenth-century seed trade with novelty is clear in a newspaper advertisement from the *Evening Post* of 24 February 1722:

> Just Imported
>
> A Fresh Parcel of fine Tuberose Roots, Cork Tree, and Ever-Green Oak Acorns; with above two hundred Curious sorts of Exotick Flower Seeds and Roots: Likewise all other Sorts of Garden and Grass Seeds for Improvement of Land. Sold by Tho. Overton at the Harrow against Middle Row in Hoborn, at reasonable Rates. N.B. Any Person in the Country directing as above, may have them sent by any Coach or Carrier they please.

Stephen Switzer was always keen to find new seeds from abroad to tempt his customers. He regularly dealt with 'a Gentleman in the City, who has long been a great Importer of all curious Seeds' who obtained seeds from Alexandria. Switzer also had a network of agents looking out exotic seeds for him: a Venetian sea captain brought him beans and he acquired 'Murcian Kele' (a type of broccoli) in 1728 'from the Revd Mr Sims, the Chaplain to the British Factory' in Portugal.[28]

The relatively small number of full-time seedsman in London before 1760, each selling a wide range of garden seeds, faced what was close to perfect competition, one with another. Advertising in print was one way of securing a share of the market, another was to have a shop in a part of the capital frequented by the gentry; seed shops in the eighteenth century were to be found in the Strand, Pall Mall, the New Exchange, and like that of Stephen Switzer, in the extremely fashionable Westminster Hall.[29]

In view of the competition it was essential for a London seedsman to protect his reputation to maintain customer loyalty. Reputation rested primarily on seed quality, a shaky foundation because many seeds were not found to be bad until, many months after purchase, they failed to germinate in customers' gardens, leaving the customer with much wasted effort and the seedsman

[26] Henrey, *op cit*, II, pp 319, 320, 339; Bradley, *op cit*, II, pp 5, 93, 127, 154, 220.

[27] *Heraculitus Ridens: A Dialogue between Jest and Earnest, concerning the Times*, Tues, February 15, 1681.

[28] Switzer, *op cit*, pp vi, 19, 21.

[29] Switzer, *op cit*, title page, p x; Henrey, *op cit*, II, pp 341, 359, 376–7.

as an obvious target for his wrath. Stephen Switzer was very particular over his reputation, explaining at some length in print in 1728 his side of a story put around to discredit him. He in turn sought to sow doubts about his competitors, writing that he could not say that 'some of them do not knowingly and willfully sell those Commodities that they are sure will not grow'. This accusation prompted further 'ill Will . . . against me by some of my Brother Seedsmen' which could not have been lessened by a renewed attack on most of his competitors who he had 'but little Acquaintance with' knowing them only 'by their printed Bills and the Imperfections with which they abound'.[30]

Aware of the damage to business poor quality seed could cause, Switzer sought to stave off criticism by telling his customers of the many reasons why seeds failed which were outside a seedsman's control. Imported seeds were a particular problem. Switzer complained about Italian broccoli seed: 'The greatest Difficulty that attends this Affair in the getting Seeds from abroad, is, the great Cheat that those People, who gather it on the Sea-side, put upon the merchant, and consequently upon us here . . . so little Faith is to be found amongst those Collectors of Seeds, who no doubt think it no Sin to cheat Hereticks'. Switzer thought foreign seed could also fail because it was old, having been too long on the journey to England. Other reasons for bad seed of which a seedsman might be innocent were: seeds not fully ripened in a bad year; seed growers piling 'hot' seeds such as onion in too large a pile to dry, causing fermentation; seeds incorrectly sown by customers which consequently would not germinate; and failure to germinate due to adverse soil or weather conditions. He also claimed that some head gardeners, resenting their masters' buying seeds on their behalf rather than leaving it to them, in revenge deliberately sowed their own inferior seed, and blamed their masters' seedsmen. Switzer assured his customers that he never engaged 'in the buying and selling that which I certainly knew was not good' and 'whenever I have had the least occasion of distrusting the Goodness of the Commodities I have told Gentlemen, and have publish'd Advertisements of it, as soon as I have made discovery of it.[31]

IV

Seed-selling was only a minute segment of the retail trade in London and other major towns by the 1760s. It had, however, an importance belying mere size. The rapid expansion of market gardening, particularly for vegetables, in England throughout the seventeenth and early eighteenth centuries required ever increasing amounts of seed. For a gardener to save his own seed was time-consuming, labour-intensive, and technically difficult. By obviating this task seedsmen facilitated the growth of commercial gardening. What was difficult for the commercial gardeners was doubly so for most private gardeners with limited skill and time. The numerous works on gardening published in the eighteenth century, many of them quite cheap books giving basic instructions for the amateur, testify both to the growing demand for seeds from the public and to the growing importance of gardening as a leisure activity and as a source of fresh, home-produced food. Grand gardens designed and constructed in the period required seeds, plants, and trees on demand on a scale hitherto not seen. Much of a seedsman's trade, however, came from people with small gardens and few horticultural skills. Seeds, small and relatively cheap, costing many customers but a few shillings a year, nevertheless underpinned much useful and pleasurable activity.[32]

[30] Switzer, *op cit*, pp ix, 52.

[31] Switzer, *op cit*, pp 2, 48–52.

[32] Henrey, *op cit*, II, pp 631 et seq; Lorna Weatherill, *Consumer Behaviour and Material Culture in Britain, 1660–1760*, 1988, pp 116, 124, 129.

Garden seed selling had some influence on agriculture as a whole. The passion for new flowers and vegetables encouraged plant breeding: peas were a speciality of a Bedfordshire gardener who gave his name to several varieties, and others bred new varieties of flowers. The leading London nurseryman Thomas Fairchild did pioneering work on hybridization of flowers although, when he successfully crossed a sweet william with a carnation in 1717, he had moral scruples about tampering with nature. By the end of the century, flower breeding had become both a commercial enterprise and an absorbing hobby.[33]

'Seeds to improve land' – clover, trefoil, sainfoin, lucerne, ryegrass, french furze, flax, and many more as the period progressed, were included in most printed seed catalogues from the 1670s having been available from London seedsmen by the middle of the seventeenth century. From the 1670s seedsmen commonly gave away free with each order of these seeds a 'paper of directions' giving brief instructions on cultivation. It is reasonable to suppose that some gentlemen first came into contact with these field crops by going to a seedsman for garden seeds or receiving by post a new edition of a catalogue. The printed directions bolstered the confidence of uncertain innovators and, like trade cards and other printed ephemera produced by seedsmen, advertised the business. It would be rash to hazard a guess as to how many acres of clover or sainfoin were sown because of a visit to a seedsman for garden seeds but it is certain that some farmers had little more than a seedsman's 'paper of directions' or brief instructions in a seedsman's advertisement to guide them when they first tried such crops.[34]

For many gentlemen the seeds of new varieties of garden vegetables and fruit were as much 'improvement' seeds as those of new grasses and legumes. After the Restoration, gentlemen increasingly began exploiting their gardens not only to provide food for their families, but also as a source of profit, selling produce to others who had developed a palate for new and delicate fruit and vegetables. The flow of new seeds from seedsmen helped to sustain this remunerative sideline.[35]

Some garden vegetables were tried in fields for animal fodder. The turnip was the most successful of these transplants, shifting in men's minds in the first half of the eighteenth century from a garden to a field crop. Carrots and cabbages followed the turnip more cautiously into the fields aided, no doubt, by the availability of seeds and advice from seedsmen. The richest gentlemen who interested themselves in agricultural improvement had access to books and to the wisdom of others, gleaned from social contact and travel, and had the resources to proceed by trial and error. Less wealthy men must have valued the counsel of a growing number of seedsmen, whether obtained first hand in their shops; from their catalogues, flysheets and books; or as individual notes written with batches of seeds dispatched to country customers. Seedsmen, like nurserymen and gardeners, had a store of practical advice which it was in their commercial interest to share with their customers.[36]

Appendix

Seeds in John Reynolds' shop on 2 April 1673

Garden Vegetable Seeds

46 [lb?]	onion
7 bu	spinach
13 bu	radish

[33] Harvey, *Early Nurserymen*, pp 76, 81–82; Ruth Duthie, *Florists' Flowers and Societies*, 1988; McKendrick *et al*, *Consumer Society*, pp 323–5.

[34] Malcolm Thick, *op cit*, *AHEW*, V, ii, p 530; Frank V Emery, 'The Mechanics of Innovation: Clover Cultivation in Wales before 1750', *Jnl Hist Geog*, II, I, 1976, 39–40.

[35] Joan Thirsk, 'Agricultural Innovations and their Diffusion', *AHEW*, V, ii, pp 562, 568–71, 580.

[36] David Hey, 'Yorkshire and Lancashire', *AHEW*, V, i, p 81; Thick, *op cit*, *AHEW*, V, ii, p 532; Thirsk, *op cit*, *AHEW*.

9 lb	lettuce
2 cwt	carrot
1 cwt	cabbage
12 bu	turnip
97 lb	cucumber
53 lb	endive
36 lb	sorrel
5 lb	cauliflower
40 lb	beet
1 bu	peas
6 lb	languedeboef
1 [bush?]	muskmelon
2 lb	succory [chicory]
2 bu	kidney beans
6 lb	cress
36 lb	leek

Culinary Herb and Medicinal Seeds

3 bu	caraway
6 lb	sweet marjoram
60 lb	coriander
1 bu	fennel
70 lb	pot marjoram
1 bu	parsley
48lb	dill
42 lb	scurvey grass
1 bu	mustard seed
70 lb	gromwell
50 lb	bugloss
1 lb	thyme
22 lb	clary

Seeds 'to improve Land'

½bu	flax
2 bu	cinquefoil
3 bu	canary seed
30 lb	burr

Trees

3 pecks	juniper berries
½bu	fir & pine apples
2 lb	cypress

Flowers

30 lb	poppy
3 lb	stock gilleyflower

And, 'Divers small quantities of fine seeds and flower seeds'

Notes on Contributors

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DR GAVIN BOWIE works for Hampshire Museums, and is responsible for a lively community museum in the town of Eastleigh. He began agricultural history research in 1978, initially to meet the needs of the Hampshire Farm Museum project, and largely prompted by the lack of reliable secondary source material on which to base museum displays and interpretation. Since 1982 he has researched changes in English chalkland farming, *c.*1600–1850, largely as a spare-time activity, and has had two papers on the subject published in the *Review* in recent years.

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(continued on page 148)

Northern Wolds and Wessex Downlands: Contrasts in Sheep Husbandry and Farming Practice, 1770–1850

By G G S BOWIE

Abstract

Two separate and distinct farming systems developed on the chalk wolds of Lincolnshire and east Yorkshire, and the downlands of South Wiltshire, East Dorset, Berkshire and Hampshire during the French Revolutionary Wars period and in the years immediately afterwards. This is rather surprising in view of the broad similarity of the 'sheep and corn' systems practised in the two areas before about 1770, the relatively minor differences in geology and climate, and the general availability of information about innovatory farming practices at the time. The characteristics of a high-input system of farming which developed on the northern wolds, and a low-input one which evolved on the Wessex downlands, are defined. The link between the high-input system and High Farming is described, as is the efficiency of the low-input system in giving farmers an acceptable income with rather less capital outlay and running costs.

BETWEEN 1843 and 1852 agriculturalists Phillip Pusey, John Clarke and James Caird noted that, whilst most of the wolds of Lincolnshire and east Yorkshire had been converted into arable fields upon which crop rotations had been established, major parts of the downland of south central England remained as sheep walk.[1] This is indicative of two separate and distinct farming systems which developed on the northern wolds and Wessex downlands during the period of the French Revolutionary Wars, and in the years immediately afterwards. In view of the broad similarity of the 'sheep and corn' systems practised in the two areas before about 1770, and the general availability of information about innovatory farming practices at the time, this is rather surprising.[2]

This article will explain the major differences between the two systems, and suggest that the major factors in determining the changes were the radically different demands put on them and the consequent different needs to which they responded. More specifically, though the market demands for cereals were roughly similar, those for sheep meat and wool were not. Improved sheep breeds were introduced on the northern wolds breeds to meet the requirements of the 'great body' of consumers in the expanding east midlands and west Yorkshire industrial areas: a fat carcase for 'the mechanic or labourer who had a large family to support', and a heavy fleece to provide the woollen mills of west

[1] The 'northern wolds' refers to the chalk wolds of Lincolnshire and east Yorkshire, and includes the 'heath and cliff' land to the west of these wolds, which shared a similar pattern of change and growth; the 'Wessex downlands' are the downs of South Wiltshire, East Dorset, Berkshire and Hampshire; P Pusey, 'On the Agricultural Improvements of Lincolnshire', *Journal of the Royal Agricultural Society of England* (JRASE), IV, 1843, p 298; J A Clarke, 'The Farming of Lincolnshire', *JRASE*, XII, 1851, p 330; J Caird, *English Agriculture in 1850–51*, 1852, p 310. The author is grateful for advice from B Afton, D Agerskow, and Alan Harris in the preparation of this paper.

[2] Caird, op cit, p 59; E L Jones, 'Eighteenth Century Changes in Hampshire Chalkland Farming', *Ag Hist Rev*, VIII, 1960, p 5; G G S Bowie, 'New Sheep for Old – Changes in Sheep Farming in Hampshire, 1792–1879', *Ag Hist Rev*, 35, pt 1, 1987, p 18; Wm Marshall, *The Rural Economy of the Southern Counties*, ii, 1798, pp 330–31. Sheep were the most important livestock during this period, as cattle were not significant in Wessex downland farming until after 1850, and only beginning to be important on the northern wolds in the eighteen forties – G Legard, 'The Farming of the East Riding of Yorkshire', *JRASE*, IX, pp 112, 115; Clarke, loc cit, pp 389–90; Caird, op cit, p 59; Alan Harris, *The Rural Landscape of the East Riding of Yorkshire, 1700–1850*, 1961, p 104.

Yorkshire with the type of longwool they wanted.[3]

However, these new wold flocks required an improved highly capitalized, high-input arable farming system which was created and sustained by the proximity of such rapidly developing markets.[4] On the other hand, the markets of the south were for the most part established, and the farmers of the Wessex downlands did not have the advantage of such a growing industrial urban market. Instead a breed of sheep was wanted which optimized existing aspects of an efficient but low-input system. Because no such sheep existed, breeders in the area developed one which suited the needs of the mixed downland farm. It was this rather than intensive arable cultivation which attracted the capital expenditure on Wessex downland farming.[5]

I

By 1850 there were completely different breeds of sheep in each area. The major changes on the Lincolnshire and Yorkshire wolds took place between about 1770 and 1830. The native slow-growing shortwool breed on the upper wolds by 1812 was 'chiefly confined to the few remaining open field townships'. These, and the Old Lincoln and Holderness longwools found on the lower wolds which were more suited to the adjacent lowland pasture, became extinct, and were replaced with flocks of Improved Lincolns on the Lincolnshire uplands, and Improved Leicesters on the Yorkshire wolds. Both breeds had a major common New Leicester longwool ancestry, which matured more rapidly and fattened more readily than other longwool breeds.[6] However, it was short-legged, carried a heavy fleece, and was unsuited to travelling much further each day than from one enclosed arable field to the next.[7]

The translation of such a breed onto the wolds of northern England, some parts of which were very bleak and inhospitable, should be regarded as a remarkable achievement, for to thrive there it had to be as well fed and managed as the sheep which Bakewell and others had bred to suit the rich pastures of the east Midlands.[8] Efforts on the Wessex downlands at the turn of the century to introduce the New Leicester, and the numerous Leicester crosses that were attempted, failed as such sheep were unsuited to the daily walking required, and were considered unable to thrive on the forage available.[9] This illustrates the different expectations of farmers in the two regions. In Wessex a sheep was required to meet the needs of farmers who had little incentive to alter their agricultural practices, the majority of them regarding their flocks principally as manure carriers, travelling daily between pasture and arable land – 'of the different manures used, the sheepfold

[3] Caird, op cit, p 49; E L Jones, 'The Changing Basis of English Agricultural Prosperity, 1853–73', *Ag Hist Rev*, X, 1962, 226–7; Bowie, loc cit, 20.

[4] J Donaldson, *General View of the Agriculture of Northamptonshire*, 1794, p 57; G Culley, *Observations on Livestock*, 4th ed, 1807, pp 106–8; A Roland, *Stock Keeping and Cattle Rearing*, 1893, p 171.

[5] 'On the Preparation of Live-Stock and Meat', *Quarterly Journal of Agriculture* (QJA), VIII, 1838, p 90; G E Mingay, ed, *The Agrarian History of England and Wales*, VI, Cambridge, 1989, pp 12, 191–4, 287.

[6] Wm Marshall, *The Rural Economy of Yorkshire*, II, 1788, pp 257, 259; A Young, *General View of the Agriculture of Lincolnshire*, 1799, pp 310–11; H E Strickland, *General View of the Agriculture of the East Riding of Yorkshire*, pp 31, 89–90, 231–34; J Thirsk, *English Peasant Farming*, 1957, p 257; R Trow-Smith, *A History of British Livestock Husbandry, 1700–1900*, 1959, pp 62–3; Alan Harris, *The Open Fields of East Yorkshire*, East Yorks Loc Hist Soc (EYLHS), 1959 (reprinted 1981), pp 14,19; J A Perkins, *Sheep Farming in Eighteenth and Nineteenth Century Lincolnshire*, Occasional Papers in Lincolnshire History and Archaeology, 4, 1977, pp 40, 47–9; G E Mingay, 'The East Midlands', Joan Thirsk, ed, *The Agrarian History of England and Wales*, V, i, 1984, p 101.

[7] Wm Marshall, *The Rural Economy of the Midland Counties*, i, 1790, p 410; *The Complete Grazier*, 1805, pp 152–53; *An Encyclopedia of Agriculture*, J C Loudon, ed, 1825, p 1007.

[8] W Pitt, *General View of the Agriculture of Northamptonshire*, 1809, p 206; Trow-Smith, op cit, p 66; D Grigg, *The Agricultural Revolution in South Lincolnshire*, 1966, pp 57, 150.

[9] C Vancouver, *General View of the Agriculture of Hampshire*, 1910, pp 365–66; T Davis, *General View of the Agriculture of Wiltshire*, 1811, pp 159–60; T Rowlandson, 'On the Breeds of Sheep best adapted to different Localities', *JRASE*, X, 1849, p 432. Note also the close correlation between the diffusion of New Leicester flocks, enclosure and turnip cultivation in northern Oxfordshire at this time – J R Walton, 'The diffusion of improved sheep breeds in eighteenth and nineteenth century Oxfordshire', *Jour of Hist Geog*, 9, no 2, 1983, p 181.

stands first'.[10] Although all but one of the native Wessex downland breeds had died out by the 1830s, they were not replaced by a longwool sheep. Instead the replacement was another shortwool which was still hardy and well able to 'travel'. It could also be stocked more intensively, was a more economical feeder, and more docile than the native breeds.[11] Cross-breds between the Southdown and the existing breeds evolved, which were larger than the Southdown and specifically adapted to the Wessex downlands. These were variously known as Hampshire West Country and West Down sheep.[12]

For most of the eighteenth century, flock management on the Wessex downlands and on the northern wolds had an emphasis on wether flocks kept on open fields by 'common' shepherds, and culling surplus lambs at Michaelmas, but there were important changes in both areas after about 1770.[13] There was a significant improvement in turnover on the Wessex downlands during the Revolutionary War, where wether flocks were being replaced by breeding flocks. The old wether sheep, which had normally been killed out at 4–6 years, had little place in breeding flock systems, and instead wethers were now being slaughtered at 2–3 years old.[14] Also, a new system of flock management, the Hampshire Custom, evolved which aimed to avoid overwintering even the wether lambs on the farm in order to devote the winter feed to the breeding ewes of the flock. Its most important feature was a rapid turnover of lambs, involving lambing in January–February; pushing the lambs forward from the end of March with an intensive feeding regime based on the early grass 'bite' from watermeadows; and selling them in the late summer or early autumn, retaining only a few rams and the ewe lambs needed to maintain the breeding flock. This development, unlike the traditional practice of autumn culling with its emphasis on the disposal of surplus wether and ewe lambs with little expectation of much financial return, was principally concerned with sending wether lambs to market in a forward condition, where they would normally realize a reasonable profit.[15]

Norfolk husbandry in the strict sense was not generally adopted on the Wessex downlands during this period. Instead, there was a fairly ubiquitous five-course rotation, with wheat followed by barley or oats, a two-year ley, and a winter and summer fallow. The two-year ley was innovative. Such a 'five-field' rotation was proposed for the farms in hand on a progressive Hampshire downland estate in 1755 where, because of the need to restore soil fertility, there was an emphasis on growing sheep food rather than cereals. Arthur Young described the country between Salisbury and Romsey, and Alresford and Alton, as generally enclosed and being farmed with this five-course in the late 1760s. Charles Vancouver described it as normal on many parts of the Hampshire downs in the early years of the nineteenth century, and John Wilkinson looked upon it as prevalent on

[10] E Little, 'The Farming of Wiltshire', *JRASE*, V, 1845, p 168; J Bravendar, 'On the Advantages or Disadvantages of Breaking up Grass Lands', *JRASE*, VII, 1846, pp 161–162; E P Squarey, 'The Hill Farming of Wiltshire and Hampshire', *JB&W*, IX, pt 1, 1861, pp 67–8; J Darby, 'Farming on the Chalk Soils of Dorset', *JB&W*, IX, 1861, p 57.

[11] Wm Marshall, *The Review and Abstracts of the County Reports to the Board of Agriculture*, 1818, p 347; Bowie, loc cit, p 17.

[12] *British Husbandry*, III, 1840, p 15; J Wrightson, *Sheep Breeds and Management, Livestock Handbook No 1*, 1895, pp 54–55.

[13] Jones, 1960, *loc cit*, p 5; Davis, *op cit*, pp 68, 110, 155–58; Harris, 1959, *op cit*, p 25.

[14] Davis, op cit, p 207. Note the wether flocks described on a progressive Hampshire down estate in 1755–56 – Russell MSS, Hampshire Record Office (HRO) TD 159 R4/6039, 6063. Wm Humphrey, 'A West Country Down Ram . . .', *Farmer's Magazine*, ser 3, XXI, Feb 1862, p 99; E P Squarey, 'A short account of the Hampshire or West Country Down Sheep', *JB&W*, ser 3, I, pt 1, 1869, p 50.

[15] Bowie, pp 20, 22 and PRO, IR 18 8949, 8984, 9142. Breeding flocks practising the Hampshire custom had come to characterize the Hampshire downs by the late eighteen thirties; L H Ruegg, 'The Farming of Dorset', *JRASE*, XV, 1854, p 404; J Darby, 'The Breeds of Sheep . . . in the South and West of England', *JB&W*, ser 3, III, 1871, pp 70, 75–76, 77–78. Note also the evidence for a major increase in root crop production on the Hampshire chalklands between about 1850 and 1870 in Raine Morgan, 'The Root Crop in English Agriculture, 1650–1870', unpub PhD thesis, Univ of Reading, 1978, pp 136, 270.

the Hampshire and Wiltshire downs until the 1850s. Although there were an infinite number of 'variations and permutations' of this rotation, only one had a distinct root break, where it was placed between the two grain crops.[16]

There was an emphasis on grass, clover, and hay crops on the Wessex downlands. The crop returns of 1801 for three parishes on the Hampshire downs are unusual in providing information on grasses, and give some idea of the importance of short-term leys in the downland farming system. At Bentworth there were over 1600 acres of cereals, 100 acres of turnips, and about 600 acres of 'clovers, sainfoin and artificial grasses'; whilst at North Waltham there were 1500 arable acres of which 30 were occupied by peas, 100 by turnips/rape, 400 were in a 2-year clover ley, and two hundred acres in fallow. Similarly, at Martyr Worthy there were about 1600 acres with 526 acres of cereals and 80 acres of turnips, and the rest of the arable acreage was in grass, clover and sainfoin leys and fallows.[17]

The cultivation of sainfoin was important in most parts of the Wessex downlands. A sainfoin ley might be left down for the period of a rotation, and the land then returned to the normal rotation of the farm. This was generally five or six years, or even as much as ten years. Sometimes it was simply left until worn out. It was usually cut for hay early in the ley, and the aftermath was looked upon as invaluable for 'finishing' lambs for the autumn markets. If carefully managed, lightly pastured, and top dressed each February-March after the third year with ashes manure (potash), such a ley might be maintained for a number of years, but under normal circumstances, without using fertilizers, the sainfoin plant began to die out after about four years. Grasses and weeds took over in the sainfoin ley that consequently was treated as pasture until it was necessary or convenient for the farmer to break it up. An old sainfoin ley was normally ended with paring and burning, which provided potash, and also a clean and pest-free seed bed for the subsequent crop. The sainfoin provided nitrogen, which continued to build up in the soil even when the ley had degenerated into pasture. It is not surprising that contemporaries considered it 'impossible for the farmer to proceed on a more economical plan for importing and retaining fertility' on his arable land.[18] This may be contrasted with the situation on the northern wolds where, at the turn of the century, the crop was widely cultivated, but by the 1840s was not much grown. In 1848 George Legard made the point that, when winter provender was a matter of anxious consideration for the wold farmer, sainfoin hay had been important, but that once turnip husbandry became reliable it had lost its original value.[19]

The thousands of acres of watermeadows in the river valleys of the chalk uplands were also important for Wessex downland farming. They came into general use in Wiltshire during the first third of the seventeenth century, and were constructed after about 1650 in Hampshire, Dorset and

[16] Russell MSS, HRO TD 159 R4/6039 f 19; HRO 18M64, box 22, Broome Farm Account Book, 1814–17, where rotations given for every field; A Young, *Six Weeks Tour Through the Southern Counties of England*, 1768, pp 168, 176; Vancouver, op cit, p 139; J Wilkinson, 'The Farming of Hampshire', *JRASE*, XXII, 1861, pp 291–2; R A Pelham, 'The Agricultural Revolution in Hampshire with Special Reference to the Acreage Returns of 1801', *Procs Hampshire Field Club*, XVIII, pt 2, 1953, p 146.

[17] Michael Turner, *Home Office Acreage Returns (HO67) List & Analysis*, pt 1, Bedfordshire-Isle of Wight, 1801, vol 189, 1982, pp 73–92, 197–218.

[18] E.g. PRO, IR 18 8912, Bramdean, Hants, 1839, where 'About one seventh of the arable lands [was] in sainfoin, and the rest cultivated in five field'; W Stevenson, *General View of the Agriculture of Dorset*, 1812, p 190; Reading Univ Lib (RUL), WIL, P 713, Farm account book of Aldbourne Farm, Wiltshire, 1836–40; Little, loc cit, pp 163–64, 169, 173; Caird, op cit, pp 33–34; J Wilson, *Our Farm Crops*, ii, 1860, pp 157–9; Wilkinson, op cit, pp 293–95; *A Cyclopedia of Agriculture*, II, J G Morton, ed, pp 781–82; J Clarke, 'On the Advantages and Disadvantages of Breaking up Grass Land', *JRASE*, VII, 1846, p 510; PRO, IR 18 8933, Catherington, Hants, 1841 – 'where sainfoin is sown it is not ploughed up as long as it will produce a crop'.

[19] Young, 1799, op cit, pp 58, 166–9, 422; Hull Univ Lib (HUL), DDSY 101/66, letters from George Britton to Sir Christopher Sykes, 3 March, 21 July, 18 and 25 August 1799, show the importance of the sainfoin hay crop on the home farm, Sledmere; Strickland, *op cit*, pp 145–47; Legard, loc cit, pp 118–19.

Berkshire. By the mid-eighteenth century they were ubiquitous, with little suitable land remaining on which they could be made.[20] Watermeadows remained important until well after 1850 for three reasons. First, the hay crop made in July provided downland flocks with much-needed winter feed – 'if it be winter, they are served with watermeadow hay night and morning'. Moreover, this hay crop was more reliable than that made from ordinary dry meadows, where yields fell dramatically in a spring drought. Secondly, the 'aftergrass' or aftermath was also valuable, and could be fed off with wether lambs that were being finished for the autumn markets.[21] Thirdly, and perhaps most importantly, watermeadows provided a grass crop about six weeks ahead of that obtainable from ordinary dry meadows. On the wolds, farmers grew, with varying success, increasing acreages of late turnips and swedes in an attempt to fill the 'hungry gap' in keep between the latter end of March and the beginning of May. However, in Wessex late root crops were to be found 'only where water meadows were lacking', and the latter provided a reliable early spring 'bite' just when it was needed for the new crop of lambs. The 'couples', pastured on the watermeadows during the day, and then walked to, and folded on, arable fallow land at night, were in turn used as dung carriers. Stocking was intensive, at about five hundred couples per acre per night, which consolidated the seedbed and provided nitrogen for the following crop, generally barley. Hence the pasture of the day was converted into fertilizer at night.[22]

[20] Eric Kerridge, 'The floating of the Wiltshire watermeadows', *Wilts Arch & Nat Hist Mag*, LV, no 1966, 1953, 109–15; Marshall, 1818, *op cit*, pp 201, 375; Wilkinson, loc cit, p 254; G G S Bowie, 'Watermeadows in Wessex: a re-evaluation for the period 1640–1850', *Ag Hist Rev* 35, pt 2, 1987, pp 152–53.

[21] Eric Kerridge, *The Agricultural Revolution*, 1967, p 259; *The Annual Hampshire Repository*, I, Winchester, 1799, p 72; J Wimpey, *Rural Improvements . . .*, 1775, p 107; Wilkinson, loc cit, pp 289–90.

[22] Vancouver, op cit, pp 133, 176–7; Wm Smith, *Observations on the Utility, Form and Management of Watermeadows*, Norwich, 1806, pp 30–31; A Young, *Annals of Agriculture*, XXIII, 1795 pp 265–66.

The idea that, 'according to the quality of the soil, the situation and lay-out of the farm, and the personal opinion of the farmer', there was a choice on the Wessex downlands between down pasture, watermeadows, and sainfoin, and that with a combination of any two of these sources of grazing and hay, it was 'possible to dispense with the third', is essentially correct.[23] However, there still tended to be shortages of winter feed on the downs, particularly in years when the hay crop from dry meadows was poor or failed, and then it was necessary to revert to the traditional practice of 'agisting' the chilver (ewe) lambs of flocks between November and April on nearby lowland pasture and vale.[24]

II

There was a similar shift in emphasis from wether to breeding flocks on the northern wolds at this time. On the Yorkshire Wolds, George Britton, Sir Christopher Sykes's steward at Sledmere, noted this in terms of a change in the proportion of the different kinds of sheep kept in local flocks. The proportion had been 'about one-third each' of ewes, hogs and wethers, the hogs being ewes and wether lambs up to the first shearing, and the wethers shearling and older wethers, but during 1798–9 farmers changed to selling shearling wethers, which 'paid better', sold off their older wethers, and bought a greater proportion of ewes to maintain stock numbers.[25]

However, other developments on the northern wolds were substantially different. Essential to these was the Improved Lincoln/Leicester's ability to mature rapidly. The wethers of the new breeds were ready

[23] M C Naish, 'The Agricultural Landscape of the Hampshire Chalklands, 1700–1840', unpub MA thesis, Univ of London, 1960, pp 361–2. Sainfoin was grown generally on the Wessex downlands except for Dorset – this can probably be explained by the high proportion of permanent downland pasture on the latter downs – Kain, *op cit*, maps 267 and 8, p 576.

[24] *Brit Hus*, III, op cit, pp 12, 18.

[25] HUL, DDSY 101/66, op cit.

for the butcher at 'two shear', or about 27-months old, whereas those of the Old Wold breed and the old native longwools required between 39-months and 5 years.[26] Also, although turnip cultivation during this period was fairly rudimentary, and mainly dependent upon paring and burning 'maiden wold', old pasture and leys, it nonetheless offered a new source of winter feed that was sufficient to allow farmers to increase their stock of sheep on the wolds.[27] This helps to explain why, in about 1780, Lincolnshire wold farmers started to buy or rent lowland pasture, marsh or meadow, to the east of the wolds: by the end of the eighteenth century a system evolved in which the young wethers spent their first winter folded on turnips on the wolds, were grazed on the lowland pasture during spring and summer and then at Michaelmas, when about eighteen months old, sold to 'butchers, and other graziers, to carry on'.[28] The next refinement in flock management on the northern wolds was the provision of spring and summer feed on the arable fields, and a system incorporating this had been established on the Yorkshire wolds by 1812. Here the wether lambs of the Improved Leicesters were weaned in late July, put on pasture or aftermath, then fed on turnips during the autumn and winter, and finally put on arable seeds for the spring and summer. The shearling wethers were normally sold at Market Weighton Fair at the end of September, most of the buyers being 'jobbers' from the West Riding of Yorkshire who drove them home, and fattened and killed them the next spring.[29]

Whereas turnips came into general use as a field crop on the northern wolds in the late eighteenth century, they were less important on the Wessex downlands. Turnips are distinguished from rape in the 1801 returns from ten Wiltshire down parishes, the average percentage of turnips to the enumerated crops being 7.3 per cent, and on the Hampshire downs there are sixteen parishes, the average being 11 per cent. In comparison nine such parishes on the east Yorkshire wolds average 17.5 per cent, and the figures for the Lincolnshire wolds, though less easy to analyse, indicate an average of at least 20 per cent. In east Yorkshire the returns for the parish of North Newbold were claimed to be 'strictly accurate' at 21 per cent, and though Hutton Cranswick was much lower than the rest at 3 per cent, the actual crop was said to be 'very good'. A factor which helped this shift to turnip husbandry was that, in general, the loess or glacial drift overlays covering many parts of the northern wolds were superior in depth, workability and natural fertility to the thin 'hungry' soils of the Wessex chalk uplands. In practical farming terms this meant that there were many more acres suitable for growing roots on the northern wolds.[30]

The main problem was that the northern wold version of the sheep and corn system did not, of itself, provide sufficient manure or plant nutrients to sustain the desired farm outputs, and chalk soils were often deficient in the phosphates needed for the cultivation of reliable, high-yielding root crops. This was reflected in the way some wold soils were cropped to exhaustion at the latter end of the French Wars, and prompted northern wold farmers to tackle the problem. They

[26] A Young, *Northern Tour*, II, 1770, p 79; Young, 1799, *op cit*, pp 310, 317; Grigg, *op cit*, p 57; Perkins, *op cit*, p 44.

[27] Perkins, *op cit*, p 33; Young, 1799, *op cit*, pp 115, 136–8, 184, 249, 259, 315, 329; T Stone, *A Review of the Agricultural Survey of Lincolnshire by Arthur Young, Esq.*, 1800, p 372.

[28] Lincolnshire Record Office (LRO), Dixon 4/2, Small account book of Thomas Dixon, 1769–98, p 45 – in November 1773 232 'hogs [were] put into winter quarters upon turnips'; 4/1 ff 103–04 – carr and marsh land rented for extra pasture in 1782 and 83; Grigg, *op cit*, pp 55, 79–80 – the coastal counties dead and livestock returns of 1798 show these changes on the 'heath' of South Lincolnshire. Thirsk, *op cit*, pp 150–151, 177 and Mingay, 1984, *loc cit*, p 105, provide an alternative hypothesis, suggesting rather an early eighteenth-century date for the general introduction of turnips as a field crop on the Lincolnshire Wolds.

[29] Strickland, *op cit*, pp 235–8.

[30] Turner, *op cit*, pt 2, vol 190, Jersey-Somerset, 1982, Lincolnshire-Lindsey Division, pp 84–119; ibid, pt 3, vol 195, Staffordshire – Yorkshire, 1983, pp 115–133; PRO, HO 67 24 ff 21, 239, 275; L Dudley Stamp, ed, *The Land of Britain, South-Western England*, IX, pt 89, 'Hampshire', 1940, p 357.

did this by using the 'artificial' fertilizer, bone manure.[31] Indeed, bone manure may be said to have been the foundation of the startling growth of agricultural output on the northern wolds, a growth which was proceeding vigorously in the years 1815 to 1835.[32] There was a staggering increase in the tonnage of bones imported into England, mainly through the port of Hull. Between 1823 and 1824 alone, there was an increase amounting to just under 300 per cent, which again doubled in 1825.[33] It is also clear that this development actually began during the Wars when several very intelligent farmers from Lincolnshire were successfully using bone manure on their farms. By 1815 their value had already been ascertained by a 'pretty extensive experience of their effects . . . on the wolds in Lincolnshire, and in the East and West Riding of Yorkshire'.[34]

III

However, not only were ever-increasing tonnages of bone manure being purchased by northern wold farmers to promote the reliable growth of their turnip crops, but the bones themselves came to be used more efficiently as a fertilizer. During the later years of the French Wars, the recommended application rate was 60–70 bushels of crushed bones sown broadcast, but during the 1820s an application rate of 12–16 bushels per acre, ground into dust and drilled in at the same time as the turnip seed, became general on the northern wolds. Here a combined drill was used where the seed and fertilizer were put into separate hoppers.[35] The realization that the finer the bones were crushed, and the closer the dust was placed to the seed, the more rapidly bones acted as a fertilizer, was critical. It meant that even the most remote fields from the farmyard could now be profitably manured, as one four-horse wagon load carried sufficient phosphate fertilizer to manure 7–8 acres of ground.[36] The northern wold system was successful because bone dust, turnips and sheep were 'all best suited for the same kind of soil'. Moreover, the value of bone manure was reckoned to depend on the turnip crop itself, the feeding on the ground by sheep, fully supporting the fertility of lightland soils during the course of crop rotations.[37]

A leading progressive farmer on the north Lincolnshire wolds was Thomas John Dixon of Holton Hall. He bought the machinery necessary for this new system of farming in 1820–23, including a 'fixed' (stationary) bone mill, a rather better portable bone mill, and three drill machines by Hornsby of Grantham for sowing turnips. For the season of 1824 he bought over 2500 bushels of bones, had them ground into dust in his portable mill, and, during late June and early July, organized turnip drilling on about 190 acres at '12 bushels bones per acre'. His major wold neighbours were also evidently buying large quantities of bones annually as the portable bone mill, and its crew of 6–7 men, was hired to them for a

[31] Clarke, 1851, *loc cit*, p 396; Pusey, *loc cit*, p 300.

[32] Mingay, 1989, *op cit*, pp 278–81; F M L Thompson, 'The Second Agricultural Revolution, 1850–80', *Econ Hist Rev*, 2nd ser, XXI, 1968, 68; Grigg, *op cit*, pp 49, 148; *British Sessional Papers*, House of Commons (*BSP*), Agricultural Distress, 1837, V, Q 3545; RUL, LIN P 323/1, farm account book, Nocton Rise, Lincoln, 1826–46, where there were regular annual purchases of bone manure even on a fairly small stock farm.

[33] *British State Papers* (*BSP*), 1836, *op cit*, VIII, pt 1, appendix 3.

[34] *Supplement to Encyclopedia Britannica*, 1815, pp 147–8, Watson, 'On Bone Manure . . .', *Quarterly Journal of Agriculture* (*QJA*), 1, May 1828–Aug 1829, pp 40–2; for the origins of bone manure see Alan Harris, 'Bones for the Land', *Bulletin of the East Yorkshire Local History Society*, no 31, Spring 1985, pp 8–11.

[35] Strickland, *op cit*, p 211; Watson, *loc cit*, p 41; Anon., 'On Bone Manure', *QJA*, 2, Nov 1829–Feb 1831, p 108; *Brit Hus*, I, 1834, p 397.

[36] Legard, *loc cit*, pp 105, 110; Pusey, *loc cit*, p 300; *BSP*, 1836, *op cit*, QQ 5887–88; PRO, IR 18 5209, Riby, Lincs, 1838 – 'a great quantity of bone and other artificial manures are used, for tho' the produce is very abundant, the natural powers of the land are not great'.

[37] *Brit Hus*, III, *op cit*, pp 27–28; *Brit Hus*, I, *op cit*, pp 399–400; Watson, *loc cit*, p 40; H Stephens, 'On Feeding Sheep on Turnips', *QJA*, 3, Feb 1831–Sept 1832, p 390.

few days each between early June and mid-July.[38] There were similar changes on the Yorkshire wolds. In the late 1830s farming at Wharram le Street was said to be a 'fair average' for the area, having been much improved since the introduction of swedish turnips and bones in about 1820, and with 'one of those soils on which the efficacy of bones . . . [was] most visible'.[39]

However, the majority of Wessex downland farmers did not purchase fertilizers in significant quantities during this period. In the mid-1830s Robert Hatch Stares, who farmed near Droxford in Hampshire, made the point that bone dust and artificial manures were only applied by neighbours 'who have a large capital employed', and Pusey remarked in the early 1840s that on no part of the Wessex downlands was there so heavy an outlay on fertilizers as on the northern wolds. This is confirmed in the tithe files where there are 18 references to bone manure in Lincolnshire; 3 in Hampshire; 1 in Berkshire; and none in Wiltshire or Dorset.[40] As may be expected with such different levels of inputs, yields per acre were higher on the northern wolds than on the Wessex downlands. In the 1840s, a very good crop of turnips on the Wessex downlands did not exceed 16 tons, and averaged about 12, whilst 18–23 tons were being achieved on the northern wolds.[41] Similarly the wheat crop on the better soils of the Wessex downlands averaged only about 20 bushels per acre throughout the period, whilst yields on the northern wolds had risen to between 24 and 28 bushels per acre by the 1840s.[42] Hence it is clear that, during this period, the majority of Wessex downland farmers were prepared to forgo the opportunity of maximizing yields in order to minimize inputs. The determining financial aspect of this was that a northern wold farm 'farmed highly', with little permanent down pasture and crop rotations having at least twenty per cent of roots, required a capital outlay of fifty per cent more than one managed on the low-input Wessex downland system. Moreover, the high-input system required an additional revenue expenditure of about 11 per cent per annum of this capital outlay. This extra annual outlay was needed to buy the fertilizer and animal feed, and pay for the additional labour, required to sustain higher outputs.[43]

IV

The wool clip had been more important than meat production in both areas until the introduction of new breeds of sheep in the late eighteenth century. On the Wessex downlands after about 1830 there was a shift in emphasis to meat production. A factor here was the better feed provided by field-folding systems; this increased shortwool fleece weight, but meant that the wool itself was coarser and poorer in quality than that grown on down pasture.[44] However wool production based on the Improved Lincoln/Improved Leicester remained an important part of the new system on the northern wolds. The good return on longwool for

[38] LRO, Dixon 6/6/2/3/3, Account with Seaman and Hornsby, 1820–23 – information confirmed in 6/6/2/3/1 and 6/6/2/11; 5/1/1, Day book for Holton, Nettleton and Thornton farms, 1824; PRO, IR 18 5023, Holton le Moor, 1838 – Mr Dixon 'has by great spirit, the expenditure of much capital and the unlimited use of bone manure increased the produce on lands which a few years ago were totally unproductive'. Hornsby of Grantham began making combine drills in 1815 – G E Fussell, *The Farmer's Tools . . . 1500–1900*, 1952, p 111.

[39] PRO, IR 18 11787.

[40] W Hutt, *The State and Prospects of British Agriculture*, 1837, pp 21–25; Pusey, *loc cit*, p 308; T Walkden, 'On the advantages of ploughing up downland', *JRASE*, IV, 1843, p 8 – on the Wessex downlands the manure applied to the swede crop consisted 'only of a few ashes, or at most one-quarter of bone dust per acre'; R J P Kain, *An atlas and index of the tithe files of mid-nineteenth century England and Wales*, 1986, pp 563, 583, 594 – insufficient data available for east Yorkshire.

[41] P Pusey, 'On the Progress of Agricultural Knowledge during the Last Four Years', *JRASE*, III, 1842, pp 197–98; Clarke, 1851, *loc cit*, pp 331–33; Mingay, *op cit*, p 299.

[42] Hutt, *op cit*, pp 21–25; *BSP*, 1836, *op cit*, QQ 5833, 5887–88; ibid, 1837, *op cit*, Q 3541; Legard, *loc cit*, p 117; Caird, *op cit*, pp 61–62, 189, 311–12; Grigg, *op cit*, pp 117, 162–3; Mingay, *op cit*, pp 139–40.

[43] J Darby, 'The Farming of Dorset', *JB&W*, ser 3, IV, 1872, pp 7–8; E P Squarey, 'The Farming of the Southern Counties', *JB&W*, XV, 1867, p 21; cf Mingay, *op cit*, pp 178–82, 609.

[44] Grigg, *op cit*, p 80; Bowie, 1987, i, *loc cit*, p 20; Mingay, *op cit*, p 111 – meat prices tended to be more stable than grain prices after about 1820.

the 'Yorkshire looms' was said to have been a 'considerable alleviation' for farmers during the post-Napoleonic War depression, the continued expansion of the woollen industry in west Yorkshire during the 1820s and 1830s created a demand for raw wool 'in excess of the home clip', and although all agricultural prices were low in these years, wool 'generally held up better' than the price of other crops.[45] Moreover, good quality longwool was versatile, being 'more or less applicable for each of the great variety of goods . . . made in the great woollen manufacturing districts'.[46] Yet even more important than the above was the weight of wool per sheep, as a ewe in good condition of either of the new breeds sheared at about 8–12 lb, which compared most favourably with the shortwool fleece of the Old Wolds breed, which weighed about 3 lb, or the fleeces of shortwool downland breeds in general at 3½–5 lb.[47] Though the price per pound of shortwool may have been higher than longwool, this was more than compensated for by the return on the extra weight of the longwool fleece. A northern wold farmer might achieve as much as double the return on his wool clip than a farmer with a shortwool flock of similar size.[48]

V

The emphasis on manures and fertilizers produced on the farm in the Wessex downland system began to change from the mid-1840s, and during the 1850s and 1860s most of the remaining sheep walks were ploughed up, and crop rotations similar to those on the northern wolds established on them.[49] This expressed not only the effect of tithe commutation on the cultivation of marginal land after about 1840, and a recovery from the agricultural depression of 1848–51, but also a shift to the general application of fertilizers on the downs. Phosphates used included both bone manure and superphosphate, the latter being a relatively cheaper, quicker-acting but less long-lasting fertilizer introduced in 1843, and oilcake was purchased in increasing quantities for animal feed. Together these inputs permitted the cultivation of reliable fodder crops in the quantities needed for High Farming with arable flocks on light-land soils.[50]

This paper has defined the characteristics of a high-input system of farming which developed on the northern wolds, and a low-input one on the Wessex downlands. In so doing, Professor F M L Thompson's theory of a Second Agricultural Revolution during the period 1815–80 has been found to have been essentially correct in the two areas. It is important, however, to be aware of the extent to which a general shift to the regular purchase of, and dependence upon, artificial fertilizers varied in time from one area to another. In addition, certain doubts about aspects of E L Jones's analysis of chalkland farming in Hampshire have been raised, particularly his ideas that, during the early years of the nineteenth century, working flocks were largely superseded by field-folded arable ones, and roots became an essential and crucial part of crop rotations.

[45] 'The Agricultural State of the Kingdom in February, March and April 1816', *Board of Agriculture*, 1816, p 164; J M Bellamy, *The Trade and Shipping of Nineteenth-Century Hull*, EYLHS, no 27, 1971, p 19; Grigg, *op cit*, p 178; Perkins, *op cit*, p 46.

[46] J Wilson, 'On the Various Breeds of Sheep in Great Britain', *JRASE*, XVI, 1856, p 242.

[47] Young, 1770, *op cit*, p 3; Young, 1799, *op cit*, pp 310, 333, 356; Caird, *op cit*, p 190; Vancouver, *op cit*, p 367; Ruegg, *loc cit*, p 432.

[48] B R Mitchell and P Deane, *Abstract of British Historical Statistics*, Cambridge, 1962, pp 495–96. The Author's analysis is consistent with Mingay, 1989, *op cit*, pp 117–19 – particularly note comparative wool prices after c 1825 in fig 2.2.

[49] Little, *loc cit*, pp 163, 168, 180; Rowlandson, *loc cit*, p 432; Darby, *loc cit*, pp 2, 5, 7, 33–45.

[50] PRO, IR 18 9112, Rockbourne, Hants, 1839 – 'a considerable part [of the parish] is Down, which will probably be broken up in consequence of this commutation of tithes'; RUL, HAN, 9/1/1, Farm account book kept by John Twynam, 1845–7; Hants Rec Office (HRO) 5M50/2262. Daly MSS, Normancourt Estate accounts, 1851, ff 32, 37; Caird, *op cit*, pp 81–3; Wilkinson, *loc cit*, p 286; J B Spearing, 'On the Agriculture of Berkshire', *JRASE*, ser 1, XXI, 1860, pp 16–17; J B Lawes, 'On Agricultural Chemistry', *JRASE*, VIII, pt 1, 1847, p 252; W C Spooner, 'On the most Economical and Profitable Method of Growing and Consuming Root Crops', *JB&W*, II, 1854, pp 9, 11–12; Darby, 1861, *loc cit*, pp 50–53, 64–65.

These ideas have recently been adopted and expanded to cover all of the Wessex downlands. Clearly this approach is more applicable to the northern wolds during this period, as working flocks remained very important on the Wessex downlands until well into the nineteenth century. Furthermore, in general, root crops were not grown in sufficient quantity to sustain field-folding systems until many years later when fertilizers came into general use on the Wessex downlands. Essentially, farming on the northern wolds and Wessex downlands developed at different rates in response to different pressures. On the Wolds, growing consumer demands for meat and wool encouraged substantial capital expenditure, and led to an early expansion into High Farming. On the Wessex downlands, the ability of the majority of farmers to supply year-round feed from arable leys, water-meadows, downs and pasture, combined with the development of a new type of sheep which, whilst providing a faster turnover of lambs than hitherto, was still capable of working efficiently as a dung carrier, meant that there was less incentive for an early shift towards the use of artificial fertilizers.[51]

[51] Thompson, *loc cit*, pp 62–5, 68; Jones, 1960, *loc cit*, pp 15–17; A K Copus, 'Changing Markets and the Development of Sheep Breeds in Southern England, 1750–1900', *Ag Hist Rev*, 37, 1989, 42, 46 and 'Changing Markets and the Response of Agriculture in South-West England, 1750–1900', unpub PhD thesis, UCW, Aberystwyth, 1986, pp 252, 307, 310, 318–19, 323.

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Flooding in Scania: A Method to Overcome the Deficiency of Nutrients in Agriculture during the Nineteenth Century

By URBAN EMANUELSSON AND JENS MÖLLER

Abstract

This article discusses ecological features during the nineteenth century in the southernmost part of Sweden (Scania). In the beginning of the nineteenth century the old system where hay-producing meadows created natural manure, gradually disappeared as arable land was extended. As artificial fertilizers were not introduced until the end of the century, this created, theoretically, an impossible situation. The paper discusses several ways of overcoming this fertilizer problem, but sees the flooding of meadows as the only technique which had a positive effect on all major elements. The flooding technique is described and its introduction in Scania is mapped. The use of watermeadows increased production fundamentally, but nevertheless, most systems were abandoned at the beginning of our century when artificial fertilizers became available on a large scale. The paper shows that between 1850 and 1890 there was a gap between the need and production of natural manure, and at this time the production of hay on the watermeadows was of utmost importance. The article concludes with a suggestion that watermeadows should be introduced in modern agriculture. This would be of double advantage: it could both act as a sink for phosphorus and nitrogen, and reduce the need for artificial fertilizers.

AGRICULTURE in Europe changed profoundly during the eighteenth and nineteenth centuries. During this time the population increased dramatically. Fallow land diminished, new rotations of crops were introduced, farm implements were improved and enclosure in different forms revolutionized the cultural landscape. Arable land was not only improved, but also expanded in area as land reclamation gathered momentum.[1] David Grigg shows that arable land in England and Wales increased by over 60 per cent between 1696 and 1866.[2] Omitting the fallow, the area actually under plough more than doubled. Concurrently, pasture and meadows diminished by 15 per cent. Thus, the expansion of arable was at the expense of meadow and pasture. Similar developments occurred over all of Western Europe but at different times. In Great Britain, the so-called 'Agricultural Revolution' had already begun during the mid-seventeenth century, while it did not reach continental Europe until the mid-eighteenth century, and Sweden in the 1820s.[3] In Sweden, the old system where hay-producing meadows (ie areas where hay was cut) created natural manure thus gradually disappeared. In England and France, however, it was the transformation of pasture into arable land that was the most profound change.

In a wider and longer perspective, four main epochs in nutritional economy can be distinguished: hunting-gathering (epoch 1), shifting cultivation (2), permanent manured field cultivation (3), and modern cultivation (4) dependent upon artificial fertilizers

[1] B A Slicher van Bath, *The Agrarian History of Western Europe, AD 500–1850*, 1963, pp 195f.

[2] D B Grigg, *The Dynamics of Agricultural Change: the Historical Experience*, 1982.

[3] P Bairoch, 'Agriculture and the Industrial Revolution, 1700–1914', in C M Cipolla, ed, *The Fontana Economic History of Europe, III, The Industrial Revolution*, Glasgow, 1973, pp 452–506.

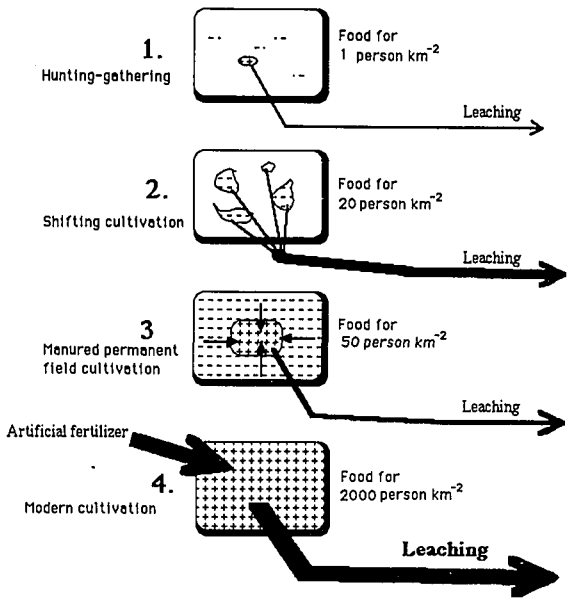


FIGURE 1
Model showing four epochs in nutritional economy.
− areas exporting nutrients
+ areas importing nutrients
Model is based on figures relating to calcareous clay moraine in south-west Scania

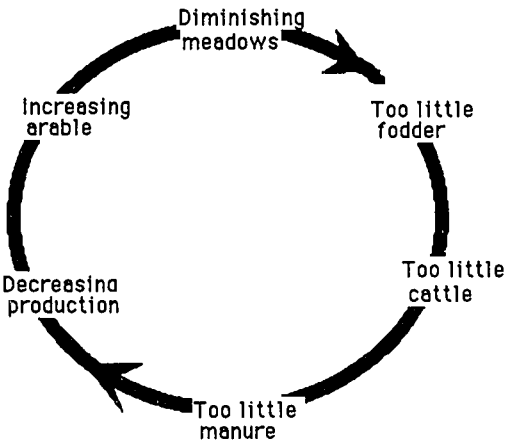


FIGURE 2
Theoretical cycle of nutrient impoverishment due to an imbalance between the proportion of arable land and meadows

(Figure 1). In Sweden, artificial fertilizers were not introduced until the end of the nineteenth century. Manure originating from natural pastures and meadows was essential in early nineteenth-century agriculture, and as it was not directly superseded by artificial fertilizers, there was a time-lag in southern Sweden (Scania) between epochs 3 and 4 of at least eighty years. Artificial fertilizers were not introduced in Scania on a grand scale until the beginning of the present century.[4] How, then, could farmers in this area eliminate the meadows and therefore the source of natural manure, without having access to artificial fertilizers? This question is the basis of this paper.

The time-lag between practices presented a theoretically impossible situation, which can be described in the form of a vicious circle (see Figure 2). As the farmers in the wake of enclosure gradually created arable land, the once extensive meadows diminished.[5] This resulted in fodder becoming scarce which, in turn, of course meant that less cattle could be fed. Declining cattle-stocks led to less manure which resulted in decreasing production. To increase production, arable land was extended at the expense of meadows, and so on.

There were several ways of overcoming the fertilizer problem[6], but the only technique which probably had a positive effect on all of the major elements was the flooding of meadows, ie the irrigation of hay meadows. By flooding, the still remaining meadows could produce up to five times as much fodder,[7] and this was of the utmost importance in Scania in the nineteenth century when natural manure was becoming scarce.

In this paper, our aim is to analyse the shortfall in fertilizers between epochs 3 and 4 above. We suggest that one of the most important methods to overcome this was by flooding of meadows. Concerning nitrogen

[4] A Zachrison, *Gödsling och jordförbättring i Skåne från 1800-talets början till nuvarande tid*, Lund, 1914.

[5] See below, p. 130
[6] See below, p 131–5
[7] See below, p 142



FIGURE 3
Map showing location of Scania with its two counties, Kristianstad and Malmöhus

alone, however, ley with legumes was probably the most important single factor. Our study area is nineteenth-century Scania (Skåne), the southernmost region of Sweden (Figure 3).

In section I, Scanian agriculture in general is described. The nineteenth century was a decade of transition and the social and economic causes underlying this are analysed. Section II is a presentation of the different methods available to overcome the shortfall in fertilizers. Of these, we are of the opinion that flooding was most significant and, therefore, the method is described in detail, and its distribution is mapped in section III. Its effect on Scanian agriculture is discussed in section IV. Here we present land-use diagrams to enable us to discuss the method in a wider context. Section V, finally, is the conclusion with some suggestions for future research.

I

Scania can be divided into three main regions based on both human and physical features: the forest region (animal and wood products), the intermediate region (mostly animal products), and the plains region (mostly grain products).[8] Through the years a number of intricate agro-ecosystems developed and this prevailed more or less until the enclosure movement at the beginning of the nineteenth century.

The agricultural area of each village was divided into *inmark* and *utmark*. The former consisted of arable land and meadows, while the latter was mainly used as common grazing land. Different practices existed for the use of the arable land. On the plains the three-field system predominated, while the

[8] Å Campbell, *Från vildmark till bygd*, Uddevalla, 1948.

two-field system was more common in the forest and intermediate regions.

Some of the meadows were concentrated, while others were intermixed with the arable fields. The meadows were mainly the understoreys of coppice-woodland and provided fodder, timber and firewood. As no artificial fertilizers whatsoever were used, the fodder-producing meadows were of great importance. Up to one half of the land belonging to a village was used as *inmark* in the seventeenth century. Of this, usually only 10 to 15 per cent was cultivated annually. The rest of the *inmark* was either coppice-woodland, wet meadow or fallow land. Gradually, as more land was put under the plough, the *utmark*, ie the natural grazing areas, diminished. The field in fallow was, therefore, used as pasture.

On the southern plains, the *utmark* disappeared totally during the eighteenth century. The three-field system was therefore necessary for pasture. The arable area could extend up to half of the land while different kinds of meadows made up the other half. All coppice-woodland had by then disappeared. Although the system probably was ecologically imbalanced, it produced sufficient corn to sell. This was due to the extremely fertile clay soils.

In 1803 the *enskifte*, a radical form of enclosure, was authorized for Scania. The Act aimed at rationalizing the number of plots per farmer. In order to achieve the aim of 'one farmer – one plot', many holders had to leave the village community and move out to their new plots. Thus, a considerable number of villages and hamlets became totally dispersed, while in other cases only two or three holders had to move out. Between 1803 and 1830 over 60 per cent of the Scanian villages had passed enclosure, particularly those situated on the plains.[9] Enclosure also generated a totally new infrastructure with new road-systems linking the new farmsteads with the old village site. The *enskifte* can be said to be the starting point of the Agricultural Revolution in Scania.[10]

The enlargement and improvement of the arable land followed in the wake of enclosure. Not all farmers received first-class arable land when the villages were enclosed; poorer quality land was compensated by larger acreage. This meant that arable land had to be reclaimed from the meadows. In some villages the tilled land area grew by several hundred per cent.[11]

The three-field system was superseded by various new rotation systems, ranging from the four-course Norfolk system with clover, wheat, turnips and barley, to a seven-year rotation with both root-crops and ley and little fallow. Zachrison points out that enclosure and new rotation systems often meant that manuring diminished.[12] As manuring took place only on the fallow, manuring occurred every third year before enclosure but only every sixth or seventh year after enclosure.

Drainage with tiles was introduced in the middle of the century, first on the large estates,[13] and then during the second half of the century, many lakes were lowered or totally reclaimed. This, of course, contributed further to the expansion of the arable land.

In 1846, England abolished her Corn Laws and, consequently, the Swedish export market grew considerably.[14] Large amounts of grain were transported to the ports for shipping to England. In Scania the main port was Malmö, and its development was helped by a growing railway network from the middle of the 1850s onwards.

[9] S Dahl, 'Storskiftets och enskiftets genomförande i Skåne', *Scandia*, 14, 1941.

[10] S Helmfrid, 'The storskifte, enskifte and lage skifte in Sweden – General Features', *Geografiska Annaler*, 43, 1961, 114–29.

[11] U Emanuelsson, 'Skånes vegetationshistoria', *Svensk Geografisk årsbok*, 63, 1987, 70–93.

[12] Zachrison, *Gödsling och jordförbättring*.

[13] J Möller, *Godsen och den agrara revolutionen. Arbetsorganisation, domänstruktur och kulturlandskap på skånska gods under 1800–talet*, Lund, 1989.

[14] G Fridlizius, *Swedish Corn Export in the Free Trade Era. Patterns in the Oats Trade, 1850–1880*, Lund, 1957.

The large landed estates, which dominate large parts of Scania, took a strong interest in the development of agriculture. It was often they who undertook the new initiatives to change, eg land drainage, marling and the introduction of new machines such as seed drills and mowers.[15]

The estates began producing grain for export and the interest in new machines, techniques and also in new transport facilities such as the railway was therefore natural. The flooding of meadows, as shall be seen, was also a technique introduced and developed by the estates. Such undertakings demanded both capital and land. During the last quarter of the nineteenth century the estates gradually moved towards animal production. This partially resulted from the competition from the USA and Russia, who were able to produce cheap grain. Another reason was that domestic grain prices rose in relation to the international level. From the 1880s butter became the main export product. Sugar-beet, which fitted in well in the crop-rotation, was introduced at this time, and fallow land gradually disappeared. Although butter production was introduced for economic reasons, it also had ecological advantages as it stimulated hay production and, therefore, the use of manure.

II

Several innovations were tried in Scanian agriculture during the nineteenth century. Many of these lasted for just a short time while others were developed and are still in use in some form. Many of these innovations were connected in some ways to the problem of annually removing large quantities of nutrients and in some way compensating for this. We will here systematically discuss what we believe were the most important new ways of compensating the soil for the increasing removal of nutrients.

Mobilization of nutrients by ploughing meadows and grazing areas

The intensive enclosure-movement in Scania in the early nineteenth century led to an enormous increase of the arable area of land. At first there were two types of land that were brought under the plough. The first was the meadows in the *inmark* close to the settlement; the second was the grazed common lands which were now distributed between private owners. On both these types of land, there was a grass-sward which had been stable for a long time. In the soil under the grass-sward there was probably a fairly large immobilized nitrogen pool. The available nitrogen pool for the plants was certainly much smaller. Jansson presents general data concerning the nitrogen pools.[16]

When a grass-covered piece of land is ploughed the microbiological activity is increased, which, in many cases results in an increase in the pool of available nitrogen for several years. This phenomenon of activating the immobilized nitrogen pool by ploughing probably played an important role in fertilizing much of the new arable land that was brought under the plough, especially during the period of 1810 to 1840. Ploughing the grass-covered land can also have been important for the short-term supply of potassium and phosphorus to the new arable land. However, there is a general difference between the nutrients concerning the size of the pools and the time-spans for which they can be used as sources of nutrients for growing crops.

The nitrogen pool in grassland is mostly in an immobilized form and is concentrated in the uppermost layers of the soil horizon. It is generally possible to mobilize much of this pool by frequent shallow ploughing. All of the immobilized nitrogen pool cannot be mobilized in just one or two years so the pool probably remains useful for up to a decade. On the other hand, much of the

[15] Möller, *Godsen och den agrara revolutionen*.

[16] S L Jansson, 'Utkast till kvävebudget för det svenska jordbruket', in T Roswall, ed, *Processer i kvävets kretslopp*, Statens Naturvårdsverk PM 1213, 1980, 33–9.

phosphorus that will become available after ploughing will be available more or less immediately. However, there was probably quite a large pool of phosphorus below the depth of the old furrows. This pool was not tapped until deeper ploughing came into practice. In the early part of the nineteenth century the ploughing of grass-land probably just released enough phosphorus for the cultivation of crops for only a few years, certainly for a shorter period than that over which the nitrogen pool could be used.

Potassium is present in most soils in quite large quantities. However, most potassium is totally unavailable for the plants, and its mobilization through weathering is a slow process.[17] But by ploughing of the natural grass-sward, potassium from the organic part of the system can be made available for plant production. Therefore, acceptable yields could be obtained from the new arable land with additional manuring with potassium.

It can be assumed that nearly all of the new arable land that was created by ploughing of meadows and the *utmark* grazing areas, had enough nutrients for several years, and was consequently not manured initially. The important question is, however, for how long did those new fields give good yields without the addition of nitrogen, potassium and phosphorus? There is little information about this from the actual sites, but a picture can be reconstructed on the basis of modern data.

Modern crops require 30-100 kg K/ha/y.[18] Clay soils in particular can store around 1000 kg K/ha/y plant available potassium amounts. The early nineteenth century gave yields which were often around a third of modern yields.[19] 30 kg K/ha/y seems therefore to be an acceptable estimate of the rate of withdrawal of potassium from the new arable lands of the early nineteenth century. It seems possible therefore, that potassium may have been available in sufficient quantities on clay soils for a decade after cultivating a new arable field. Perhaps this is an over-estimate, not taking into account the easy loss by leaching that is characteristic of potassium. It is also worth noting that the earliest expansion of arable fields in Scania in the nineteenth century took place in areas with fertile clay soils, but in the later part of the century most of the new arable fields were cultivated on poor moraine soils and on organogenic soils. Such soils have a small capacity to store K-ions.[20] We can therefore assume an earlier deficit of K in the organic soils following ploughing compared to the clay soils. It is not surprising therefore to find that Zachrison points out that the use of artificial K-fertilizers came into general use when peat-soils were drained and farmed at the end of the nineteenth century.[21]

'Paring and burning'

In the early decades of the nineteenth century the so-called 'paring and burning' method was introduced in Scania. Using this method, the grass-sward was pared loose from the lower soil. Thereafter it was dried, and finally burnt. The ash was then spread over the bare soil. The method was often used on infertile grassland and leys from which the production had fallen due to over-cultivation without adequate fertilizing. The method was used frequently from 1820 to 1870, especially in north-western and south-eastern Scania.[22] It is difficult to estimate the extent of this practice. One can assume, however, that as the tools for this practice are found in the majority of state inventories from the middle of the nineteenth century in south-eastern and north-western Scania,

[17] T Troedsson and N Nykvist, *Marklära och markvård*, Stockholm, 1973.
[18] *Ibid.*
[19] S Dahl, *Torna och Bara. Studier i Skånes bebyggelse- och näringsgeografi före 1860*, Lund, 1942.
[20] Troedsson and Nykvist, *op cit.*
[21] Zachrison, *Gödsling och jordförbättring.*
[22] N-A Bringéus, *Brännodling. En Historisk/etnologisk undersökning*, Lund, 1963.

most farmers practised the method there.[23] Using information from Bringéus, one can assume that about 20 per cent of the farmers in Scania used the method.[24] Between a half and one third of the land of these farmers was subjected to this method. About 10 per cent of the arable land in the late nineteenth century is a rough estimate of the area which at some time, was subjected to 'paring and burning'. One can assume that after twenty years of this practice, the area had to be abandoned. Under good conditions, this method could have enabled five to eight acceptable harvests to be obtained without additional fertilizers. However, this must have resulted in a great reduction of the nitrogen content of the soils in particular. Such soils must, therefore, later have been very demanding of fertilizers and difficult to cultivate.

Slash-and-burn agriculture

Slash-and-burn agriculture was widely used during the early part of the nineteenth century, particularly in the forested north-eastern part of Scania. From the middle of this century onwards however, the forest became commercially valuable and the slash-and-burn practice was gradually abandoned. It is obvious from the studies undertaken by Weimarck that nearly all forested land in some villages of north-eastern Scania was used at some time during the nineteenth century for slash-and-burn agriculture.[25] In southern Scania, the practice was not so important because of the lack of large forest areas. The burned and farmed forest areas were also important areas for grazing and winter fodder collection which meant that these areas became new sources of nutrients for the enlarged permanent fields.[26] It is, therefore, possible that we can to a large extent regard the slash-and-burn practice as a main factor for supplying the enlarged arable field areas of the northernmost parts of Scania with sufficient nutrients for much of the nineteenth century. However, these areas were of minor agricultural interest for the whole of Scania, and it is not possible to use the slash-and-burn practice as a main explanation of the solution to the shortfall in nutrients.

Ley with N-fixating plants

Gradually, the natural fodder areas diminished through the nineteenth century as the arable land grew. The meadows were, to some extent, replaced by leys. In northern continental Europe (Germany, Belgium, The Netherlands and northern France) one-fifth of the arable land was under leguminous crops in 1880.[27] The seven-year rotation including ley, began in some Scanian villages in the 1820s and 1830s.

In the eighteenth century legumes were already being used for fodder plants, and a number of experiments were carried out and documented in various ways.[28] At this stage, and also at the beginning of the nineteenth century, it is sometimes difficult to distinguish between ley and meadow, as the meadows were partially improved by sowing some leguminous species (*Trifolium* spp, *Medicago* spp).

According to Lägnert, leys with legumes were regularly in use at the beginning of the 1840s – at least in the areas with more fertile soils.[29] It can, therefore, be assumed that the nitrogen requirements of grain crops and potatoes were already met to a substantial degree at this stage. In less fertile

[23] *Ibid.*

[24] *Ibid.*

[25] G Weimarck, *Ulfshult: investigations concerning the use of soil and forest in Ulfshult, parish of Örkened during the last 250 years*, Lund, 1968.

[26] C Bergendorff and U Emanuelsson, 'Vegetation and management in wooded meadows and coppices in Scania', in preparation.

[27] G P H Chorley, 'The Agricultural Revolution in Northern Europe, 1750–1880: Nitrogen, Legumes, and Crop Productivity', *Econ Hist Rev*, 2nd ser, XXXIV, 1981, 71–93.

[28] H Osvald, *Vallodling och växtföljder. Uppkomst och utveckling i Sverige*, Uppsala, 1962.

[29] F Lägnert, *Syd-och mellensvenska växtföljder, del I) De äldre brukningssystemens upplösning under 1800–talet*, Lund, 1955.

areas, it seems that legumes were used some decades later.

Marling

Marling also began in Scania in the 1840s. The method spread quickly with the aid of farmers from Denmark and Schleswig-Holstein. The use of marling on a large scale in Scania was restricted in time to the years 1860–1885. Marling is the practice in which the deep-lying calcareous clay is dug up and spread over the topsoil. In Scania, less calcareous soil types were also dug up and spread over the fields. Marl cannot be said to be a real fertilizer as the fertilizing effect is rather indirect. On clay soils, the calcium ions from the marl will be exchanged for potassium ions located on the clay particles. The potassium ions will therefore be available to the plants. Marling can be regarded as a method which will give short-term advantages to the farmer by 'forcing' out some of the nutrients in the soil. In the long term, the increase in pH can be regarded as a positive effect for the farmer. The calcareous clays increased fertility for a short period; after ten to fifteen years, however, the result was the reverse and marling was therefore said 'to give rich parents but poor children'. Today, the landscape still contains plenty of old marl pits.

In the light of events, marling can be regarded as an emergency action to increase the fertility of infertile soils. Under these circumstances it is very striking to see the sudden decrease in marling around 1885 when artificial fertilizers were becoming commonly used.

Better handling of natural manure

The practice of using natural manure was fundamental to agriculture in the beginning of the nineteenth century, but the technique was still not fully efficient. Still in the 1850s the handling of the natural manure was inefficient according to a number of notes collected by Zachrison.[30] The dung was collected in places where much of it easily was lost in streams during rainfall. Furthermore, nothing was done to collect urine at this time. In the 1860s some larger farms (for example Säbyholm) developed a good technique to conserve the nutrients in the manure. Slowly, such techniques spread in Scania towards the end of the century.

Early artificial fertilizers

Artificial fertilizers were very little used in Scania until 1840. Ground bones from cattle and horses were already being used in England at the end of the eighteenth century, but even as late as 1825, 13,000 tons of bones were exported annually from Scania to areas where they were used in agriculture.[31] Another fertilizer of the period – although not so widespread – was ashes derived from burning peat. This was mainly used on the meadows. In the 1850s many larger farms began to use different types of artificial fertilizers, but the average farmer was still not using it regularly in the 1870s. However, more or less all Scanian farmers were regularly using artificial fertilizers by about 1900.[32]

The importation of artificial fertilizers began in 1844 when guano was shipped to Sweden.[33] Guano, which contains phosphoric acid and nitrogen, was common during the 1860s and 1870s. Later, towards the end of the century, a change towards superphosphate and Chile saltpetre (sodium nitrate) can be detected.

During the 1860s and 1870s the available nutrients which could be used to fertilize the arable doubled probably because of the development of better manuring practices.[34] Between 1870 and 1920 the use of potassium

[30] Zachrison, *Gödsling och jordförbättring.*
[31] H Juhlin-Dannfelt, *Kungliga Landtbruksakademien 1813–1912, samt svenska landthushållningen under nittonde århundradet*, Stockholm, 1913.
[32] Zachrison, *Gödsling och jordförbättring.*
[33] *Ibid.*
[34] *Ibid.*

and phosphorus as artificial fertilizers grew rapidly and probably became more important than manure. The relative importance of nitrogen fertilizers came much later in Scania. The arable land in Scania was 589,281 ha in 1912 according to Zachrison. To this area 71,893 tons of artificial fertilizers were applied. This means that 122 kg/ha of fertilizer was used on average each year in Scania in about 1912. During the late nineteenth century and beginning of the twentieth century importation of oil-cakes as fodder into Scania probably was of some marginal importance for the balance of nutrients. References to this are however scarce.

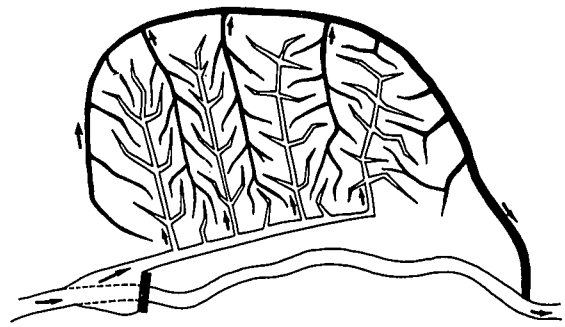


FIGURE 4
Principle of flooding using dammed irrigation. The stream is dammed and the water led into small canals (unfilled) and the supply regulated to the meadow. Surplus water is caught in the other canals (filled) and led back to the stream. After Emanuelsson *et al*, *Det Skånska Kulturlandskapet (1985)*

The flooding of meadows

Flooding of meadows, in its primitive form, was probably already in use in Scania at the beginning of the nineteenth century. More advanced systems were built from 1850 onwards. We assume that these meadows were of great importance for the nutrient balance in nineteenth century Scanian agriculture. They enabled a large production of hay, and associated manure to be obtained. This method will be discussed in more detail in the next section.

III

By the term 'flooding of meadows' we refer to the irrigation of hay-producing meadows, or in some cases irrigation of pastures (Figure 4). In this paper we will not discuss the natural flooding of areas around lakes and rivers, although this has been of great value to fodder production in earlier periods. The practice of flooding has been widely used throughout the temperate parts of Europe. In northern Scandinavia and Finland, vast areas were flooded in order to increase the production of hay during the nineteenth century.[35]

In Denmark, there is evidence of flooding practices in Jutland as early as in the year 1600.[36] The method spread during the 1770s and 1780s, but was discontinued during the Prussian War, and the practice ceased in the last quarter of the nineteenth century. According to Rasmussen, the practice of flooding was restricted almost entirely to Jutland. This is surprising as the islands of Denmark are in many respects (agricultural and biological) similar to Scania. A few of the Danish systems can still be seen in the landscape today.[37] The method is currently still in regular use in some countries of Europe, eg in parts of Poland, Yugoslavia, Portugal and Spain. Zimmermann gives

[35] E Bylund, *Koloniseringen av Pite lappmark till och med 1867*, Uppsala, 1956; Campbell, *Från vildmark*; J Elveland, *Norrländska våtslåttermarker. Bevarande av ett gammalt kulturlandskap*, Statens naturvårdsverk, PM 1737, 1983; J Frödin, *Skogar och myrar i norra Sverige i deras egenskap av betesmark och slåtter*, Instituttet for sammenlignende kulturforskning, ser B, XLVI, Oslo, 1952; Y Vasari and K Väänänen, 'Stratigraphical indications of the former use of wetlands', in K-E Behre, ed, *Anthropogenic Indicators in Pollen Diagram*, Rotterdam, 1986, pp 65–71.

[36] S Rasmussen, 'Studier over engvandingen i Danmark specielt vedrørende Store Skjernå Kanal', *Geografisk Tidsskrift*, 63, 1964, 146–90.

[37] R M Buttenschøn, 'Engvanding', in *Plejebogen – en håndbog i pleje af naturområder og kulturlandskaber*, Fredningsstyrelsen, København, 1984.

detailed descriptions of systems in north-western Spain.[38] In southern France, remains of canals and dams can be seen in the landscape. In some cases, the canals are occasionally used for irrigating grazing areas, eg in the Pyrenees and the Cevennes.

There is a difference in the reasons for flooding meadows between areas with mild winter climate – as in England – and areas with more continental climate. In the former the objective of flooding was to expand the grazing period, while in the latter hay production was more important. In England, at the end of the Middle Ages, vast areas of arable land were converted to sheep-grazing areas for the expanding wool industry. The bottleneck of this system was the production of pastures during late winter and early spring. Frost hampered the growth of pasture plants. With the aid of running water, the ground temperature could be increased and this increased the plant production. Systems were constructed already by the end of the sixteenth century,[39] and there were still some watermeadows in use in southern England in the inter-war period.[40]

Watermeadows were also constructed to produce as much hay as possible on which to feed sheep during winter months. In this case the sheep were not primarily bred for wool or mutton. Instead, their ability to transport plant nutrients from the commons to the arable fields was the most important feature. After grazing on the commons during the day, the sheep were taken to the arable fields where they were night folded and where the dung was dropped. Thus they were bred to drop only at night when folded on the arable fields. The prime purpose of the watermeadows in this case was therefore the ability to keep as many sheep as possible over winter so that the transportation of nutrients from commons to arable land could be effective.[41]

1 *Its Introduction to Sweden*

It was not until the nineteenth century that the flooding of meadows was introduced in Scania on a large scale. The Swedish landowners and agricultural reformers were influenced by colleagues from abroad, especially those from Germany and England. Many Swedish engineers and agronomists made field trips to north Germany to learn about the method. In an overview, Magnét describes the evolution of the method in Sweden.[42] He points out, too, the relatively short period in which systems were built.

Many of the Swedish agronomists who introduced the method in Sweden had probably visited the special school for flooding in Herrnsdorff, Ober-Lausitz, Germany. This school must have led to the construction of many systems in Germany. Today, however, all of these systems are probably abandoned. In Sweden as early as in 1814, a national competition led to the establishment of systems at Gårdsby and Böksholm in the county of Kronoberg, and in Söderfors and Valsta north-west of Stockholm.[43]

Guides on the subject were published in Sweden in the 1840s. Stephens noticed the difference between running and stagnant water.[44] In contrast to other scientists of the time, he advocated flooding throughout the year, with the exception of the most severe winter days when an ice-crust could be formed. The advantage of this would be the

[38] G Zimmermann, *Die bäuerliche Kulturlandschaft in Südgalicien. Ein beitrag zur Geographie eines Übergangsgebietes auf den Iberischen Halbinsel*, Heidelberger Geographische Arbeiten, 23, 1969.

[39] C Taylor, *Fields in the English Landscape*, 1975.

[40] H P Moon and F H W Green, 'Water Meadows in Southern England', in L Dudley Stamp, ed, *The Land of Britain, 89, Hampshire*, 1940, pp 373–90.

[41] E Kerridge, 'The Sheepfold in Wiltshire and the Floating of the Watermeadows', *Econ Hist Rev*, 2nd ser, VI, 1954, 282–9.

[42] J H Magnét, 'Hvilken erfarenhet har man hittills vunnit i vårt land med afseende å översilning eller i allmänhet bevattning af odlade marker eller ängsmarker?', *Kongl Landtbruks-Akademiens Handlingar och Tidskrift*, 29, 1890, 243–51.

[43] A Eskeröd, *Jordbruk under femtusen år. Redskapen och maskinerna*, Stockholm, 1973.

[44] G Stephens, *Afhandling om ängsvattning, dikning och vallars anläggning*, Stockholm, 1841.

earlier greening of the meadows. Another guide was published a few years later by Patzig.[45] He examined and explained the different kinds of systems. There were two main kinds of meadow-irrigation systems: catchwork irrigation for inclined meadows; and dammed irrigation for flat land. He also describes how to build the systems and which tools to use. Another thorough introduction to the method was given by Arrhenius.[46]. He describes in detail the different types and suggests when to use them. He also lists the disadvantages of transforming meadows into arable land, stressing that the meadow was an essential component of well-cultivated farms. Arrhenius gave this warning at a time when many farmers in Scania created arable land from hay meadows.

2 *The flooding of meadows in Scania*

The advanced form of the technique was used in Scania during a rather short period. The first systems were introduced in the 1840s, and many followed during the 1860s and 1870s.[47] Some of the earlier systems may have replaced older, more primitive ones.

Primitive systems have probably been in use in Scania since medieval times. One simple form of watermeadow was constructed by damming a stream and letting the water from the dam run into small channels dug at the side of a shallow valley. This simple type of watermeadow has been found at a few sites in Scania, for example at Tolånga in the south-eastern part of the province. At several other sites there are ditches which could be traces of old primitive watermeadow-systems, but the ages of these systems are not known, as we have not yet found any documents specifically relating to this type of watermeadow; all known examples have been found during field excursions or by contact with farmers.

It can be assumed that this old type of watermeadow has a long history in Scania. Similarities can be found with the British systems of this type. These types were also constructed in northern Sweden and Finland, many before the second half of the nineteenth century.[48] Sjöbeck is very speculative when he proposes that medieval Cistercian monks constructed watermeadows as early as in the thirteenth century in Scania.[49] Almost no investigations have yet been undertaken to prove if the watermeadows were constructed in Scania before the nineteenth century.

A variety of the simple type of watermeadow discussed above has been found on some bogs east of Båstad in north-western Scania. Here the water of some rivulets has been directed out onto the ombrotrophic sphagnum-dominated bog. The water has been used for transforming the very unproductive bog to a somewhat more productive carex-dominated fen. This method of transforming bog vegetation into fen vegetation is known from northern Sweden[50] and from northern Wales.[51] Also Linnaeus describes dams at Lärkesholm in north-western Scania that are used for creating fertile meadows out of infertile bogs. He does not, however, describe any ditches associated with these dams, nor does he include any more information about watermeadows in his texts.[52]

Another type of watermeadow which is also probably old and has not been satisfactorily described in the literature from Scania was *dammäng*. It is, however, adequately described from northern Sweden.[53] In England, the technique was

[45] G C Patzig, *Enkel och lättfattlig anvisning till ängsvattning*, Stockholm, 1845.
[46] J Arrhenius, *Hanbok i svenska jordbruket*, Stockholm, 1874.
[47] See below, pp 138–9.
[48] Vasaari and Väänänen, *op cit.*
[49] M Sjöbeck, *Skåne, Färdvägar och vandringsstigar utgående från statsbanorna*, Stockholm, 1936.
[50] Elveland, *op cit.*
[51] Personal communication, Prof Tony Bradshaw.
[52] C Linnaeus, *Skånska resa förrättad 1749*, Stockholm, 1751, repr 1963.
[53] Elveland, *op cit.*

called 'drowning' or 'floating upwards' according to Taylor.[54] In Scania such a *dammäng* was often combined with a water-mill. On several sites, for example at Baldringe in south-eastern Scania, there have been several such *dammängar* according to local tradition.

It is almost impossible to give a true and thorough account of when and where the modern technique of flooding meadows was introduced into Scania. Published statistics are not available until the mid-1860s. Prior to this period, one is dependent upon records from the different estates and farms. These, of course, vary in availability and condition. A source of great importance is the series of annual reports from the government's agricultural engineer. His reports give accounts of all the undertakings supervised by him. Unfortunately, some of the reports are missing, while many estates evidently constructed large systems without calling on the engineer's assistance. Zachrison gave an account of the evolution of the technique, but this is, however, brief.[55] Our account is a combination of the different sources above.

Before 1850, flooding was in its earliest stages. We know that some smaller systems had been constructed in the 1840s at the estates of Marsvinsholm, Klågerup and Krapperup. In 1851, the engineer Åkerman constructed a system on *flat* land and claimed that this was the first such undertaking in the country. In the 1850s, the method spread considerably and vast areas were flooded, eg meadows belonging to the manors of Börringekloster, Skarhult, Osbyholm, Dybeck, Hjularöd and Övedskloster.

Figure 5 shows those places where at least fifty hectares have been permanently flooded. Of the twenty-six locations in the province, four estates had systems of at least 150 hectares, viz Vomb (owned by Övedskloster, by far the most extensive system with over 400 hectares), Dybeck, Börringekloster and Hjularöd.

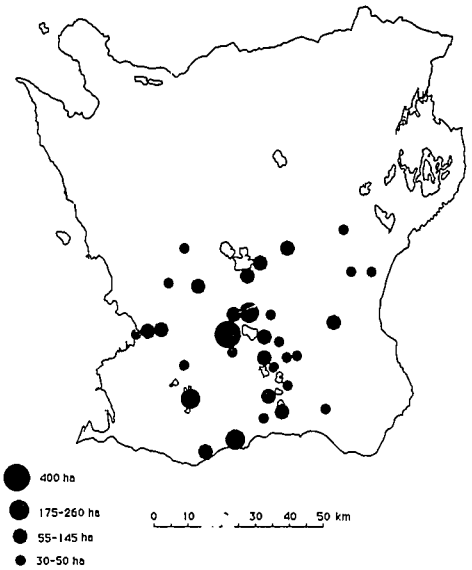


FIGURE 5
Flooding in Scania. Places where at least 50 hectares are known to have been flooded during the nineteenth century

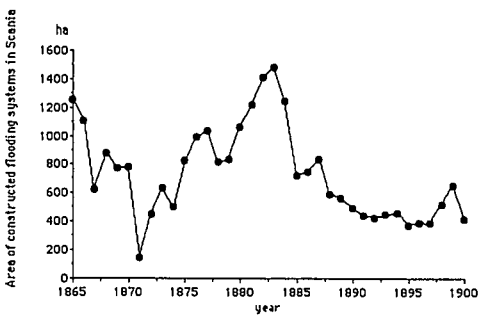


FIGURE 6
Construction of flooding systems in Scania (hectares). Source: Zachrison, (1922).

Figure 6 shows the total effect of flooding since 1860, ie, from the start of published statistics. As can be seen, the period 1875-85 was of great importance. The total area of registered flooding in Scania was 33,302 hectares.[56] This figure is, however, an underestimate as many systems were unregistered. It should be noted that all systems were not functioning simultaneously. The

[54] Taylor, *op cit.*
[55] A Zachrison, *Nyodling, torrläggning och bevattning i Skåne 1800–1914*, Lund, 1922.
[56] *Ibid.*

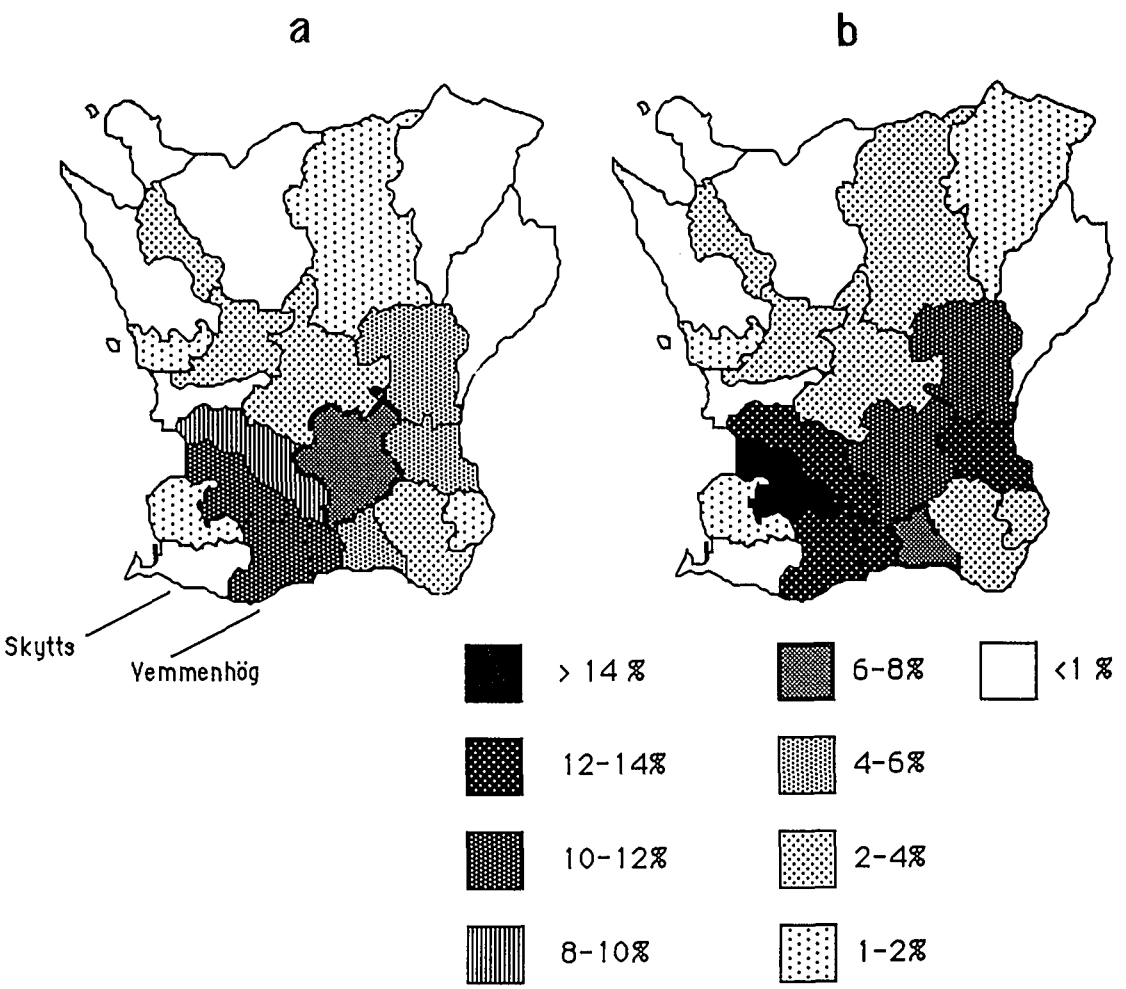


FIGURE 7
Flooding of meadows in Scania 1865–1911 in relation to
(a) total area (b) area of arable land
Source: Bidrag till Sveriges Officiella Statistik, N) Jordbruk och Boskapsskötsel

decrease in the extent of flooded land during the first years of the 1870s can be explained by the lack of capital for the construction of watermeadows due to several bad harvests at the end of the 1860s.[57]

Flooding in relation to area is presented in Figure 7 where it can be seen that it was concentrated in the middle and southern parts of the region. These areas were dominated by large landed estates, and this has probably contributed to the high figures. Note, for example, the difference between Skytts and Vemmenhög (arrows), which are physically similar but have a different social structure. In the peasant-dominated Skytts, there was almost no flooding as the

[57] E Sommarin, *Ur det skånska jordbrukets historia från 1800-talets början till 1914*, Lund, 1938.

construction of irrigation systems required both capital and labour. Ecological features also need to be taken into consideration. Especially striking is the lack of systems in the forested northern parts of Scania. Here the fodder-producing areas were much more difficult to transform into arable land, and therefore the great imbalance seen in the plains never occurred here. However, there is proof that several systems existed but as they were either old, small or primitive they were never entered in the statistics. Note the difference between the two maps. Flooding in eastern Scania was of great importance although the absolute area was not so extensive.

Few systems were constructed after the turn of the century, and old systems were allowed to decay. According to Zachrison, no more than fifteen systems were working in the 1920s. The last systems were abandoned in the late 1940s. In many cases it was the flooding during late autumn which made the practice inefficient as the water was too cold and the nutrient poor.

The watermeadows which were constructed during the nineteenth century were mostly located on relatively flat ground. The largest systems were placed in the most fertile agricultural areas. Quite advanced technical solutions were found at a number of places to improve the practice. At Öved, in southern-central Scania an aqueduct was built to carry water over the river Björkaån (Figure 8). The aqueduct can still be seen even if most of the watermeadows have gone (Figure 9). At Torreberga and some other places, there were pumps to carry the water up to the meadows. Watermeadow-systems were often constructed in association with sugar-beet and other factories which produced a lot of waste water. One example is at Torreberga.

Today, channels previously used for flooding of meadows can be seen at at least twenty sites in Scania. At two sites (Beddinge on the south coast and Öved at the eastern shore of Lake Vombsjön), the abandoned systems are still well preserved. At Vombsängar, west of Lake Vombsjön, a large watermeadow-system was restored in the early 1970s. The restoration was carried out for the preservation of cultural history. Unfortunately, the restorations were subsequently neglected.

3 *Production results*

The advantage of using watermeadows was, of course, the increase of production. The increased production can be of two types: increases during the normal vegetation period; and prolonging of the vegetation period. The latter is especially stressed by authors dealing with British[58] and Portuguese conditions. In these cases it was mostly pasture that was flooded. In such areas there was or is a need for early spring grazing but because of the mild winters there is not much need of stored winter fodder.

The increased production during the vegetation period was especially important in areas where large quantities of stored winter fodder were needed. The supply of nutrients in the water to flood meadows has been regarded by several authors as a major cause for increased production.

Discussing the amount of nitrogen and phosphorus that could have been available in nineteenth century Scanian watercourses, we can of course not rely on any chemical measurements from this time. Today, a very nutrient-rich river as Höjeå has a content of 2–12 g/m^3 of total N and 0.05–1 g/m^3 P.[59] In some smaller riverlets these values can reach figures around 30 g N/m^3. In less nutrient-rich rivers around 1 g total N/m^3 and 0.1 g P/m^3 are normal values. Using the later values and a value of 10-20 litres water per hectare and second as a normal flooding regime, 1 hectare will be exposed to 864–1728 g total N and 86–173

[58] Taylor, *op cit.*

[59] N-O Mårtensson, *Höjeån 1988. Samordnad vattendragskontroll*, Staffanstorp, 1989.

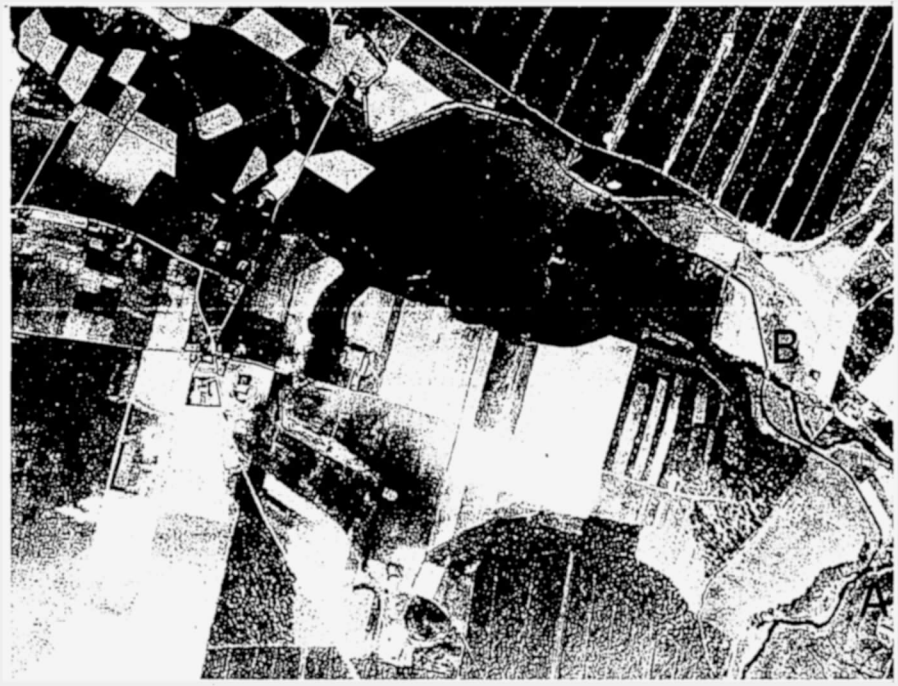


FIGURE 8
The area around the river Björkaån in 1939. Canals and rivers are recognizable as dark lines. The dammed river can be seen at the lower right (A). The canal crosses the river on an aqueduct (B). The flooded meadows lie between the canal and the river in the middle of the photograph (C).



FIGURE 9
The abandoned aqueduct which brought the canal over the river Björkaån.
Photographed in January, 1986

g P during 24 hours. With approximately 100 days of exposure a year, it will theoretically be possible for 1 ha water-meadow to catch well above 100 kg N and 10 kg P per year.

On organic soils, Elveland suggests that oxygen in the floating water causes faster mineralization of litter and this is probably a major reason for increased production.[60] Also, a direct irrigation effect during dry summers must have been of great importance. Further investigations are required to assess the importance of different factors causing increased production on water-meadows of different types.

Normally, inundation causes anaerobic conditions in the soil. Such conditions are negative in two ways for the production of normally used hay-fodder plants: first, the anaerobic soil will gravely hamper the root-function of the plants; and secondly it will favour the process of denitrification, especially if the water is acid.[61] Thereby much nitrogen will be lost from the meadows. To cope with these negative phenomena drainage was used as an important part of the treatment of the flooded meadows. The water was only left standing in the meadows for a couple of days. Thereafter the meadow was carefully drained. In some cases water was brought on to the meadow at the same time as drainage occurred. The water had to move over the meadow constantly. By using this method anaerobic conditions never occurred. On the other hand, anaerobic conditions would reduce ferric ions to ferrous ions and this would release phosphorus to improve plant nutrition.[62]

The production of a large watermeadow at Öved on the eastern shore of Lake Vombsjön of approximately 11 ha was 21 *lass hö* (wagons of hay) according to Harry Persson, Sjöbo (former farmer of the site). When the practice of flooding had stopped, the yield dropped to 9 *lass hö*. He also mentioned that the harvest at one meadow was reduced from 46 *lass hö* to 14 when the irrigation stopped.

There was an annual requirement of 2–300 kg NPK/ha to maintain the production at Vombs ängar after 1949 when the flooding of meadows had stopped. Later the additional amount of NPK/ha per year was as much as 4–500 kg.[63]

Arrhenius cites several sources as he discusses the results of flooding.[64] The best results gave increases in production of ten times after flooding had been introduced. This, however, seems to be an exception. Typical increases in production due to flooding were between three and five times.

IV

During the nineteenth century there were a number of ways which compensated for the loss of meadows which produced manure in earlier times. It is important to compare the different fertilizing systems that were used in Scania in the nineteenth century in order to evaluate how the compensation took place. Paring and burning, and different types of slash-and-burn agriculture were probably locally important in the northernmost part of Scania as methods of maintaining the productivity in villages in forested areas.[65] These methods must have been marginal for Scanian agriculture as a whole. As marling was used for only a short period this was also of marginal importance.

The other methods to overcome the shortfall in fertilizers which have been identified in this paper are: 1, new fields manured by nutrients available when the grass-sward is turned by the plough; 2, use

[60] Elveland, *op cit.*
[61] C A Black, *Soil-plant Relationships*, 2nd edn, New York, 1968.
[62] N K Savant and R Ellis Jr, 'Changes in redox potential and phosphorus availability in submerged soil', *Soil Science*, 98, 1964, 388–94.
[63] S Bengtsson, H Larsson, and S Petersson, *Vombs ängar. Vegetation, fågelliv, markanvändning samt synpunkter på resaurering och skötsel*, Länsstyrelsen i Malmöhus län, Malmö, mimeograph, 1973.
[64] Arrhenius, *op cit.*
[65] Weimarck, *op cit.*

of legumes in crop rotations and in leys; 3, better handling of natural manure; and 4, increasing the amount of natural manure from livestock by using watermeadows which produced more hay per hectare than other meadows. In order to analyse the relative importance of these methods, it is useful to divide the materials into the two administrative regions of Scania; Malmöhus county and Kristianstad county (Figure 3). The first region is dominated by large plains which are mostly used for grain production today. Kristianstads län is a much more forested region where agriculture has always played a lesser role.

The first step in an analysis of the nutrient balance during the nineteenth century is to reconstruct the development of land-use for the two Scanian counties during this period. Such reconstructions are presented in Figures 10 and 11. The figures are largely based upon official statistics from 1858 onwards which seem to be fairly reliable. During the first half of the nineteenth century however, there are only data for 1805 and 1833. The details of the statistics used are described and discussed in the appendix.

It is evident that there were two types of agricultural land; land from which nutrients were exported and land with imports of nutrients. Land from which nutrients were lost were more or less all pastures and meadows in the early nineteenth century. Nutrients were taken from the meadows continually in the form of hay. However, nutrients were also exported from the pastures as much of the livestock was taken home to the farms at night-time and left there a large part of its dung.

The types of land receiving nutrients were those fields that were manured. There were also land-use types that were independent in terms of nutrient transport across the landscape, eg forests and peat bogs. Also those forests which were grazed are regarded as having an independent nutrient circulation.

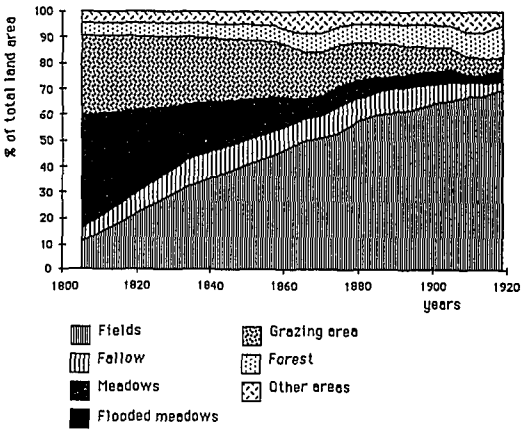


FIGURE 10
Land-use in Malmöhus county, Scania, 1805–1919.
Sources: see appendix

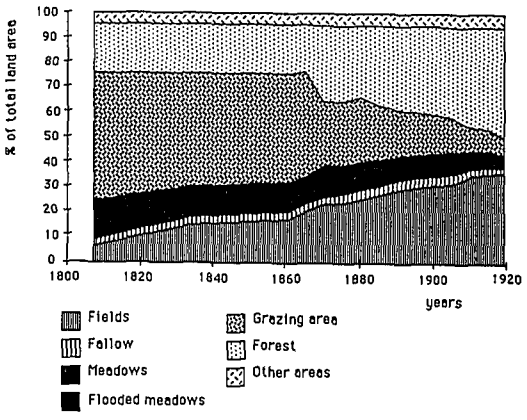


FIGURE 11
Land-use in Kristianstad county, Scania, 1805–1919.
Sources: see appendix

The degree of export of nutrients varies a lot. In order to assess the potential nutrient export at different occasions during the nineteenth century it is necessary to scale the nutrient exporting areas against each

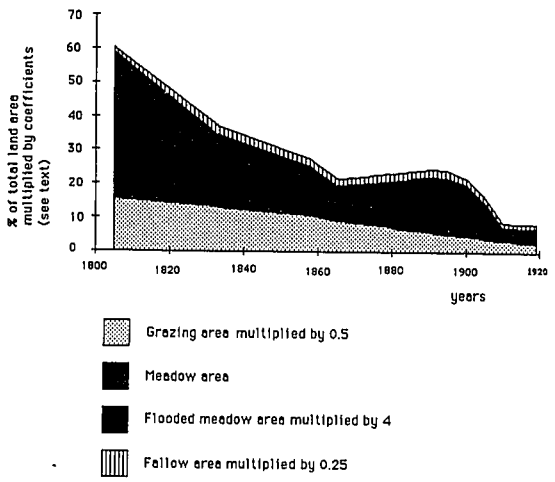


FIGURE 12
Sources of manure in Malmöhus county 1805–1919
Literature sources: see text

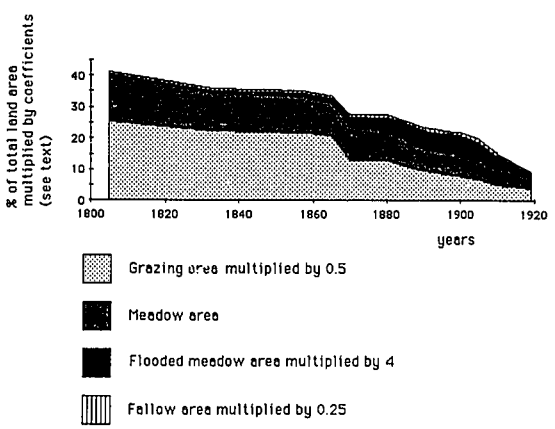


FIGURE 13
Sources of manure in Kristianstad county 1805–1919
Literature sources: see text

other.[66] This gives a relative potential curve for the export of nutrients from pastures, meadows and fallows during the period 1805 to 1919 (Figures 12 and 13).

The two curves (Figures 12 and 13) show that the manure-producing areas decline rapidly during the century. In both cases the decline is reduced from the 1860s up to the beginning of the twentieth century. It is evident that this is caused by the introduction of watermeadows on a large scale (black area). Thus, the watermeadows played a significant role in the production of manure in Scania during this half of the century. The decline, and thus the role of the watermeadows, was much greater in Malmöhus county with its large grain producing plains.

The next step is to analyse the need for manure and the sources to supply this need during the period of investigation. The potential use of manure is shown in the two counties of Scania in Figures 14 and 15. The two curves were constructed thus: we started with the curve showing total land under plough. From this we subtracted first 'the self-manuring part' of the fields used for animal fodder production. We use this term because many of the nutrients in the fields are returned as manure. However, this is not a perfectly balanced system, and we suggest that 50 per cent of the nutrients are lost in the circulation between fodder plants, fodder, manure, and nutrients for fodder plants. This means that 50 per cent of the animal fodder producing area can be regarded as 'self-manuring'. We also subtract newly cultivated land which was especially important in the beginning of the nineteenth century. Remaining areas thus need manure from outside the arable system. With minor exceptions (seaweed, heather, peat) the only source of manure at the beginning of the century was animal dung. Artificial fertilizers were not introduced on a large scale until the 1860s. If we subtract the areas which *de facto* received artificial fertilizers, the remaining areas in Figures 14 and 15 are the areas needing natural manure. During the first half of the century the need for natural manure was steadily increasing, reaching a peak during the 1860s and 1870s. The demand was about twice as much in Malmöhus as in Kristianstad county.

[66] See appendix for the details of the coefficients.

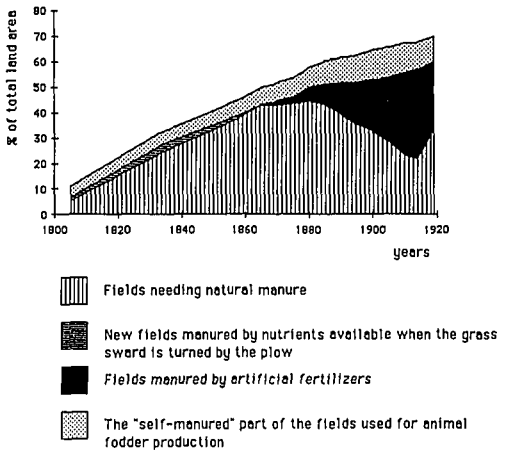


FIGURE 14
Manuring of the fields in Malmöhus county 1805–1919. Sources: see text

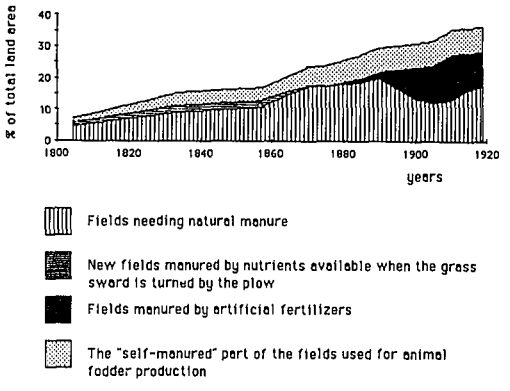


FIGURE 15
Manuring of the fields in Kristianstad county 1805–1919. Sources: see text

It is now relevant to compare the need for manure with the actual production of manure (Figures 16 and 17). The curves showing the areas needing natural manure are taken from Figures 14 and 15. Hypothetical areas for natural manure production are taken from Figures 12 and 13.

There is a theoretical overproduction of manure in Malmöhus county (Figure 16) in the early nineteenth century, which is transformed into a deficit during the 1840s. Because of the inefficient handling of manure documented by Zachrison 1922, many of the nutrients were lost and the higher potential harvests could not be achieved. The handling of manure was considerably improved about 1840, and

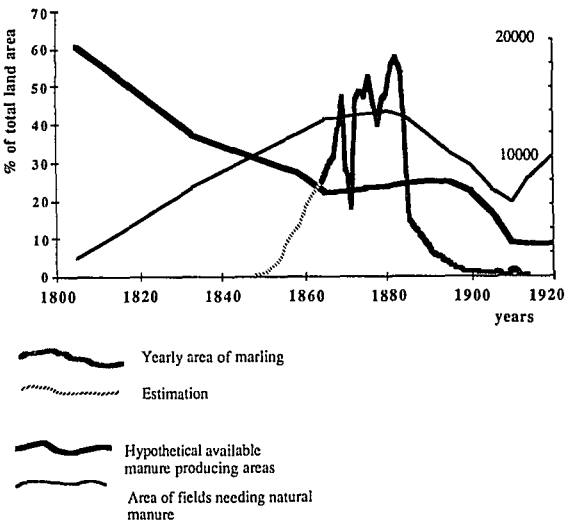


FIGURE 16
Synthesis: need and production of manure in Malmöhus county 1805–1919. Sources: see text

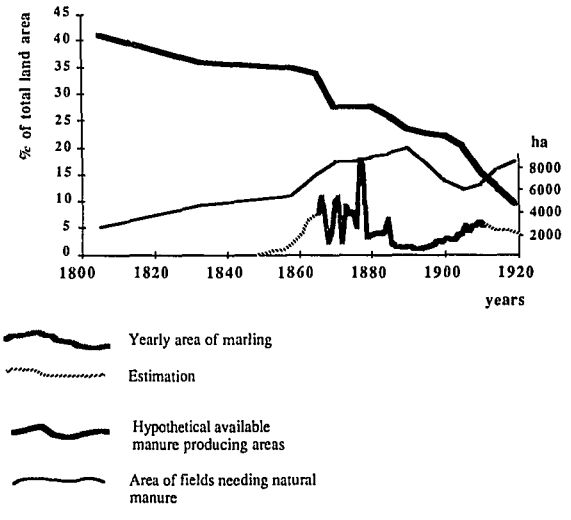


FIGURE 17
Synthesis: need and production of manure in Kristianstad county 1805–1919. Sources: see text

therefore, the theoretical deficit in natural manure is not shown as a reduction in productivity per hectare.[67] However, after 1850 the gap between the need and production of natural manure was increased further, and this could not be compensated for by still more efficient handling of manure. Therefore, during a forty-year period marling was used to increase soil fertility. This is also shown in the figure. Marling, however, could only be used during a rather short period, as this method only gives short-term advantages. During the period of marling the production of natural manure was maintained by the introduction and development of water-meadows. In the 1880s, when marling was more or less abandoned, the hay/manure production on the watermeadows came to be of great importance for the fertility of the arable land. Not until the turn of the century did artificial fertilizers become a significant type of manure in Scanian agriculture. Concurrently, watermeadows were abandoned probably because of the high costs of maintaining the meadows. In comparison, artificial fertilizers at this time had become both cheap and easily obtainable for the average farmer.

The development in Kristianstad county (Figure 17) shows many similarities to that in Malmöhus county. However, the transformation of meadows and pasture into arable land was not at all of the same magnitude as in Malmöhus. This means, of course, that there were not such large deficits of natural manure here. As a consequence, marling was not used to the same extent.

As shown by Olsson,[68] using seventeenth- and eighteenth-century material from Scania, lighter soils and soils with lower pH need a much larger input of nutrients to achieve the same production as heavy soils with higher pH. This fact explains to a large extent the comparatively high input of manure used in the agriculture of Kristianstad county, which is a country of generally lower pH soils and lighter soils compared to Malmöhus county.

We have now shown how it was possible to increase the extent of arable land without having artificial fertilizers available; marling and nitrogen fixing legumes were important factors; but methods of conserving the nutrients in the agro-ecosystem were of greater importance. The two main methods were the flooding of meadows, and improved treatment of animal dung. It was in this way possible to drastically change the relationship between arable and meadow by conserving the nutrients. The nineteenth century developments in Jutland in Denmark seem to have been fairly parallel to those in Scania, and Rasmussen stresses the importance of the watermeadows as sources of hay and thus manure for fertilizing the increasing arable lands.[69]

As already mentioned, we can divide patterns of land-use into four main epochs (compare Figure 1). Permanent fields dependent upon large areas of meadows were in use in Scania probably from the eleventh century up to the beginning of the nineteenth century. Then, as has been shown above, the relationship between arable land and meadows was significantly changed. As a result of the good conservation of nutrients in the agro-ecosystems (eg watermeadows), many of the land-use systems of the nineteenth century can therefore not be said to belong to epoch 3 as it persisted during most of the historical time. We therefore suggest that epoch 3 should be divided into two sub-epochs, 3a and 3b (Figure 18).

In the south of Sweden, sub-epoch 3b lasted only for about eighty years, from the 1820s until the beginning of the twentieth century. In England and The Netherlands,

[67] *Historical Statistics of Sweden*, II, 'Climate, Land Surveying, Agriculture, Forestry, Fisheries – 1955', Stockholm, 1959.

[68] G Olsson, 'Nutrient Use and Productivity for Different cropping Systems in South Sweden during the 18th Century', in H H Birks, H S B Birks, P E Kaland and D Moe, eds, *The Cultural Landscape. Past, Present, and Future*, Cambridge, 1988.

[69] Rasmussen, *op cit.*

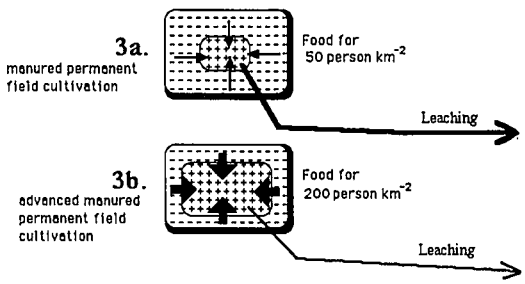


FIGURE 18
Model showing epoch 3a and 3b. Compare Figure 1
– areas exporting nutrients
+ areas importing nutrients

watermeadows and other nutrient-conserving systems (eg the Norfolk system) were introduced much earlier – in some cases as early as the end of the seventeenth century. Artificial fertilizers, however, were not introduced significantly earlier than in southern Sweden. The extent of sub-epoch 3b was thus much longer in England (*c* 200 years). The practices spread to northern Germany and Denmark before they came to Scania. As the distance between the innovation centres (England and The Netherlands) and the areas importing innovations increased, the duration of sub-epoch 3b probably decreased. For instance, in remote parts of northern Scandinavia, sub-epoch 3b was never introduced; in parts of Lapland the transition from 3a to 4 was made in the 1940s.

V

Evidently, there was a time-lag in Scania of about eighty years between the major enlargement of the arable fields and the introduction of artificial fertilizers. It is, however, not possible to show a significant reduction in the production per hectare during this period. The theoretical 'vicious circle' did obviously not exist on a regional scale. The shortfall in nutrients was 'filled' by the introduction of a number of methods to conserve the nutrients in the agro-ecosystem. Of methods fixing nitrogen, the flooding of meadows was of great importance during the second part of the nineteenth century. Such methods may have helped England escape the 'vicious circle' two centuries earlier.[70] An agricultural system without artificial fertilizers but, with effective conservation of nutrients, must be categorized as a separate system from the earlier systems where small fields were dependent upon large meadows, and the treatment of the manure was inefficient.

The methods of efficient treatment of manure and the flooding of meadows must have been known to the Scanian farmers for a long time, but as the system involved both capital and labour, it was not introduced until it was really needed. It was the large landed estates which introduced it on a grand scale, as they had both capital and labour. This agrees well with Boserup who emphasizes the primary role of population: although an innovation in another region is known it is not introduced until the population size has passed a certain threshold thereby making the available resources limited.[71] When artificial fertilizers were introduced, flooding rapidly decreased in importance.

Looking towards the future, it is interesting to note that the waste water from the sugar-beet factories of Staffanstorp and Jordberga, as well as the waste water from the city of Lund, was used to fertilize water meadows during the beginning of this century. Today, we have problems, especially during spring and parts of autumn, with nitrogen and phosphorus eutrophication of rivers, lakes, and the sea. Nitrogen in particular is to a large extent not removed by the sewerage plants, and there is, at that time of the year, a major loss of nutrients from ploughed fields. A new type of watermeadow using modern

[70] Kerridge, *op cit.*
[71] E Boserup, *Population and Technology*, Oxford, 1981.

techniques would, therefore, be of double advantage: on the one hand it would act as a sink for phosphorus and nitrogen thereby reducing the risk of eutrophication and on the other hand, the use of artificial fertilizers could be reduced by growing hay and energy-crops (eg *Salix*-spp). Thus a knowledge of past agro-ecosystems can be applied to the needs of modern agriculture and environmental planning.

APPENDIX:

The statistical material

The land-use figures

The early land-use figures from the time before 1865 derive from Zachrison *Nyodling, torrläggning och bevattning: Skåne 1800–1914*, Lund, 1922, (1805), and from *Tidning för Landthushållning*, nr 1 1858, published by Skånska Hushålls-föreningen (1833 and 1858). From 1865 onwards, the figures are taken from *Bidrag till Sveriges officiella statistik, N) Jordbruk och boskapsskötsel*. The flooded meadows are not distinguished in official statistics; they are calculated from *Tidning för Landthushållning* and Zachrison. Additional material has been gathered from *Malmöhus läns Jordbruk år 1909*, published by Malmöhus läns Hushållningssällskap.

The manure-source figures

During the scaling the relative amount of nutrients exported from the 'meadow' category was set to 1. The harvest from watermeadows are equal to those from untreated meadows 2–10 times as large (see above). A factor of 4 for the increase in harvests of the watermeadows is estimated here to be an approximate average. The grazing areas have a factor of 0.5 as more than half of the dung is probably dropped on the pastures and not around the farms at night-time. It must also be stressed that the meadow during autumn actually functioned as pasture. Finally, the fallows are assumed to be poor nutrient exporters (0.25) as such areas were often used for pigs and ducks from which little manure was collected. Another reason is the sparse vegetation.

The need of manure figures

Figures for the area where artificial fertilizers and marling were used were calculated from figures given in Zachrison, *Gödsling och jordförbättring: Skåne från 1800–talets början till nuvarande tid*, Lund, 1914.

Figures of flooding of meadows

Figures are calculated from 1, *Tidning för Landthushållning;* 2, Zachrison (1922); 3, The annual reports from the government's agricultural engineer, archives of Kungliga Skogs-och Landtbruks-akademien; and 4, *Malmöhus läns Jordbruk år 1909*.

Notes on Contributors

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Dairywomen and Affectionate Wives: Women in the Irish Dairy Industry, 1890–1914[1]

By JOANNA BOURKE

Abstract
Milking and butter-making were important to the rural Irish economy. In the nineteenth century, dairy work was dominated by women. By World War One, it was dominated by men. The establishment of creameries and male-only agricultural colleges, in addition to legislation limiting female hours of employment, encouraged the substitution of male labour for female labour. Schemes to educate rural women in the new dairying technologies had minimal effect. Although the value of dairy production in Ireland increased, female status in the industry declined as managerial control came to be vested in men. The removal of women from the dairy was justified by reference to the need of increasing female investment of time in housework.

On 16 October 1892, the Irish-American, Denis Hurley, wrote to his sister in County Cork about their brother.

> I believe Tim is foolish to be postponing his marriage so long under the circumstances. As dairy farming is the most profitable, he should get a good looking and affectionate wife that would make first class butter. If you cannot help him to get one in Cork, why I will give him a letter of recommendation to go wife seeking down to Connaught.[2]

Denis had emigrated to America twenty-two years earlier: his advice was becoming dated. Butter prices had been declining since Hurley left Ireland in the 1870s. They rose briefly in 1891 and 1892, before falling again. Prices did not pick up until the turn of the century and then remained relatively stagnant for another decade. However, the industry was vital to the Irish economy. In 1912 the production of butter and milk made up twenty-one per cent of the total agricultural income of Ireland.[3] Astute publicists could see that, with regard to female participation in dairying, the industry was changing. By the beginning of the twentieth century, the practice of Irish farm women milking cows, making butter for family consumption, selling the surplus in markets and shops, and using the money to pay off shop debts was no longer the dominant pattern. A technological and managerial revolution in the dairying industry was affecting female farm labour in large parts of the country. This article examines these changes. The first section discusses the declining participation of Irish women in milking and butter-making. What caused the movement of women out of these sectors? Historians of the dairying industry stress the rapid growth in the dairy industry in this period.[5] The cost of these changes was high. Women were driven out of the industry. Contemporaries responded to increasing unemployment among dairy-women in two ways. Rural reformers attempted to educate women in improved

[1] I would like to thank the two anonymous referees for their help in preparing this article.

[2] Cork Archives, U170 Hurley Emigrant letters, letter from Denis Hurley to his sister Kate, dated 16 October 1892. His family was from Clonakilty (County Cork). Denis emigrated in 1870.

[3] Department of Agriculture and Technical Instruction for Ireland (hereafter DATI), 'Council of Agriculture, 27th Meeting, Tuesday, 4 May 1915, Report of Proceedings', p 6.

[4] R D Crotty, *Irish Agricultural Production, Its Volume and Structure*, Cork, 1966; Liam Kennedy, 'Aspects of the Spread of the Creamery System in Ireland', in Carla Keating, ed, *Plunkett and Co-operatives. Past, Present and Future*, Cork 1983, pp 92–110; and Cormac Ó Gráda, 'The Beginnings of the Irish Creamery System, 1880–1914', *Econ Hist Rev*, 2nd ser, xxx, 1977, pp 284–305.

forms of buttermaking. These schemes failed. More realistically, they attempted to divert 'redundant' labour into three areas: home industries, poultry-rearing, and housewifery. Economic and social forces meant that the promotion of housewifery was the dominant (and successful) response.

I

Census statistics provide information on the sexual division of labour within the dairying industry. People involved in milking and butter-making could be categorized under a number of occupations. A small proportion of domestic servants would have been employed as dairymaids, but this occupational group dropped from 220,700 women in 1891 to 144,900 women in 1911 and remained composed almost entirely of women. The number of female farm servants fell from 13,000 in 1891 to 9000 in 1901 then only 2000 in 1911. We have no way of knowing what proportion of these domestic and farm servants were dairymaids. Women explicitly given dairying occupations were placed in different categories 1851–1861, 1871–1891 and 1901–1911. In the nineteenth-century censuses, they could be called butterdealers and factors, milksellers and dairywomen, or cheesemongers and butterwomen. In 1881 women made up 43 per cent of all persons within these categories. Ten years later, this had declined to 31 per cent. If we then turn to the 1901 and 1911 census, under the heading 'milkseller, dairywoman', the percentage of women declined from 26 in 1901 to 16 per cent by 1911. The 1901 and 1911 census included a separate category for creamery workers. Women constituted almost 30 per cent of this category in 1901 and only 12 per cent by 1911. If we take all those occupations explicitly labelled as employment in creameries or concerned with milk and dairy products, in 1881 over 40 per cent of this workforce was female compared with less than one-sixth by the end of the period (see Table 1).

Men had begun to take a larger role in dairying. Wealthier households altered their practices first. Women in these families began relegating dairying tasks to hired male labourers.[5] The first widespread change occurred in milking practice as this was an outdoor job and more easily re-defined as men's work. The *Agricultural Class Book*, in its editions of 1848, 1853 and 1860, encouraged young boys to read the chapter entitled 'The Cow – The Dairy – Milk – Butter – Cheese – Pigs' with the words 'possibly some *boys*, on reading the heading of this lesson, may be so foolish to think it is a fit study for *girls* only', but although girls milked, made butter, and scoured milk vessels, the boys should still read the chapter so that they could perform their role of feeding and attending to the cow, helping with particularly heavy churning, and supervising the women if necessary.[6] Women regarded the dairy as their 'traditional' province.[7] Folklore conferred 'natural' superior milking skills on women.[8] But commentators agreed that increasingly men milked.

> Long ago it was the women milked the cows, but in later years it was done in a lot of cases by the men.[9]

> In days gone by cows were all milked by women. There was no such thing as a man milking a cow. Men would not consider it their work to milk a cow. Whatever be the cause, women have gone out of the

[5] J P Sheldon, *Dairy Farming, Being the Theory, Practice and Methods of Dairying*, originally published in 1879, 1888, p 360.

[6] Commissioners of National Education for Ireland, *Agricultural Class Book*, Dublin, 1848, edition 1848 (pp 240–1), and editions 1853 and 1860 (pp 288–9).

[7] Helen Blackburn, ed, *A Handy Book of Reference for Irishwomen*, 1888, pp 84–5.

[8] Irish Folklore Commission (hereafter IFC), Mss 843, story told by Mickey Crowley of Carrigroe (County Cork), aged 95 years, recorded between August and October 1942, p 88. Also see evidence by R A Anderson (secretary of the Irish Agricultural Organisation Society, hereafter IAOS) and Henry S Guinness (of Stillorgan in County Dublin, the owner of a dairy herd) in Department of Industry and Commerce for Saorstat Eireann (hereafter DIC), *Commissioners of Inquiry into the Resources and Industries of Ireland. Minutes of Evidence. Part 1. City Hall Dublin, 2nd, 3rd, and 4th December, 1919, Milk Production and Milk Products and Fisheries*, Dublin, 1919, pp 25 and 50–3.

[9] IFC, Mss 1024, discussion by John Cullen, aged 71, labourer of Bailieborough (County Cavan), collected by P J Gaynor of Bailieborough, in January 1948.

TABLE 1
Percentage of Workers in Dairying Occupations Who Were Female 1851–1911

Job	*1851*	*1861*	*1871*	*1881*	*1891*	*1901*	*1911*
Milkseller, Dairykeeper, Cheesemonger, Butterseller, Butterdealer and Factor	35.3	52.2	52.5	43.4	30.6	na	na
Creamery Worker, Milkseller, Dairykeeper	na	na	na	na	na	27.7	14.8
Farm Labourer and Servant	19.7	12.1	na	na	na	na	na
Agricultural Labourer	na	na	9.0	7.6	7.2	5.3	1.7
Indoor Farm Servant	na	na	14.4	17.1	10.8	10.6	3.5

business, and in a great number of cases, therefore, cows have got to be milked by men and boys.[10]

Although it is easy to perceive the general movement of men into milking activities, precise identification of the timing and locational aspects are more elusive. The evidence is impressionistic and often contradictory. For example, in 1911, dairy farmers in Bangor and Newtownards stated that male milkers had completely replaced females. They later added that the wives of milkers assisted their husbands in large dairies.[11] However, the questionnaires of the Folklore Commission and of the Cultra Folk and Transport Museum Archives provide some indication of the changes, although the precise dating of the data is difficult as the elderly respondents were encouraged to speak generally about 'their youth'.[12] In 1958 the Folklore Commission issued a questionnaire on the social aspects of work. Question five asked whether milking was considered 'beneath the dignity' of the 'average farmer' in their district. Eighty-seven respondents replied by specifying whether men or women milked. The questionnaire on hiring fairs sent out by researchers at the Folk and Transport Museum asked for lists of work performed by male and female agricultural labourers. Eighty-two replies stipulated whether men or women milked. Examination of the questionnaires reveals a mixed pattern. Men rarely replaced women entirely in the business of milking. Poorer classes of women were more likely to be engaged in milking. Women did not milk where male wages were high. If the milk was used merely for household consumption, women were more likely to milk cows as part of housework. With the advent of creameries which regularized production and marketing, men were increasingly likely to take over milking. Furthermore, with increasing wages for male labourers and the rapid substitution of casual labourers for live-in servants, farmers were more likely to hire men who could be employed at other agricultural work during slack milking months. Thus, we see an increase of *male* farm servants in households with dairies. In a sample of the original census forms for eight District Electoral Divisions (that is, a sample of 4536 individuals in 1901 and 4215

[10] DIC, *Resources and Industries of Ireland. 2nd, 3rd, and 4th December, 1919, Milk Production and Milk Products and Fisheries*, p 9, evidence by R A Anderson.

[11] '*Vice-Regal Commission on Irish Milk Supplies. Appendix to the First Report of the Irish Milk Commission, 1911. Minutes of Evidence (Taken in Dublin, Belfast and Newry, 29th November, 1911, to 1st March, 1912 (Inclusive) with Evidence*', PP, 1913, XXIX, pp 281 and 285, evidence by M Shiels, farmer in Bangor and Rev. W Wright, Presbyterian clergyman at Newtownards and vice-chairman of the North Down Agricultural Society.

[12] These questionnaires may be found in the folklore archive at University College Dublin and in the Ulster Folk and Transport Museum at Cultra.

in 1911),[13] ten per cent of all households in both 1901 and 1911 had dairy sheds. In 1901, while only 8 or 9 per cent of *all* households in the areas had either a domestic servant or a farm servant, 35 per cent of households with dairies had servants. By 1911 40 per cent of households with dairies had servants. The number of domestic servants and farm servants in these households remained stable. What changed was the sex composition of farm servants. In 1901 27 per cent of farm servants working on holdings with dairies were female. Within ten years, only 11 per cent were female.

II

Milking was only the first of many jobs in which a predominantly female workforce was replaced by men. The traditional way of making butter, with women churning the milk or cream, was gradually replaced (in the dairying regions) by large-scale creameries, co-operatively or privately run.[14] The move to creameries was particularly strong in Limerick, Tipperary, Kilkenny, Sligo, Cavan, Monaghan, Cork, Leitrim, Kerry and Waterford.[15] Canon Baggot started the first Irish creamery in 1884, to be copied five years later by the establishment of a creamery at Limerick Junction by two partners. Farmers in North Cork and County Limerick experimented with joint-stock creameries. The English Co-operative Union also set up creameries in Ireland under the Industrial and Provident Societies' Act. However, the sudden upswing in large-scale butter production came with the growth of the co-operative movement under the managerial encouragement of the Irish Agricultural Organisation Society (IAOS). These creameries were managed by a committee elected by the shareholders. Farmers took shares in the co-operatives and profits were shared between the shareholders. People supplying milk were paid according to the highest market price for butter consistent with creamery survival. In most co-operative creameries, the farmer was paid in proportion to the amount of butterfat in the milk. The milk was separated by centrifugal separators and the skim milk given back to the supplier. By 1908, nearly all societies were adopting a 'binding rule' whereby the supplier had to supply all the milk to the society in which she or he held shares. There was also a tendency to restrict acceptance of milk from non-shareholders.

By 1915, the dairy societies of the IAOS had a membership of over 45,000 with a turnover of £3 million.[16] Propounders of the creameries argued that they were the only salvation for a dairy industry depressed through generations of poverty, with insecure land-tenure, and facing strong international competition.[17] Irish dairying required creameries because small-scale production techniques did not result in uniformly high quality butter. Without

[13] The districts examined in 1901 and 1911 were Ards (County Donegal), Ballatrain (County Monaghan), Belleek (County Fermanagh), Keeldra (County Leitrim), Kilconickny (County Galway), Rathmore (County Limerick), Tullamore (Kings' County), and Woodstown (County Waterford). For a detailed analysis of these districts and labour trends in all sectors of the rural economy, see Joanna Bourke, 'Husbandry to Housewifery. Rural Women and Development in Ireland, 1890–1914', unpublished PhD thesis, Australian National University, 1989.

[14] Co-operative creameries accounted for at most half of total butter production: Cyril Ehrlich, 'Sir Horace Plunkett and Agricultural Reform', in J M Goldstrom and L A Clarkson, eds, *Irish Population Economics and Society*, New York, 1981, pp 281–2. In Canada during the same period, the establishment of creameries drove women out of the industry: Marjorie Griffin Cohen, 'The Decline of Women in Canadian Dairying', *Histoire Sociale. Social History*, xvix, November 1984, pp 307–34 and J A Ruddick, 'The Development of the Dairy Industry in Canada', in Harold H Innes, ed, *The Dairy Industry in Canada*, Toronto, 1937, p 44. For a summary of the role of the Canadian government in this process which parallels the Irish case, see Fowke Vernon, *Canadian Agricultural Policy: The Historical Pattern*, Toronto, 1946, p 213.

[15] DIC, *Agricultural Statistics, 1847–1926. Report and Tables*, Dublin, 1928, pp xx–xxi.

[16] *Ministry for Reconstruction. Summaries of Evidence Taken Before the Agricultural Policy Sub-Committee Appointed in August 1916 to Consider and Report Upon the Methods of Effecting an Increase in the Home-Grown Food Supplies, Having Regard to the Need of Such Increase in the Interest of National Security*, PP, 1918, V, p 330, evidence by R A Anderson.

[17] *Report from the Select Committee on Industries (Ireland), Together with the Proceedings of the Committee, Minutes of Evidence, and Appendix*, PP, 1884–5, IX, p 229, evidence by William John Lane, Cork butter merchant. Also see the letter from Mrs Anne Hart republished from *Daily Graphic* in *Irish Farming World*, 4 December 1891, p 788 and Liam Kennedy, 'Aspects of the Spread of the Creamery System in Ireland', in Carla Keating, ed, *Plunkett and Co-Operatives. Past, Present and Future*, Cork, 1983, pp 92–110.

creameries, the best butter was exported and sold at the same price as the 'rancid productions evolving from a smoky cabin, where one churning lay gathering for weeks.'[18] The industry could not compete with mild Danish butter: Irish butter was accused of tasting of peat.[19] What was the good of dairy farmers in Limerick or Cork having 'grass so rich you could grease your boots on it' if no market would accept their butter?[20] Even if women had the training and facilities for making high quality butter, the lack of uniformity in farmhouse butter meant they would not secure the highest price. Creameries increased the profits of dairy farmers. It was claimed that they raised the average price of the farmers' butter by about 4d per pound and increased output by as much as ten per cent.[21] Creameries were said to be superior to the factory (or blending) system because 'responsible' butter-producers received the milk straight, so to speak, from the cow's teat, with no intermediate peasant woman to dirty the milk through her methods of setting, preparing and churning.[22]

> You would have to reform the conditions of Irish dairy farming altogether if you wanted to adopt the factory [that is, blending] system, and you would have to teach every woman who makes a pound of butter in Ireland how to make it properly, you would have to build new dairies on special and proper principles, and you would have to have a system of inspection which would insure the dairies being properly clean. You must recollect that the bulk of butter which comes from Ireland is manufactured in districts where the people are untidy. I have known cases where some of the butter made in County Kerry was stored in a room where there was a patient suffering from typhus fever.[23]

Historians have generally accepted this view of creameries, portraying them as economically desirable (because they are 'efficient') in areas with a sufficiently large milk supply.[24] However, creameries drastically reduced the income potential of many women and girls.[25]

> The inevitable effect of the general adoption of such institutions [creameries] in this country must be, I apprehend, to remove from the wives and daughters of the farmers a healthy, and at the same time, most valuable source of industrial occupation and training; in every way peculiarly adapted to their condition and habit of life for which it will not be easy to discover in any other direction, an equally suitable or sufficient substitute, and the want of which now, on the part of these by no means insignificant classes of the working population, may – it is quite conceivable – in the many possible contingencies of the future, be found to ultimately result in serious loss to the farmers themselves.[26]

Local controversies developed as to the relative advantages and disadvantages of replacing homemade butter production by

[18] Sarsfield Kerrigan, *Leader*, 7 March 1908, p 39. Also see 'Confidential Report [Base-line Reports], Congested Districts Board for Ireland, County of Donegal – Union of Inishowen, Report of Major Gaskell, Inspector, District of North Inishowen', p 3 and *Royal Commission on Congestion in Ireland. Appendix to the Eighth Report, Minutes of Evidence (Taken in Kerry and Cork, 3rd to 19th July, 1907), and Documents Relating Thereto*, PP, 1908, XLI, p 75, evidence by the Very Rev. Canon Humphrey O'Riordan, representing the Bishops, the Cahirciveen Rural District and the fish curers.

[19] *Committee on Butter Regulations. Minutes of Evidence to the Interim Report of the Departmental Committee Appointed by the Board of Agriculture and the Department of Agriculture and Other Industries and Technical Instruction for Ireland to Inquire and Report Upon the Desireability of Regulations . . . for Butter, With a Digest of Evidence; and Appendices*, PP, 1902, XX, p 300, evidence by Miss K A Brown, dairy instructress for the DATI in Donegal.

[20] Augusta Gregory, 'Ireland, Real or Imaginary', *Nineteenth Century*, November 1898, p 771.

[21] Creameries extracted ten per cent more butter out of the same amount of milk used in home churning: *Leader*, 21 March 1908, pp 73–4.

[22] The factory or blending system meant that farmwomen churned the milk in their home, then brought the butter to the factory where it was mixed with butter made by other women in the district, and marketed. Creameries spearated the milk and churned the butter.

[23] *Royal Commisssion on Agriculture. Minutes of Evidence Taken Before Her Majesty's Commissioners Appointed to Enquire into the Subject of Agricultural Depression, with Appendices, Vol. III*, PP, 1894, XVI, Part III, p 393, evidence by R A Anderson.

[24] Ó Gráda, 'Irish Creamery System', *Econ Hist Rev*, 2nd ser, xxx, pp 284–305.

[25] For a comparative study based on the introduction of creameries in Denmark from the 1880s, see Bodil K Hansen, 'Rural Women in Late Nineteenth Century Denmark', *Jnl of Peas Stud*, 9, 1982, pp 225–40.

[26] *Royal Commission on Labour. The Agricultural Labourer. Vol. iv. Ireland. Part iii. Reports by Mr W. P. O'Brien, CB (Assistant Commissioner), Upon Certain Selected Districts in Counties Carlow, Cork, Clare, Kerry, Kildare, Kilkenny, King's, Limerick, Queen's, Tipperary, Waterford, Wexford, and Wicklow, With Summary Report Prefixed*, PP, 1893–4, XXXVII, part I, p 169, report on Kanturk (County Cork). Also see *Irish Peasant*, 28 April 1906, p 6 and "M.G.", *Irish Nation*, 13 February 1909, n.p.

creameries.[27] The *Irish Nation* pointed out that farmers' daughters would resist the time and labour constraints imposed upon them in the factories.[28] This argument is deceptive, however, because few farmers' daughters were given employment in creameries. The IAOS defended raising female unemployment by advising farmers to calculate the economic value of the time of their daughters. When a farmer learned about the value of time

> then he will be able to judge more truly what the creamery system means; where the cream from 1,000 farms is churned in two churns instead of 1,000, and where two or three girls do the work of many hundreds, and the selling of tons of butter is done at less cost of time and money than the selling of pounds by individuals, and more important, perhaps, still, where you have only one good quality instead of 1,000 of all sorts.[29]

In a labour-surplus economy, such reasoning only prolonged the debates.

Women were under-represented within the creamery labour structure. None of the twenty-seven creameries and dairy societies examined in the Registry of Friendly Societies had a woman on a managing committee.[30] Female shareholders were also rare. They were usually women who had taken over the shares after the death of their husbands. Single women frequently transferred their shares to their husband after marriage.[31] Only 6 to 9 per cent of shareholders in the Ballyrashane Co-operative Agricultural Dairy Society (County Derry) between 1908 and 1924 were women.[32] Table 2 has been constituted from lists of members found within the Registry papers in Dublin.[33]

TABLE 2
Percentage of Shareholders who were female in Creamery or Dairy Societies Registry of Friendly Societies, Dublin

File Number	*Area*	*Year*	*Percentage Female*
153	Tipperary	1916	3
371	Roscommon	1919	4
924	Donegal	1914	5
1172	Limerick	1919	5
1172	Limerick	1916	6
972	Kilkenny	1919	6
152	Tipperary	1916	6
638	Monaghan	1916	8
638	Monaghan	1919	8
280	Mayo	1914	8
109	Kerry	1916	9
774	Caven	1916	10
1097	Limerick	1919	15
230	Tipperary	1919	16
693	Cork	1915	27

With the exception of the last three societies, these statistics show the low representation of women in dairy societies. The last three societies in Limerick, Tipperary and Cork seem to show a large proportion of female shareholders. However, these societies were the only ones which set out to encourage membership by dealing in eggs and poultry as well as in milk and butter. The larger proportion of female shareholders in these societies was a function of their role as collectors and sellers of eggs.[34]

[27] Ibid, p 198, report by W P O'Brien on Cashel; *Irish Homestead* (hereafter *IH*), 15 June 1901, p 407, report on Killeagh; and throughout the reports on co-operative meetings in the *IH*.

[28] "M.G.", *Irish Nation*, 13 February 1909, n.p.

[29] Arthur S Laough, *Irish Technical Journal, I*, December 1903, p 142.

[30] The following creameries and dairy societies were examined at the Registry of Friendly Societies: Dublin, Pettigo, Killowen, Centenary, Poles, Mayo Abbey, St John's, Drumholme, Moycartkey, Ardrahan, Ballyhadereen, Kill, Kilnaleck, Kiltoghert, Lower Ormond, Toher, Kildimo, Thurles, Ballinfull, Ballinode, Busna, Inver, Bruree, Corcaghan, Newtownards, Ballinaglera, and Bennettsbridge. I have detailed accounts for all these societies. They were chosen because they were the only societies for which detailed information existed. Thus, they represent 'successful' societies. Also see signatures to the rules of the Monaghan Co-operative Creamery in 1900, in Gerr Dunne, *Town of Monagham Co-op The First Eighty Years*, Monaghan 1983, n.p.

[31] For example, see letters of Eliza Robinson and Ellen Convoy in the Public Record Office of Northern Ireland (hereafter PRONI), D3076/BA/1, papers of the Deerpark Co-operative Agricultural and Dairy Society Ltd, Glenarm (County Antrim).

[32] PRONI T3132/BA/1 and 2, Minute Book of the Ballyrashane Co-operative Agricultural and Dairy Society, Ltd, Coleraine (County Derry), 28 February 1908 to 17 April 1924. Note the scarcity of female shareholders in the list in PRONI D3076/BA/1, for the Deerpark Co-operative and Dairy Society Ltd, Glenarm (County Antrim).

[33] I have only included those lists which consistently give both forename and surname.

[34] See my argument in Joanna Bourke, 'Women and Poultry in Ireland, 1891–1914', *Irish Hist Stud*, xxv, May 1987, pp 293–310.

Few women were employed in creameries. A photograph in the Public Record Office of Northern Ireland shows a male dairy-maker and all-male staff. Men sit and stand around carts stacked with cans delivering milk. The only females in the photograph are two small girls with pails, obviously waiting to buy skim milk for the family.[35] In the twenty-seven creameries examined in detail, eleven hired no women and the remainder employed one or two. The societies hiring no women were scattered throughout the sample – as likely to be found in Tipperary and Cork as in Leitrim and Roscommon. Most creameries hired more than two men. Creameries had to be significantly larger to warrant the employment of another dairymaid, while new male workers might be required after only a slight increase in production. Furthermore, the larger a creamery, the more likely they were to prefer men to perform the functions previously designated to women. In part, a technological argument is valid here. Heavier machinery necessary in a very large creamery required 'male' strength.

> I do not think that in a large creamery a woman could do the work as effectively as a man. Two women might. I think this is the reason there has been a tendency on the part of creameries that have a large output, to replace women by men. The management would naturally say that it would be better to pay a man once and a half the salary of a woman, than to pay two women their salaries for the work that only one woman previously did. That, and the fact that the work is heavy, that the physical labour is heavy, accounts for it [the decline of female employment in creameries].[36]

Technological arguments have their weaknesses. Even where physical strength was no prerequisite (such as in managerial posts) women were excluded. Photographs show groups of 'Creamery Managers in Training' – all male.[37] Of course, these patterns should not be exaggerated. A distinction must be drawn between creameries and blending societies. Miss Eustace was manageress of the Drumlease Co-operative *Blending* Society.[38] Conventional creameries (as opposed to blending cooperatives) were reluctant to employ female manageresses. In 1899, the Erne Co-operative Dairy Society was the first full-scale creamery to accept a woman on its committee.[39] In 1898, replying to a question from a female reader as to whether women were eligible to become creamery managers, the editor of the co-operative newspaper, *Irish Homestead*, warned that the work was 'exceedingly laborious' and hardly suited to anyone not willing to 'rough it with a vengeance'.[40] In 1905, the editor was still arguing that, although women were dairy instructresses, 'we have not heard so far that any of them were daring enough to visit creameries and see that the managers kept them in proper order.' Similarly, they had not heard of women being employed by creameries to travel and solicit orders for butter.[41]

III

The Registers of Cowkeepers, Dairymen and Purveyors of Milk provide another way of measuring the extent of female participation in dairying. Although some local districts anticipated the nationwide legislation by as much as eight years,[42] in 1907 the Local Government Board for Ireland issued regulations imposing compulsory registration of all dairies, cowsheds and milk shops in an attempt to stamp out disease and raise standards of cattle, milk

[35] PRONI D3057/ib/2, photograph of creamery.

[36] Evidence by Mr O'Connell, 'Commission on Technical Education, Typescript of Evidence, 1927', Fifth Instalment, no page numbers but 3–4 pages into the evidence given by Mr J Mahony, Agricultural Instructor in County Clare and Chairman of the DATI Officers' Organisations, no. 48–9, in the National Library of Ireland.

[37] *IH*, 17 March 1906, p 203.

[38] *IH*, 1 January 1898, p 890.

[39] *IH*, 12 March 1899, p 228.

[40] *IH*, 4 June 1898, p 482.

[41] *IH*, 6 January 1905, p 13.

[42] For example, *Larne Rural District. Regulations Made by the Larne Rural District Council With Respect to Dairies, Cow Sheds, and Milk Shops, in the Rural District of Larne*, Carrickfergus, 1900, in PRONI LA 44/1E/1.

and butter.[43] The 'vexations' connected with registration caused many farmers to give up selling milk, while others simply ignored the legislation and hoped for a benevolent inspector.[44] Despite these biases, the registers give us some indication of the proportion of female owners of dairy cows and sellers of dairy products, at least in the north of Ireland (see Table 3). I have examined four complete registers: Enniskillen Rural District (County Fermanagh); Newcastle Urban County District (County Down); Strabane No. 1 Rural District (County Tyrone); and Lisburn Rural District (County Antrim). Women made up a small proportion of registered dairy-owners in all districts except in the Urban County District of Newcastle where women would own a couple of cows in order to sell the milk in the city. Women owned fewer cows than men, and their average herd size increased more slowly than their male counterparts.

TABLE 3

Women Registered as Cowkeepers, 'Dairymen', or Purveyors of Milk as a Percentage of All Persons Registered and Average Number of Cows Kept by People Registered

Area and Date	*Percentage Female*	*Average Number of Cows owned by*		
		Women	*Men*	*Number*
Enniskillen				
1912–13	13.2	4.9	5.2	136
1930	13.4	5.7	6.0	178
Newcastle				
1908–12	27.9	1.8	3.1	43
1921–23	21.4	2.2	4.7	28
Strabane				
1910	9.6	5.2	8.5	208
1933	7.2	5.8	7.6	125
Lisburn				
1908–12	19.8	6.6	18.8	131

Public debate about the hours and conditions of work of women in creameries further weakened the position of the few women in this industry. The Factory Acts which restricted the employment of women came at the same time as accusations of sweated female labour in creameries and dairies. At the Third Annual General Conference of delegates from cooperative dairy and agricultural societies, R A Anderson spoke about the need to lobby the Home Secretary to exempt creameries from the general rules regarding female labour.[45] For the first time, the IAOS was able to turn criticism levelled at their creameries on its head: instead of the IAOS reducing female employment through establishing creameries, governmental legislation, they claimed, had blocked their attempts to employ women in the creameries.

> If the Factory Acts were strictly enforced, it would be impossible to employ women at all in creameries.[46]
>
> Factory and workshop legislation bore so heavily on creamery work as virtually to penalise the employment of young girls under the only conditions on which it was, in most cases, practicable to provide them with occupation in creameries.[47]

The IAOS received considerable sympathy for their arguments. Even *The Times* referred to Irish dairymaids, with Horace Plunkett's deputation to the Home Secretary pointing out that the Factory Acts meant that around 600 dairymaids would have to be dismissed and that women in training at the Munster Dairy School would have to emigrate to find employment, receiving wide coverage.[48] Lady Frances Balfour on 13 July 1901 joined the appeals, writing to the *Irish Homestead* on behalf of the Freedom of Labour Defence League.

> To the Lord's Day Observance Committee it may seem immoral to do any work on Sunday, or it may only be immoral in their eyes to work for hire on that day; but how have they solved the problem of paid domestic service in which the duty of preparing and

[43] Particularly tuberculosis – their legislation was tied in very strongly with the Tuberculosis Prevention (Ireland) Act, 1908.

[44] *IH*, 20 April 1912, p 309 and the Reports of the Committees of the Newtownards Rural District Council esp 22 October 1909, 1 December 1909, and 17, 18 and 27 December 1909 in PRONI LA 61/3c/1.

[45] R A Anderson, *IAOS Annual General Report 1898*, Dublin, 1899, appendix D, p 53.

[46] *Ibid*, p 53.

[47] *IH*, 18 October 1902, p 813.

[48] *The Times*, 2 July 1901, p 3.

preserving food is as important on Sundays as on week-days? Is there not a tendency in specialising of this kind, to overlook the true balance of things – to put all weight of immorality on the side of a supposed breach of Sunday observance by Irish Dairymaids, and nothing at all on the domestic service side of Sabbath-breaking for wages in their own homes?[49]

Through a committee appointed by the Irish creamery proprietors, the legislation was amended to allow women and young persons to be employed between 6 am and 9 am.[50] Creamery managers and co-operative officials argued, however, that this new Order still gave 'a quite insufficient time for the performance of absolutely necessary work in connection with the business of a dairymaid in a creamery'.[51] By further amendment, women were allowed to be employed on Sundays for three consecutive hours at any time between 6 am and 7 pm that the manager should choose.[52] Even so, prosecutions continued, as creamery managers employed dairymaids outside of the three hours they had fixed.[53] These infringements were treated lightly by the magistrates: often the managers simply received a caution. Opposed to any form of restrictive legislation, creamery managers continued to complain.

> The special exemption allowed under Section 42 of this Act [Factory and Workshops Act] is availed of by a good many creameries, including ourselves, and as we found it impossible to do the necessary work during the three hours on Sunday, we arranged to have one of our dairymaids work from 7 am to 10 am and the other from 9 am to 12 noon, thereby giving ourselves two hours longer for working, and giving one of our dairymaids a decent opportunity of attending early prayers and the other late. The Factory Inspector will not allow this, maintaining that only one period of employment can be worked by all the women, and all at the same time, nor will the Government allow different meal hours for women and young persons. We have been summoned for this Sunday working, and convicted.[54]

The losers in this legislation and the debate surrounding it were female dairymaids. The Department of Agriculture and Technical Instruction (DATI) listed eighteen creameries which could not reduce operations requiring a dairymaid to only three hours on Sundays. To continue usual levels of production, they were going to replace their female dairymaid with men. They listed another fifteen creameries which had 'recently' replaced female dairymaids with male operators.[55] There is no reason to think that these lists fully represent the extent of the substitution. Larger dairies were more likely to be affected than smaller ones. Creameries were likely to be more affected in summer than winter. Extracts from the creamery instructor's notes tell the same story:

> Most of the creameries have solved this by employing males. Three hours are not long enough on Sundays in summer.
>
> In the North West district women are not employed at work on creameries. In the South West I consider that five hours are required to carry out the work during the summer months.
>
> It would be impossible for female buttermakers in large creameries to get through the work in three hours on Sundays.[56]

The agitation came to little. During the war, the legislation was allowed to lapse.

IV

Given the importance of the dairying industry and the large number of reforming

[49] *IH*, 13 July 1901, pp 463–4.
[50] Statutory Rules and Orders 1902, No. 465, of 2 June 1902.
[51] *IH*, 18 October 1902, p 813, and *IH*, 29 August 1903, p 715.
[52] Statutory Rules and Orders 1902, No 465, Factory and Workshop – Creameries. Order of the Secretary of State, Dated 23 October 1903, Granting Special Exemptions: – Creameries.
[53] *IH*, 27 August 1904, p 703, concerning Effin Co-Operative Dairy Society; *IH*, 18 October 1902, p 813; *IH*, 29 August 1903, p 715; and D Meehan (manager of Piltown Co-operative Dairy), *IH*, 1 October 1910, pp 816–7.
[54] D Meehan, *IH*, 1 October 1910, pp 816–7.
[55] From the papers of the DATI in the Public Record Office of Ireland, Mss A13881/16 and A20703/19.
[56] DATI Papers in the PRO AG1 A20703/19. All these reports were confidential reports from Instructors of Dairying. More could be cited. Frequently the name of the Instructor has been omitted but the second quotation has been taken from a letter from Thomas Scott (dairy instructor in Liverfovill) and the final quotation came from a report by A Alcorn (dairy instructor in Ballymullen, Tralee). Also see the letters between the secretary of the DATI and Eliot F May (Inspector of Factories), at the same location.

institutions dedicated to agriculture, it is not surprising that the dissemination of knowledge concerning scientific dairying was a central policy. The revival in the dairy industry was actively promoted by governmental organizations. The DATI encouraged the scientific breeding of dairy cattle, instigated schemes to improve tillage and the production of dry feeding stuffs, and supplied farmers with the latest information on farm improvements. They inspected dairies and provided credit for the purchase of equipment and the construction of dairies and creameries. Each year the Committee of Agriculture spend over £3000 on butter improvement schemes. The classes in practical dairying were the most significant of their reforms.[57] Butter-making classes were a response to popular fears that standards of housekeeping would drop as women ceased making butter.[58] The educational schemes were run by County Committees who appointed instructresses and supplied them with equipment. The 'school' moved around districts at regular intervals. The cost of the classes was paid out of the DATI's joint fund. Between 1901 and 1912, the number of instructresses increased from one to thirty-three.[59]

It is difficult to assess the effect of these classes. In November 1904 the dairy instructress in Dromore (County Longford) had fewer than ten pupils.[60] The classes were accused of attracting only the better dairy-workers. There was a fundamental contradiction in these educational schemes: why, if 'home dairying is a thing of the past', was all this money being spent on itinerant instructresses?[61]

In addition to itinerant instruction, colleges training women in farm work were established. At first, it seemed as though the colleges would promote men at the expense of women in their training schemes. The Albert Agricultural College had provided a special dairying course of women in 1883.[62] By 1895 a course for creamery managers was started – largely attended by men. Finally, when the College was transferred from the Commissioners of National Education to the DATI by the Act of 1899, it was decided to discontinue all courses for women. They claimed that the system of teaching a course in dairying for women and a course in agriculture for men in separate halves of the year was expensive, duplicated staff and led to inadequate training of the men.[63] However, female students were not left uncatered for. At the Munster Institute classes for women continued.[64] Applications for admission increased each year. For applicants, a period of over a year elapsed between application and acceptance.[65] Students came from all over the country. For example, in 1902 although 37 per cent of all students came from Cork, 9 per cent came from both Cavan and Limerick, 5 per cent from Kerry, 4 per cent from Clare, and 3 per cent from each of the counties of Kilkenny, Galway, Sligo, Derry and Kildare.[66] In 1908 the Ulster Dairy School at Loughry (County Tyrone)

[57] The DATI was not the first organization to institute dairying courses for the 'ordinary farm woman'. On a much smaller scale, individuals and philanthropic organizations had been providing local courses. For instance, clergy in several areas taught their female parishioners new dairying techniques: see *DATI. Departmental Committee on the Irish Butter Industry. Minutes of Evidence, Appendices and Index*, PP, 1910, VIII, p 476.

[58] The 'discipline' of buttermaking stems from the need to keep the place where the milk is stored and churned exceptionally clean. Reformers feared that without this economic incentive, farm women would become careless about household cleanliness. *Royal Commission on Congestion in Ireland. Appendix to the Ninth Report of the Commission, Minutes of Evidence (Taken in County Mayo, 21st August to 3rd September, 1907), and Documents Relating Thereto*, PP, 1908, XLI, pp 715–6, evidence by Rev. John McDonnell, representing the National Directory of the United Irish League.

[59] *DATI. Fifth Annual General Report of the Department, for the Year 1904–1905*, PP, 1906, XXIII, p 320 and *DATI. Twelfth Annual General Report of the Department, for the Year 1911–1912*, PP, 1912–13, XII, p 575.

[60] *IH*, 12 November 1904, pp 95–6, on Dromore (County Longford).

[61] 'Dairymaid', *IH*, 7 October 1905, p 743.

[62] At different times, this college was called the Glasnevin Model Farm and the Albert National Agricultural Training Institute.

[63] *DATI. Report of the Departmental Committee of Inquiry into the Provisions of the Agricultural and Technical Instruction (Ireland) Act, 1899*, PP, 1907, XVII, p 828.

[64] Also called the Cork Model Farm.

[65] *DATI. Seventh Annual General Report of the Department, for 1906–1907*, PP 1908, XIV, pp 617–8.

[66] *Munster Dairy School and Agricultural Institute. Cork. Report of the Governors and Statement of Accounts for 1902*, Cork, 1903, p 10.

accepted its first pupils. This institute was similar to the Munster Institute, teaching dairying, poultry-keeping, cooking, laundry-work, sewing and cottage gardening. However, between 1905 and 1913, the Munster Institute was the only training centre in Ireland for instructresses in dairying.[67]

Other schools were established for farm women. With financial help from the DATI, communities of nuns set up small schools training women in dairying, poultry-keeping, and domestic work. The DATI helped establish the schools, paid the teachers' salaries and contributed towards the cost of pupils. The most successful schools run by nuns were the residential schools at Portumna (County Galway), Westport (County Mayo), Ramsgrange (County Wexford), Claremorris (County Mayo), Swinford (County Mayo), and Clifden (County Galway) rather than the non-residential schools at Loughglinn (County Roscommon) and Beneden (County Clare). The DATI also helped private individuals to set up schools to train women in farm work (such as the school at Killashandra, County Cavan). However, the success of these schools depended more on their role in teaching domestic arts than on the dissemination of new dairying skills.[68]

These aspects were revealed most strongly in the debates about emigration and creameries. By reducing female employment, creameries were accused of increasing female emigration. Furthermore, since women did not have to show proof that they were going onto farms as the men attending the Albert Agricultural College had to ('because a girl cannot very well guarantee to get a husband who is a farmer'), some of the female students used the school as a stepping stone to emigration. The reformers perceived that there was only one solution. It was unrealistic to find remunerative employment in Ireland for graduates of the school. Demand for their services was not increasing and the days of roving instructresses were nearing the end. Instead, women were to be trained as skilled farm-wives. This aim was most explicitly carried out in the itinerant dairying classes and in the Schools of Rural Domestic Economy, but even the Munster Dairy School determined that its students should not become preoccupied with waged labour. Their aim was not so much to train dairy servants as to train women to share the labour of their household's farm in a more efficient manner. These women required training in domestic arts such as cookery, laundry and needlework and, from 1880, this was taught by a Ladies' Committee. Between 1880 and 1901, this committee spent almost one-fifth as much money promoting housewifery as the Governors spent on experiments on water in butter, organizing butter shows throughout the country, bestowing prizes on pupils, paying salaries to lecturers and so on.[69] This committee was continued when the DATI took control of the Munster Dairy School.

In the early years, the reforming organizations complained about men's lack of interest in dairying. It was 'women's work'. Professor Carroll commented,

> One of the principal difficulties that had to be overcome in the establishing of dairy instruction in the country is the small amount of interest taken in the subject by the male population; indeed, about the period of establishing the Munster Dairy School, a man who knew anything about practical dairy work was looked upon almost with contempt.[70]

[67] After 1913, the Ulster Dairy School began providing similar training for women.

[68] *Munster Dairy School and Agricultural Institute. Cork. Report of the Governors and Statement of Accounts for 1902*, Cork, 1903, p 9.

[69] *Royal Commission on Congestion in Ireland. Appendix to Fourth Report. Minutes of Evidence (Taken in London, 14th to 23rd February, 1907), and Documents Relating Thereto*, PP, 1907, XXXVI, p 65, evidence by Professor J R Campbell. The more popular argument was that creameries encouraged emigration by inflating the number of unemployed females of emigrating age groups, see *IH*, 25 May 1901, pp 336–7.

[70] Professor Carroll, 'A Brief Account of the Progress of Dairy Instruction in Ireland', Appendix 4, *DATI. Departmental Committee on the Irish Butter Industry. Minutes of Evidence, Appendices and Index*, PP, 1910, VIII, p 476.

For this reason women were trained as instructresses, even though men were moved into all prestigious positions and all managerial posts. Even the Commissioners of National Education who were responsible for Glasnevin before it was taken over by the DATI had been concerned with getting *men* managerial posts in dairying. An 1885 Report of the Commissioners of National Education expounded,

> As a rule, in this country, this important industry [dairying] is carried on by the female portion of the farmer's family, the men knowing very little of the subject. The women, confined to the narrow circle of the home, without time for reading or opportunity of seeing improved methods, and frequently having no knowledge of the various qualities of butter required for the market, could scarcely be expected to contribute much towards improvement in butter-making. It should not be considered that it is desirable that women should be superseded by men in the work of the dairy. The largest portion of dairy work is eminently suited to women, but, taking into account the vast importance of the industry, and that intelligent direction in the dairy would be useful, the question as to how far the training of men in dairy management is advisable is deserving of serious consideration.[71]

That 'question' had been decided by the following year. The Commissioners introduced at the Albert Institute the first course in dairy management for men. Their policy of pushing men into managerial positions was continued by the DATI, which went a step further in promoting men at *every* level of dairy work.

V

This policy created strained relations in the 'real world' of creamery management. Creamery managers and dairymaids were frequently antagonistic. Women 'considered that they "knew all about it", and so despised any attempts at teaching by men'.[72] The most detailed exposition of the tension is found in a letter by 'Mejerist'.

> It is unfortunate that in a good many of our creameries, young intelligent men are installed as managers, who, through lack of sufficient training and experience under expert tuition, are subject to the anomaly of being subordinated to the dairymaid in the primary department of his work . . . It therefore behoves us to make all our young, intelligent creamery candidates pay, first and foremost, attention to the dairymaid's duties, particularly the handling of the cream, so that he may be in a position to assume full responsibility for the proper and efficient carrying out of her work, as well as that of the rest, and that he may be able to dictate instead of being dictated to, and also if necessary that he himself may be capable of performing the work without having to receive instructions first from the dairymaid.[73]

Other, more general, changes were driving women out of dairying. In counties like Wicklow, Carlow, Kildare and Longford (as well as most of the other eastern countries) the number of milch cows in each county declined by as much as one-quarter between 1891 and 1911. The practice of the wives and daughters of male farm workers being employed as milkers during the summer season remained undisturbed in many areas, but increasingly this work was being performed on large farms hiring a number of labourers, rather than on the small family herd.

Crucial to all the reforms were technological advances. The invention, in 1878, of a centrifuge 'separator' capable of efficiently separating cream from milk provided the chief way to improve farmhouse and factory butter-making. Here, as well as in the educational schemes, the DATI attempted to resolve the contradiction between home and factory dairy-making. They promoted dairy equipment at every level of dairy organization. Beginning in Cork in 1902, small farmers could purchase hand separators with the help of loans from the

[71] Quoted in *ibid*, p 476.
[72] *Ibid*, p 476.
[73] 'Majerist', *IH*, 20 January 1905, p 52. The letter received a reply from 'Munster Manager' in *IH*, 27 January 1906, pp 75–6. Also see Public Record Office of Ireland, Irish Co-Operative Organisation Society (ICOS) files, 1088/5/4, report on the Achonry Creamery by R S Tarrant, dated 10 November 1902.

Committees.[74] Instructresses sold equipment – especially thermometers – for buttermaking at reduced cost to women in their classees.[75] Dairy societies and creameries also benefited from departmental loans amounting to almost five thousand pounds for the purpose of erecting pasteurizing plants. Twenty-six loans were sanctioned, with low interest rates and repayment schemes spread over five years.[76] The DATI also encouraged creameries by schemes whereby instructors visited creameries, policed their registration, provided courses of instruction for creamery managers, awarded Creamery Managers' Certificates, held Surprise Butter Competitions and conducted experiments.[77]

Creamery promoters had to face the problem of unemployed wives, sisters and daughters. Initially, they planned that women made redundant because of creameries would be given alternative employment. However, policies designed to develop alternative industries failed and, in many areas, were never started. The Reverend Terence C Connolly of the Manorhamilton Rural Council (County Leitrim) confessed,

> I was one of the men who committed what some call the sin of doing what I could to start the co-operative creameries. I spent a good many hard days at it. The idea was where a girl was deprived of the industry of churning she would be turned over at once to a cottage industry like lacemaking or sprigging or something of that kind. I think that matter has not been sufficiently followed up, simply because after the Department of Agriculture was started, those who had asserted it before said, 'There is enough money now; we will do nothing.'[78]

Reformers, creamery managers and larger dairy farmers hastened to reassure critics, asserting that although creameries denied farm women an important area of productive employment, 'the farmer's wife has enough employment to keep her out of mischief without making butter.'[79] George F Trench reasoned

> Another objection to creameries is that women of the farms have less to do. This is the ordinary complaint that follows the introduction of any kind of machinery in field or factory; but the wants of men are so many that the female part of the farm family have abundance of occupations with rearing children, milking, feeding calves, pigs and fowl, keeping everything clean and tidy, needlework, etc.[80]

In particular, poultry-rearing and increased domestic work were promoted as the main ways in which women could occupy their time.[81] The muscular arms of the butter-churning maid will give way to 'a slim young miss looking after poultry'.

> Our anti-co-operators would have it that if a woman wasn't sweated over a churn she has nothing to do which is a fit and womanly employment for her. We say that the more she has to do with the churn the worst for Ireland, and the more she has to say to the poultry yard the better for Ireland. These silly journalists seem to think that labour-saving machinery is bad for a country and bad for the farmer. We, on the contrary, assert that any device which will enable four hands at a creamery to do work which 100 women were engaged in is good for the country, because those 100 wives do not emigrate and their

[74] John Donovan, *Economic History of Livestock in Ireland*, Cork, 1940, p 327. The 1902 loans were limited to Cork farmers. Even after this date, most of the loans were accepted by farmers in Cork. For instance, in 1907 Cork farmers accepted fifty-four of the eighty-one loans.

[75] *DATI. Third Annual General Report of the Department, for 1902–1903*, PP, 1904, XVI, pp 458–9.

[76] *DATI. Report of the Departmental Committee on Agricultural Credit in Ireland*, PP, 1914, XIII, p 316.

[77] *DATI. Seventh Annual General Report of the Department, for 1906–1907*, PP, 1908, XIV, pp 653–4.

[78] *Royal Commission on Congestion in Ireland. Appendix to the Sixth Report, Minutes of Evidence (Taken in County Sligo and County Leitrim, 17th to 27th April 1907) and Documents Relating Thereto*, PP, 1908, XXXIX, p 928, evidence by Rev. Terence C Connolly representing Manorhamilton Rural Council and the fishermen of the Leitrim coast.

[79] *Ark. (The Official Farmers' Magazine). Journal Devoted to the Interests of Cattle, Poultry, Pigs, and Farming* (hereafter *Ark*), vi, February 1914, p 7.

[80] *Royal Commission on Congestion, Appendix to the Eighth Report. Minutes of Evidence (Taken in Kerry and Cork, 3rd to 19th July, 1907) and Documents Relating Thereto*, PP, 1908, XLI, p 129, evidence by George F Trench. Also *IH*, 7 February 1903, p 102.

[81] *IH*, 29 September 1906, p 790. Also see *IH*, 9 March 1895, p 6 for an address by R A Anderson to a meeting of tenant farmers and others about setting up a co-operative dairy in Tralee and the *IAOS Annual Report 1897*, Dublin, 1898, appendix L, 'Report of the Annual General Meeting 1897', comments by Thomas Patrick Gill, p 58.

husbands . . . but they now make the farm more profitable by devoting their spare time to poultry-keeping, by which Ireland gains as much as it does by its butter production.[82]

Although the extension of poultry-rearing was frequently thrown up as an alternative occupation for redundant butter-makers, another argument was more prevalent. The removal of butter-making from female work-schemes left women more time to devote to their 'proper' duties – housework. At a large meeting of the Dromore Co-operative Home Industries Society in July 1904, the political economist and ardent supporter of co-operation, Father T A Finlay, asserted that the diversion of female labour into housework was ample justification for the existence of creameries.[83] Lady Londonderry at the annual meeting of the Ulster Branch of the IAOS praised the introduction of creameries for leaving women more time for recreation and their 'proper domestic duties'.[84] A 'County Cork Woman' argued that freeing women from butter-making was the only way to improve the 'semi-barbarous condition' of rural homesteads. She suggested that home-buttermaking had led to the 'deterioration of the breed of women and children': the transfer of this 'drudgery' to creameries 'saved a needless sacrifice of life, and has protected both mother and child from ill-health'.[85] Critics of the creamery movement consisted of urban journalists: rural households were less likely to disparage the transfer of the energies of women to housewifery.[86] The success of the farm depended on the housekeeping skills of farm women:

> Take the man with an income of £50 a year and an unskilled wife: all he was getting out of that income would not represent, perhaps, as much of the real advantages of living, of the conveniences and necessaries of life, as his neighbour with a skilled wife was getting from £25 a year. For that reason, it was an advantage to the farmers that the women were set free from the rather strenuous task of churning to devote themselves to the study of their proper business in the home.[87]

Related to this stress on housework was the response of the co-operative societies to criticisms that creameries denied children milk.[88] The creamery was satirized as 'a horrible ghoulish monster' snatching milk out of the lips of starving children and frantic parents.[89] This argument, although repeated constantly by the anti-creamery faction, was treated with contempt in IAOS publications. The Vice-Regal Commission on Irish Milk Supplies showed that creameries could not be held responsible for the shortage of milk. The Dairy and Cowsheds Order was more to blame since registration and inspections reduced the number of farmers willing to sell milk.[90] However, the argument periodically recurred because of its critique of female competence in the home: if Irish women were better housekeepers, they would welcome the opportunity to devote more time to such activities as childcare and would wrest milk for their dependants out of the grasp of creameries.

VI

Of course, many women continued making butter. Not all areas were provided with

[82] *IH*, 27 March 1909, p 242. I have examined the poultry industry in 'Women and Poultry in Ireland, 1890–1914', *Irish Hist Stud*, 99, 1987, pp 293–310.
[83] *IH*, 30 July 1904, pp 622–31.
[84] *IH*, 23 April 1910, p 345.
[85] *IH*, 11 May 1901, p 303.
[86] *IH*, 18 May 1901, pp 317–8.
[87] *IH*, 22 June 1912, p 510, speech by Father T A Finlay to the Cavan District Conference. Also see *Ark*, vi, February 1914, p 7.
[88] *Royal Commission on Congestion in Ireland. First Appendix to the Seventh Report. Minutes of Evidence (Taken in Ireland, 16th May to 11th June 1907), and Documents Relating Thereto*, PP, 1908, XL, pp 236–7, evidence by P E Mallon of Doobally (County Down), representing the Enniskillen Rural District Council No.2 and Doobally branch of the United Irish League; *Leader*, 14 March 1908, p 58; and *Leader*, 21 March 1908, p 73.
[89] *IH*, 4 May 1907, p 347. Also *IH*, 2 May 1908, p 349; *IH*, 16 May 1908, p 388; Sarsfield Kerrigan, *Leader*, 7 March 1908, p 39 and 28 March 1908, p 91; a report on a speech of John Clancy, in *IH*, 13 June 1908, pp 470–3 where he links shortages of milk to the creameries and says that this is why the people drink too much tea and porter in the fields; *IH*, 17 January 1914, pp 45–6; and Harold Barbour, 'The Work of the IAOS', pamphlet reprinted from the *IH*, Dublin, 1910, p 6.
[90] *Vice-Regal Committee on the Irish Milk Supplies, Appendix to the Final Report of the Irish Milk Commissioners*, PP, 1914, XXXVI, pp 669 ff.

creameries and many women churned for family consumption using the weekend milk supplies.[91] During World War One, Irish women took up butter-churning again on a large scale – resulting in a massive decline in the amount of milk taken to creameries.[92] The dairy industry, however, had changed. Farming households were more likely to buy butter than to make it.[93] This change is indicated by the increasing amounts of butter being bought from the creamery by the milk suppliers, suggesting that these suppliers were no longer retaining some of the milk to churn at home for household consumption.[94] Women training in the dairy schools were liable to find that training increased their wages to such an extent that demand for their labour declined as farmers became conscious that seasonal labour requirements favoured the employment of men who could work at other occupations when milk production was low (that is, during winter). If women made butter, they were more likely to be found as the solitary female in large dairies or creameries, overseen by male managers, than in their own homes. The home churn became a less prominent feature of the farm household. Women lost a dominant forum for discussing matters of community interest.[95] Less obviously, a tradition of folklore and folkcharms fell into disuse. The 'good people' were not invoked in creameries. May morning charms, prayers and spells lost their efficacy: 'The advent of the separator has, I fear, destroyed nearly all the poetry of these times, and with it the power of the butter witch.'[96] Butter-making had become 'as scientific a business as brewing' and women were moved out.[97]

Both absolutely and relatively, female workloads in dairying were reduced, along with access to control over cash income. Organizations set up to revolutionize the rural community lamented the declining work opportunities for women but they decided that the Irish farm woman had enough work to do in looking after her family. In most cases, the reforms instigated by these organizations benefited the communities as a whole. The Irish dairy industry would have been significantly weaker without the rationalizations instigated by the DATI and the IAOS. But the adverse affects of the reforms fell disproportionately on the female members of the rural communities. No one said it as well as 'Peper' in the *Ark*:

Where is the maiden all forlorn
That milked the cow with crumpled horn?
She has gone to the town
Where she's now holding down
A job as a skilful typewriter.[98]

However, alternative employment for women in Ireland was declining. The skills of the milking maid were less likely to be appreciated in the towns and cities of Ireland, England or America, but were more valued when channelled into the home. Although Humphrey James's story *Paddy's Woman* was written around the same time as Denis Hurley's letter at the beginning

[91] *Royal Commission on Congestion in Ireland. Appendix to the Ninth Report, Minutes of Evidence (Taken in Mayo, 21st August to 3rd September, 1907), and Documents Relating Thereto*, PP, 1908, xli, p 624, evidence by the Very Rev. Canon Humphrey O'Riordan; Mrs Maxwell (of Dungloe United Irishwomen, County Donegal), *IH*, 26 November 1910, pp 976–7; *Leader*, 28 March 1908, p 91, article by Sarsfield Kerrigan; and Mr C F Costello, manager of the Ballyhaise Creamery, *Commission of Inquiry into the Resources and Industries of Ireland. Minutes of Evidence. Pt.1. City Hall Dublin, 2nd 3rd and 4th December 1919, Milk Production and Milk Products, Fisheries*, National Library of Ireland R10/11, p121.

[92] *DATI. Report of the Departmental Commission on the Decline of Dairying in Ireland*, PP, 1920, IX, p 588.

[93] *Vice-Regal Committee on the Irish Milk Supplies, Appendix to the Final Report of the Irish Milk Commissioners*, PP, 1914, XXXVI, p 749, evidence by James Stewart of Strabane.

[94] Taken from an analysis of the dairy accounts in the Registry of Friendly Societies.

[95] For examples of the role played by groups of women meeting to churn or mix butter ('choring'), see the interview of Mrs Dore (of County Limerick), aged sixty, interviewed by P Ward in January 1939, typescript in IFC, Mss 591, pp 484–6 and *IH*, 30 March 1895, p 53.

[96] R A Anderson, *IH*, 4 June 1904, p 469. For lengthy descriptions of the folklore and folkcharms associated with dairying, see the IFC, ie. Mss 80, collected by Padraig Mac Greiue of Ballinalee, Edgeworthstown (County Longford), November 1929, pp 45–50, and Mss 1340, collected by James G Delaney from James Dermody of Columcillen parish (County Longford), aged 54, collected in the 1950s, pp 41–2.

[97] *IH*, 22 June 1912, p 497.

[98] *Ark*, iii, December 1913, p 1

of this article, James showed more foresight by identifying the element which was to become dominant by the first decades of the twentieth century. Paddy and Barney discuss the marriage prospects of Titia, a skilful dairywoman:

"And she's as good as she's nice and clean."
"Them that'll get her, will have a bargain, for if she's so nice and clean, and can sing so well, she can hardly be expected to milk the cows and make the butter," said Paddy, laughing.
"I'm thinking you and me'd be rich, Paddy," said Barney, "if we had half the cows she could milk or make butter from – according to what Mickey Coulter, her mother's servant boy, tells me. Besides, any steel of a girl can feed the pigs and wash the veshels [sic]."
"Ay, but not everyone of them can make it a pleasure for a neighbour to come into your house, and kaly at your fire." said Pat.[99]

[99] Humphrey James, *Paddy's Woman and Other Stories*, 1896, pp 107–8.

Notes and Comments

WINTER CONFERENCE 1990

The joint Winter Conference with the Historical Geography Research Group of the Institute of Historical Geographers was held on Saturday 1 December from 10.30 am to 4 pm at the Institute of Historical Research, Senate House, London. The theme was 'Farmers and Landowners' and the speakers were Dr C Dyer on 'Farmers and Landlords in the Middle Ages'; Dr Sarah Wilmott on a title to be announced; Dr John Chapman on 'Landownership and Enclosure'; and Professor Michael Thompson on 'Business Elites and Land Purchase in the Nineteenth Century'. The conference fee is a modest £5 (cheques payable to the 'British Agricultural History Society') and should be sent to Dr Peter Dewey, Dept of History, Royal Holloway and Bedford New College, Egham Hill, Egham, Surrey TW20 0EX.

SPRING CONFERENCE 1991

The Society's Spring Conference will be held at Chester College of Education, and the dates to keep clear in your diary are Monday 8 to Wednesday 10 April. Papers will be delivered by Dr Marjorie McIntosh, Professor John Beckett, Dr Ann Kussmaul, Professor R A Dodgshon, Dr Avner Offer, Dr Jean Birrell, and Dr Nick Higham who will also lead the afternoon excursion to Tatton Park. All individual members will receive a registration form well in advance, but further details can be obtained from the Secretary.

ANNUAL GENERAL MEETING 1991

The 39th annual general meeting of the Society will be held at 9 am on Tuesday 9 April 1991 at Chester College of Education. Nomination forms for officers and members of the Executive Committee should be returned to the Secretary no later than Friday 30 March 1991. Members are reminded that it was agreed at the 1986 AGM that those nominating candidates for the Executive Committee should supply a twenty-word statement about each candidate to be circulated at the AGM of the Society. Because of the rise in the printing and other costs of running the Society, expenditure is now greater than income and accumulated balances. Therefore, the Executive Committee will propose that the annual subscription for individual members be raised to £15 from 1 February 1992.

ATTENDANCE AT SPRING CONFERENCES

The Executive Committee are concerned that attendance over recent years has not been as large as in the past. Does this mean that members would prefer different sorts of conferences with different types of papers from those which we have become used to? The Committee is anxious to discover what members really want. So if you can suggest any ways to improve the conference and attract a larger audience please write to the Secretary now. All letters will be acknowledged and he will pass on your suggestions to the Executive Committee.

CALL FOR PAPERS

A Symposium on the History of Agriculture and the Environment will be held in the USA at the National Archives Building, Washington, DC, 19–22 June 1991. The symposium will be interdisciplinary in nature and will cover the topic of the history of agriculture and the environment as broadly conceived. Please send proposals of not more than two pages to: Douglas Helms, National Historian, Soil Conservation Service, PO Box 2890, Washington, DC 20013. Telephone: (202) 447-3766. Deadline for proposals was 31 December 1990.

Irish Agricultural History: Recent Research*

By CORMAC Ó GRÁDA

PROBABLY the best-known message of Irish agrarian historiography of the last few decades has been that 'the landlords are not central to Irish history' (Cullen, 1981: 253). The result has been increasing attention to the business of farming, and to techniques, output, and prices. It has been shown, surely to the satisfaction of everybody by now, that traditional historiography had been misled by farmer-nationalist propaganda in its depiction of the typical landlord as cruel and neglectful. The revisions have come in different flavours, though: some betraying shades of nostalgia for polite landed society (Roebuck, 1981a, b), some holding in unsentimental fashion that tough landlords were necessary for agricultural efficiency (Crotty, 1966).

In terms of efficiency, simple economic theory suggests that there is little to choose between a system of rent-paying tenants and peasant proprietorship, since in either case the farmer retains the marginal return on extra effort. For this outcome to hold, of course landlords and tenants must be surplus maximizers: the efficient landlord must eschew short-term predatory behaviour but must evict the lazy and the incompetent tenant, just as the leisurely owner-occupier must be willing to sell to his more energetic peer at a price reflecting the land's productive potential (Crotty, 1966; Solow, 1971; Mokyr, 1983; 1985: Ch 4). In effect, most recent research into the Irish tenure system reaches conclusions that better fit these theoretical presumptions.

The literature reviewed here includes no grand survey of Irish agriculture such as the multi-authored *Histoire de la France Rurale*, or van Zanten's impressive 'Economische ontwikkeling van de Nederlanse landbouw'.[1] Most of it has appeared in Irish journals or in Irish-oriented conference or *festschrift* volumes.

Much of it is necessarily tentative and unsystematic. Still, it reflects the flowering of Irish economic-historical and historical-geographical research in the last few decades, and its quality and scale is striking compared to, say, that of the previous half-century.

* I wish to thank David Dickson, Arnold Horner and Sarah Maza for their helpful comments on an earlier draft.

[1] *Histoire de la France rurale*, under the direction of Georges Duby and Armand Wallon, Paris, 1976; J L van Zanden, 'Economische ontwikkeling van de Nederlandse landbouw in de negentiende eeuw', *AAG Bijdragen*, vol 25.

1 *1600–1800*

The output of research into seventeenth- and eighteenth-century agriculture has been growing, but is still small. Raymond Gillespie's chronology of harvest failures in the early seventeenth century (1984) shows one reason why: the thinness of the raw material make this a frustrating and difficult period to explore. Gillespie manages to show that despite the received view of a mainly pastoral agriculture, poor grain harvests could lead to dearth and even famine. At the same time, his contribution is a good guide to the sparseness of contemporary written records sources: 'it is impossible to make a full assessment' of the crisis of 1601; 'evidence for the second decade is sketchy', while 'the evidence for the remainder of the 1630s is sparse' (Gillespie, 1984: 8, 9, 10, 12). The continuous price data so readily available elsewhere in this period are apparently lacking for Ireland. The raw state of the historiography of seventeenth-century agriculture is also plain from the recent debate between Gillespie, Nicholas Canny, and M Perceval-Maxwell on the implications of an unusual source for agricultural history, the depositions presented by landholders claiming compensation for property lost during the rebellion of 1641. The accompanying inventories resemble the probate and farm sale data used by English economic historians. Canny, who equates modernization with the Irish adoption of imported techniques (compare Bell and Watson, 1987; Bell, 1987), infers substantial progress in the south from the depositions, finding that anywhere English planters settled, farming 'compared favourably with the best in Europe'. Gillespie and Perceval-Maxwell deny the randomness of the depositions, and Gillespie the implicit claim that the immigrants had nothing to learn from native techniques, drawing attention to how Ulster planters copied the native method of ploughing by the tail (1986: 93)! The non-specialist may find something incongruous about inferring regional differences from such thin sources. McCarthy-Morrogh's study of the government-sponsored Munster Plantation of the 1580s is relevant here too. Though intended to promote tillage, that plantation's benefits (as revealed through trade figures) were concentrated on livestock and wool, and on limited changes to field boundaries (McCarthy-Morrogh, 1986: 225).

Gillespie also invokes Sir William Petty's crop yield ratios, presumably based on Petty's own observations in Munster in the 1660s, to criticize Canny's cheerful picture of farming in that province (Gillespie, 1986: 93). Alas the wide ranges cited by Petty are enough to back either case:

	Yield		*Ratio*
Wheat	4	to	9
Rye	5	to	10
Bean-Barley	3.3	to	8
Oats	2.67	to	5.33
Barley	5	to	10
Peas	3	to	4.5

Source: C H Hull, *The Economic Writings of Sir William Petty*, 1899, vol 1, p 176.

Petty's lower-bound estimates seem positively medieval, but his upper-bounds are quite impressive: in England a century later the ratios for wheat, oats and barley were about ten, eight and nine. In Ireland, such high yields, if at all common, must have reflected technology rather than intensive labour input, since the island was rather sparsely populated in the seventeenth century. But Petty typically leaves no clue as what 'representative' yields were. Of course, since seventeenth-century Irish farming was pastoral in orientation, reliable data on milk yields and carcass weights would be more revealing.

The Canny-Gillespie-Maxwell exchange is a reminder of how little we really know still about agricultural productivity in early modern Ireland. Research on land tenure and settlement patterns is on firmer ground. While O'Dowd (1988) has been able to show that the power of Gaelic landlords persisted longer than previously thought, work on the pattern established by the brutal expropriations and settlements of the seventeenth century highlights regional variation. In south Ulster, that pattern held broadly until the nineteenth century, but in south Munster it was disturbed by substantial land sales in the interim, particularly by non-resident landlords (Duffy, 1981, 1988; Dickson, 1982; Smyth, 1988a).

Agricultural progress in the post-Restoration period is indicated by very rapid growth in both external and internal trade. The latter is captured by export data (a sevenfold rise between the 1660s and the 1790s), the former proxied by the proliferation of fairs throughout the country. The number of fairs held almost doubled between 1684 and the 1770s, the rise being greatest outside Leinster, and farmers everywhere increasingly turning their operations towards the market (Dickson, 1988: 96–101; see too Gillespie, 1987; Crawford, 1987; Smyth, 1988b). This was a period of rapid population growth by contemporary European standards and of urbanization too, indirect evidence that agriculture hardly stood still. Though livestock provided the main link with markets, farming remained mixed, with the potato substituting for fallow and winning an increasing share in tillage output. An appreciation of the limited role of head landlords in engineering these changes has earned a more important role for those 'middlemen' wedged between proprietor and farmer (Dickson, 1979). Crawford (1975; also Gillespie, 1988) has charted the course of Ulster 'tenant right' over the eighteenth century from merely a tenant's claim of priority when his lease came up for renewal to a right to payment (in the words of one astounded observer) 'where no lease exists and where no improvement has been made. Andrews has pointed to the humbler victories won by some squatters on the public commons; he tells with relish the story of one John Doyle of Broadleas Common, a long-time squatter, whose registration as a freeholder was upheld in court in 1836 (Andrews, 1987: 20). A common theme in the literature is that by the late eighteenth century, when proprietors began to remove middlemen and take direct control of the running of their estates, rural population was too great for direct management to have much effect (Roebuck, 1981a, 1988; Maguire, 1972; Horner, 1981).

In terms of thoroughness, detail, and methodology, the work of Arthur Young marks a great leap forward over Petty. Though Young was reviled by many contemporary agronomists, a re-examination of his research methods is a reminder of how ambitious and original his project was. Allen and Ó Gráda (1988) argue that while Young was opinionated and wrong-headed on many issues, his methods of enquiry were conscientious enough. Young was inclined to consider Irish farming methods silly and backward, but his data belie his harshest criticisms. A detailed analysis of the English, Irish and French yield data collected on his various tours shows that Irish yields were respectable, far higher than French and emulating English levels. However, for Young (and this recalls Gillespie's criticism of Canny) the only way forward was through the diffusion of English methods, and their failure to spread in Ireland upset him. In truth, such methods were inappropriate or superfluous in Irish context in several respects. The potato reduced the appeal of turnip diffusion, and the abundance of natural grasses in Ireland obviated the need for artificial varieties (Bell and Watson, 1987; Ó Gráda, 1988: Ch 2). 'Improvement'-oriented contemporaries castigated the Irish for 'archaic' practices such as paring and burning, spade-tillage, and small fields, but modern historians are more inclined to give Irish cultivators the benefit of the doubt (eg Lucas, 1960; Lucas and O Danachair in Gailey and Fenton, 1970). If anything, they tend towards the other extreme,

applying the 'survivor principle' to farming techniques: a technique's perseverance is evidence of its 'efficiency'.

2 1800–1850

The critical period between the Union and the Great Famine has been a magnet for some of the best research in Irish economic history, and particularly the history of agriculture. Contemporary sources, both printed and manuscript, are much richer than for any earlier period, and they have now been intensively quarried. Bourke (1965, 1978), Crotty (1966), Solar (1987), Mokyr (1985), and Turner (1984) have performed the essential spadework for a quantitative history of prefamine agriculture.

On the eve of the famine output per male worker was about half the British level (Solar, 1987; Ó Gráda, 1988; Ch 2). Now that historians no longer believe that the gap was due to laziness or some other Irish character defect (Bell and Watson, 1987; Bell, 1987; Solar, 1983; Ó Gráda, 1988, Ch 2), they highlight instead the paucity of resources at the disposal of the average Irish farm labourer and farmer. And, though this comparison with Britain hardly flatters Irish agriculture, the half-century before the famine was one of progress in many respects. Yields per acre, already high in Arthur Young's time, continued to rise. In the early 1840s, potato yields were twice the French level, and grain yields not much less than the English (Allen and Ó Gráda, 1988). The prefamine decades now emerge as an era of technological diffusion: historians have unearthed from farming manuals, trade data, and farm accounts a story of 'improvement' in terms of seed varieties, livestock strains, and new equipment such as Scottish ploughs and lighter carriage vehicles (Bell and Watson, 1987; Ó Gráda, 1988: Ch 2). Modernization was most marked on larger farms but certainly not confined to them. It encompassed the humble donkey, almost unknown in Young's time, and the 'lumper' potato, notorious in the wake of *Phythophthera infestans*, but reputed safe and high-yielding before then. Just before the famine, there were over ninety thousand donkeys on Irish farms (three-fifths of them on holdings of ten acres or less, compared to one-fifth of the horses). The size distribution of farms must be borne in mind in evaluating the extent of 'improvement'. It was enough for a minority of farmers to be 'improvers' for the bulk of the landed area and agricultural labourers to be affected (compare Jones Hughes, 1982). The period has also been considered one of estate 'improvement', as head landlords removed 'middlemen' and assumed a more active role in management (Donnelly, 1973; Maguire, 1972).

Still, the extent of progress remains a matter of debate. Solar's brilliant dissertation (Solar, 1987) paints an extremely gloomy picture of an agricultural economy grinding to a stationary state, while Andrews (1982) has pointed to the limited prospects for further land reclamation on the eve of the famine. Turner's comparison of livestock numbers in county Down in 1803, 1841, and 1847 seens to point the same way, ruling out much increase in livestock output in that atypical county. The data used by Turner are probably too weak for strong inferences, however (Turner, 1984). The shortcomings of the 1841 censual data are familiar (Bourke, 1965b), but the 1847 figures – the first in an annual series of Irish agricultural statistics – are also probably too low. I suspect that the steady and substantial rise in nearly all the series, livestock and crop acreages, between 1847 and 1853 or 1854 (see table below) may be in large part due to improving coverage in the early years of official data gathering. Certainly the massive rise during those years was never to be equalled again during the nineteenth century, and is difficult to square with the modest rises in live cattle, beef, pigmeat, and butter exports (Solar, 1987: 110, 159, 160, 189).

Year	*Cattle*	*Horses*	*Sheep*	*Pigs*
1803	96286	25164	36698	41597
1847	115411	30644	44530	22475
1854	130974	31483	64159	57262

Source: Turner, 1984: 31; *Agricultural Statistics*

Most of the literature on pre-famine agriculture remains Malthusian, at least implicitly. A predictable controversy broke out, therefore, over Joel Mokyr's finding that the land-labour ratio is a poor predictor of average income or wages in Irish counties in the early 1840s (Mokyr, 1985: ch 3). Cogently argued with newly-marshalled data, the result prompted its author to engage in a fascinating quest for other reasons 'why Ireland starved'. Criticism of Mokyr's anti-Malthusian finding has focused on the assumption of low economic integration across counties (necessary for the econometric exercise) and the specification of land quality (Kennedy, 1983).

However, the revisions of recent research must not obscure the problems facing Irish agriculture. Mokyr (1983) and Hoffman and Mokyr (1983) are reminders of the drawbacks of over-reliance on the potato. A long-term perspective suggests too that there was something 'unnatural' about Ireland's reliance on grain, given that it 'is by nature counted a great soil of pasture' (Edmund Spenser quoted by McCarthy-Morrogh, 1984: 158).

Yet both optimists and pessimists now agree that there was nothing inevitable about the crisis that struck Irish agriculture in 1846. Neither the history of pre-famine famines (Ó Gráda, 1984, 1989) nor the variability of pre-blight potato yields indicate that the potato was unduly risky, particularly given how poor

Ireland was by contemporary standards (Solar, 1988; 1989a,b). If evidence in contemporary Irish provincial newspapers enables Solar to argue that 'the potato does not seem to have been noticeably more likely to fail than other crops in the southeast' (Solar, 1989b), what of areas further west where root crops had a comparative advantage for climatic reasons? Perhaps further research along the lines pursued by Solar can tell. Pre-famine Ireland was in terms of material consumption the poorest place in western Europe, but its poor were generally well fed and relatively healthy, and they lived relatively long lives (Clarkson and Crawford, 1988; Solar, 1987; 353; Ó Gráda, 1988). These meagre comforts were due to the potato.

Between the Union and the famine, the Corn Laws benefited Irish landlords and farmers, and encouraged tillage. The proportion of output due to grain and potatoes was probably as high in 1840–5 as it ever had been. Some historians nevertheless point to 1815 as the high-water mark for tillage in Ireland, claiming that the famine accentuated rather than initiated consolidation and the drift towards pasture (Crotty, 1966; Foster, 1988: 318; Goldstrom, 1981). Two ways of answering the question have been attempted. The only effort so far at obtaining a direct aggregate impression of consolidation has produced conflicting evidence. Some 165 of 317 witnesses (mostly farmers and land agents) interviewed by the Devon Commissioners in the early 1840s declared it 'prevalent', but only 63 of 1502 witnesses questioned by the Poor Law subcommissioners in 1835 declared it 'very widespread' or 'prevalent', and 800 of them did not bother to answer (Mokyr, 1985: 130–1). Dramatic examples of a shift to pasture might be cited. The distinguishing feature of the great Terry Alt rebellion of 1830–1 was the sight of substantial crowds of farm labourers engaged in digging up large enclosures recently converted to grass, and turning cattle free to roam on the roads.[2] But such evidence is no proof of overall trends. The alternative route is a macro-level analysis of the composition of output before the famine and the trend in agricultural exports between the Union and the famine makes a significant switch to tillage very unlikely (Ó Gráda, 1988: Ch 2: Solar, 1987: 407–12). The famine quickly convinced proprietors and farmers that the days of tillage were over. Both Corn Law repeal and the rise in real wages in the wake of the famine forced a switch away from grain.

The growth of agricultural output was undoubtedly slackening before the famine. The extent and cause of the deceleration are a matter for debate. Solar (1987: 30–5) has inferred what amounts to a Ricardian stationary state from the failure of agricultural exports to rise in the pre-famine decade, but the trend is muddied by the series of extremely bad harvests in 1839–44. In England these were the years of the 'hungry forties'; in Ireland an unknown proportion of output was diverted from exports to domestic consumption (Donnelly, 1973: 32–5). Thus it would be premature to infer the beckoning of a stationary state from trade data alone. Besides, some slackening is to be expected from the decline in labour input growth, most serious in the east where marginal productivity of labour was highest.

Rural violence and protest, a fashionable field of inquiry further afield, have also attracted the attention of Irish specialists. The 'low politics' of local peasant societies have been traditionally ignored by Irish political historians, but social historians have shown how important they were (Clark and Donnelly, 1983; Fitzpatrick, 1985). Connolly (1987) and Donnelly (eg 1978) have studied eighteenth-century movements, though most recent work has been on the post-1800 period. Aims, causes and results have been debated. There is fertile ground here for competing hypotheses: tenants versus landlords (Beames, 1983; Mokyr, 1985); labourers versus tenants (Lee, 1980); intrafamilial and interfamilial squabbling (Fitzpatrick, 1982). Roberts (1983) has proposed a class model of faction fights, Fitzpatrick a familial one for what was earlier seen as class-inspired (Fitzpatrick, 1982). Donnelly (1985: 166–7) clearly thinks that there is no simple answer.

Nor has the extent of the unrest been decided. 'Nothing could have been further from the peaceful society of some anthropological folklore' (Clark, 1979: 66) than rural Ireland before the famine. Peaks such as the Rockite uprising of 1820–2 in Munster or the Terry Alt unrest of 1830–1 in Clare involved very large numbers of people, and truly terrified the landed élite. The perception from Dublin, London and further afield was of endemic violence. And yet there are grounds for supposing that the agrarian crime rate was probably falling before the famine, and the police ability to cope improving (Broeker, 1970).[3]

The Great Famine highlighted the uniqueness of Irish agriculture (Daly, 1986; Ó Gráda, 1989). Recent estimates of output on the 'national farm' just before the famine (Solar, 1987; Ó Gráda, 1988) show that the potato accounted for less than one-quarter of the total. Nevertheless, it was the dominant food of three million out of Ireland's 8.5 million people, and an important element in the diet of the remainder (Bourke, 1965a; Mokyr, 1981; Cullen, 1981). Moreover, the low wages associated with the 'potato standard' underpinned the huge tillage acreage that made Ireland to some extent Britain's 'granary' (Ó Gráda, 1984; Solar, 1989a). When it failed, the poor

[2] James S Donnelly, 'The Terry Alts', unpublished, 1986.

[3] A good local example is provided by Micheál Ó Ciosáin, *Choc an Óir*, Maynooth, 1988, p 137.

may well have been willing to offer work for less than a subsistence wage, but the 'efficiency wage' that farmers must pay rose (McGregor, 1984; Mokyr, 1983: 223–6).

In medieval Europe a crop shortfall of 50 per cent was typically enough to produce a 'dearth': in Finland in 1867/8 a shortfall of less, in a depressed economic environment, was enough to trigger a famine. The failure in Ireland in the late 1840s, a halving or more of the potato harvest for several years in succession, was of a different order by historical standards. Indeed, the harvest of 1845/6, down by nearly one-half, resulted in privation, but in little if any excess mortality.

It was frequently claimed during the famine that Irish agriculture continued to produce enough food for everybody. The point, echoed in populist historical accounts, anticipates Sen's entitlements approach to famine mortality (Sen, 1981). Crude political arithmetic lends it some support (Ó Gráda, 1988: ch 3; Solar, 1989; see too Bourke, 1978), but the calculations ignore the dynamic effects of requisitioning or redistribution in a context of repeated crop failure. The best defence of the entitlements argument entails analysing the famine in a United Kingdom context: even if Ireland's own food supply was hard stretched, there was certainly enough in Sen's sense in the United Kingdom, of which Ireland was a full partner, to prevent starvation. The populist search for scapegoats had identified groups who gained from the famine: moneylenders, resilient landowners, shopkeepers, farmers. Hard evidence is lacking, but there are theoretical grounds for doubting that any of these groups really benefited much. The crisis ruined many landlords and reduced the rent-rolls of most; the drop in land prices hardly compensated most farmers for the big increase in money wages; and traders were hurt by reduced agricultural demand (Ó Gráda, 1988). The most likely gainers were lawyers, waxing fat on property transfers, probate and bankruptcy business – their numbers outside Dublin rose by almost half between 1841 and 1851 – and farmers specializing heavily in cattle-raising.

3 1850–1920

This period has been the main target of the 'new' history of tenurial relations. Here the statistics are relatively good. What happened to agriculture? Solar (1983), in a sparkling paper, carries out total factor productivity calculation which shows Irish agriculture on a par with Scottish in the 1850s. The bleak picture painted by nineteenth-century propagandists of post-famine Irish farming has been thoroughly revised in the last two decades or so. Despite some bad years, agricultural output per worker certainly rose, and some new techniques seem to have been adopted with alacrity (Solow, 1971; Vaughan, 1985; Ó Gráda, 1988). The role of landlords in this improvement has not been measured, yet it is unlikely to have counted for much. Their investment in tenant farming, much of it for show and of doubtful economic value, never exceeded more than a few per cent of output (for a good recent case-study, see Proudfoot, 1986). It is hardly surprising therefore that the decline in landlord investment during the Land War had little impact on farming. Solow's gloomy image of Irish agriculture during the Land War, neglected by agitating tenants and alienated landlords alike, must be weighed against evidence that living standards and productivity continued during the Land War (Solow, 1971; Ó Gráda, 1988). Nor is the post-1880 stagnation claimed by Crotty (1966) borne out by subsequent work either: modest changes in output masked significant productivity increases. The 'ageing' of Irish farmers which Crotty (1966: 104–7) attributed to the demise of an active market in land turns out to be largely a fiction based on farmer mendacity prompted by the Old Age Pension Act of 1908.

Vaughan's micro-study of the farm accounts of Meath grazier Edward Delany implies stasis – at least insofar as land productivity is concerned – on one substantial Meath holding. On Delany's original holding at Woodtown (not far from Dublin), beef output fluctuated around 230 cwt annually between 1851 and 1899 (Vaughan, 1982: 68n). However, output per worker seems to have expanded impressively enough, since Delany increased his income, not by cultivating more intensively but by buying up neighbouring farms. Yet, however enlightening, this is but a sample of one, difficult to square with macro evidence: in County Meath as a whole the number of cattle almost doubled in the same period.[4]

If the gist of Solow's influential study (Solow, 1971) is that the Land War of 1879–1903 was *unnecessary*, Vaughan's lively survey of the Land War literature considers its outbreak a fluke, and its outcome at best a draw from the tenants' standpoint (Vaughan, 1985); landlord exploitation cannot explain its origins, nor can it be proven that the tenants won the battles of 1880–2 or 1887–90. The tenant struggles of the 1880s and 1890s, far from putting an end to evictions, only provoked more of them, and failed to reduce rents significantly. In the short run at least, the hard-fought Plan of Campaign (1886–91) was at best a draw from the tenants' standpoint (Geary, 1986). The deromanticization of landlordism's more violent foes has been carried to extremes by Foster ('activity . . . linked to *machismo* and sexual frustration') and Murray ('a form of rural gangsterism') (Foster, 1988: 408;

[4] Department of Industry and Commerce, *Agricultural Statistics 1847–1926* (Dublin, 1930), pp 76–7.

Murray, 1986: 72). Recent work in this anti-deterministic vein credits the genius of Parnell and Davitt (see the excellent biographies by Bew, 1980 and Moody, 1981) with converting an agrarian downturn no worse than another earlier one in 1859–64 (Donnelly, 1976) into a revolutionary situation (Donnelly, 1976; Moody, 1981; Vaughan, 1985): without them there would have been no Land War.

Relentless in pursuit of populist myths, the recent literature has been rather indulgent towards landlordism, stressing its powerlessness in the face of overpopulation and economic crisis before 1845, and the modest rent rises and eviction rates of the post-famine period. Only during the famine itself, when, in his eagerness to protect himself, the typical landlord 'cleared' without much scruple, is a less generous verdict warranted (Curtis, 1980; Malcolmson, 1974; Maguire, 1972; Roebuck, 1988; Solow, 1971; Donnelly, 1989). Yet a 'post-revisionist' verdict on the Land War might be that, as social revolutions go, its cost in terms of lost output was low. What seems striking now is how easily the system introduced in the seventeenth century was eliminated in the late nineteenth and early twentieth (Jones Hughes, quoted in Horner, 1981; Duffy, 1988).

A welcome variation on the heavy emphasis on landlord-tenant relations has been the attention focused by Bew and Jones on a different arena: the conflict between landless labourers and smallholders on the one hand, and graziers on the other. The very titles of the studies of agricultural labour by J W Boyle (1983) and Fitzpatrick (1980) tell their own story. As predicted by Davitt, the outcome of the Land War traded one form of inequality for another, and gave rise to new tensions. These tensions found parallels elsewhere in Europe at this time. In Ireland they lay behind the creation of the Congested Districts Board, but their ultimate resolution brought the landless and the western smallholder little joy (Jones, 1983; Bew, 1987; O Tuathaigh in Drudy, 1982).

4 The Record since 1920

Crotty's claim that owner occupancy was 'bad' for Irish agriculture (Crotty, 1966) is one of the most striking in the literature surveyed here. Surprisingly, it has failed to attract the attention that it deserves from historians (see, however, Lee, 1969). Nevertheless, twentieth-century agriculture has been extensively studied; the essays in Drudy (1982) are a good introduction.

Partition in 1921 has lent a welcome comparative focus to much of the work on the twentieth century. O'Connor and Guiomard's separation of the twenty-six county Irish Free State area from the official estimate of all-Ireland farm output in 1912 raises the interesting implication that output per worker was *higher* in the South than in six-county Northern Ireland before 1930, and that the gap widened between 1912 and the mid-1920s (O'Connor and Guiomard, 1985). Following an established tradition, several authors have recently compared agricultural performance North and South (Attwood, 1966; 1983–4; Sheehy *et al.*, 1981; Stainer, 1987; Cuddy and Doherty, 1984). By taking a long-term perspective the comparison may be used to shed some light on the effect of public policy on output and productivity. The outcome is that the South's performance, measured in terms of output per worker, was abysmal up to *c* 1960 but much better since then, so that labour productivity in both areas in the 1980s was similar (Kennedy *et al.*, 1988). Other evaluations of recent experience confirms a new southern dynamism, particularly since accession to the EC (Boyle, 1986, 1987; Stainer, 1987; Whittaker and Spencer, 1986). But why was the record of Southern farming so poor before 1960? Historians imply, admittedly without much analysis, satisfaction with the 1920s. If farmers looked back on that decade as a kind of golden age, it was largely because after 1931 the world depression, a tariff regime compounded by an 'economic war' with the United Kingdom, and World War II conspired in turn to hurt them. Their plight is reflected in land price trends, usefully chronicled by Nunan (1987). Though the De Valera administration elected in 1932 sought to aid the small farmer at the expense of the grazier by promoting tillage, its policies placed nearly all farmers at a disadvantage. Smuggling could help them only marginally (Johnson, 1979; compare Norton, 1983). Post-war policy was a different matter, however. Not only was freer access gained to outside markets, but farmers gained increasingly from transfers from consumers and taxpayers (Matthews in Drudy, 1982). Since accession to the European Community, most of the transfer has come from EC sources.

BIBLIOGRAPHY

Key

IESH = *Irish Economic and Social History*
JSSISI = *Journal of the Statistical and Social Inquiry Society of Ireland*
ESR = *Economic and Social Review*
IJAERS = *Irish Journal of Agricultural Economics and Rural Sociology*
IHS = *Irish Historical Studies*

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Work in Progress

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This list has been compiled from the information given in response to a form which was circulated in the autumn of 1989. It does not lay claim to completeness.

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Dovecotes in the North and Borders: photographs, written descriptions and drawings.

ATKINS, DR P J, Department of Geography, University of Durham.
Food Systems in nineteenth-century Britain.

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Land ownership in mid-nineteenth century Staffordshire.

BERESFORD, MAURICE, University of Leeds.
Medieval Peat Extraction.

BIGMORE, DR PETER, School of Geography and Planning, Middlesex Polytechnic.
Village Squires and the Antiquarian Pursuit (in Suffolk and Hertfordshire).

BORTHWICK, ALISON, Department of English Local History, University of Leicester.
Roman and Post-Roman Settlement on Salisbury Plain.

BOUD, DR ROY C, Department of Earth Sciences, University of Leeds.
Agrarian patronage and the geological mapping of Scotland 1830–1850.

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Land drainage in the inter-war period.

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The Enclosure History of North Herefordshire.

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Changes in Agricultural Technology in England and Wales, 1850–1914.

BRIGDEN, ROY, Museum of English Rural Life, University of Reading.
Farming and Landscape Change in the twentieth century.

BROAD, DR JOHN, Polytechnic of North London.
Seventeenth and eighteenth-century nonconformity and education in South Midlands; Regional History of the South Midlands and the Thames Valley.

BROWN, MARGERY, Department of English Local History, University of Leicester.
Aspects of Parliamentary Enclosure in Nottinghamshire.

BUCHANAN, MRS BRENDA J, 13 Hensley Road, Bath, Avon, BA2 2DR.
Social and Economic History of North Somerset, 1750–1830, especially sources and employment of capital. Interests include enclosure and drainage.

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The Political Economy of Measurement: The Agricultural Statistics Movement in Nineteenth-Century Britain; Information as a Commodity: a scarce resource in Britain's international grain trade; The Evolution of International Agricultural Information Infrastructure in the Twentieth Century.

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Agricultural change in the marshlands of south-east Yorkshire since *c*1600, with special reference to the Manor of Hatfield.

CAMPBELL, BRUCE M S, Department of Social and Economic History, The Queen's University, Belfast, BT7 1NN.
The geography of seigneurial agriculture in medieval England; Feeding the City: agriculture and land use in the hinterland of London 1250–1350 (with Dr Derek Keene, Centre for Metropolitan History, London).

CHAPMAN, DR JOHN, Department of Geography, Portsmouth Polytechnic, Lion Terrace, Portsmouth PO1 3HE.
The parliamentary enclosure movement in England and Wales; Land use change in West Sussex and South Hampshire, 1750–1950.

CHARTRES, DR J A, School of Business and Economic Studies, University of Leeds, Leeds, LS2 9JT.
The distilling industry in England, 1600–1830; Agricultural servicing and trades, 1850–1914; Domestic trade and transport in England, 1600–1850.

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The development, breeding and use of the Heavy Horse breeds in UK with reference also to aspects of social history.

CHORLEY, P H, Department of History, University College, London.
Introduction of merino sheep into France and Germany 1760–1850.

COLLINS, DR E J T, Institute of Agricultural History, University of Reading.
Introduction and consumption of human food-grains in Europe and overseas since the sixteenth century; Use and manufacture of agricultural edge-tools in Britain 1500–1950; The coppice and underwood trades 1700–1939.

COOK, PETER J, Faculty of Law, University of Birmingham, PO Box 363, Birmingham B15 2TT.
Custom and the law in the eighteenth and nineteenth centuries; The Game laws and 'rural crime' in the eighteenth and nineteenth centuries, History of 'animal law'.

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Allotment History in England 1780–1980.

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Rural Settlement Patterns in East Anglia (multi-period); Ancient Landscapes in S and SE Norfolk (with Dr T Williamson and K Penn).

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Late nineteenth-century farm labour in Britain; Twentieth-century British Farming.

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Evolution of the Irish Cattle Trade 1650–1850; Provisioning of Irish Cities in the eighteenth century.

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Agricultural Change in Cumberland, 1650–1850.

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Agriculture and Environment in the Wessex Chalklands: The Rawlences, Farmers and Land Agents, *c*1810–1901.

DUNCAN, COLIN A M, Department of History, Queen's University, Kingston, Ontario, Canada, K7L 3N6.
Land stewardship ethos in English and North American Farming compared.

DYCK, IAN, Department of History, Simon Fraser University, Burnaby, BC, V5A 1S6, Canada.
William Cobbett and Rural Popular Culture; Rural Song since the seventeenth century.

DYER, C C, School of History, University of Birmingham.
Medieval origins of capitalism; Rural settlements – History and Archaeology.

DYMOND, DAVID P, Board of Extra-Mural Studies, University of Cambridge.
Agriculture of High Suffolk, fifteenth to eighteenth century; Glebe terriers and agricultural history.

ELLIOTT, GORDON, School of Education, University of Hull.
Agricultural change in Cumbria since the sixteenth century.

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Productivity of demesne agriculture and peasant holdings on the sub-manors of Taunton, 1208–1347 (with C Thornton); The labouring poor on the Somerset estates of Glastonbury Abbey, 1250–1348; The cottager in the Later Middle Ages; Agrarian landscapes and settlement in Devon, AD 500–1500.

FROST, W M, School of Economics and Commerce, La Trobe University, Bundoora, Victoria, Australia 3083.
The decline of wheat and agricultural restructuring: a comparative study of East Anglia, California, and Victoria in the late nineteenth century.

GALLOWAY, DR JAMES A, Centre for Metropolitan History, 34 Tavistock Square, London, WC1H 9EZ; Feeding the City – London and its Agrarian Hinterland 1250–1350 (with Dr Margaret Murphy).

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Patterns of land-tenure, inheritance and rural settlement in medieval Sussex.

GIELGUD, JUDY, University of Sussex.
Nineteenth-century farm women in Northumberland and Cumbria.

GINTER, PROFESSOR DONALD E, Department of History, Concordia University, 1455 De Maisonneuve Boulevard West Montreal, Quebec, Canada, H3G 1M8;
The Land Tax; The size and distribution of landed estates in late eighteenth century Yorkshire; The distribution of farm tenancy in late eighteenth-century Yorkshire; Gentry and clerical participation rates in local officeholding; Yorkshire eighteenth to nineteenth centuries; Voting patterns and their relationship to landholding in Yorkshire, eighteenth to nineteenth centuries.

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British Agricultural Engineering Industry 1780–1914.

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The growth of apple orcharding and the development of the cider industry in England, 1550–1850.

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History of Charlton Kings – in general; History of the poor in Charlton Kings before 1830; Cheltenham in the medieval period.

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Agrarian conditions in later medieval Wiltshire and Hampshire (including estate policies, sheep-farming, and landscapes)

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Estates of Winchester Cathedral Priory to *c*1340; Medieval Settlement Pattern in the Northern Pennines and North York Moors.

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The Composite manor of Brent, Somerset: A study of a wetland edge community in the Middle Ages.

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Twelfth-century rural society in England; Food and diet in medieval England.

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Medieval and Post-Medieval agricultural landscape and associated building forms on the East Yorkshire Wolds as part of the Wharram Research Project.

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Medieval Linen Industry; Medieval Lonsdale and Ewcross – settlement patterns etc; Forest exploitation in the north-west.

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'The Working Countryside' – compilation of contemporary photographs of Shropshire's rural industry and agriculture, 1860–1945; Agricultural Trade Unionism in Shropshire and Herefordshire in late nineteenth century.

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Links between population, agriculture, and industry in north-east England, *c*1550–1850; Lordship and landscape in Britain since *c*1550; The progress of enclosure in mining districts.

HORN, PAMELA L R, 11 Harwell Road, Charwell Road, Sutton Courtney, Abingdon, OX14 4BN; Victorian Country Women – Life and Work; Social Status; Victorian rural education and child life.

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Agriculture and peasant communities in eighteenth-century Wales.

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Erratum

Because of an oversight, it is regretted that the artwork for Figures 2 and 3 in the article by Jules N Pretty, pp 8–9, was not labelled with sufficient clarity. In each Figure, the five graphs on the *left* relate to *oats*, and the five on the *right* to *wheat*. The Editor apologizes for any confusion that may have resulted.

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The Critical Century? The Agrarian History of England and Wales 1750–1850*

By MARK OVERTON

THE CENTURY after 1750 is perhaps the most famous in the historiography of British agriculture, for this is the period first designated as one in which agrarian developments amounted to an 'agricultural revolution'. The designation has not, of course, gone unchallenged, although for all the debates over the meaning and use of the term, the century is still regarded as a period of outstanding significance in the progress of British agriculture. But was there an 'agricultural revolution'? The publication of the *Agrarian History of England and Wales* Volume VI, *1750–1850*, which its editor hopes is an 'authoritative, comprehensive, and judicious survey', might be expected to settle the matter once and for all.[1] The search for the answer is not for the faint-hearted (or for those with weak wrists) since the sheer bulk of the book (1215 pages with contributions from twenty authors) makes it rather a daunting prospect. If the reader is not put off, and perseveres to page 953 they will find Professor Mingay's verdict, which might come as a surprise to those familiar with his past writing on the subject.[2]

> Given the many persistent obstacles which lay in the path of agricultural progress, the achievements of the hundred years after 1750 were remarkable. It could hardly be said that they amounted to an agricultural revolution . . .[3]

The argument has a slightly whiggish tone for the final sentence of his conclusion to the book considers that:

> In many ways the hundred years that ended in 1850 may be seen as a base, or rather a preparation, a limited but essential preparation, for the greater changes yet to come.[4]

Certainly if we judge the period by the standards of late twentieth-century agriculture then this verdict is correct. In whatever ways we measure output and yields before reliable statistics start to appear in the late nineteenth century, it is clear that the period since 1950 has seen by far the greatest rates of growth.

But if we look back rather than forward one of the most striking features of the century after 1750 is that for the first time in English history there was no longer a direct relationship between population and food prices. Just as Malthus was pursuing the pessimistic implications of this relationship, which he accepted as an inevitable lesson of history, the link between population and prices was broken. For the first time growth in population did not lead (in the end) to a rise in prices which would eventually check that growth. In other words agricultural output kept up (just about) with a rising population.[5]

But something else was happening too. Not only did agricultural output keep up with population, but a falling proportion of the workforce was able to produce it. For the first time rising output was achieved without intensifying labour inputs. In other words labour productivity was rising as output rose. The importance of this is beyond question. If an industrial revolution is defined as an increase in the proportion of the labour force working in non-agricultural occupations, it follows that a decreasing proportion of the labour force must be employed in feeding the population (unless food imports increase). Thus judging the century after 1750 (perhaps actually 1700) with any previous period in English history makes it exceptional in two fundamental ways.[6]

The task of measuring changes in yields and output, which is a particularly difficult one for the century covered by this volume, falls to BA Holderness. Probate inventories, which constitute one of the main

* A review article of G E Mingay, ed., *The Agrarian History of England and Wales, Volume VI, 1700–1850*, CUP, 1989. xxii + 1215, £90.

[1] p 5.

[2] For example in G E Mingay, 'The agricultural revolution in English History: a reconsideration', *Agricultural History*, 26, 1963, p 123.

[3] p 953.

[4] p 971.

[5] This is clearly demonstrated by E A Wrigley and R S Schofield, *The Population History of England 1541–1871*, 1981, p 405.

[6] This is recognized by Mingay (p 953) but he rather downplays its significance.

TABLE 1
English population, agricultural population, and exports 1700–1850

Date	*Population*	*Agricultural population*	*Net imports*	*Labour productivity*		
				low	*mid*	*upper*
1701	5.06	2.78	−2	1.95	1.86	1.77
1751	5.77	2.64	−12	2.56	2.45	2.34
1801	8.63	3.12	+10	2.63	2.49	2.35
1831	13.28	3.38	+12	3.65	3.46	3.34
1851	16.74	3.84	+16	3.88	3.66	3.44

sources of information for the early modern period cease to survive in quantity after the mid-eighteenth century, and national agricultural statistics were not collected until 1866. Instead there are scraps of information from a variety of sources, and one sympathizes with Holderness's conclusion, given at the end of an extremely thorough and scholarly assessment of available material, that his findings read like 'a litany for sceptics'.[7] His verdict is that agricultural output doubled between 1750 and 1850.

This accords with an attempt to measure agricultural output from a different perspective. Table 1, based on original work by E A Wrigley,[8] shows the population of England, an estimate of the proportion of that proportion employed in agriculture, and the percentage of the consumption of agricultural products accounted for by imports. Population tripled from 1750–1850, net imports rose roughly by a third, and, assuming a more or less constant consumption per head, output must have doubled or a little more. The estimates for the proportion of the population in agriculture are crude, and the import figures cruder still, but even allowing for substantial margins of error, the order of magnitude remains the same. Three indications of 'labour productivity' are given, which are simply calculated as the ratio of the total population to the proportion of the population employed in agriculture; the one labelled 'mid' uses the import figure shown in the table, and the other two columns assume the proportion of imports to be 5 per cent below and 5 per cent above this figure.

How was the increase in output achieved? The sections on farming techniques are generally excellent (particularly the sections on sheep and cattle) but, perhaps as a consequence of dividing the material between five authors, there is no single comprehensive analysis of exactly *how* output doubled. Agricultural output can increase in four principal ways: by extending the area under cultivation; by increasing farm inputs (such as seed, labour, and fertilizers but also capital); through regional specialization and associated changes in land use; and finally through technological change, whereby output will increase while the level of inputs stays the same.[9] Evidence for all four strategies is scattered throughout the book, though given the nature of the evidence it is impossible to weight their relative importance. Most surprising is the absence of proper assessment of the likely impact of those technological changes which hitherto have rather obsessed agricultural historians: the introduction of new crops, new rotations, new breeds of livestock, and new farm tools.

Land productivity influences the productivity of labour since a rise in the former can lead to a rise in the latter. The crude approximations in Table 1 indicate that the first thirty years of the nineteenth century saw a sharp rise in labour productivity. Yet crop yields at this time seem to have been static. For twenty English counties the yield per acre of wheat remained roughly constant between 1800 and 1830 at around twenty-two bushels per acre. Barley yields may have fallen slightly from thirty-two to thirty bushels per acre.[10] A rise in labour productivity between 1800 and the 1830s seems all the more surprising since after the Napoleonic Wars wages

[7] p 174.

[8] E A Wrigley, 'Urban growth and agricultural change: England and the continent in the early modern period', *Jnl Interdisc Hist*, 15, 1985, pp 683–728, reprinted in R I Rotberg and T K Rabb, eds, *Population and economy*, Cambridge, 1986, pp 123–68.

[9] Cf. Mingay's discussion p 970. The relationships between output and productivity are discussed in Mark Overton and Bruce M S Campbell, 'Productivity change in European agricultural development', in Bruce M S Campbell and Mark Overton, eds, *Land, labour and livestock: historical studies in European agricultural productivity*, forthcoming, Manchester, 1991.

[10] Comparing the yield estimates for *circa* 1800 in Michael Turner, 'Agricultural productivity in England in the eighteenth century: evidence from crop yields', *Econ Hist Rev*, 2nd ser, XXXV, 1982, pp 489–510 with evidence from the tithe files for 1829–35 in R J P Kain and H C Prince, *The Tithe Surveys of England and Wales*, Cambridge 1985, pp 226–8. Unfortunately Kain and Prince's results were not available when Holderness was writing his chapter, nor were the maps of yield and output in Mark Overton, 'Agriculture', in J Langton, and R Morris, eds, *An Atlas of Industrializing Britain 1780–1914*, 1986, pp 34–53.

were low and there appears to have been an excess supply of labour. Mingay concludes:

> To some extent, at least, the productive achievements of this period were secured at the expense of the hardship and deprivation of the more than 900,000 workers who laboured on the farms of England and Wales for meagre rewards.[11]

If this judgement is correct, and if labour productivity in fact did rise as Table 1 suggests (although by what means we are not yet in a position to say) perhaps the labourers were simply not rewarded for their extra effort.

Some might regard the figures in Table 1 as another example of a 'litany for sceptics'. National estimates of the cultivated area, agricultural output, crop and livestock productivity, and so on, have been pushed to the limit, indeed perhaps beyond. The way forward therefore, on some of the most fundamental questions in the agrarian history of this period, is by more detailed locally-based research.

One of the most striking contrasts between this volume of the *Agrarian History* and the preceding volumes IV and V, lies in the nature of the source material employed.[12] The earlier volumes are dominated by manuscript evidence; but with some exceptions volume VI relies on published secondary material. Of course some primary sources such as inventories dry up after 1750, and contemporary published material becomes much more reliable, but a good dose of primary sources, especially farm accounts, would have given some chapters more authority and made them read less like exhaustive surveys of existing literature. The chapter on prices, productivity and output goes so far as to deliberately ignore manuscript material.[13] One wishes that N Goddard, in an excellent chapter on agricultural literature, could have devoted some space to discussing the value of such material as an historical source, given the reliance of his co-contributors on it. Even the comprehensive statistical appendix is mostly based on secondary material (much of it in parliamentary papers) and, unlike volumes IV and V contains relatively little new material gleaned from the archives. Nevertheless the gathering of so much statistical material in one place, together with Dr Holderness's summary tables of agricultural output is an immensely useful service for historians.

There are other contrasts with the preceding two volumes. Several themes neglected in volume V, especially the fortunes of the rural labourer and social conditions in the countryside, are dealt with at length in this one. Labourers are considered in two chapters by W A Armstrong and J P Huzel. These are prime examples of cautious and judicious surveys of available literature (mostly up to about 1980) and will prove useful to students. 'Even-handed' is probably a better description than 'judicious', since decisive judgements are hard to find. As a consequence the chapters lack the passion that characterizes debates about the social impact of enclosure, living standards, the poor law, and, most of all, rural riots. As one might expect, J V Beckett handles landownership and estate management with assurance[14] and a final chapter on rural society as a whole is contributed by R Porter.

One would not expect each volume in the series of *Agrarian Histories* to cover exactly the same ground, if only because each historical period produces its own particular problems. Thus volume VI has 160 pages devoted to the agricultural servicing and processing industries (covering corn milling, country trades, leather, coppice and underwood, malting, and agricultural engineering), each written by a different author. These are some of the most interesting pages of the book since they deal with important yet relatively neglected topics, and are mostly well researched and well written. The same can be said for the section on the development of agricultural societies by N Goddard.

Some themes covered in previous volumes are not dealt with in this one. Rural housing is not included, but the most startling omission is a chapter on parliamentary enclosure. Admittedly the topic was covered in two books published while the volume was in preparation, and many contributors make reference to the causes and consequences of enclosure, but the absence of a systematic treatment seriously undermines the claim that the volume is comprehensive.[15] Students will therefore have to turn elsewhere for a survey of enclosure (unless they use the index), as they will for a discussion of the impact of the Corn Laws, or for the effects of the Napoleonic Wars, neither of which receive much attention.

One of the more serious failings of the book as far as this reviewer is concerned is the lack of a more comprehensive bibliography, which one would expect to find in a volume such as this. There is a 'select' bibliography and, as with all such bibliographies, Murphy's Law usually operates when one attempts to use it to find a particular reference. The search involves guessing which chapter is most likely to mention the reference, and then picking through footnotes in the hope that it might be there. Another

[11] p 961.

[12] J Thirsk, ed, *The Agrarian History of England and Wales Volume IV 1500–1640*, Cambridge, 1967, and J Thirsk ed, *The Agrarian History of England and Wales V, 1640–1750*, Cambridge, 1984-5.

[13] Some general references are made to primary souces (eg on p 128 note 37) but no reference is made to actual documents which scholars can follow up.

[14] Much the same ground is covered in his book; J V Beckett, *The Aristocracy in England 1660–1914*, Oxford, 1987.

[15] J A Yelling, *Common field and enclosure in England 1450–1850*, 1977, and M E Turner, *English Parliamentary Enclosure: its Historical Geography and Economic History*, Folkestone, 1980.

thirty-eight pages could easily have been found for an enlarged bibliography by cutting the section on weights and measures, which is reproduced verbatim from a volume of parliamentary papers. Such material is useful, but without comment or criticism offers nothing that a xerox of the original could not provide.[16]

The editor refers in the introduction to the chequered history of the volume and one does not envy his twenty-nine year journey from the original synopsis meeting in 1960 to publication in 1989. Difficulties along the way are no doubt responsible for the fact that many of the chapters read as independent contributions, seemingly written in ignorance of the other contributions. Even the editor's conclusion cites more recent work in preference to some of the findings of his contributors. Inevitably, therefore, there are inconsistencies and contradictions between chapters. This is no bad thing if the inconsistencies are highlighted to prompt further debate, but that opportunity has been missed. Some of the inconsistencies arise, not from differing historical interpretations, but simply because the chapters were written at different periods. For example, some authors use Wrigley and Schofield's population estimates while others must have finished their contribution before they were available.[17] Incidentally, those figures refer to England alone, and have to be modified to include the total for Wales.[18]

Some of the divisions of responsibility between chapters are hard to understand. It is surely illogical to divorce the analysis of prices (Holderness in chapter 2) from the discussion on markets and marketing (Perren in chapter 3). Both chapters look at the movement of regional price series using different collections of prices. The graphs in both chapters show that prices move together in harmony (except for years of dearth and hiatus). Holderness suggests this might indicate the presence of a national market, but Perren does not address the issue and so misses the opportunity to continue the story where Chartres left off in the previous volume.[19]

The chapter by H C Prince on changing rural landscapes has no shortage of maps, but they fail to shed much light on this particular issue. Instead we are provided with a series of contemporary views of the regional patterns of English (and not Welsh) farming from the *General Views* and the *prize essays* from the *Journal of the Royal Agricultural Society*. These are interesting, but are not really comparable with the farming regions constructed for volumes IV and V which were regions of farming practice derived from primary material. The other maps in the chapter are rather a mixed bag, and include a map of root crops *c.*1800, which tells us more about the varying enthusiasm of Board of Agriculture Reporters for turnips than it does about the distribution of the crop.[20]

In fact, this volume of the *Agrarian Histories* displays a very different attitude to regional differences in comparison with the previous two volumes. The assumption underlying the regional sections in volumes IV and V is that there was a series of distinct farming regions with fairly uniform farming practices, and these farming practices determined or influenced the distribution of a much wider range of social and economic factors – ranging from industry to religion and sport. Such was the importance of these regions that volume V devoted a whole book to them. What happened to them after 1750? Did agricultural specialization increase as the national market integrated, thus making regional identities more pronounced? Or did the integration of the economy break down regional differences?[21]

A more explicit consideration of the varying experience of particular regions helps to prevent bland national generalizations, which, because they are national, lose their meaning. It makes sense for economists to talk about the national economy, as in the performance of the agricultural sector in the national economy for example, but it is difficult to talk about the typical or average condition of the farm labourer when such an 'average' condition was not the typical experience. For example, the editor states:

> The great majority of farmers in both England and the Principality employed either no paid labourers at all, or, if any, seldom more than two or three. Farming was not, therefore, a capitalist activity.[22]

The word 'capitalist' has a multitude of meanings but if we look at the social relations of production then it seems that some areas were distinctly capitalist. The ratio of labourers (the 'agricultural proletariat') to farmers not employing labour ('peasants') in 1831 averaged about four to one. However, in the south-east of England it averaged more than fifteen to one, and in Essex rose to forty-three to one. In some districts it was higher than this. Conditions were very

[16] There is no mention of R E Zupko, *A Dictionary of English Weights and Measures: from Anglo-Saxon times to the nineteenth century*, Madison, 1968. Xeroxing the original Parliamentary Paper would also be cheaper per page in comparison with the *Agrarian History* if copying costs were under about 12.7 pence per copy.

[17] They were published in 1981 but had been available for several years before.

[18] Compare Perren's use of them (p 192) with that of Holderness (p 91).

[19] J A Chartres, 'The marketing of agricultural produce', Thirsk, ed, *The Agrarian History of England and Wales, Vii; 1640–1750: Agrarian Change*, pp 406–502.

[20] p 42.

[21] J Langton, 'The industrial revolution and the regional geography of England' *Trans Inst Brit Geog*, ns 9, 1984, 145–67.

[22] p 954, yet elsewhere he speaks of growing alienation amongst social classes in the countryside, p 963.

different in the north-west; the average for Lancashire for example was only two to one.[23]

This raises a question about the scale at which we should investigate regional or local differences. The unit of analysis in early modern England, for both agricultural and social change, is taken to be the farming region. In the nineteenth century the parish is seen as the appropriate unit, exemplified in models of open and close parishes for example. The difference is probably simply one of historiographic convention, but exploration of the inconsistency would probably help in understanding regional differences in both periods.

Thus volume VI is clearly not the last word on the agrarian history of England between 1750 and 1850; one does not imagine that the editor or his contributors would wish it to be so. In conclusion, to use Mingay's criteria, is it an 'authoritative, comprehensive, and judicious survey'? It is judicious, although excessive caution and qualification give it an equivocatory air, which does not make for exciting reading. Its intimidating bulk does not by itself make it authoritative, and several conclusions really need more empirical evidence before they can be accepted. It is not comprehensive; one wonders how a single volume possibly could be, but one suspects circumstance is as much to blame for some omissions as editorial judgement. On the whole the volume does live up to the high standards set by the others in the series. Above all, albeit with some limitations, it will prove extremely useful for both teaching and research, and remain the standard point of departure for both the undergraduate essay and the new research project.

[23] Mark Overton, 'Agricultural revolution? England, 1540–1850', pp 9–21 of Anne Digby and Charles Feinstein, eds, *New Directions in Economic and Social History*, 1989, p 18.

Obituary: Dr George Fussell

All members of the Society, and the wider historical community, will mourn the death on 1 January 1990 of Dr George (G E) Fussell. He had reached his hundredth birthday on 10 September 1989. At the time of his death, like the great Gascon historian Charles Samaran before him (d. 1982 at the age of 102), he was almost certainly Europe's oldest practising historian.

With a book in the press at his death, George certainly remained a practising historian to the last. However he was never a professional academic, and had developed his skills for himself since his first exploratory essays in the *Journal of the Ministry of Agriculture* in the early 1920s. What he described as his own industriousness and his 'writing itch' produced more than twenty books and six hundred articles in a publishing career spanning nearly seventy years (from 1922).



Dr George Fussell, September 1987
Photograph courtesy of Mrs K R Fussell

A native of Weymouth, he entered the Civil Service as a boy clerk in 1906, moving from the War Office to the Board of Agriculture and Fisheries in 1909, effectively remaining in what became the Ministry in 1919 throughout the remainder of his Civil Service career. H G Richardson, his superior there, positively encouraged Fussell's literary interests, and was an important mentor in his development as a historian of agriculture. With his encouragement, Fussell produced a series of articles on the history of farm machinery in the Ministry *Journal* during the 1920s, and joined Hubert Hall's medieval seminar at the London School of Economics. By 1930, without the benefit of any formal academic training – he had sought unsuccessfully to matriculate before the war – he had established himself as an authority on agricultural history. His achievement was recognized by election to Fellowship of the Royal Historical Society in 1933.

He remained at the Ministry until 1949, as its Librarian, a post which offered opportunities for research, but also as a practical administrator during the Second World War, when he was concerned, successively, with the rationing of raw materials for the production of agricultural machinery and tools, and the supply of petrol to agriculture. He also served in the Home Guard, having been rejected for military service in the First World War because of 'poor physique'. An eventful Second War brought also marriage to Kathleen Rosemary Turner in 1940, the mother of his only child, a daughter.

It is probably difficult for modern agrarian historians fully to appreciate the problems which beset pioneering agricultural historians like Fussell. There were few post-medieval secondary studies of merit available in the 1920s, apart from Lord Ernle's *English Farming Past and Present* (1912) and its precursor, *The Pioneers and Progress of English Farming* (1888), and establishing patterns of interpretation and even sketching basic chronology was difficult. This made many of Fussell's early studies remarkable by any standards, and many remain valuable points of departure. Early articles in *Economic History*, in the new US journal *Agricultural History*, and in the *Economic History Review*, some written in collaboration with Constance Goodman, from the late 1920s began, for example, to attempt to quantify aspects of eighteenth-century farming in novel ways, and these became established elements of the secondary literature, only relatively recently overtaken by modern research. A remarkable part of the synoptic view of eighteenth-century growth by Deane and Cole (1962) proves, on close examination, to be heavily dependent upon this era of Fussell's work.

His work of listing and describing the library of the Ministry helped also to fuel a continuing theme of his work, that of bringing early books and pamphlets on agriculture to wider attention. He was also responsible, following a hint by Hubert Hall, for bringing before a wider readership one of the outstanding farm sources for the seventeenth century, *Robert Loder's Farm Accounts, 1610–1620*, published in the Royal Historical Society, Camden Series, in 1936. Fussell transcribed and edited Loder's accounts, with

some specialist assistance, and contributed a brief introduction to make this volume, with Henry Best's farming and memoranda books, a critical printed source for early modern agriculture.

His lasting reputation has not, however, in general been founded upon his skills and range as a documentary historian. Rather he has established a remarkable record of achievement, based upon encyclopaedic knowledge of the contemporary printed literature, and a clear awareness of the need for descriptive analysis. This methodology enabled him to explore many areas for which his pioneering books will long be consulted. Thus works such as *The English Rural Labourer* (1949), *The Engish Countrywoman* (1953), and *The English Countryman* (1955, both with his wife, K R Fussell) attempted to discuss life style, material culture, and work experience in the long agrarian history from the sixteenth century, and in so doing provided broad and popular surveys which no single modern work has supplanted. The later study of *The English Dairy Farmer, 1500–1900* (1966), also remains the only single volume study of this sector of farming. Many of Dr Fussell's books look somewhat old-fashioned to modern historians, in their great dependence upon printed sources and in their approach, but most have yet to be supplanted by popularly accessible single volume studies, and they therefore remain the points of departure for research by both professional and amateur historians. It was in recognition of his long-term and significant contributions to agricultural history that the University of Exeter awarded him the degree of D.Litt. in 1970, a distinction that brought him considerable pleasure.

Dr Fussell's immense record of publication is remarkable in itself, but he was also a major figure in the creation of The British Agricultural History Society, and in the promotion of interest in agricultural history in general. It was Fussell, who himself regarded Robert Trow-Smith and Eric Kerridge as partners in the foundation, who convened the meeting in Holborn in early 1952, which led, through further meetings in September and November 1952, to the formal inauguration of the Society at the University of Reading in April 1953. He subsequently served on its Executive Committee and the Editorial Board of the *Review* until 1962, and again from 1964 to 1971, serving as the Society's President, 1968–71. He was made the first Honorary Member of the Society in 1985 in recognition of his contributions to its work.

Many members of the Society will have had the pleasure of knowing George Fussell, and he will be remembered with warmth and affection. He remained an active participant in the Winter and Spring conferences of the Society until quite recently, and was always a trenchant and active commentator on the papers given. He took pleasure in travel, and enjoyed wine, even if that provided at some of the Society's conferences did not match his exacting standards. He was greatly pleased by the 'magnificent gift' of champagne given by the Society to celebrate his centenary. In remembering him, and in celebrating the life and achievement of the doyen of Britain's agricultural historians, the Society extends its sympathy to his widow and his daughter.

J A CHARTRES

Conference Report: Spring Conference 1990

By DAVID HEY

On arriving at Trinity and All Saints' College at Horsforth, Leeds, we were greeted with the news that the organizer had fled to Nepal. There, she was no doubt able to practise the orienteering skills necessary to find one's way around the College. Some distinguished geographers were prominent amongst those who frequently got lost. Once found, the facilities were first class and the conference began with a reception and an excellent dinner. Speaking from below the salt, the President reminded the Principal of the College of his lapsed membership of the Society and proposed a toast in memory of George Fussell, who had enlivened many a previous conference.

The intellectual feast began with Colum Giles (Royal Commission on Historical Monuments), who gave a carefully-researched and well-illustrated paper on 'Rural Housing and the Economy: Calderdale, 1500–1900', in anticipation of the field trip for the following day. Upper Calderdale has a remarkable collection of vernacular buildings which can be used alongside a range of documentary sources as historical evidence. Probate inventories, valuations and hearth tax, land tax and census returns were pressed into service to illustrate landholding customs, farm sizes, agricultural practices and dual occupations. We were left to ponder the wider questions of why the large parish of Halifax, rather than other parts of the West Riding, should have emerged in the sixteenth century as a wonder of the age and whether we should dismiss partible inheritance as the cause of small farming units and turn instead to the idea that wealth generated by textiles permitted the reorganization of holdings in this way. Colum Giles concluded that the growth of rural industry in Calderdale was not a response to a desperate situation.

The following morning, after the excitement of an election at the AGM, medieval history was presented to us in a lively form by Jules Pretty (International Institute for Environment and Development), who spoke on 'Sustainable Agriculture in the Middle Ages: The English Manor'. He approached his subject from the perspective of low-yielding agricultural regimes in developing countries. As his paper has now appeared in the *Review*, it is unnecessary to summarize it here. Members responded warmly to his emphasis on the varied opportunities for income generation and on the fine-tuned management of natural resources. A society that sustained itself but saw no growth reminded some of us of the BAHS.

In his paper on *Who profited from improving the Crown lands, 1603–40?* Dr Richard Hoyle (Magdalen College, Oxford) introduced us to the enormous amount of material in the Public Record Office on the sizeable but scattered estates of the biggest landowner in the country. Historians have long been interested in the sale and dispersal of Crown lands from the Dissolution onwards, but little research has been done on the management of these estates. He showed that commentators in government circles during the time of Salisbury knew a great deal about the circumstances of disafforestation. Norden, Manwood, Church and an anonymous author argued for the benefits that would accrue to commoners as well as to the Crown. Various disafforestation and drainage schemes were implemented over the next three decades, but the original ideals were cynically debased as priority was given to sales. The commoners were the greatest losers, the Crown benefited to a limited extent, many of the purchasers accepted allotments in lieu of existing debts, the lawyers reaped short-term rewards, but large profits were not available until the second generation made large-scale agricultural improvements. Dr Hoyle was thanked for opening up a subject which was clearly worthy of a sustained programme of research.

Appropriately clad for an afternoon on the Pennines, we drove to Norland township, where Colum Giles introduced us to a variety of farms and vernacular buildings. We began at Lower Old Hall, a hall-and-cross-wing house built in 1634 by a dyer, George Taylor. The lower wing was interpreted convincingly as the shop end. Internally, we were greeted by an astonishing display of decorative plasterwork. Just up the road at Fallingworth Hall, we saw a similar, though smaller, house of 1642, with later farm buildings now used for sheltering cattle. Our next stop was Bents Farm, a laithe-house of *c.*1800, a common building type on land newly-colonized upon parliamentary enclosure. Here a young farmer was

now faced with the problem of milk quotas. We then refreshed ourselves more than adequately at the Hobbit Inn before a brisk walk to the hamlet of Sowerby Croft. Dramatically sited above the Calder valley, the hamlet consists of fifteen cottages clustered around an early eighteenth-century house, laithe and gazebo that were built by a cloth dresser with a twenty-three acre holding. Towards the end of the eighteenth century eleven cottages were built next to the house; four more were added later. The 1841 census shows that they were occupied by woollen weavers, cotton weavers, bobbin winders and a dyer. We left as the snow began to swirl around us and as we gazed on the spectacular Pennine landscape, like Defoe before us, at last we began to perceive the reason for it all. Our thanks are due to Messrs Brooks, Halliday, White, Hill and Bilbo Baggins for allowing us to inspect their properties.

After a late dinner, the evening session was devoted to a discussion of the way forward for research into English farming during the period 1750–1850, now that volume VI of *The Agrarian History of England and Wales* had appeared. Discussion centred on the striking differences of treatment between volume VI and the two previous volumes, notably the lack of chapters on regional farming systems and on buildings, also the concentration on printed rather than manuscript sources. This was largely a matter of editorial judgement, constrained by the availability and interests of contributors at the planning stage. *The Agrarian History* had been launched in 1958 and volumes had been planned before anyone knew what was going to be discovered. The General Editor, Dr Joan Thirsk, commented on the growth of interest in the social structure of regions and expressed the hope that some day a third part to volume V might treat such matters at length. Detailed local and regional studies were needed for the 1750–1850 period. Other speakers expressed disappointment that volume VI had not discussed the concept of an Agricultural Revolution, nor the relationship between agricultural and industrial growth. These were vital matters that should be addressed. Nevertheless, a volume that was 1215 pages long certainly covered a wide range of topics and provided a huge amount of useful information. Some of us thought that it was a healthy sign that we were still not satisfied and wished to build further on the achievements of the series as a whole.

The final morning began with a paper by Dr Michael Toch (The Hebrew University of Jerusalem and Clare Hall, Cambridge) on 'Ethics, norms and law in rural society: fifteenth-century Bavaria'. Using the internal minutes of the manor court of a Bavarian monastery, from 1479 to 1493, he described the ways in which conflicts between lords and tenants were defused by face-saving devices and mediation. In carefully-defined times of need, the lord – 'out of mercy and without legal claim' – did not insist on the payment of arrears of rent. His reputation was based on honour as well as wealth; giving was also a way of possessing. Late fifteenth-century Bavaria was no longer feudal; the peasants did not need to take part in the 1525 insurrection because they had already made inroads into lordly power. Dr Toch's reconstruction of the *mentalité* of this local society portrayed a real world where emotions and conciliatory feelings were more important determinants of social behaviour than was the insistence on rights and dues. One conflict ended with the pronouncement: 'We have seen his simplicity and therefore out of mercy forgive him'.

In the second session Professor George Grantham (McGill University, Montreal) gave a technical paper on 'Some Implications of the Level of Agricultural Labour Productivity in Eighteenth and Early Nineteenth Century France'. Taking into account grain yields, days worked, the numbers involved in non-grain growing farming occupations, and the range of crops grown, he suggested that the proportion of the population required to feed the whole was less than had been assumed. He also addressed the question of how wide a space was required to provision a town, especially Paris. In the ensuing discussion many members felt that the paper was too theoretical and did not give enough consideration to factors such as wastage and the extent to which grain was actually consumed. We adjourned to increase our own consumption of agricultural products.

In the final session Dr Joanna Bourke (Emmanuel College, Cambridge) considered 'The Household Economy and Female Labour: Rural Ireland, 1890–1914'. She argued that the heightening of the sexual division of labour in this period was beneficial to women as a means of avoiding poverty. Paid female employment declined dramatically partly because women made a deliberate choice to do more household work. A radical improvement in housing standards and in diet required increased skills and more time in the home. The assumption of a welfare role within the household was a sensible strategy, except in the very poorest families, as agricultural productivity increased. It was a fine paper on which to finish the conference. We drank to absent friends and vowed to meet again next spring.

Book Reviews

NILS HYBEL, *Crisis or Change. The Concept of Crisis in the Light of Agrarian Structural Reorganization in Late Medieval England,* trans. James Manley, Aarhus UP, 1989, xxiv + 333pp. 220 DKK.

It is always more interesting to write about the eventful than the uneventful. 'Crises' and 'revolutions' have thus become the stock-in-trade of historians, especially of those endeavouring to animate accounts of socio-economic trends during the pre-industrial centuries, with their pronounced continuities and generally slow tempi of change. Few 'revolutions' have been claimed of the period from the thirteenth to the fifteenth centuries, at least as far as the agrarian relations of production are concerned, but the 'crisis' literature is substantial and growing. It is with the latter that *Crisis or change* is concerned. No new research findings are presented; instead this is an exercise in historiography.

The medieval crisis debate began in the 1860s with an exchange between Frederic Seebohm and Thorold Rogers as to the demographic impact and social and economic consequences of the Black Death (on and off, these have remained central concerns ever since). Hybel rehearses their arguments and then traces the issue as it was taken up and developed by subsequent scholars, demonstrating the emergence of different concepts of crisis. Five main definitions/theories of crisis are identified, each stressing contrasting elements within the mix of endogenous and exogenous factors, whose conjunction lends this period its enduring intellectual fascination. Hence, we see a 'neo-classical' theory of crisis, stressing monetary factors and the crisis of income experienced by landlords during the late middle ages; a 'political and constitutional' theory of crisis, with its emphasis on the role of government, war, and taxation; an 'epidemiological' theory of crisis, attributing central importance to a mortality-induced demographic collapse with plague as its main agent; a neo-Marxist 'crisis of feudalism' and the socio-property relations embodied by lordship and serfdom; and a 'neo-Malthusian' crisis, which interprets the demographic, economic, and ecological problems of the fourteenth century as the price paid for over-expansion during the previous two centuries.

These theories are discussed within a chronological framework – 1865–66, 1888–90, 1884–1915, 1900–30, 1930–50, 1950–60, and post-1960 – determined by the stages by which historical debate and enquiry progressed. Unfortunately, while this may elucidate the history of the debate it makes for a very disjointed exposition of the issues being debated. Nor is the discussion up to date, since it stops short of the crucial Brenner debate of the late 1970s and the major restatement of a variety of viewpoints to which this gave rise. These are serious defects. Nevertheless, those who teach and research the period will be grateful for Hybel's extensive survey of a partially forgotten literature and for the many unresolved issues which this exposes. The book is handsomely produced, although indifferently translated, and its final plea for more systematic research into the crucial half-century before the Black Death is timely.

BRUCE M S CAMPBELL

R A LOMAS and A J PIPER, eds, *Durham Cathedral Priory Rentals, volume 1, Bursar's Rentals,* Surtees Society, CXCVIII, Durham, 1989, 286 pp. 1 map. £14 (incl p & p).

The latest volume of Surtees Society publications of texts from Durham Cathedral is an edition of five fiscal documents compiled between the thirteenth and fifteenth centuries: valuation (*c* 1230); rent-roll (1270); bursar's rental (1340–1); bursar's rental (1396–7); and bursar's rent book (1495–6). The volume includes a gazetteer, an extensive index, and a small map.

The editing is of very high quality. The text is expanded and doubtful expansions of the vernacular indicated. Erasures, deletions and subsequent interpolations are clearly marked. Each document has a detailed introduction on location, format, hand, and dating where appropriate. The quality of editing and the variety of documents makes it especially useful to students wishing to get the 'feel' of a medieval account before proceeding to tackle the real thing.

The somewhat unusual selection principle appears to be that these documents are the earliest instances of their type in the Priory records. Nevertheless it has the considerable advantage of collecting in one volume an overview of estate administration over a much broader period than is usual. This presents great opportunities to the editors, but for these to be exploited to the full, with maximum benefit to the reader, the quality of the historical introduction to the documents has to match the quality of their textual presentation.

Regrettably, historical comments on the texts are disappointingly brief, especially with respect to the first and last. The 1230 valuation is connected with papal taxation, which is mentioned, but since its nature is not explained the reader's comprehension of both the document itself and its difference from later estate records is unnecessarily restricted. The late fifteenth-century bursar's rent book is fascinating, showing rents being paid piecemeal in both cash and kind. A longer commentary on this would have been most welcome, particularly if the editors had been able to explain why this developed and whether it was a purely local phenomenon.

The book will doubtless be of great interest to local historians, including non-specialists. Bearing the latter in mind it is excellent that the text is expanded, making the work much more accessible, but a pity that explanations of customary terms (like *wodeladpennies*) is confusingly found partially in the index and mainly in the middle of the gazetteer. A note to this effect at the front would have been useful to this far from negligible category of readers.

MARIE STINSON

PETER EDWARDS, *The Horse Trade of Tudor and Stuart England*. CUP, 1988. xii + 205 pp. £22.50.

Under Mary and Elizabeth I increasing concern with horse stealing led to legislation which decreed that all transactions involving horses should be recorded: the resultant toll books reveal the buyers and sellers, the types of horses sold, their prices and characteristics such as their sex, colour, age and size, thus providing 'a range of information unrivalled among sources for inland trade'. Unfortunately, the survival of the toll books is patchy – both geographically and chronologically – but, by using them and other sources, Peter Edwards has been able to present a fascinating picture of the equine world of Tudor and Stuart England. As in other branches of agriculture there was substantial regional specialization: breeding was more concentrated in the north and west, and also in pasture regions of lowland England such as the Fens, and rearing was more prevalent in the East Midlands and southern counties, although it is difficult to generalize since both activities were practised in all districts on a small scale and there was a bewilderingly complex movement of horses and their offspring about the country. Under the triple stimulus of rising population, growing commerce and the increasing switch from oxen to horses within agriculture, both the quality and quantity of output improved substantially. With this excellent study of the horse trade Peter Edwards has opened up a little-frequented section of early modern English agriculture.

Perhaps the chief delight for the reader of this book is to discover the similarity between the early horse trade and the trade in second-hand motor cars. Peter Edwards does something to rescue the low opinion in which contemporaries held horse dealers but he admits that they drove a hard bargain, and just as many today 'can be taken in by the outward appearance of a second-hand car', so were gullible customers for horses frequently duped. Stolen horses could have their colour and markings changed – in the manner of a modern respray – and fraud ranged from the casual opportunity open to the dodgy salesman or youthful joy-rider to the organized crime practised by groups such as the Harrison gang, which operated in Lancashire and along the Welsh border during the 1670s. Horses, like cars, were status symbols which depreciated quickly. Once past work the horse was worth no more than the knacker would offer, since the English had no stomach for horse-meat. Why this should have been the case – especially when their continental cousins regularly feasted on the product – is not clear.

DONALD WOODWARD

G C BAUGH, ed, *The Victoria History of the Counties of England: a History of Shropshire*, IV, OUP for the Institute of Historical Research, 1990. xix + 293 pp. Maps; illus. £60.

PAUL STAMPER, *'The Farmer Feeds us All': a Short History of Shropshire Agriculture*, Shropshire Books, Shrewsbury, 1989, vii + 78 pp. Illus. £4.75.

The early volumes of the *VCH*, published in the first two decades of this century, commonly included an overview of agriculture. These are now so out of date – some were even written before Lord Ernle's book appeared – as to be almost useless. Happily, the projected Shropshire histories failed to materialize until the modern revival of the scheme, so that, uniquely, we have a volume which is entirely devoted to agriculture and which is as authoritative as we could wish. The seven contributors – including the present Secretary of the *BAHS* – have done an enormous amount of new research and have presented it within a framework of ideas that will be immediately recognizable to readers of this *Review*. They succeed admirably in providing both an overview of this rather remote part of England and a quarry of rich pickings for those in search of comparative details.

But that is not all there is to applaud. Paul Stamper, the assistant editor responsible for the early chapters, has also written a short, well-illustrated, popular account of the county's agriculture, the third in a series of *VCH* booklets that present the latest research to a wider audience. The committee of the *BAHS* has long been concerned by the general ignorance, even in schools, of the work that during the last four decades has transformed our understanding of agricultural history. In Shropshire, at least, the laymen can now obtain readable, concise information, attractively packaged at a modest price.

Shropshire is still one of England's least-populated, most obviously agricultural counties. It is probably fair to say that its history is not of major interest to the outsider until the early-modern period. It was then that a series of connected changes shifted the emphasis from sheep to cattle. Shropshire had always been a pastoral county, now it became overwhelmingly so. The relatively small acreages

devoted to open-field husbandry were already being reduced by enclosure during the late middle ages; few systems remained intact as late as the era of parliamentary enclosure. During the sixteenth and seventeenth centuries thousands of acres of commons and wastes were enclosed, woods were converted into pastures and marshes and meres were drained. At the same time, copyhold tenures were commonly converted to leaseholds for three lives. The small farmer continued to keep sheep and pigs, but he put most of his resources into cattle. In many parts of the county the raising of stores was the main activity, but in the north the emphasis was on dairying and particularly on the rapidly-developing Cheshire cheese trade. Dr Peter Edwards's chapter on this formative period is central to the whole volume. It was during the early-modern period that Shropshire's agriculture acquired a distinctive character and became integrated into the national economy.

The subsequent history of the county's agriculture is broadly that of the country at large. Shropshire farmers, whether freeholders or tenants, profited from the general agricultural prosperity of the Georgian period and the era of Victorian High Farming. Although leases were almost universally replaced by rack rents, on many large estates farms continued to be held by one family for generations. The labourers fared far less well; wages were low and housing often bad. In the poorest areas, eg. Clun, the poor left the countryside in droves. Between 1870 and 1914 the county's agricultural workforce fell by 36 per cent. The twentieth century has seen inter-war slump, post-war recovery and revolutionary change. The new economic realities of the 1980s have led to projects that the most fertile minds of the sixteenth and seventeenth centuries never dreamt of: places to see butterflies or old livestock and poultry breeds and even a snail farm. The future promises more diversity and ingenious enterprises, including a conscious rejection of some of the less savoury aspects of the agro-chemical industry of recent years.

DAVID HEY

A BAGOT and J MUNBY, eds, *'All Things is Well Here', Letters from Hugh James of Levens to James Grahme 1692–5*, Cumberland and Westmorland Antiquarian and Archaeological Society, Record Series, X, Carlisle 1988. xvii + 205 pp. No price given.

Annette Bagot and Julian Munby, who have cared for the archives at Levens Hall for more than forty years, have in this volume edited the 117 letters which Hugh James, the Levens steward, wrote almost weekly to his master, Colonel James Grahme, in London between 1692 and 1695. They provide an agreeable, unexceptional account from a loyal servant to a remote and demanding squire of impeccable Jacobite connections. Their chief interest is that they record the building of the South Wing at Levens and, in less detail, the commencement of William Beaumont's famous work on its gardens. James's account of the difficulties encountered in building even a modest extension – the wing principally built to provide additional service accommodation cost no more than £500 in all – is a revealing one. With no architect's overall supervision and with Grahme making only migratory summer visits, a great deal of the responsibility of seeing that the largely estate-produced supplies of stone, timber and lime matched the irregular appearances of masons, joiners, and painters alike, of accommodating Grahme's demands, of re-utilizing old materials fell upon the steward. Engaged similarly with Beaumont in the garden, perhaps not surprisingly he succumbed to a fatal pleurisy from supervising work in a chill Cumbrian spring.

Interspersed with these preoccupations are James's reports on the home farm (especially its draught animals) and the requests made by and the exactions wrung from the Grahme tenantry. But both these subjects are dealt with only partially, because James was not Colonel Grahme's sole informant of events at Levens. The letters of his agent, Tim Banks, also survive, and for a complete picture one needs both these and the letters written in reply, however vile the hand and erratic the spelling, of Grahme himself. But this volume provides an attractive edition about the work and position of a steward on a smallish estate of a largely absentee owner. It is well collated and in addition provides plans, photographs, and a glossary besides reproducing contracts, inventories, and some specimen accounts.

R G WILSON

D R HAINSWORTH and CHERRY WALKER, eds, *The Correspondence of Lord Fitzwilliam of Milton and Francis Guybon, his Steward 1697–1709*, Northamptonshire Record Society, Northampton, 1990. xxiii + 312 pp. £18.

Eighteenth-century agricultural experts were unanimous in asserting that efficient estate management required frequent appearances by the owner on his property. Leaving everything to the steward was commonly considered a recipe for disaster. Yet for the historian a corresponding absentee is nothing but good news since the surviving letters often provide a vast store of evidence about how an estate operated. William, third Baron, later first Earl Fitzwilliam of Milton House, near Peterborough, was deeply interested in his estate even though he never managed to visit it in the years covered by this correspondence, 1697–1709. Despite his oft-repeated claims to be 'coming down', and despite frequent requests to do

so from his steward, somehow London had attractions which always managed to outweigh any appeal the Soke of Peterborough might have offered. Even his son's funeral was supervised from London. Fitzwilliam at least kept in touch, and by publishing the letters Hainsworth and Cherry have provided a wealth of information about management and farming on this estate, and incidentally about Fitzwilliam's personal and political background.

The letters cover a range of subjects including the 1696 recoinage, the Land Tax, the problems of returning money to London, the game (and particularly supplies of venison to be sent to Fitzwilliam), the health of the tenants, his own illnesses, London life, and agricultural and rent policies to be followed on the estate. The most persistent topic, however, is money; letter after letter implores, cajoles, and generally demands, money. Contemporaries were well aware that, in the absence of the landlord, stewards found it hard to collect rents and taxes. As these letters illustrate with almost monotonous regularity, Francis Guybon was no exception; the letters are excellent material for the historian, but Guybon would doubtless have forsworn them all for an occasional visit from Fitzwilliam. Overall a worthy volume to set beside Hainsworth's earlier edition of Lowther correspondence, and to go towards his promised book on stewardship.

J V BECKETT

D HUW OWEN, ed, *Settlement and Society in Wales*, University of Wales Press, Cardiff, 1989, xx + 315 pp, 62 figures, 12 plates, £35.

This handsomely-produced volume fills an important gap in British agrarian and landscape history for hitherto no such comprehensive, multi-disciplined approach to the complex, difficult subject of the evolution of settlement and agricultural organization has been available for the distinctive region of Wales. The many knotty problems that beset this subject are tackled head-on by a well-chosen team of experts whose joint enterprise has yielded up the best overview we have of the making of the Welsh landscape.

After pertinent observations are made in both the editor's valuable introduction and in Glanmor Williams's essay on 'Local and National History in Wales' – which he himself has done so much to foster and shape – as to the crucial role of local studies in landscape history, there follows a number of scholarly essays on 'The Welsh Landform' (D Q Bowen), 'Vegetation' (William Linnard), 'The Landscape' (Frank Emery), 'Place-names' (Gwynedd Pierce), 'Houses and Building Styles' (Peter Smith), and 'Archaeology' (H N Savory). This reviewer found the essay by the much-lamented Frank Emery especially stimulating in its scope and authority. All these aforementioned chapters, drawing on a wide range of disciplines, provide a vital explanatory framework for the more conventionally 'historical' essays that follow, chapters which deal with 'The Dark Ages' (Glanville R J Jones), 'The Middle Ages' (D Huw Owen), 'The Emergence of the Modern Settlement Pattern 1450–1700' (Matthew Griffiths), 'Rural Settlements in the Modern Period' (Colin Thomas), and 'Urban and Industrial Settlement in the Modern Period, 1750–1914' (Harold Carter).

In these latter authoritative chapters, collectively containing much new research, we are, in particular, presented with a picture of the evolution of settlement in so far as upland Wales was concerned (comprising the area of *pura Wallia* to the north and west of the Anglicized, manorialized lowlands of the south and borders) from the old tribal order and its 'gwely' communal ownership pattern, which dominated before around 1350, into consolidated, scattered farms which emerged in the late Middle Ages and the century or so after 1500. The pressures forcing through this change both internal ones as escheat, and the operation of 'cyfran' or gavelkind and of the *prid* mortgage under Welsh land law, and external ones as population decline in the later Middle Ages and the damaging impact of Glyndwr's rebellion, are carefully assessed as, too, are the factors catalysing this changing pattern of settlement after 1500, notably population growth. The transformation of the landscape after 1700, too, was largely owing to population pressure and the part played by enclosure in remodelling the landscape after 1700 is underlined. While Colin Thomas's chapter on post-1700 rural settlements is valuable and demonstrates the marvellous contribution to agrarian history which can be made by historical geographers adept at measurement techniques, the discussion would have been even better had he pointed to the intermixture of property in the eighteenth century which rendered improvements impracticable, to the end of the 'great estates' from around 1900 and to the increasing tendency in the later nineteenth century for married farm labourers to live in villages. Appropriately, the final chapter considers the 'new' type of settlement of mining towns and villages and of coastal ports growing up with the industrial revolution from the late eighteenth century.

Students of agricultural and settlement history will benefit from reading this volume, not least from the discussion devoted to the value and application of different categories of source material. All the essays make a substantial contribution; those of Matthew Griffiths and D Huw Owen are outstanding.

D W HOWELL

DENNIS MILLS and CAROL PEARCE, *People and Places in the Victorian Census: a review and bibliography of publications based substantially on the manuscript Census Enumerators' Books, 1841–1911*, Historical Geography Research Group, Historical Geography Research series, 23, Cheltenham, 1989. ii + 144 pp. £3.50.

Since the 1960s, historians, geographers and a few sociologists and anthropologists have made considerable use of the census enumerators' books of the nineteenth century, to penetrate behind the aggregated tables which feature in the published census reports. In a brief introduction, Dennis Mills discusses some of the census-takers' foibles yet concludes, rightly, that the enumerators' books are 'a mine of largely reliable economic, demographic and social information' on the Victorian population. Approximately four hundred studies are listed including Ireland (42), Scotland (19) and Wales (43). The English studies are therefore much more numerous, but as Mills shows, far from evenly distributed. Lancashire and Yorkshire, together with Lincolnshire among the more rural counties have received most attention (61, 42 and 26 studies respectively). By contrast there are two each for Norfolk and Hertfordshire, one for Wiltshire, and apparently none which focus on communities in Cumberland, Huntingdonshire, or Gloucestershire. This shows that the source is far from having been mined to the point of exhaustion, especially when the ever-increasing scope for longitudinal studies is borne in mind, with the accession of successive data sets under the hundred-year rule.

The four hundred studies range from the highly professional works of scholars such as Anderson, Foster, Lawton, and Dennis through to loving compilations prepared by enthusiastic amateurs or WEA groups and published more obscurely. In each case, the content of the work and the use made of census data is sketched out, Many, of course, focus on towns or industrial communities, but some deal with issues of direct interest to readers of this journal, eg, farm labour in Warwickshire (R Peek); population and enclosure on Exmoor (R Scott); East Yorkshire's agricultural labour force (J Sheppard); tenancy turnover on the Ashburnham estate (B Short); Irish farming families before the First World War (D Fitzpatrick); the social position of commoners in Herefordshire (G Charnock); landownership in Leicestershire (J Allsopp); family farming in Hartland, Devon (M Bouquet); the structure of farming in Rutland (A Chinnerey) etc. Many more offer snapshots and sometimes moving pictures of individual villages, among them Cardington, Laxton, and North and South Rauceby; or of small market towns such as Ashbourne, Lewes and Thirsk. The entries are listed in alphabetical order (by author) but they are also arranged by county and by subject in a useful matrix. From this one can see at a glance, say, that there are eleven studies of Kent, for example, and which places and topics they examine.

This publication yields a rich harvest of useful references for general research and teaching purposes, and will be indispensable to anyone contemplating a similar study. It is excellent value for money.

W A ARMSTRONG

A D M PHILLIPS, *The Underdrainage of Farmland in England during the Nineteenth Century*, CUP, 1989. xv + 315 pp. 52 maps and diagrams. £32.50.

It was estimated in the mid-nineteenth century that about half the farmland of England suffered from the deleterious effects of excess surface water. Historians have since contested this figure but it goes a long way to explain the importance of this subject in contemporary thinking. This major aspect of Victorian agricultural improvement has long awaited its historian.

In this monograph Tony Phillips has produced an impressively authoritative summary of the many debates in this area of research, to which he has himself already contributed significantly, and has incorporated new research and brought the whole together in ways that will quickly make this the standard work. Focusing on historical controversies that emerged most noticeably in the 1960s, he has combed through myriad archival evidence to create a picture of contemporary views of the need for underdraining, of the spatial location and temporal patterns of post-1845 draining schemes and of the sources, scale and management of financial resources.

His chief finding is that underdraining was a major component in the rise of agricultural productivity, outside the South and the East, in the three decades after 1845 (the Golden Age of underdraining) and that its recuperative effect on the arable was so great that many farmers were persuaded to stay in corn even though relative price movements suggest that their best interests would have been served by switching to grass and stock. Nonetheless, by returning good heart to many of the nation's arable fields, this improvement prepared soils well for conversion to grass when corn prices fell from the mid-1870s. A question mark is raised over the association, often found in historical literature, between clay soils and underdraining, by pointing out that drainage was introduced on other soils than clays and that in any case not all claylands were drained.

Analysis of the loans administered under the Public Money Drainage Acts (clearly a gold-mine of information) corroborates the conclusions derived from study of a sample of estates in Devon, Northampton and Northumberland and the outcome

is used to cast light on old controversies. A salutary reminder is given of the extent to which regional and local variations serve to qualify generalizations about national developments. As compensation for the frustrating scarcity of evidence of investment by tenants and owners of small estates we are offered a magisterial appraisal of other available evidence. Even though a quibble, it should however be said that readers (like this reviewer) might find the frequency with which data is presented in map and diagrammatic form to be an excess of riches. And the use of gross rather than received rents in chapter four can convey a misleading impression of the burdens of drainage outlay on true estate income. But these are minor points.

Perhaps at some later date Dr Phillips will set underdraining into the broad context of general farming improvements. Here, whilst acknowledging the inter-related nature of farming progress – draining of wet soils and the replacement of obsolete farm buildings were often undertaken as part of an integrated plan – he forbears to take up these more speculative issues. This is a pity, for his comments would have been extremely valuable. But, in any case, agricultural historians are already heavily in Dr Phillips's debt for this major contribution to knowledge of progress in Victorian farming.

ROY STURGESS

PETER BENES, ed, *The Farm*, Boston University, Mass, 1988. 192 pp; 4 maps; 11 figs; 34 plates. $9.00.

The Farm is a collection of nine articles selected from the papers given at the 1986 Dublin (New Hampshire) Seminar for New England Folklife. Three of the articles, based on journals kept by farmers in the nineteenth century (from Nova Scotia, Massachusetts, and Maine), form the first section of the book, and are preceded by a discussion of cooperation between farmers in Maine, for the purpose of assisting one another in farm operations, road maintenance, building work, and care of the sick and needy. Taken together, the four articles throw much light on the day-to-day working of the farms and its highly seasonal nature. Also revealing are the extent to which goods and services were paid for in kind rather than cash, the use made of borrowing and credit, the families' political and religious views, and their use of leisure.

A second group of three papers deals with farm improvement, beginning with an account of a family of gentleman farmers, whose members included a doctor and a storekeeper and tavern keeper. A further discussion considers the role of the New England agricultural press in fostering technical advances in the first half of the nineteenth century. The journals provided a forum for the exchange of readers' advice and information, and even attempted to promote good taste in the architecture of farm buildings and ornamentation of grounds. The third paper is concerned with the various ways in which Massachusetts farmers adapted to changing market trends in the early nineteenth century, notably in meeting the demand from the expanding non-farm population, in satisfying the rising industrial market for raw materials such as wool, hides, and timber, and in reducing wheat production in response to increased western competition.

The paper which is perhaps of greatest direct interest to British readers, however, concerns the introduction from Europe, especially England, of cattle, sheep, and swine into coastal New England in the first century of settlement beginning in 1620. Devon cattle, for example, were popular among the settlers, while the original sheep brought to eastern Massachusetts were Wiltshire Horns, though there were also Old Leicesters and Romney Marsh sheep, the last especially well suited for survival in harsh New England winters.

Lastly, a commentary on seventeen most interesting contemporary illustrations of farmhouses and farming scenes of the period 1790–1865 provides an attractive conclusion. The volume is rounded off both by an informative editor's introduction, and by valuable bibliographies of primary and printed sources relating to the American north-east.

With its numerous illustrations, which help greatly to bring the text to life, the volume provides the kind of detailed local history which is the essential underpinning of regional studies, and succeeds admirably in putting flesh on the bare bones of textbook generalizations. It should be read by all English scholars who want to gain a deeper understanding of American rural history, and the book makes a worthy addition to the publications of the Dublin Seminar. And, at nine dollars, it is extraordinarily good value for money.

G E MINGAY

Z A MEDVEDEV, *Soviet Agriculture*, Norton, 1987. xiv + 464 pp; 3 maps. £17.95.

Agriculture has been the Achilles' heel of the Soviet economy since the revolution in 1917. At that time, the vast majority of people in Russia were peasants, engaged in traditional forms of farming. Although Imperial Russia was a major grain exporter and some improvements had been introduced onto a minority of farms by the turn of the century, average yields were low and rural poverty remained a problem. The period since the Revolution has seen an expansion of agricultural output (today the Soviet Union is included among the world's leading producers of cereals, some livestock products, and technical crops), but this

achievement has to be seen against a background of the growth of the nation's population, three major famines, increasing inefficiency, and, at times, grave human suffering. Today, many foodstuffs are rationed in Soviet cities and the prospects for an immediate improvement are slight. *Soviet Agriculture* is an analysis of why the world's first experiment in socialist farming has had such a chequered history. Its author, Zhores Medvedev, is well qualified to have undertaken the analysis; born just before the collectivization drive swept peasant farms from rural Russia, he trained as a biologist and geneticist. He witnessed, and later took part in, the post-war debates about how to reverse the cumulative affects on agriculture of Stalin's neglect, World War II's destruction, and Lysenko's domination of agro-biology. After a spell in a Soviet mental hospital for his dissident activities, Medvedev was exiled from the Soviet Union in 1973 just at the time when the signs of a terminal stagnation in agriculture were becoming apparent. Medvedev has had to observe the latest chapter in Soviet agriculture's fortunes from afar but his observations have remained percipient.

One advantage that Medvedev has over political economists writing on Soviet agriculture is that his scientific background means that he understands the biology of agricultural systems. In the text he makes good use of this knowledge to explain why decisions on farm practice taken by the political leadership have had variable success. As a result he is able to go much further than others in untangling the influence of organization, politics and agronomy on Soviet agriculture's failures. For example, he is the first author I have read who satisfactorily explains why the much expanded use of mineral fertilizers since the 1960s has made no appreciable difference to yields; the answer lies in the chemical composition of the fertilizers manufactured in the Soviet Union which are not suited to many of its soils. Medvedev's scientific knowledge is combined with an understanding of the workings of the Soviet bureaucracy that only someone who has lived most of his life in the country can possess. Medvedev understands how the agro-industrial complex's various parts fit together, and how they articulate with the rest of the Soviet economic and political system. Fortunately for non-specialist readers, he does not assume too much prior knowledge so it is easy to follow his account of the organizational changes that have taken place since collectivization. The text is also enriched by personal reminiscences about people he met when working in biology and references to his own research interests.

The book falls into two main parts; the first is an historical account of agricultural policy from the Revolution to Khrushchev's fall in 1964 and the second is a systematic discussion of the sources of weakness in post-war agriculture. The account of the collectivization drive provides a useful reminder of the lasting effects that upheaval had on rural society and farm production. The loss of five million households in the 1930s as a result of deportation, famine, and flight undermined the rural labour force and peasant morale. This, plus the slaughter of livestock in protest against collectivization, the constant interference by Party members in intermediate production decisions, and the economic discrimination practised against the collective farms and their members, ensured that Stalin bequeathed to his successors an economic, social, and ecological disaster of mammoth proportions. Medvedev explains the subsequent failure to overcome this bequest by the reluctance of any of the post-Stalin leaders to question the legitimacy of collectivization and of the social ownership of agricultural resources; attempts to increase productivity through 'chemicalization', mechanization, and administrative changes were ultimately limited by a continuing faith in the collective and state farm system. Medvedev argues that the solution to Soviet agriculture's problem lies in a more flexible approach to farm organization (including the legalization of private farm ownership) a precondition for which is a critical reappraisal of the decision to collectivize in the 1930s. Some of Medvedev's recommendations have been voiced by other specialists in the Soviet Union in recent years and Gorbachev himself has expressed sympathy for the idea of greater organizational flexibility. However, there also are powerful oppositional forces to any de-collectivization. In the preface to his book Medvedev writes: 'I wanted to present it (Soviet agriculture) as a political, economic, social, or scientific experiment in which the final results differed from those originally expected.' He has succeeded in doing this, but he has also shown that the experiment continues, the outcome remaining just as unpredictable as in the past.

JUDITH PALLOT

ELINOR M C ROPER, *Seedtime: the History of Essex Seeds*, Phillimore, Chichester, 1989. xvi + 294 pp. Illus. £14.95.

Seed growing in Essex has a history stretching from at least the seventeenth century to the present. Its longevity demonstrates the tenacity of an agricultural innovation where favourable climate, soil, and social conditions are augmented by longstanding local expertise. Unfortunately, this book does not do justice to an important subject, a disappointment given the wealth of material the author has collected.

Two introductory chapters trace English seed growing from 'the pre-glacial era' to 1750. In the first chapter supposition usually replaces historical evidence: we are told that Roman London *must* have

had a seed trade, although the author has found 'no mention of any such trade until centuries later'. The rest of the book describes the Essex seed industry in the eighteenth to twentieth centuries, with most space devoted to the last hundred years. Much information has been amassed on local growers, merchants, and labourers. The reminiscences of those involved with seeds are interesting; these passages demonstrate the considerable knowledge held by Essex seed farmers of growing, breeding, harvesting, and storing seeds, and the formidable hazards faced by them from pests, disease, cross-pollination, and weather. One reads of the complexity of relationships between seed merchants and large- and small-scale producers, and the ease with which smallholders could begin seed growing. Also covered are the major seed merchants and local industries which served growers and merchants such as agricultural engineering and sieve making.

This book is not well organized. Material is arranged in sections of varying quality, loosely held together in chapters. Some of the eleven appendices are useful, most are superfluous. The author seems loath to discard any information collected and, as a result, the text has a 'curate's egg' quality. No knowledge of modern agricultural historiography is displayed; Townshend and Tull are given prominence in a discussion of turnips and a recommendation of turnips as cattle fodder in 1723 is described as 'early' (cf Blithe, 1653; Speed, 1659). Some factual errors mar the text: Sir Richard Weston is renamed 'Hugh' and Sir Hugh Plat is said to have been writing in the 1640s – he died in 1608. Many of the illustrations are line drawings which do little but fill space although photographs of work in progress on seed farms do complement the text. The book, despite the imperfections, is useful as a source of information on the most important seed-growing area of England.

MALCOLM THICK

NAGATSUKA TAKASHI, translated with an introduction by ANN WASWO, *The Soil: a Portrait of Rural Life in Meiji Japan*, Routledge, 1989. xviii + 204 pp. £25.

The Soil is a novel written in 1910 by the literarily-inclined son of a landowning family living in a village to the north-west of Tokyo. It was published in serial form in a Tokyo newspaper the same year and has continued to arouse both controversy and admiration as an example of naturalistic writing, finally achieving, in recent years, the respectability of a set text in university entrance exams. Nagatsuka based the novel on his own village and many of his characters on its real inhabitants, so that, for the agricultural historian, its chief interest lies in its detailed and faithful depiction of life and work in a rural community in turn-of-the-century Japan.

Through the lives of the characters over a number of years, readers can follow the agricultural cycle, observe the festivals and ceremonies which mark the passage of time, and trace the social relations within and between households, all against the background of the sometimes devastating forces of nature. What emerges is not altogether a pretty picture: Nagatsuka gives an unsentimental account of the village as a world of gossip, petty meannesses, and few uplifting virtues. The main character, a tenant farmer struggling to survive on the fringes of village society, is dishonest, morose, and at times cruel, although he battles through to better times by means of grim hard work, on the part of himself and his relentlessly oppressed daughter, and some protection from his patron/landlord. Conditions within the village reflect the improving standards of life in Japanese rural areas at the time and the strife we observe is not born so much of economic and class inequalities as of the niggling quarrels and resentments of inter-connected households, smoothed over by social pressures to preserve harmony.

Ann Waswo provides an excellent introduction to the ethnographic background of the novel and to interpretations of it, and her translation reads smoothly, although difficulties in conveying the local dialect which Nagatsuka used leave the dialogue sounding more formal and stilted than perhaps seems appropriate. Waswo notes that the real-life model for the novel's chief female character lived until 1978 and for those seeking to appreciate the real dimensions of the economic transformation which has taken place in Japan over one life-time, as well as those interested in a wealth of unromanticized detail and insight into Japanese rural life, *The Soil* can be thoroughly recommended.

PENELOPE FRANCKS

Shorter Notices

GAVIN KITCHING, *Development and Underdevelopment in Historical Perspective*, 2nd, revised edition, Routledge, 1989. xii + 209 pp. £30 (hbk); £6.95 (pbk).

This is a re-issue of Gavin Kitching's 1982 text tracing the line of 'populist' and nationalist reactions to the social and economic costs of industrialization, from nineteenth-century agrarian socialist thinkers through to the various influential contemporary writers whose thoughts went to constitute the anti-industrial 'radical orthodoxy' of development studies in the 1970s. This edition includes a new postscript which discusses the issues raised in the original in the light of the shift, during the 1980s, to a more free-market approach to industrialization strategy within major development agencies, and, very briefly, brings the case-studies of Tanzania and China up to date. It also attempts to answer, or at least justify the author against, the criticism that the original hovered uncertainly between the history of ideas and the sociology of knowledge. The text remains a stimulating and clear critique of ideas still widely current and should continue to provide undergraduates in development fields, or history students interested in the recurrence of agrarianist responses to industrialization, with a challenging introduction, though those with access to the original edition need not, I think, rush out to buy this one.

PENELOPE FRANCKS

HAROLD B CLINGERMAN, *Field Man. The Chronicle of a Bank Farm Manager in the 1940s*, Iowa State University Press, Ames, Iowa, 1989. xii + 183pp, $19.95.

During the Great Depression the United States National Bank in Omaha acquired some 400 farms through foreclosure. To manage and eventually sell these farms when they could realize the full value of their listed price the bank hired 'Field Men' or supervisors. Harold Clingerman was such a Field Man between 1941 and 1948 and his autobiographical account describes the 'nitty-gritty' of small-scale farming in Nebraska in those years. For readers interested in agricultural, rural, social and economic history this memoir is useful in showing how leasing arrangements worked, which crops were grown and why, what happened to tenants when farms were sold, how and when repairs were made, how government agencies operated and what war-time shortages meant. Clingerman, a 'local boy' with wide knowledge of farming and some experience in real-estate, conveys the positive role in which his Omaha bank sought to help rebuild a shattered agricultural economy. His story is interesting and is clearly written and though limited in its implications, gives a contrasting and refreshing picture to the macro-analysis found in a standard chapter of a United States Economic History textbook.

MARGARET WALSH

STEPHEN DUCK, *The Thresher's Labour*; MARY COLLIER, *The Woman's Labour; Two Eighteenth Century Poems*, with an introduction by E P Thompson, The Merlin Press, 1989. xvi + 30 pp. Illus. £4.95.

Duck's poem is a graphic illustration of the hard physical lot of the agricultural labourer in the eighteenth century. His description of the monotony, sheer hard physical work and long hours will surprise no agricultural historian. As Thompson points out, Duck's analysis of threshing belies any notion that mechanical and repetitive labour was the product of industrialization and the production line. The arduous male working day is underlined by Duck's dismissal of female workers as marginal contributors to agricultural labour, who gossip, waste time, and perform only light work. In Duck's opinion, it is a pity women's hands are not as active as their tongues.

His onslaught was challenged by Mary Collier who had worked as a washerwoman, household brewer, and housekeeper. Her response is a highly informative catalogue of the hard physical work performed by women in agriculture, domestic industry, and household production. Her poem is an evocative portrayal of both the gender and class oppression of women in the eighteenth century.

The two poems, together with Thompson's informative short bibliographical introduction, are not only entertaining but also highly informative on a whole range of subjects of interest to economic and social historians. In twenty-six pages there is evidence of the nature of agricultural labour, social class

relations between farmer and labourer, male attitudes to women as wives and workers, the contribution women made to agriculture, and household production and the gender class system in the eighteenth century. Both poems are witty, spirited and well worth reading.

SUE BOWDEN

E J T COLLINS, A K GILES AND J G K MALLESON, (eds), *Innovation and Conservation: Ernest Edward Cook and his country estates*, Reading; Department of Agricultural Economics/Institute of Agricultural History, Reading University, 1989. 155 pp. + statistical appendix. 1 map; 21 plates. £7.50 (incl p&p)

The story told in this book is a little-known and fascinating one. Ernest Edward Cook sold his interest in the family travel firm in 1928. A rich bachelor, his interest turned to purchasing country estates, with a view to preserving the endangered landlord/tenant system, which he valued for its economic and social effects. By the time of his death in 1955, he had purchased seventeen estates, covering 37,000 acres. Some of these were sold or went to the National Trust; six (14,000 acres) were retained in the Ernest Cook Trust, whose story is told here. Essentially, it may be said that the ECT has achieved its primary aim of preventing sale and fragmentation of these estates, but this volume also shows how the Trust has reacted (up to 1985) to the pressures on large estates. The greatest challenge has been to find the capital to invest in farms which were already by the 1930s severely run-down. This task has been exacerbated by the post-Second World War shift from grass to arable in lowland England (where the estates were all situated) which required even more capital. But the challenge was met, and a heavy investment programme brought its rewards, in the form of higher rental income, thus permitting the ECT to continue its investment programme (including building estate houses), and to engage in the educational work which was also part of its aims.

The editors and authors have written a very useful volume, which gives a clear idea of the forces recently affecting large estates, and devotes some space, and some good photographs, to the present condition of the estates and their buildings. Altogether a useful contribution to agricultural and environmental history.

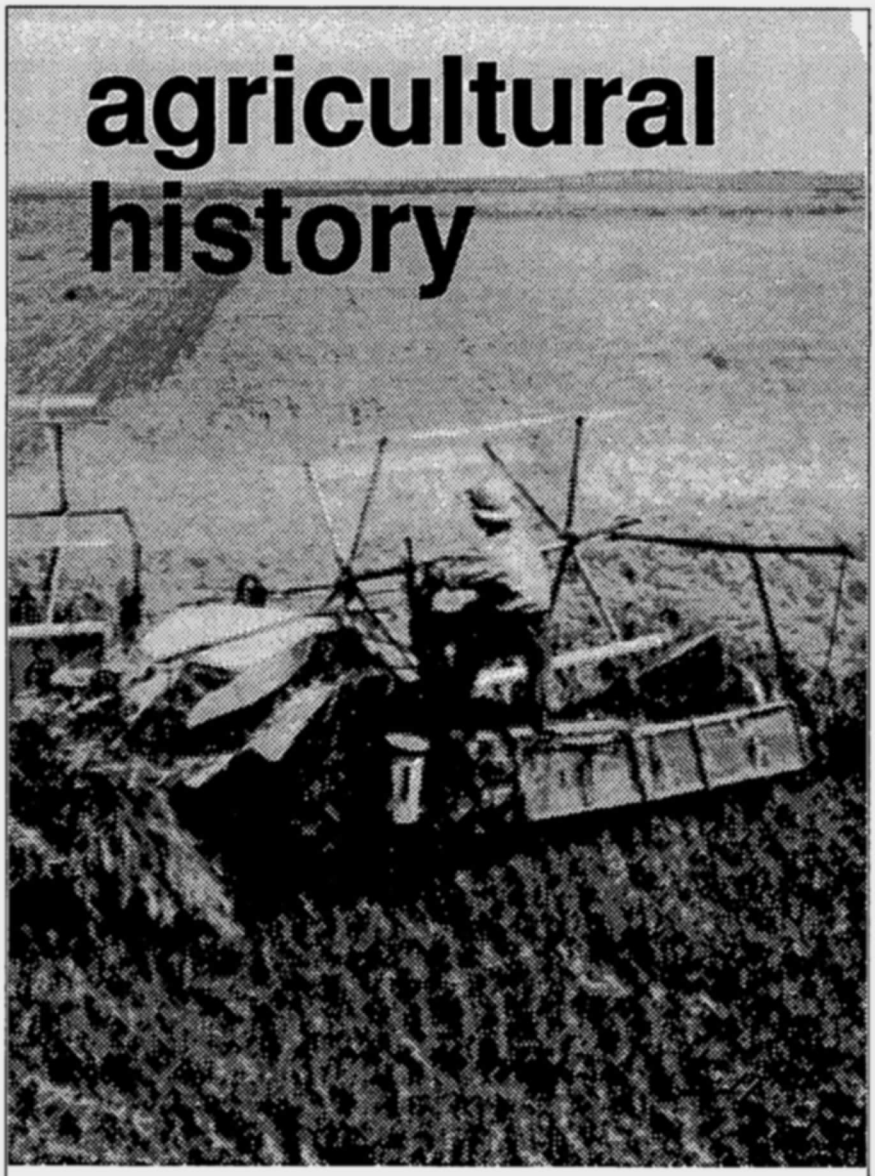
P E DEWEY

Agricultura y Sociedad, 53, October – December 1989, Ministerio de Agricultura, Pesca y Alimentación, Madrid, 1200 ptas; *Revista de Estudios Agro-Sociales*, 149, July – September 1989, Ministerio de agricultura, Pesca y Alimentación, Madrid, 1200 ptas.

The Spanish Ministry of Agriculture has for many years published a variety of works on the wider aspects of agrarian change, including its economic, social and political implications. Not least, it has strongly encouraged research into Spain's agricultural history. The Ministry's publications are generally well-priced and greatly in demand by economic historians, agricultural economists and others. Since 1958 the Ministry of Agriculture has published the journal, *Revista de Estudios Agro-Sociales*, joined in 1976 by another periodical – possibly of more use to agricultural historians – *Agricultura y Sociedad*. Both journals follow a standard format of about six to a dozen articles, including review articles, detailed book reviews and a synopsis of the periodical literature. Often, a fair amount of material included is translated, and all articles contain brief summaries in French and English.

The Winter 1989 edition of *Agricultura y Sociedad* comprises a special issue on technical change in the agriculture and foodstuffs sector, edited by Alfredo Cadenas Marín. The Autumn 1989 issue of the *Revista de Estudios Agro-Sociales* contains articles on such topics as the demand for Galician shellfish, artificial intelligence in agriculture, reafforestation and the impact of Spain's EC membership on the agriculture of the Canary Islands. Its book review section is excellent and informative, especially so for a country where objective criticism in the social sciences is an underdeveloped art.

JOSEPH HARRISON



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