THE THAMES THROUGH TIME

The Archaeology of the Gravel Terraces of the Upper and Middle Thames: The Thames Valley in the Medieval and Post-Medieval Periods AD 1000–2000

The Post-Medieval Rural Landscape

AD 1500–2000

Historic England

The post-medieval rural landscape, *c* AD 1500–2000

By Anne Dodd and Trevor Rowley

INTRODUCTION

Compared with previous periods, the study of the post-medieval rural landscape of the Thames Valley has received relatively little attention from archaeologists. Despite the increasing level of fieldwork and excavation across the region, there has been comparatively little synthesis, and the discourse remains tied to historical sources dominated by the *Victoria County History* series, the *Agrarian History of England and Wales* volumes, and more recently by the *Historic County Atlases* (see below). Nonetheless, the Thames Valley has a rich and distinctive regional character that developed tremendously from 1500 onwards. This chapter delves into these past 500 years to review the evidence for settlement and farming. It focusses on how the dominant medieval pattern of villages and open-field agriculture continued initially from the medieval period, through the dramatic changes brought about by Parliamentary enclosure and the Agricultural Revolution, and into the 20th century which witnessed new pressures from expanding urban centres, infrastructure and technology.

THE PERIOD 1500–1650

by Anne Dodd

Farmers

As we have seen above, the late medieval period was one of adjustment to a new reality. The much lower population levels of the period meant that demand for grain fell, while at the same time the shortage of labour and rising wages meant that arable farming became increasingly difficult and expensive for landlords. This had several consequences. Landlord incomes fell, and the aristocracy tended to dispose of many of their houses, and focus on the development of one or two country residences and a house in town. Most major estates abandoned large-scale demesne farming by the middle of the 15th century and the land was leased to peasant farmers, either piecemeal or *en bloc*, and labour services were commuted (Youngs 1967, 311). This process was temporarily reversed in the early 16th century, but overall the leasing of

demesne created new opportunities for those lower down the social scale to farm more land, retain the profits from doing so, and build up larger consolidated family holdings. The Dissolution of the Monasteries in the 1530s added yet more to the stock of land available for lease or purchase; it has been estimated that the monasteries had controlled as much as 25% of the landed wealth of the country (ibid., 307). Former monastic land was acquired by a wide range of people, from the vast estates accumulated by royal favourites like the Earl of Bedford, to ambitious local gentlemen, lay bailiffs and former stewards of monastic estates, and tenant farmers, buying, leasing, extending and consolidating the manors and lands they and their families had previously rented from the monks. The growth of an increasingly prosperous landed gentry, and a new class of 'yeomen' farmers at the apex of peasant society, is a very characteristic feature of the 15th and 16th centuries. In practice, there was much overlap between these two groups, and much upward and downward mobility, but the chief distinction between them was one of lifestyle, with the yeoman living comfortably but simply, without the expenses of a gentleman's social obligations and pretensions (ibid., 301).

With the leasing of demesne and the commutation of labour services, the period also sees the gradual extinction of villeinage. The medieval villeins, bordars and cottars, who had been tied to their native manor by custom and need, were acquiring greater independence, although for many this would also be accompanied by insecurity and poverty. On the one hand, there were the new 'husbandmen', leasing and working holdings sufficient to provide their entire, or main, income, and largely using family rather than hired labour, and on the other, cottagers and labourers whose holdings, usually well under four or five acres, were too small to support a family and who were obliged to rely either partially or entirely on waged work (Everitt 1967, 399). The numbers of landless labourers increased significantly as the population and pressure for land grew again from the mid-16th century, and they may have comprised nearly half the entire population by the 17th century (ibid., 399). The poorest labourers were particularly dependent on their ancient customary rights to pasture a few animals on common land, to feed a pig and collect firewood from the manorial woodland resources, or to catch fish or wild birds. They were hard hit when such rights were curtailed, or even extinguished altogether, by enclosure. In general, labourers were less well off in rich arable areas, where common waste was limited and under pressure, and cottage holdings were small. Conversely, common resources were less constrained in woodland and heathland areas, and these provided more by-employments such as the cutting of wood and furze for fuel, wood-working to make

furniture, fences and a wide range of vessels, tools and implements, charcoal-burning and general forestry.

Cottagers and labourers were also widely engaged in other industrial by-employments such as spinning and weaving wool, hemp and flax, and the making of pots, tiles and bricks. Nevertheless, the main source of income for most labourers remained farm work, which was relatively abundant, if seasonal, in large arable parishes, where gentry and yeoman farms employed a sizeable labour force, the structure of society was patriarchal, manorial organisation was rigid and the working population was relatively static (ibid., 433). Ancient village families of labourers were employed in this way generation after generation, and often developed specialisms. (ibid., 435) In woodland areas, there was less farm work and labourers had to be more mobile; the winter was often spent working in woodland crafts or by-employments at home, while at the busier times of the agricultural year work was available on the arable farms of other districts.

Over the course of the 16th and early 17th centuries, in a trend that was to intensify during the 18th and 19th centuries, many factors combined to favour the large farmer over the smaller holders, and cottagers reliant on waged work. If wages had risen sharply in the late medieval period, the trend was reversed in the 16th century as population rose and the value of wages was eroded by inflation (Bowden 1967, 599, fig. 12). The wages of an agricultural labourer rose from 4d to 1s 0d a day between 1450 and 1650, but price inflation meant that by the second decade of the 17th century his purchasing power was less than half what it had been in 1450 (ibid., 600). For many labourers, the little extra they could derive from a small holding of one or two acres, a cow and a few hens, and the money earned by wives and children for spinning, stone gathering, weeding and fruit picking, would have been the difference between survival and destitution. The small husbandman was vulnerable in the face of poor harvests. In poor years of low yields, a small arable farmer might not make enough from his sales to cover the following year's farm and living expenses. A run of poor harvests might exhaust his savings completely and force him to give up (ibid., 659). Conversely, large arable farms did well in years of shortage as their greater marketable surplus, which would attract high prices, would be more than sufficient to cover personal and farm costs for the following year. Farmers of larger holdings might enjoy substantial economies of scale in relation to the cost of keeping plough animals, but the largest farms would face considerable extra charges for farm labour; it was on farms such as these that increasing the productivity of the land would make all the difference between success and failure.

Many substantial landowners would have relied primarily on their rent receipts to maintain their standard of living. These receipts could be increased by raising rents, where this was possible, and by creating new holdings and extending existing ones by intakes from forest or waste (ibid., 680). Costs could be reduced by requiring tenants to take on an increasing share of obligations for repairs, maintenance and public charges; by not carrying out maintenance work on unprofitable holdings, thus allowing them to 'decay'; and by amalgamating small holdings into larger farms. This practice of amalgamating holdings was known as engrossing, which was widely deplored by contemporaries as a cause of rural unemployment and depopulation. Many tenants were still holding land on long leases at rents that were increasingly out of step with rapidly rising land values and prices. As the period progressed and leases were renewed large rent increases could be applied, particularly to large, commercially-operated leasehold farms. Conversely, many smallholders would have had no capacity to pay more, but often had greater security of tenure from older forms of copyhold lease. It was therefore in the landlord's interest to replace small holdings with larger ones when the opportunity arose. In general, rents increased sharply on the estates of many landowners from the 1570s onwards, as old leases gradually expired. The levels of rent depended on the type and location of the land. Rents in the London region and areas close to major groupings of population tended to be higher. Meadow land was often worth two or three times as much as common field arable, and often more than pasture. Over the course of the 16th and early 17th century, however, there was a marked increase in the rents of arable land, which presumably reflected the long-term rise in the price of cereals.

The economics of farming choices

After two centuries of decline and stagnation the population began to increase again from the middle of the 16th century, reaching perhaps 5.5 million by around 1650 (Overton 1996, 65, fig. 3.1). With increasing numbers of people came an urgent need for more food, and farmers in the late 16th and early 17th century were exhorted to use every resource available to them, and to extend and improve the land in agricultural use. At the same time, as the late medieval trend towards specialisation continued, those farmers who could make choices responded to the expanding market, and their perceptions of what was in demand and fetching good prices. In very broad terms, it is generally accepted that grain prices had doubled from around 3s to

around 6s a quarter as the population expanded in the 13th century, but had fallen back to an average of 5s a quarter in response to reduced demand in the 15th century (Dyer 1989, 101–2). At the same time, labour shortages had made cereal growing much more expensive than before, as wages rose. The net effect of these changes had been a substantial reduction in arable production, with a retraction of the area of cultivated land, the abandonment of marginal land and associated secondary settlements, and the end of attempts to colonise waste. As we have seen above, in some places the response of landlords was to turn their land over to pastoral farming, particularly for sheep.

The 16th century was to see the reversal of many of these trends. Under pressure from inflation, population increase and spells of bad weather, grain prices rose six-fold by 1600 (Bowden 1967, 594–5). Once again there was an imperative to grow more corn, and arable land was once again expanded, by taking in more land from the waste, ploughing up pasture, employing more intensive rotations and reducing the amount of land left lying fallow. More intensive manuring also became a factor in increasing the productivity of arable land, along with increasing incorporation into the crop rotations of leguminous crops with nitrogen-fixing mechanisms in their root systems—these were key factors in reducing the amount of land left lying fallow.

Buoyant demand for wool, both in the home and export markets, made sheep farming particularly attractive in the early part of the period. Annual exports of raw wool and cloth averaged 15,690 sacks in the mid-15th century, but had risen to an annual level of 35,890 sacks in 1519–20 and were to peak in the 1540s. A slump in the third quarter of the century was followed by another surge in the early 17th century as demand for woollen textiles recovered, until poor harvests, disease, poverty and unemployment returned from the 1620s to the 1640s and the wool trade went into depression again (Bowden 1967, 640–41). Nevertheless, even when wool prices were low, many farmers would continue to keep their flocks, and even increase them, because of the importance of sheep dung as a fertiliser for arable fields.

If grain and wool were the most important products of English agriculture, however, the period also saw an expansion in cattle farming for meat and dairy produce, and for secondary products such as hides for leather. Land was being enclosed in the years 1504–18 and 1537–48 for the grazing of cattle both for beef and draught, while the second half of the 16th century saw a very strong growth in livestock fattening (ibid., 644). Prior to this point, although data are limited, evidence suggests that sales of livestock onto the meat market were usually of old, weak and inferior animals that were not needed for traction, wool production or

breeding (ibid., 643). Rising demand from towns, particularly from London, in the later 16th century, together with the development of more efficient distribution and marketing systems, seems to have encouraged more farmers to concentrate on meat production, breeding or buying-in cattle and sheep to be fattened and sold on to butchers. This in turn led to an increased emphasis on the growing of fodder crops such as oats, beans, peas and tares. Evidence suggests that although dairy farming increased during the 16th century it was chiefly undertaken by smaller farmers and cottagers, who produced milk, butter and cheese from a few animals grazed on the common pasture (ibid., 649). Dairying was much more suitable for small farmers than the breeding and fattening of livestock for meat, since there was a much quicker return on the capital outlay on animals and feed. Dairying was labour intensive, as cows needed milking regularly, and the milk had to be made into butter and cheese, but on a small farm this work could be carried out by the farmer himself and his family, and the equipment needed was relatively inexpensive. Large farmers tended to keep dairy cattle for domestic requirements only (ibid., 672–3).

Horse breeding presented many of the same challenges as beef production, with high costs associated with breeding and buying young animals and then feeding them for several years before they were ready for sale and use. Horse-breeding was particularly associated with forest districts of England, and many horse fairs were held in towns bordering forest districts; locally Woodstock was a typical example (Thirsk 1967b, 191). Large-scale pig farming was chiefly associated with forest and dairy farming districts with cheap feeding resources; pigs could be fed in large numbers on the whey from dairies, and on acorns, beechmast, crab apples and hazelnuts in forest areas (ibid., 193). Pig-rearing was also profitable in the neighbourhood of large towns, where there was a strong demand for pork and bacon, and pigs were fed in sties on peas, barley mash, malt and the dregs of ale barrels. While many peasants were able to keep a pig for their own family needs, this would have been beyond the means of the poorest, who would have had insufficient kitchen waste to feed even one animal (ibid., 192–3) Many small husbandmen and cottagers would have kept a few hens, chickens and sometimes ducks, and geese were an option where adequate common rights were available; bees were also very widely kept by smallholders, as the production of honey required very little in the way of capital outlay. During the second half of the 16th century larger landlords tended to turn parkland over to the grazing of cattle rather than deer and poor waste such as heathland could be brought into profitable use by the construction of rabbit warrens. Rabbits could be ready for eating from six weeks of age, and were also useful for their fur (ibid., 194–5).

Farming in the Thames Valley

The south of England supported both arable and pastoral farming, but the balance between them varied from one district to another, in response to soil and climate, the weight of tradition and individual initiative, and access (or lack of it) to wider markets. In broad terms, the main characteristics of the medieval distribution of farming regions remained in place throughout the 16th and 17th centuries (Thirsk 1967a, 64–71; Williamson 2002, 23). The chalk downs of Berkshire and the limestone hills of the Cotswolds were dominated by sheep-corn husbandry. These were districts of nucleated villages, common fields and extensive downland commons, where there was to be little enclosure until well into the 18th century.

Evidence suggests that around half the land was given over to sheepwalks, with the other half comprising roughly three quarters arable and the rest permanent grass. Parishes in these areas were often long and thin, with the villages located where water was available, in the principal river valleys or along the springline at the scarp foot (Williamson 2002, 53). This is also where the meadows were situated, which produced the hay for winter fodder. The main areas of arable were usually on the slopes just above the village, characteristically in three great fields on the Wessex Downs, and two in the Cotswolds, with the downland grazing beyond (ibid., 53–4). Flocks of a thousand sheep or more were not unusual, and the agricultural system of such areas depended on the practice of 'folding'. The sheep grazed on the pasture during the daytime, and were moved down to the arable land for the night, where they were 'folded' on the fallow fields, which would be fertilised by their dung. Folding involved the use of hurdles to make temporary fences to pen in sheep overnight, the pens being moved to a new position each successive night to ensure an even spread of manure over the fallow prior to the next sowing. A thousand sheep would 'fold' an acre of arable land in one night (Thirsk 1967b, 188). Barley and wheat were the two main crops, although by the start of the 17th century oats, tares, peas and beans might occupy as much as a quarter of the sown land (Thirsk 1967a, 53); these were presumably largely fodder crops to supplement the hay as winter feed. Although lambs and wool were sold, the major part of the farmers' income came from the arable crops. In these areas, the traditional manorial organisation remained strong throughout the early post-medieval period, and there was a trend towards the amalgamation of holdings into larger farms, with a

steady decrease in the number of small family holdings. Generally, there was little work available outside farming in these regions, and the numbers of small holders dwindled.

Between the Downs and the Cotswolds were the clay lands of the Vale of Oxford and the Vale of the White Horse. The western part of the Vale of the White Horse was dairying country, but elsewhere, the claylands were a mixed farming region similar to the Midlands. With good access to marketing networks, these were areas where barley and wheat were the chief crops; some fodder crops such as beans, peas and vetches were grown, but oats and rye were rare. Most farmers kept a few sheep, probably chiefly for manure, but the main livestock interest in the region was the raising and fattening of cattle, and some dairying. Although the soils of the clay vales were heavy and poorly drained, they were also fertile. Small, open field farms predominated, with surveys suggesting many holdings of around 75 acres in size. Open field farming worked well here, and although there was some enclosure to increase the area of grassland for stock, these were generally some of the last areas to be enclosed, with the open fields surviving in many cases well into the 19th century. The open field parishes of the clay vales were relatively densely populated, and many of the inhabitants by the 17th century were poor tenants who were heavily reliant on the commons (Wordie 1984, 323–6).

A variety of farming types existed in the Chilterns, and this kind of landscape has been described as ‘a chequer board of champion and woodland’ (Kerridge 1967, 56). The hills were heavily wooded in places, particularly in the south-west, on the thin soils of the scarp slope and on the very poor soils of the Burnham plateau on the dip slope (Wordie 1984, 327, 341). Timber, coppice wood and bark were produced in the region on a large scale, with coppice wood being used for fuel, much of it sent to London, timber for building, and bark for tanning. Pigs had been kept on a large scale here, feeding on the beechmast, from the medieval period. In some places, however, there was good arable land, fertilised by small sheep flocks and distributed among small common fields and enclosures. Again, ready access to the London market seems to have encouraged the growing of wheat and barley in the Chilterns. Average farm sizes were probably rather larger than in the clay vales, because more land would be needed to produce a viable output (ibid., 328). At the very south of the Chiltern region, the land bordering the Thames was more fertile, overlying free-draining river terrace gravels. This was mainly arable land, with irregular open fields, numerous isolated farms and small hamlets (Williamson 2002, 85); under the influence of demand from London this was to develop into a rich market-gardening plain (Wordie 1984, 342). Overall, the Chilterns represent a complex and highly varied agricultural landscape. Williamson (2002, 57) characterises the area as one

of 'ancient countryside' with highly irregular field systems, with open fields and enclosed land interspersed, and a settlement pattern that included many isolated farms and small hamlets as well as villages.

The river Kennet cuts through the chalk of the Berkshire downs, creating a relatively fertile valley of alluvial and gravel soils. The agricultural system here was essentially a sheep-corn system, with grazing on the Downs and wheat as the chief market crop, although there were also coppice-wood, peat and osier industries (Wordie 1984, 340). East of Reading, the land lying within the northwards loop of the Thames is a chalk plateau and here, farming systems were similar to those of the Chilterns, with sheep, wheat and barley produced to supply the London markets for mutton, lamb, cereals and malt (ibid., 341). The area was also characterised by extensive areas of parkland and woodland, and enclosed fields. To the south is a broad band of the Reading and London Clay, where the poorly drained and heavy soil was used for mixed farming, with a wide variety of crops grown in rotation by the 18th century. Cereals were the main output of the region, although there was some rearing of cattle for beef, and dairying on a domestic scale; sheep were kept to manure the arable, but most were marketed for meat. The south and south-east of Berkshire and much of the land bordering the Thames in Middlesex and Surrey was very infertile and generally an area of heath, woodland and rough pasture, which extended into northern Hampshire; much of the area had formed part of the royal forest of Windsor.

Key agricultural changes

The imperative to increase food production and make full use of available resources inevitably had an impact on the way in which agricultural land was used and organised. Extending and intensifying arable cultivation was particularly worthwhile in districts that had good access to marketing networks, which was true of much of the Thames Valley. Although open-field farming is often thought of as typically medieval, much of the Thames Valley continued to be cultivated in this way throughout the 17th and 18th centuries, with substantial areas of common land surviving until common rights were largely extinguished by Parliamentary enclosure in the century after 1750. The productivity increases and innovations of the 17th and 18th centuries must therefore be understood against a background of widespread survival of open-field systems.

The propaganda of the agricultural improvers in the 19th century always tended to paint a picture of open-field farming as backward, limited, inflexible and hindered by the high proportion of small farmers without adequate resources or ambition; but it could never have survived over such large areas until such a late date if it was so ineffective. There was, in fact, every incentive for open-field farmers to improve their methods and output to meet the expanding demands of the urban market, and plenty of evidence that they achieved this. Havinden (1961) suggests that there was a growing urban demand for meat, tallow, wool and cheeses disrupted the dominance of arable in open-field farming, while the increase in livestock rearing produced more manure that increased the fertility of the fields and permitted decreasing the area of fallow and increasing the acreages of wheat and fodder crops. Several characteristic innovations have been recognised from open-field areas. The restructuring of medieval two- or three-field systems into systems of four fields or more allowed for greater diversity in land use, and a reduction in fallowing. There is clear evidence of this happening in the 17th century across the upland areas of north Oxfordshire (ibid.), and it is very likely that it happened in the Thames Valley lowlands as well. At Kempsford, for example, there had been three medieval open fields, Town Field, Upper Moor Field and Ham Field. The rotation of two crops with fallow remained normal practice over most of the parish until the time of enclosure, but the subsequent naming of Dunfield Field, Honey Field and West Horcott Field suggests that the medieval fields had become subdivided, while the hamlet of Whelford had separate Great and Little Fields (VCH 1981, 101). Individual farm holdings would continue to be made up of strips in common fields, but strips could be consolidated into larger blocks through exchange. More flexible rotations could be adopted by agreement to reflect the varying productive capacity of different soils; some land being sown every year (often with cereals and pulses in alternate years) and other land being cropped and fallowed in alternate years. At Kempsford, from the late 17th century up to 1727, part of Dunfield Field was cultivated every year, then returned to the normal rotation (ibid., 101). The area under arable cultivation could be extended by encroachment into permanent pasture. This was achieved on the chalk downland, for example, by a process known as ‘burn-baking’, which involved paring off the turf, burning it and scattering the ashes before ploughing. New land of this sort might be converted into strips and allocated to the tenants, or used for experimentation with new leguminous fodder crops or industrial crops without interfering with the existing common grazing. In a high proportion of open-field townships, however, the extent of pasture was limited, and there the reverse could take place, with the conversion of some arable land to permanent grass. There was increasing

use of intensive controlled manuring by means of sheepfolds, and some or all the cultivators might agree to introduce new leguminous crops such as sainfoin, clover and vetches, to improve the rotation and reduce the extent of fallow. In some places a wider range of specialised commercial crops were adopted, such as woad, madder, tobacco

Innovations that increased the quantity and quality of grass to feed livestock are particularly characteristic of this period, notably the adoption of 'convertible' or 'leys' husbandry. This involved alternating the growing of cereal crops and grass on the same land. Part of the arable land would be closed off and sown with grass, which would provide good quality pasture for animals and rest the soil. After several years, the leys would be opened up, ploughed and brought back into arable cultivation, with another area of arable being put down to grass in its place. Grass leys could be established in this way by fencing off some of the strips within an arable field, or by the sowing of an entire furlong with grass (often at the margins of the township), or by sowing grass on headlands or awkwardly placed strips, or by introducing grass baulks in the furrows between strips.

The use of water meadows (Williamson 2002, 59–62; Cook and Williamson 2007) also greatly increased the amount of grass available to feed animals, and there is increasing evidence for the practice from this period onwards. Over winter, a covering of water would protect the grass from frost and encourage earlier and stronger growth; over summer it irrigated fields that might otherwise become dry, promoting repeated strong growth of grass for pasture or hay. The process of 'drowning' or 'floating upwards' had been used from the medieval period, and was widely employed in the Midlands and the south-west. 'Drowning' of the meadows is recorded at Kempsford, for example, from 1707 onwards (VCH 1981, 101). The practice was typical of lowland areas where the main stream in a wide valley was dammed so that the pent-up water flooded the entire meadow. This had some of the advantages of the more complex system described below (the grass was given some protection from frost, and a nutrient-rich silt was deposited), but also some drawbacks—if the grass was covered with stagnant water for long periods, anaerobic and potentially toxic conditions developed, and only the coarser grasses survived. This seems to have been a common problem with meadowland along the Upper Thames in Oxfordshire, for example, at riverside townships such as Chimney, Northmoor, Standlake, and Aston and Cote (VCH 1996).

The irrigation of upland meadows by the introduction of a 'catchwork' system to protect grass over winter and stimulate early spring growth seems to date from the late 16th and early 17th centuries, notably in Somerset and Devon. There appears to have been some adoption of

the system on the scarp of the Berkshire Downs from a relatively early date, and Robert Loder's farm accounts refer to payments to a man for watching the water in the meadows, implying that some such system was in place in Harwell in the early 17th century (Fussell 1936). On a sloping hillside meadow, the leats carrying the water followed the natural contours of the land, ensuring a constant flow and avoiding the problems associated with standing, stagnant water. It is likely that Robert Loder was using some such system. The creation of a 'bedwork' water meadow on valley-bottom sites was a much more complex and expensive process and its operation required considerable skill and judgement. It involved the digging of a network of channels to direct water from a nearby stream or river into the meadow (Fig. 1). Through the period between November and February, water from springs feeding the headstreams of the chalk valleys was consistently warmer than the air temperature, maintaining the ground temperature above the critical five degrees necessary to stimulate grass growth. The slopes of a bedwork system were so calculated that the water was constantly overflowing from the feeders or carriers along the top of each ridge, filming over the surface of the ground down the sides of each ridge and then being returned to the stream by the drains between the ridges. The moving water dressed the sward with dissolved lime and suspended sediment which fertilised the soil and favoured the growth of more palatable grasses over coarser species. Normally through the winter months between November and February the grass was irrigated for four to six days at a time, until all danger of spring frosts was past, and by mid-March the grass could be 5–6" high. Any farmer with a water meadow of this type had rich grass at his disposal up to two months before most other farmers, so could overwinter more stock and advance his lambing time. Sheep would graze the grass up to April, and then further irrigation could produce two or even three hay crops or the meadow could be given over for grazing of dairy cattle. In October, the channels and drains were cleaned out, and the whole process began again in November. Some forms of meadow irrigation can be traced back into the middle ages and perhaps even earlier, but fully developed bedwork systems seem to appear first in the chalk valleys of Dorset around 1600, soon expanding into Wiltshire and Hampshire, and it is in these areas that they worked best and lasted longest (EH 2013).

Locally, water meadows were created in the upper reaches of Thames tributaries such as the Kennet, Lambourn, Pang, Mole and Wey, and on the Berkshire Downs. These all rise on the chalk, and their upper reaches were well suited to the use of bedwork systems. One group of bedwork water-meadows above Ramsbury in the upper Kennet valley is said to have been installed by William Herbert, Earl of Pembroke, around the 1620s, and some remains survive

despite the realignment of a corn-mill leat early in the 19th century and their subsequent conversion to watercress beds (Cowan 2005, 25–7). By the later part of the 17th century floated water-meadows were beginning to appear along the Lambourn valley, and along sections of the Kennet valley in Berkshire, and by 1680 they were present in the Wey valley between Haslemere and Frencham. William Pearce, who wrote the Berkshire report for the Board of Agriculture in 1794, urged that this method of irrigation was so successful that it should be extended 'to every tract of land that is capable of being watered' (Pearce 1794, 53). One area of chalkland where they seem not to occur is the Chilterns, possibly because the valley floors were generally narrow, tributary streams relatively few, and their flow insufficiently reliable through the dry summer months. Many of the water meadow systems in the Thames Valley were abandoned during the years of agricultural depression in the late 19th and early 20th centuries. Some of the most impressive earthwork traces survive at West Overton in the Kennet Valley.

Conversely, this period saw little change in the way that fields were ploughed, sown and harvested. On the heavier soils, fields were still ploughed up into the traditional ridges to keep the seed out of the waterlogged furrows, whereas on the lighter soils of the chalk the land was ploughed flat without water furrows, to retain moisture; here grass balks were used to define the boundaries of strip holdings (Thirsk 1967b, 165). On heavy soils, the water draining through the furrows would be collected into gutters cut across the headlands to drain off to the sides of the field.

In general, by this period, lowland common-field farmers were more likely to be using horses than oxen for traction, and oats might be grown as a fodder crop. Oxen required better quality grass and were therefore generally used in areas where this was more readily available. On large farms, both oxen and horses might be used (ibid., 164–5). Arable land was usually ploughed three times in preparation for wheat: in April, June and July or August. It was then harrowed to break it down finer, and then sown; for spring crops the land would be ploughed once or twice before sowing. A very wide range of material in addition to animal dung was used to manure the fields. This often-included town rubbish and ashes, and other materials known to have been used include river sludge, bracken, stable waste, malt dust, soap ashes, animal hair, decaying fish, offal and blood (ibid., 168).

The extent to which new crops were introduced in this period in our area is difficult to gauge, and in general it is likely that the good access to marketing networks enjoyed by farmers in the Thames Valley, and the fertility of the region's soils, would have sustained the growing

of the traditional regional crops of barley and wheat. Peas and beans were widely grown as fodder crops, although in poor years they were also used as a substitute for cereals. Lentils tend to prefer warm, dry continental summers and were less widely grown, although they are recorded as a crop in Oxfordshire in this period; vetches, a crop of southern England, were more widely grown to improve soil fertility and provide animal fodder. Coleseed or rape was introduced into East Anglia from the Low Countries in the 1550s, and did particularly well in the newly-drained Fenland. Although its cultivation had expanded into the west of England by the 1620s, it remained relatively localised. Tobacco was first grown in England as a field crop around 1618–20. It became especially popular and sometimes very profitable in the Vale of Gloucester and Vale of Evesham. Opposition from the Virginia planters led the government to make intermittent attempts to forbid its cultivation after 1619, but later investigations show that, outside the middle Severn basin, it was also being grown in Buckinghamshire in 1626 and in Oxfordshire and Wiltshire in 1655, and it was not until the 1680s that its cultivation finally ceased (Thirsk 1974).

Flax and hemp were widely grown, particularly on small peasant plots. The growing of woad was encouraged in the late 16th century to support the textile industry, and woad became a very popular crop because it was particularly profitable. It was grown in Surrey and Buckinghamshire by this time, and in Oxfordshire and Gloucestershire by the mid-17th century. Woad needed deep, well-drained and well-cultivated soil; it was usually grown on alluvial land near rivers, and the intensive cultivation necessary for its growth meant that the fields were often in better condition for subsequent cereal crops (ibid.). Field-names and other records commemorating woad cultivation in Oxfordshire are widely scattered, but not especially numerous (about 20 examples). Another important dye crop was madder, which had previously been imported from the Low Countries, but in the 1620s Parliament was keen to encourage its growth in England, and there were several trials around London. Its cultivation declined in the 1690s, but revived again around London in the 1760s–1770s; it never appears to have been grown on any significant scale in the Middle or Upper Thames region.

There is evidence for imports of hopped beer from the Low Countries from the 15th century and, despite some initial resistance, it came to be favoured because it kept better than unhopped ale. This encouraged the cultivation of hops, for which there is evidence in Kent from about 1520. During the second half of the 16th century hop cultivation was taken up in many parts of southern England. A hopyard is mentioned in the probate inventory of Nicholas Hill of Witney in 1589–90 (Havinden 1965, 307), and hopyards begin to appear on estate maps.

One 1612example is shown surrounded by a moat on a Magdalen College map of Golder manor, near Chalgrove. Most early hopyards were small, usually less than five acres, producing mainly for domestic use, but their increasing occurrence in the probate inventories of town brewers during the 17th century reflects an expansion of commercial cultivation. Field-names record the former existence of hopyards throughout most of Oxfordshire and north Berkshire, excepting only the Wychwood Forest area. Although vine cultivation had declined considerably during the later middle ages it had never entirely died out, and there are indications of a small revival of interest in south-east England in the early part of the 17th century. King James I had a vineyard at Oatlands Park in Surrey and a vine garden near St James's Palace in London, while in 1611 Lord Salisbury acquired 20,000 vines from France for planting at Hatfield House, with a promise of another 10,000 to follow (Barty-King 1977, 65–74).

THE PERIOD 1650–1750

by Anne Dodd

If the 16th and early 17th centuries had been a long period of growth in population, the economy and agricultural incomes and output, the years following the Civil War saw the onset of a century of stagnation (see Overton 1996, 66–7, figs 3.2 and 3.3). Grain fell in price by 12% overall and wool by 33%; conversely, cattle prices rose by nearly 13% and pig prices by 71% (Thirsk 1984, xxii). The years from 1664 to 1691 and from 1725 to 1750 were the most depressed. The root of the problem was over-production and under-consumption. The population growth of the preceding period came to an end and the demand for food slackened again. At the same time, however, the longer-term trend to increase agricultural output that had begun in the 16th century did not slacken off and many gentry found that they needed to increase the productivity of their estates to make up for losses during the Civil War (ibid., xxiii). The problem eventually became so serious that the government began to provide financial incentives to farmers to export grain and malt. It became much harder to make a good living from farming, and this encouraged greater diversification, but also greater efforts by individual farmers to increase the productivity of their land by the application of more fertilisers and the introduction of more fodder crops into rotations to increase the numbers of animals that could be supported on individual holdings, and thus the quantity of manure. The

greatest difficulties were faced by smaller farmers on less than ideal soils, and at distance from water transport to markets (ibid., xxx). The period sees a considerable increase in the adoption of horticultural and other specialised crops, which provided an important supplementary source of income for farmers at a time when prices for many agricultural staples were depressed. Livestock prices generally held up better than grain, and this encouraged a move to grow more grass and less grain during the period (ibid., xxviii). The adoption of new grasses, clover, rye-grass, lucerne and sainfoin, seems to have spread during the period from 1660 to the 1680s, but the adoption of turnips as a regular part of crop rotations does not seem to have occurred widely in southern England until around 1760. There was a very marked expansion in dairy farming, which was well suited to small farmers; eventually, the numbers of small producers and the difficulties of marketing their produce may even have led to problems with over production (ibid., xxix). Sheep farmers had a particularly difficult time during this period as wool prices fell continually; in response, the development of new breeds and better fodder grasses accompanied an increasing emphasis on the production of meat, while the new breeds tended to yield coarser and heavier fleeces (ibid., xxix). In general, however, selective breeding to improve livestock did not develop significantly until demand rose again from the middle of the 18th century. At a time when agricultural incomes were under such pressure, the wages that could be earned from weeding and fruit picking, for example, and from by-employments in handicrafts assumed an even greater significance for family budgets (ibid., xxx–xxxi).

Farmers

In broad terms, conditions and developments over the century from 1650 to 1750 resulted in the marked expansion of established large estates, and the creation of new ones, from the absorption and amalgamation of smaller units. Over much of the country the great age of social mobility, for peasant yeomen farmers to rise into the gentry by the purchase of land, had come to an end. As the period progressed, the nature of land ownership was gradually transformed as small landholdings were absorbed into larger consolidated units. This period sees a clear trend for small landowners to sell out to wealthier buyers, and an increasing tendency for land to be bought as a financial asset that could be sold to release funds for other purposes when required (Clay 1985, 119–297). In some parts of the country, this period thus sees a trend for

more land to accumulate in the hands of absentee landlords, who had no personal or family interest in farming or country life.

In a period when agricultural returns were frequently poor, large landowners were much better cushioned against short-term fluctuations than the lesser gentry and yeomen farmers, and would generally still have had enough surplus to meet all their essential needs. To an extent they were protected from the worst effects of the agricultural recession because much of their income came from rent-paying tenants and was thus consistent, even if the tenants themselves were facing a reduced income from sales of produce. For the smaller gentry and yeomen, the difficult economic circumstances would have reduced their ability to save to provide funds for future investment or for family expenses, and they generally found it more difficult to borrow money. Sales of farmland were probably at their height during the most difficult periods of agricultural depression, during the 1670s and 80s and the mid-1700s, while a marked rise in land prices in the early 18th century made the sale of an estate particularly attractive even for those who were not forced into it by financial hardship. Selling land but continuing to farm it as a tenant could, for example, provide funds for investment in more leased land, or improvements, by those whose primary interest was commercial farming. Equally, as the century progressed, there were opportunities to develop new economic activities, and the sale of family land could provide the necessary funds for industrial investments. Samuel Whitbread, for example, sold a small estate in Gloucestershire to raise money to found his brewery, while Mathew Boulton sold his estate at Packington to raise capital for his industrial enterprises.

The trend for land to be sold into new ownership was reinforced during this period by demographic factors, with an unusually high frequency of land passing from one family to another because of the direct male line of inheritance dying out, and land passing via heiresses through marriage, or to indirect collateral branches. Land often ended up in the hands of people who did not have ‘deep roots’ in the countryside, but were employed in trade, industry or the professions, or lived the lives of leisured urban gentlemen on the incomes derived from estates in which they themselves had little direct involvement. Contemporary observers deplored the tendency for such estates to fall into neglect. The increase in estates held by absentee landlords was particularly striking in the Midlands and Home Counties.

The readiness of absentee landlords to sell land in which they had only a financial interest, however, provided opportunities for those who did wish to extend or develop a country estate. Amongst landowners who were committed to farming and to their country estates there was an increasing fashion for ‘ring-fencing’. Over the course of the 18th century this was

reinforced by increasingly professionalised estate management, illustrated by increasing numbers of accurate estate surveys concerned with understanding the agricultural conditions of the farm and its potential. Accurate maps and surveys showed landowners very clearly where their holdings were interrupted by the land of others, where there were gaps to be closed, and where there was potential to expand the estate outwards. The consolidation of estates made good financial sense, because there were excellent returns to be had on improvements, even if the returns on land were low. It was in the interests of large landowners to buy up small holdings to achieve sole possession, or to reduce the numbers of owners to a level where it would be much more straightforward to achieve agreement for enclosure.

Many county families made large numbers of such small purchases in each generation, as holdings became vacant, motivated not simply by economic interests, but also the satisfaction of enlarging and consolidating their family's hereditary home estate. In general, the consolidation of estates was of much greater significance than the acquisition of large amounts of new land, and indeed purchases for 'ringfenced' estates might be financed by the sale of land elsewhere, particularly land that had come into the family through windfall inheritance or marriage. The other main group interested in buying up farming land were those who had made a fortune from a commercial or professional career, and were looking to buy their way into county society. Clay (ibid., 184) comments that, even if the accumulation of an estate took two or three generations, ultimately 'almost all the fortunes built up within this period were invested in land'. Throughout this period, these trends were particularly marked in the Midlands, the south and the south-east, where the seats of the aristocracy and gentry were most abundant, and which were most attractive to new buyers (ibid., 186).

The position of tenants was variable. Many still held land on inherited copyhold leases that would entail attendance at the manorial court, and payment of entry fines for a renewal, heriot on the death of a tenant, and sometimes other archaic customary dues, although these tended by now to be of very little value. Although the rents were often below the market value of the land, the entry fines and heriots did provide landowners with useful lump sums, and hereditary copyholders shared the landlord's interest in enhancing and protecting the long-term fertility and value of the land. Customary tenancies were very much in decline in this period, however, as land encumbered in this way was often the first to be sold off when landlords wanted to raise money, and not infrequently the sale was to the sitting tenant (ibid., 208). Elsewhere, particularly in the eastern half of the country, land was leased for negotiated cash rents reflecting the market value of the property, and let for a fixed term of years, usually up to

a maximum of 21, with leases for 7, 9, 12 and 21 years being the most common. In times when agricultural returns could be poor, good tenants might be hard to find and were a valuable asset. There were many examples of landlords tolerating rent arrears or lending money to their tenants during particularly bad years, or helping tenants by undertaking improvements to land or buildings. In general, those most inclined to be sympathetic tended to be resident landowners with their own home farms, who were experiencing the same difficulties, and the aristocratic families who held very large estates and valued a good local reputation and political support. Conversely, absentee landlords with no personal local connections might be more inclined to evict tenants in arrears, push ahead with enclosures and amalgamate small holdings into large farms, in the hope of re-letting at higher rents to wealthier tenants.

Landlords were also concerned with those at the opposite end of the social and economic spectrum. Since tenants were usually responsible for paying the poor rate for their land, it was in the landlord's interests to keep poor rates as low as possible. This could be achieved in one of two ways. On the one hand, they could try to ensure that the numbers of poor families were kept to the minimum necessary to provide the required level of farm labour; this would typically be achieved by pulling down cottages when cottage holdings became vacant, and transferring their associated land and common rights to larger tenancies. Attempts by poor migrants to settle in the village would be resisted. On the other hand, landlords could attempt to provide employment for the poor, thus paying them for useful work rather than to remain idle. More work could be provided, for example, by the growing of more labour-intensive industrial or horticultural crops that provided work in hoeing, weeding and picking, while poor labourers could also be employed on wood cutting, hedging, ditching, trenching, draining and stone picking. Resident landlords would also provide much work for local people as domestic or farm servants, gardeners and stable hands, as well as local craftsmen. Conversely, local employment suffered from the increasing trend in this period for landowning families to live away from their estates, in London, Bath or county towns for part or much of the year. Where the landowner was an absentee, the manor house might eventually be allowed to decline to the status of a simple tenanted farmstead, with no requirement for a substantial household of servants; moreover, the landlord's income was no longer spent locally, but transferred out of the region altogether. Under these increasingly common circumstances, the demand for labour followed landlord expenditure from the countryside to London and the districts that supplied it (ibid., 240).

The economics of farming choices

In general terms, the most important trend in this period was the long-term decline in the price of grain and wool (Thirsk 1985, 298–388). From 1663, the government was acting to support grain production, by allowing engrossing and export of corn, and imposing duties on corn imports. From 1672, the government paid bounties on corn exports in many years of domestic surplus; by encouraging producers to export a proportion of their grain, this policy had the effect of supporting domestic prices by reducing the quantities offered for sale on the home market. In years of poor harvests, conversely, grain exports could be prohibited entirely, although this was unpopular with grain producers and was only rarely enforced. The replacement of ale by hopped beer over the period from 1500 to 1640 had led to marked changes in the brewing industry, with a shift away from domestic production to brewing on a larger scale by urban breweries, perhaps because hopped beer kept better and it was therefore feasible to produce and store it on a much larger scale. The encouragement of brewing, including the export of beer from 1670, the development of stronger beers that used larger quantities of barley, and the use of grain to produce distilled spirits such as gin, provided other outlets, and the export of beer and malt was encouraged by legislation. The promotion of distilled spirits as a way of supporting farmers was highly controversial, and gin drinking among the urban poor became one of the most notorious social evils of the 18th century. Nevertheless, Thirsk (ibid., 338) concludes that these various measures by the government to protect agricultural incomes undoubtedly made the difference between survival and ruin for many, and particularly for larger farmers.

If the government's actions in support of the grain trade had a positive effect for arable farmers, however, the same was not true for the wool producers. At the beginning of the 17th century increasing competition in European textile markets was reducing the demand for English cloth. English cloth producers believed that continental manufacturers were only able to succeed in this way because of their access to good English wool; if they could not obtain English wool, English textiles would sell better because of their higher quality. The government banned the export of wool in 1614 to protect the home textile industry, which created a great deal of employment. Inevitably, the net result of this was a glut of English wool in the domestic market, reinforcing the tendency for the price to fall. The ban on wool exports was widely contravened by smuggling, but was not to be completely removed until 1824. The poor returns

on wool encouraged sheep farmers to place more emphasis on breeding and raising animals for meat.

The second edition of Plot's (1705) *Natural History of Oxfordshire* mentions some recently-introduced strains of wheat, barley and peas. 'White Cone' wheat, a variety of rivet wheat (*Triticum turgidum*), is noted as a successful recent introduction in the clay vale below the Chiltern scarp, and he commended 'long Cone' for rank claylands and enclosed land, though it produced a coarse flour not liked by bakers (Plot 1705, 154). It retained its popularity on the clay soils into the 19th century. Young (1813, 146–7) noted a productive white cone wheat being cultivated on rich loamy soils around Bampton and Wendlebury in east Oxfordshire, and stated that it was less vulnerable to smut than other strains of wheat and, though it was subject to mildew, this could be reduced considerably by earlier sowing. Rivet wheat fell out of favour during the 19th century, partly because it was less amenable to machine threshing (because its glumes clasped the grain tightly until it was fully ripe), and partly because its grain was inferior to that of bread wheat for commercial baking.

Rye-grass was probably first grown locally in the Chilterns, and subsequently introduced onto lower ground at Islip by an 'Ingenious Husband-man' named Eustace. Plot (1705, 156–7) recommended it as cattle feed, but it was also good for horses and sheep, and he believed that it improved both cold, sour clayland and light, stony or sandy soils. Among the other new fodder crops, the value of red clover was being promoted by the later 17th century (Yarranton 1663). Sainfoin is said to have been introduced into England by John Hastings on his estate at Daylesford in the upper Evenlode valley in the mid-17th century. It became widely cultivated over the light upland soils of the Cotswolds and north Oxfordshire during the late 17th and 18th centuries, and appeared in the Vale of White Horse and on the chalk downs. However, field-name evidence suggests that it was not much grown on the Chilterns. Plot (1705, 156–7) notes some confusion between lucerne and sainfoin. Lucerne is known in Oxfordshire only from a single recorded field-name near Thame. Turnips, a key component of the Norfolk four-course rotation, provided an excellent winter fodder, but their adoption in regular open-field areas was slow, partly because of the difficulty of accommodating them into the customary field courses. They could only be planted as a substitute for fallows where the right of common grazing on the fallow field had either been abolished, or could be limited or controlled. The need for turnips was greatest in areas where hay meadows were most limited. There is some indication from probate inventories that both turnips and clover were being grown in the Chilterns by the 1690s (Richardson 1984, 254–5), though it was not until the late

18th century that these crops were replacing pulses in the rotation on higher ground in north Oxfordshire.

Repeated attempts were also made to encourage diversification into the growing of more profitable crops such as hemp and flax, madder, safflower, hops and rapeseed. Safflower, a thistle-like plant producing red dye, was introduced in the late 17th century. It was grown in quantity by Col. Vernon at North Aston in the Cherwell valley between 1675 and 1707. However, imported seed was expensive, and it ripened at the same time as the wheat harvest, so it was never widely adopted. Plot (1705, 157–8) also mentions the cultivation of caraway, grown around Bampton and Clanfield. Reading gentleman, astrologer and writer Joseph Blagrave recommended the breeding and teaching of singing birds for cages, aviaries, parks or chamber windows, and canary seed was a small-scale specialised crop in Kent.

After the Restoration, vine cultivation witnessed a revival in the face of considerable scepticism about the suitability of the English climate. Sir William Temple introduced four new varieties of grape, which he cultivated in his garden at Sheen in the 1680s (Barty-King 1977, 74–79) and Plot (1705) records experiments with vine grafting in the Physic Garden in Oxford in the 1680s. Vineyards are recorded at Kensington and Hammersmith in the early 18th century. In about 1720, James Oglethorpe planted up an extensive walled vineyard at Westbrook Place near Godalming, producing his own wine and breeding edible French snails, which grazed on the wine leaves. It was still productive in 1754, being noted by Dr Richard Pococke in his Travels through England, and a 'Vineyard of considerable Extent' was sold with the property in 1788. Much of the boundary wall of the vineyard still survives. Pococke also notes the two vineyards totalling 10 acres planted at Painshill near Cobham by Charles Hamilton in the early 1740s, which became famous in their time, and were still productive into the 1790s. By this time vineyards were beginning to reappear elsewhere in southern England (Barty-King 1977, 80–107). Conversely, in the face of pressure from the Virginia colonists, the government repeatedly attempted to suppress domestic tobacco growing, and even sent out horse troops to break down growing crops in the 1670s and 1680s. An illegal tobacco crop covering about 26 acres was destroyed at Standlake in the late 17th century (VCH 1996, 189). In the event, the price of Virginia tobacco eventually dropped so low that its cultivation in the less reliable English climate was no longer financially viable.

The period from 1650 to 1750 also saw a marked resurgence of upper class interest in game. Over the previous century, interest in hunting deer and keeping deer parks had waned, and many Elizabethan gentlemen had replaced their deer with more profitable cattle. By the

later 17th century, however, social attitudes were changing. The pursuit of fashionable pleasures became a major preoccupation of the aristocracy and gentry, linked to an increasing belief in the value of outdoor exercise. The first signs of these changing attitudes came with the growing popularity of horse racing from the beginning of the century, but Joan Thirsk suggests that it was the aristocracy's experience of French game rights and hunting while in exile during the Commonwealth that encouraged their reintroduction here. A sequence of increasingly repressive acts of Parliament, from 1670 through to the notorious Black Act of 1723, secured the landowners' exclusive rights to deer, warrens, wildfowl decoys and fisheries, hares, pheasants, partridges and grouse, allowed the employment of gamekeepers and introduced harsh penalties for poachers. The use of guns and nets meant that catches were much greater than before. Thirsk (1985, 371) describes the increasingly competitive nature of elite rural society by 1750, 'Gentry and peasantry were engaged in a bitter battle for deer and other game by increasingly destructive methods. Pleasure for one, food for both—its pursuit brought forth legislation which greatly widened the social gulf between them'.

The period also saw a substantial increase in market gardening. Although garden produce had been grown and consumed by many during the medieval period, it was considered inferior, and vegetables were thought fit only for the poor who could afford nothing better. By 1600, peas, beans, cabbages, carrots, parsnips, turnips, radishes, Jerusalem artichokes, onions and summer salad stuff were eaten in quantity by those who were unable to afford the rapidly increasing prices of grain and meat (Thick 1985). Market gardening was becoming strongly established around London and other major towns, including Oxford and Henley, and had benefited particularly from the skills and knowledge of Dutch and French Protestant refugees who had fled religious persecution to settle in England during the 16th century. During the period from 1650 to 1750, commercial gardening spread steadily around most large towns, and many smaller centres, and particularly around London, where gardens spread far into Middlesex, Surrey, Essex and Kent, and garden ground was estimated to have increased from 10,000 acres in 1660 to 110,000 acres by 1721 (ibid., 507). This expansion was still driven largely by demand from the poor, but the fashion for eating vegetables (even the common root vegetables of the poor) gained popularity among the middle and upper classes as the 17th century progressed, following French fashion. The location of commercial gardens was influenced by several factors, perhaps the most important of which was ready access to the markets, since much of the produce was highly perishable. Fruit and vegetables were carried into London by boat from districts near the river, but elsewhere growers transported produce

by packhorse or (for more robust vegetables such as root crops, peas and beans) by cart. Human and animal waste from city privies, streets and stables was sent in the opposite direction. The growing of fruit and vegetables was also labour-intensive, and tended to flourish in areas where cheap labour was available, there were smallholders with a need for additional income, and landowners who were willing to allow land to be used in this way. Kitchen gardens tended to be relatively small as rents for productive land near big towns were high, and the costs of manure and labour were substantial. Garden crops were also grown by farmers, in rotation with arable crops, but as they were usually further from the towns their output tended to be restricted to produce that could be transported some distance, typically comprising roots, beans, peas, onions, cabbages, pickling cucumbers and, from the 18th century increasingly, potatoes. Garden crops were cultivated in open as well as enclosed fields, and common field gardening is recorded from Middlesex, Surrey and Oxfordshire.

At the same time, the fashion for creating private ornamental and kitchen gardens was rapidly spreading through the landowning classes. From the middle of the 17th century general nurserymen began to develop businesses distinct from those of market gardeners, and dedicated to the raising of young trees, shrubs and plants, seeds and bulbs for sale. For many years, the market was dominated by the nursery at Brompton Park in Kensington, where 10,000,000 plants were estimated to be growing in 1705, but demand in the London area meant that it was possible for several smaller nurseries to become established as well. Much of the trade in seeds was concentrated in London because of a continuing reliance on the importation of seed from Europe well into the 18th century. As well as ornamental plants and trees, the seeds of new grasses to improve land (such as clover, trefoil, sainfoin, lucerne and ryegrass) were imported, promoted and sold. In the long run, the improved methods of cultivation associated with gardening were to play an important role in improving agricultural techniques in general, and it was widely recognised that improved agriculture owed much to the application of gardening methods to the arable (ibid., 530).

Everywhere, and at all levels of farming society, increasing diversification was encouraged. Thirsk (1985, 571) notes that, ‘Gentlemen favoured orchards, vineyards, vegetable gardens, woodland plantations, deer parks, fish ponds, rabbit warrens and dovecotes, and duck decoys...The middle ranks of yeomen and husbandmen favoured orchards and hops, coleseed and dye crops, which could be inserted into existing rotations. Smallholders turned to vegetable gardening...’ Alternative agriculture flourished in this century of depression in traditional

farming, but it was to recede again after 1750, when a renewed rise in population and growing demand for food encouraged farmers to focus on a narrower range of traditional staples.

Woodland

The late 17th century also saw rising concern about the depletion of England's timber resources. The legal disafforestation of many royal forests removed protection from woods formerly within them, and opened them up to a much wider range of exploitation (Rackham 1976, 96–103). At the same time, the expansion of agriculture at various stages through the post-medieval period led to many woods being grubbed out, and a significant contraction on the overall area under woodland. In 1792 the Commissioners of Land Revenue requested information from the chairmen of the county Quarter Sessions on this matter, and the reply from Oxfordshire was that 'Many woods have been grubbed and converted to tillage, but not a single plantation of oak in the county, except where Gentlemen have planted for Ornament'. Where woodland was maintained, the demands placed upon its resources increased between the 16th and 18th centuries, through increasing needs for domestic and industrial fuel, and timber for domestic building. Apprehension about the apparent increasing shortage of timber suitable for ship-building was a notable source of complaint from the mid-16th century onwards, though English woodland continued to be able to satisfy the demand without real difficulty, even after the great expansion of the merchant fleet and navy in the 1780s.

Government concern over future timber supplies in particular led to legislation aimed at preserving existing woods: the first significant statute had been the 'Act for the Preservation of Woods' passed in 1543, which required that woods were not to be grubbed out, that they should be fenced after felling to allow proper regeneration and that they must contain a minimum of 12 standard trees per acre of coppice. There was nothing especially innovative about this, but the aim was to support traditional woodland management practices and to oppose radical or damaging changes. Subsequent Acts to discourage the destruction of woodland and to encourage the preservation and planting of timber trees continued to be passed throughout the 17th and 18th centuries. Several government inquiries and other surveys into the condition of timber and woodland resources were carried out. In 1608, surveys of the royal estates in Oxfordshire recorded that there were 58,936 timber oaks, 2678 timber ashes, 3722 decaying trees, 1633 acres of coppice in leaf and 1981 acres out of leaf. Numerus pamphlets

and books aimed at encouraging timber production were published, the most comprehensive and influential of which was John Evelyn's *Sylva*, first published in 1664, which had been reissued through nine editions by 1812. Evelyn's concern was the production of large oak timber for shipbuilding, mostly for the need to ensure future timber reserves owing to recent naval conflicts with the Dutch, but he also covered many other aspects of woodland.

Overall, woodland management was conservative and resistant to change. Nevertheless, in some areas a tendency for increasing the intervals of coppicing, can be detected, from about five years up to 15 years or more. On big estates, coppice rotation might be arranged for the entire property rather than for individual woods, so a quite extensive wood might be felled all at one go. Despite the widespread practice of coppice-with-standards management by the 16th century, it had certain drawbacks. The wide spacing between the standard trees meant that there was no competition between them, so they tended to produce short trunks with wide-spreading crowns, which then inhibited the coppice growth beneath them. Increasing demands for long straight timber during the 17th century led to the adoption of high forest management, aimed at producing tall standard trees by growing them much closer together. Many Chiltern woods were converted to this system in the 18th century, beech being especially in demand from the furniture industry. The price of beech timber was usually only two-thirds that of oak, but the growth of beech was more rapid. In other areas, the growth of sporting interests such as pheasant-shooting caused some private estates to abandon woodland management altogether, allowing their woods to relapse to scrub simply to provide game cover.

It is now recognised that tree plantations were not unknown in the middle ages, but from the late 16th century onwards there was a growing interest in plantations on big estates. Much of the planted woodland along the slopes above the Thames relates to parks and estates. Trees and seeds were imported from France for making a plantation in one of the parks at Windsor in 1674 (Roberts 1997, 257). Initially, new plantations tended to be fairly small, made for ornamentation as much as for commercial investment. They were usually contained a mixture of species, managed by coppicing. As early as 1580, Lord Burghley is reported to have made a new oak plantation of 13 acres at Windsor and fenced it into the Great Park (Roberts 1997, 250). By the 18th century plantation practices were beginning to diverge from traditional woodland management, increasingly moving towards monoculture and standard timber production. Around 1700, some three acres at Northmoor had been planted with *abeles*, the fast-growing white poplar (*Populus alba*), an early introduction from southern Europe (VCH 1996, 160). In open countryside interests in fox-hunting from the 1780s onwards resulted in

the plantation of fox-coverts, often in the corners of hedged fields created by Parliamentary enclosure. Since the end of the middle ages, hundreds of new tree species have been introduced to Britain from abroad, about 50 of which passed into general use in gardens and ornamental grounds, and a much smaller number of which became extensively grown in commercial forestry. The Lombardy Poplar, introduced to England in about 1758, had become widely grown in plantations and in parks by the late 18th century. Conifers attracted particular interest, since these are almost absent from the native flora, and softwoods of northern European and American origin began to be grown on a large scale during the 19th century. Scots pine (*Pinus sylvestris*) was reintroduced into southern England during the 17th century, and became widespread on the light sandy soils of south-east Berkshire and west Surrey.

Farming in the Thames Valley

The upper reaches of the Thames lie along the south edge of the Cotswold Hills, which occupy the eastern third of Gloucestershire (Thirsk 1984, 159–93). The Cotswolds dip southwards to meet the broad flat gravel terraces bordering the Thames, which is fed by numerous tributaries running down from the higher ground. Here, a well-developed system of sheep-corn husbandry had become established during the medieval period. Enclosure seems to have spread at an early date, and improved grasses were adopted relatively early. Sainfoin was grown at North Cerney by 1695, and the use of sainfoin, clover and ryegrass was credited with transforming the barren pasture of the southern Cotswold slopes into rich grassland. This was usually treated as convertible, with grasses incorporated into longer rotations. More cattle were kept, and the size of some sheep flocks increased to over 1000 in the possession of individual farmers by the early 18th century. Wheat, barley, peas and oats were the major arable crops, and there was little diversification into new crops such as hops and dye plants, and little mention of orchards.

The limestone upland country of the Cotswolds extending across central Oxfordshire was an area of mixed farming (Wordie 1984, 320–23). Although two thirds of the area were still probably unenclosed in the early to mid-18th century, there had generally been more enclosure in the uplands than in the clay vale to the south, with several large estates appearing. It is suggested that this could be linked with a high proportion of absentee landlords in the area, with no resident landowners at all in some parishes; this made the process of achieving agreement for enclosure much simpler. The rearing of livestock seems to have become more

important in the area, with a marked increase in the numbers of cattle, horses and pigs between 1640 and 1730. Over the same period, fewer farmers were keeping sheep, but those who did kept much larger flocks. Although the arable land of the area was still predominantly used for barley, the barley acreage had reduced significantly; the cultivation of oats declined to 4%, and rye cultivation seems to have ceased altogether. Conversely, there was a marked increase in the growing of wheat and pulses. Havinden (1961) provides a valuable insight into the details of how new ideas were adopted in the limestone uplands. In places, areas of arable land had been sown with grasses for convertible 'leys' by agreement between all the cultivators by the early 17th century, each cultivator undertaking to sow grass seed in proportion to his acreage of arable, with the animals being fenced or tethered on the grass to prevent them straying into the cereal crops. Sainfoin was introduced in the county in the second half of the century. Sainfoin had been introduced from France, its name meaning 'healthy hay'. A highly nutritious feed for animals, sainfoin was deep-rooted and thus resistant to drought on thin soils, and, like all legumes, had the added advantage of helping to improve soil by fixing nitrogen. Havinden cites examples in which the landowner and tenant cultivators agreed that they would all sow sainfoin on their strips in part of the common field, and would share access to the crop for their cows and sheep in relation to the size of their holdings. Evidence suggests that clover and trefoil were also being sown, with clover recommended for wet soil, sainfoin for stony soil, and trefoil for dry soil. There was little evidence that turnips had been widely adopted in Oxfordshire, however. Output could also be increased by reduction of the area of land left fallow, and two-field systems were subdivided to form four fields (or sometimes five) all over the county during the 17th century. Under such a system, a smaller area than previously could be left fallow, for grazing and manuring by animals, while other fields could be used to grow improved grass such as sainfoin, and for crops such as peas and beans which provided fodder for animals and improved the soil by fixing nitrogen. The practice of growing fodder crops on the fallow field was known as 'hitching' and was applied in a small way in the early 17th century. Hitching spread widely in the 17th century, with temporary hitches gradually replaced by permanent fields in sub-divided systems.

To the south were the extensive clay vales, extending from the Vale of Aylesbury westwards to north-east Wiltshire, bordered to the north by the Cotswolds and to the south by the Berkshire Downs and Chilterns (Wordie 1984, 323–6). Dairying predominated in the western part of the region, but elsewhere small open field farms were dominant everywhere. Here, wheat and barley were grown on the fertile soils, and exported to London; beef cattle

were raised, and sheep kept more for meat than wool. The area had seen relatively little enclosure and it is generally thought that this reflects the fact that open field farming was working well in this mixed area with its excellent access to the London market and fertile, if heavy, soils. Where enclosure had taken place, it seems to have been to extend the area under grass, rather than arable. Cattle became more numerous in the clay vales over this period, and Havinden's researches showed (as in the limestone country) that the proportion of farmers keeping sheep fell slightly, but flock sizes again rose; by the early 18th century it is estimated that some 45% of clay vale farmers were keeping sheep, with an average flock size of 52. There is no sign, however, of an increase in the keeping of pigs and horses. The open field parishes were particularly populous, with many poor tenants and squatters who relied heavily on common rights, and it was notoriously difficult to obtain agreement for enclosure in such areas. Overall, there appears to have been no general increase in farm size in the vale during the century up to 1750, and limited evidence suggests that there may even have been a small decrease, which may have been due to population pressure (ibid., 326).

The Chilterns saw an increased emphasis on cereal production in the south-west part of the region during this period, with a marked increase in wheat, a smaller increase in barley, and a marked decrease in the share of oats and rye (ibid., 327–9). There was also a decline in the numbers of farmers keeping sheep, and no increase in the size of flocks. Notably, the deficit in sheep dung appears to have been made up with much heavier use of lime and chalk to improve soils, and this became a notable feature in south Oxfordshire after the Restoration (ibid., 327–8). Perhaps surprisingly, given the extensive beech woods, there seems to have been little interest in pig rearing in the region, and there is no evidence that cattle were kept in any significant numbers. The predominance of wheat and barley production probably reflects the ease with which cereals grown here could be transported down the Thames for the London market. Between 1650 and 1750, most of the new enclosure that took place in the region was associated with the intake of land from the waste, usually land taken from beech woods for arable. There is only limited evidence for the adoption of new grasses such as sainfoin and clover, and little evidence for the planting of turnips before the end of the period.

On the Downs, as on the limestone uplands, there was a marked tendency for large estates to grow at the expense of smallholders during this period, and increasing emphasis on cereal production rather than the rearing of sheep (ibid., 329–37). Intakes of new land for arable are likely mostly to have been in the river valleys, and the improvements in navigability, particularly of the Kennet, in the early 18th century would have increased the incentive for

farmers to grow more grain. Although the fold remained central to the region's agricultural system, there were fewer sheep than before and more emphasis on taking new land into arable production. As with other parts of the region it is likely that good access to London markets for grain, meal and malt underpinned the viability of arable farming here, even in a period of depressed prices. There is more evidence for the adoption of innovations in the sheep-corn country of the downs, and it was here that water meadows were at their most extensive, many of them created in the period 1640–1750. Manure was critical to fertilise the thin soils of the downs, and the region saw an early emphasis on the growing of improved grasses and fodder crops to provide winter feed. Clover, sainfoin, ryegrass and turnips were introduced, with turnips being adopted notably in the period from 1730 to 1750.

The clay Vale of the White Horse lay between the Thames to the north and the Berkshire Downs to the south. At the east end of the Vale, farming systems were similar to those of the Oxfordshire clay vale, generally mixed farming in open field communities. The 1713 inventory of John Leaver, a prosperous yeoman of Brightwell near Wallingford, left 140 sheep, 7 cart geldings and mares, a bull, 14 milking cows, 6 hogs, 6 pigs, poultry, and growing crops comprising 43 acres of barley, 42 acres of wheat, 23 acres of beans and 13 acres of peas and vetches. He owned 52 acres of grassland, and had £12 worth of fruit in his orchards. He had 110 quarters of malt worth £100 in storage, plus 93 new cheeses worth £4 (ibid., 337–39). The west end of the Vale was dairying country, with many enclosed fields farmed by small tenants leasing land from absentee lords who tended to hold large estates of land spread across the region. The dairying area extended into north Wiltshire, where small, enclosed farms specialised in cheese production, with some production of beef, bacon, mutton and wool, but only limited arable (VCH 1959, 44). Along the Corallian ridge on the north side of the Vale, lighter and better drained loams, sands and gravels supported larger farms with common fields, often extending into the lower-lying dairy region. Here sheep were kept in greater numbers and the emphasis was on the production of barley and wheat as market crops; some cattle and sheep were raised for meat on the lower-lying lands. A typical inventory from this region is that of Joan Southby of Buckland, from 1690, who left 173 sheep, 20 cows, 3 heifers and a bull, 6 hogs and a sow with pigs, 11 horses and 4 colts, 7 stocks of bees, poultry, and growing crops comprising 43 acres of barley, 25 acres of wheat and 20 acres of beans, with 150 quarters of malt in store.

The Kennet Valley was a relatively fertile area of of alluvial and gravel soils where a sheep-corn system prevailed, utilising grazing lands on the Downs. Much of southern and

south-eastern Berkshire, however, remained intractable heath, woodland and rough pasture, with some dairying and the raising of livestock, including plough horses. One of the major industries of the region by 1750 was the growing and cropping of coppice wood for various agricultural uses, including hop poles. North of the infertile Bagshot Plateau, the London clay supported mixed farming similar to that in the clay vale of Oxfordshire and Buckinghamshire, with an emphasis on arable crops despite the relatively poor, ill-drained soils, a wide variety of crops grown in rotation, domestic dairying and some production of sheep, lambs and cattle for meat. To the north, the chalk plateau south of the Thames from Twyford to Maidenhead was generally enclosed, with much parkland and woodland, with wheat and barley grown on good soils to which chalk and lime were added, and some raising of sheep for mutton and lamb for the London market (Wordie 1984, 340–41).

On the opposite bank of the Thames, the Chiltern dipslope offered two strongly contrasting farming regions. The infertile Burnham plateau remained heavily wooded, principally with beech. To the south, bordering the Thames, were excellent loams on the Taplow gravel terrace, which Wordie suggests supported the best farmers in Buckinghamshire (ibid., 342). Careful attention was paid to cultivation, with extensive manuring, cross-ploughing and drill sowing by the end of the 18th century. By this time, market gardening had become the main farming practice in the area.

Closer to London, Middlesex had become, by the 18th century, almost an effective suburb, where rich citizens, gentlemen, the nobility and the crown had their rural retreats. By 1700, the population of London is thought to have risen substantially beyond half a million (Richardson 1984, 246). The capital's demands for hay and straw had become 'almost insatiable', and four additional hay markets were set up in the 17th century, at Whitechapel, Westminster, Chapel Street and Haymarket, Piccadilly. Large parts of Hertfordshire and Middlesex were given over to the production of hay, with some farmers specialising exclusively in hay production. Although much market gardening was focused very close indeed to the city, being particularly important at places such as St Martin in the Fields, it was also spreading westwards along the Thames as far as Hampton, Isleworth and Sunbury, as well as northwards into Bedfordshire and Hertfordshire. Rural industry was limited in Middlesex, but baskets and mats were made, and by-employments of this kind were to be found in Thames-side parishes like Hampton and Sunbury. Richardson quotes the inventory of John Evans of Sunbury who died in 1673, leaving 2 cows, a bullock, a calf and a hog, together with his stock-in-trade of reeds, worth £10.10s (ibid., 266). South and west of the Thames, in north-west

Surrey, there was a stark contrast between the poor furze-covered heathlands that extended from the river Wey westwards to Windsor, and the fertile alluvial, gravel and brickearth lands along the Thames itself and its tributaries (Short 1984).

Much of the Thames-side land remained in often highly fragmented and intermixed open fields throughout this period, perhaps reflecting its high value and the very varied uses to which it was put, for gardening, fishing, carriage and industry. A variety of cereals and pulse were grown in the London region, reflecting the readily available markets. Wheat and barley were the main cash crops, but rye and buckwheat were grown on the western heaths, and oats were grown in increasing quantities throughout the region to feed the ever-increasing numbers of horses in the city. As in Middlesex, hay was extensively cultivated in hay meadows, and water meadows were created on the rivers Mole and Wey. Hay was required in great quantities for London's cowkeepers, many of whom kept their animals much closer to the city to enable them to sell milk. Pasture for fattening animals was also a valuable use of land near to London. Demand for lamb was high, and ewes brought up from the West Country would be sold at Kingston, for example, and then fed on rye, clover, tares and turnips around Esher, or sainfoin around Croydon. 'Heathcropper' sheep could be fed on the poor heathlands and folded on arable nearby, and produced sweet mutton. Other fattening enterprises in the region included fattening of birds and fish, with fishponds created in the dips and hollows on the heaths, while pigs were fattened on distillery and starch factory waste. Market gardening in Surrey extended as far as Chertsey and Weybridge by the middle of the 17th century, where carrots, cabbages and turnips were grown. Osiers were cultivated and harvested from the many Thames 'aits' or alluvial islands.

THE PERIOD 1750–1900

by Anne Dodd

Overview: the agricultural revolution?

After a century of stagnation, prices for agricultural products began to rise again as demand grew from a rapidly expanding, and increasingly urbanised, population. Agricultural prices reached a peak in the years around 1800 when a series of poor harvests coincided with fears of shortages caused by the war with France. Thereafter, however, although the population and

urbanisation continued to increase at an unprecedented rate, agricultural prices did not, and this is generally considered to be the result of increasing output by English farmers (Overton 1996, 66–7, figs 3.2 and 3.3). At the beginning of this period the population of England stood at around 5.7 million, probably the highest it had ever been. The century and a half that followed saw exponential population increase. By the time of the first national census, in 1801, the population of England had passed 8 million, rising to 16.5 million by 1851, and 32 million by 1901 (ibid., 75, table 3.5). Domestic agricultural output rose over the period from 1520 to 1851, and provided most of the food consumed by the expanding population with imports contributing very little as late as 1851. A change in output of different agricultural products occurred over the period from 1700 to 1850, and it is likely that wheat production had more than doubled, while barley production had increased by over two-thirds with other types of food probably increasing by a similar amount. Over the same period, the area of land taken into agricultural production rose substantially (ibid., 76, table 3.6). Land sown with arable crops had doubled and proportionately much less was being left fallow. The area of meadow and pasture rose sharply in the 18th century and declined in the 19th century as arable land expanded. These increases in output were not, however, accompanied by a commensurate increase in the numbers of people working in agriculture, and estimates suggest that the output of each agricultural worker increased nearly fourfold between 1520 and 1850 (ibid., 82, table 3.8). Effectively, by the 18th century the output of one labourer could feed one other person, while by the middle of the 19th century it could feed nearly three more people (Williamson 2002, 4). Much of the dramatic increase in productivity has traditionally been attributed to the 100 years between 1750 and 1850, the period of the Agricultural Revolution, which accompanied and sustained the Industrial Revolution.

The traditional view of the Agricultural Revolution of 1750–1850 was set out by Lord Ernle in 1912, in his *English Farming: Past and Present* (Prothero 1912). The increased output was attributed to large-scale enclosure of open field and common land, the adoption of new agricultural machinery, the improvement of livestock breeds, and the adoption of new crops and crop rotations, particularly involving clover and turnips (Williamson 2002, 1). Prior to the 18th century, it was believed, farming had continued to operate according to relatively wasteful and inefficient medieval methods. However, this view has been both questioned and modified by more recent scholarship, which has shown, for example, that many agricultural improvements were underway at a much earlier date (see this chapter, above). At the same time, some of the most important innovations largely post-date the century after 1850. The

widespread under-draining of heavy and waterlogged land did not take place until tile drains became generally available in the second half of the 19th century. Although improvements had been made to agricultural tools, including the partial replacement of wood by iron in the manufacture of ploughs and harrows, agricultural machinery was generally little used before the middle of the 19th century. The agricultural engineering industry did not develop on any scale until the 1830s, when the price of iron fell and the development of machine tools reduced costs and increased the reliability of production (Overton 1996, 121–5). Artificial and imported fertilisers and bought-in manufactured animal feed, such as oilcake, were also not available on any scale until after 1840. Although the revolution was not quite the total transformation suggested by traditional accounts, the period from 1750 to 1850 nevertheless stands out as being that of the most rapid and fundamental change in agricultural productivity and output (Williamson 2002, 4; Overton 1996). Wheat yields appear to have increased nationally by some 50% over this period, from 20 to 30 bushels per acre, while barley yields doubled from 25 to nearly 50.

On the one hand, output could be increased by enlarging the cultivated area, and on the other by increasing productivity. However, the two are very closely linked. As Overton (1996, 88) points out, even in the 16th century, most land was in agricultural use though much of it was being used non-intensively. The long-term, sustainable enlargement of the cultivated area was therefore closely linked to productivity and increasing intensity of use. Although, land improvement in the form of liming and marling, the adoption of new crops and crop rotations, and the improvement of livestock, were not new, it seems to be during this period that they were widely adopted. This not only increased productivity on existing land, but also enabled arable cultivation to spread, for example, onto soils that would previously have been unusable, or only marginally usable, for the purpose. This was perhaps most significant of all in the east of England, where draining and reclamation of fens had been underway since the 17th century, but intensified in this period to create what became, and remains, one of the most fertile and productive areas of arable land in the country (see Williamson 2002, 103–9). The Thames Valley saw the clearance of woodland to create new farms, such as at Wychwood (Overton 1996, 90), while the general adoption of land improvements for acid and light soils permitted the expansion of intensified farming onto reclaimed heathland and downland sheep pasture.

New crop rotations also reduced the amount of land left fallow. Fallowing had been important, as we have seen above, to ‘rest’ the soil enabling it to replenish stocks of nitrogen from the air via bacterial action, to keep weeds under control as they were grazed off by animals

or killed by cultivation, and to control pest infestations. The crops that were used to replace fallow provided the same benefits, but with the advantage of also providing much more nutritious animal fodder than a field full of weeds. Turnips grew quickly and their large leaves smothered weeds; good cultivation practice would also encourage the growing of turnips in rows, allowing easy access for hoeing, which improved the soil and removed many of the weeds that had managed to grow. Clover fixes nitrogen much more efficiently than peas or beans; while peas, beans and vetches had been grown for centuries, it has been estimated that the new leguminous plants increased total nitrogen supply by around 60% in northern Europe (ibid., 110). Changes in livestock productivity may have been even greater in this period than arable improvement, although there is generally much less information available (ibid., 111). Livestock productivity could rise in two ways. The number of animals that could be kept on a given area of land increased with improvements in the nutritional value and quantity of fodder. Such improvements had been underway since at least the 17th century, with the gradual adoption of improved grasses in leys, and the use of watering to increase grass production, but Overton (ibid., 113, 120) suggests that yields would have been increased significantly with the widespread introduction of fodder crops in arable rotations from the 18th century, and particularly in the first half of the 19th century. The best known of these was the Norfolk four course, in which four fields grew, successively, wheat, turnips, barley and clover. This meant that instead of leaving large areas of land fallow every year, and feeding animals on weeds, hay and permanent pasture, often of limited nutritional quality, all or most of the land was in productive use and the nutritional value of the resulting fodder was considerably better. Secondly, the productivity of the animal itself could be improved. Over this period, it seems likely that both sheep and pigs were increasing in size, as farmers bred the former for quicker growth to maturity, and a distribution of flesh to the expensive parts of the animal, and the latter were perhaps increasingly kept indoors and fed more intensively (ibid., 114–6).

The growth of the agricultural market

The period from 1750 to 1850 was not only one of rapid population growth, but also of rapid urbanisation. With increasing numbers of people living in towns and working in industry and commerce, with no means of producing their own food, the transportation and marketing of agricultural produce had to become more efficient. In the earlier part of our period, the great majority of people had lived in the countryside and were likely to have been involved in food

production on at least a part-time basis. Many farmers could produce enough basic food for their own needs, and the contemporary concept of the market was a place where producers would bring their surplus and sell it directly to consumers. In the early 16th century, most marketing remained very local, with a network of hundreds of town and village markets providing weekly opportunities for buying and selling, largely to those living with a radius of some 6–10 miles. The principal exception was London, where the very large population drew on the agricultural resources of a much wider hinterland. Trade in some goods, such as wool, and grain for the London market, had long needed the input of middlemen in the form of merchants who would buy up goods directly from producers, from regional fairs, and from local markets, and sell on (usually at a considerable profit) to London or abroad. Such developments are clear from the medieval period onwards, but transport costs ensured that it was generally only high value products such as these that were traded over long distances.

By the 17th century, livestock marketing had become organised on a national scale, as animals could also be moved with relative ease on the hoof. Cattle reared in Wales, Ireland and Scotland were brought to England and sold on to farmers in the south for fattening (Overton 1996, 139). Local marketing remained more significant for grain, but ever-increasing quantities were being moved over longer distances, and particularly to London. By the 1830s, however, national markets had become established in most agricultural commodities except highly perishable ones such as milk and fresh vegetables (ibid., 140). The integration of the markets was promoted by greatly improved transport facilities, particularly with the spread of turnpiking from *c* 1700, and the building of canals from the 1770s; information about prices could also be spread rapidly as letters and publications were carried across the country by stagecoaches and the Royal Mail. The development of national markets was accompanied by a rise in the numbers of middlemen. These included wholesalers and dealers who traded in agricultural produce, and those who bought in bulk for processing, such as millers, bakers, maltsters and butchers (ibid., 144). Such people would buy directly from the producer and by the 19th century, it was usual for farmers to take a sample of grain to market to shown corn dealers in anticipation of a large sale, rather than taking a waggon load of grain to sell in small lots direct to consumers. By 1800, dealers and farmers tended to meet in inns rather than in the market place, and by the mid-19th century many towns had built corn exchanges where selling by sample could take place (ibid.). The development of national markets articulated through networks of middlemen wholesalers, dealers and manufacturers inevitably undermined the traditional markets and fairs and encouraged increasing agricultural specialisation.

Farmers and the changing farming community

Change in the social structure of the countryside arising from change in the way in which land was held had been underway since the late medieval period. As shown above, several factors combined to favour larger farmers, whose greater resources meant that they were generally much better able to withstand a run of bad farming years. There had been a strong tendency for owners to seek to consolidate and 'ring-fence' their farms and estates, and a gradual replacement of the older forms of tenancy with leases for defined periods of years at 'rack rents' that reflected the changing value of the land and the profits that could be expected from farming it. Large farms were more profitable and Overton (1996, 173) comments that larger grain farms generally had lower costs per acre than small farms and could benefit from economies of scale and more efficient use of labour. With lower costs and greater output, the profits from large farms would be higher than those from small farms, and landowners could charge higher rents for them, thus offering a clear incentive to create more large farms, and eliminate small holdings when opportunities arose.

Opportunities for commercial farming in expanding national marketing networks were undermining older systems of subsistence mixed farming, particularly in common field systems, which came under increasing attack by agricultural improvers as backward and inefficient. Overton (ibid., table 4.11) has shown that a change in farm size occurred between the 1700 and 1800 (based on data from Allen 1992). This evidence suggests that while there was a tendency for farm sizes to increase through the 17th century, the process accelerated during the 18th century on open field as well as enclosed land. With rare exceptions, surviving common field systems were largely eliminated during the wave of Parliamentary enclosure in the late 18th and early 19th century. It is not now generally thought that Parliamentary enclosure was fully responsible for the growth of large farms at the expense of smallholders, since the process was already well underway. However, detailed studies of Buckinghamshire have shown that enclosure was often associated with a high turnover of landowners, with smaller farmers particularly likely to sell up rather than face the costs associated with taking on their newly allocated land (Turner 1975). Almost all change in this period served to reinforce the restructuring of rural society into three principal groups: landowners, tenant farmers and agricultural labourers. The word 'farmer' came into general use in its modern sense in the 18th

century, replacing the older categories of 'yeoman' and 'husbandman'. Land ownership changed dramatically over the late medieval period, with the clear winners being the larger landowners, aristocracy and gentry, who possessed nearly 80% of the land by the third quarter of the 19th century (Overton 1996, 168, table 4.8). Losers included yeomen and small, independent farmers who held roughly 10%. Hardest hit of all were the small tenants or cottagers who had depended on the right to graze a cow on the common, or collect firewood, whose loss of common rights and small cottage holdings reducing them to the position of landless labourers who were dependent on waged work on larger farms. While small family farms did survive across the country in the 19th century, their numbers were greatly reduced, particularly so in the south and east. In the Thames Valley counties, the great majority of 19th-century farms were large enough to employ labourers drawn from what were, by now, sizeable populations of landless agricultural workers (ibid., 181, fig. 4.4).

Parliamentary enclosure

Another factor that has long been considered central in the increase of agricultural productivity was enclosure. Enclosure was the process by which land was transferred from the shared use of numerous cultivators to the exclusive use of a single private owner. Enclosure was not new in the 18th century, and had been implemented to a variable degree across the Thames Valley over centuries. Where, for example, all the land of a parish was held by a single landowner, it was a relatively straightforward process to enclose and this kind of enclosure (known as enclosure by unity of possession) is characteristic of the late medieval period, when land was enclosed for sheep farming. Much enclosure had also come about through more informal local agreement between holders of land. The consolidation and exchange of open-field strips could be a preliminary to permanent enclosure, and in some cases landowners might agree exchanges of land with tenants to enable them to enclose convenient areas. The importance of enclosure by agreement has generally been underestimated because it is not generally well documented. Nevertheless, evidence may be found in glebe terriers, or in government papers where a fictitious lawsuit was devised to create a documentary record of the enclosure as a guarantee against any future disputes. Often it is most readily detectable by distinctive field patterns, which tend to fossilise the shapes of consolidated bundles of pre-existing strips, making long, narrow fields with reversed-S margins. In the two tithings of Fairford, 810 acres were enclosed

in 1755 and 1657 acres in 1770 by agreements between James and Esther Lambe and smaller landowners and leasehold tenants (VCH 1981, 77). There is evidence of early enclosure by agreement in some 25 parishes in Oxfordshire, and another 17 cases in north Berkshire. At Marston, the lord of the manor, Unton Croke, was the leading figure in the enclosure by agreement amongst the 38 tenants of the two open fields in 1655.

The late 18th and early 19th centuries were to see a wave of enclosure supported by the authority of acts of Parliament, in which the power and incentive to enclose was increasingly with the larger landowners (Kain *et al*. 2004). Parliamentary enclosure no longer needed the agreement of most landowners in the township or parish concerned, but the agreement of the owners of much of the land (generally around three quarters). Thus, a small number of owners could initiate the process without general consent. The process of enclosure was almost entirely concerned with the rights of the owners of land, rather than those who were using it. The value of arable and pasture land was significantly increased, and tenants had to pay more for it as a result. Rents for enclosed land were on average 30% higher than for holdings in common field systems (Overton 1996, 162), which provided an obvious incentive for landowners. Enclosed farms were worth more because contemporaries were convinced that they were more efficient and productive, and they offered more scope and more reward for individual initiative. Enclosure provided the individual farmer with control over his own crops and livestock, the opportunity to make his own decisions about how he used his land, and all the benefit of any improvement he undertook. He was thus insulated from poor farming practice by other members of the local community, and able to change the way in which he used his land without the need for the agreement of the other cultivators. Enclosed farms were also considered to save time and labour, in that all the land lay together in blocks, and there was no longer time lost in moving between strips that might be scattered widely across large fields. Common field systems had been well suited to the farming needs of earlier times, when the great majority of people worked on the land and produced mostly to meet their own needs. By contrast, in the changing conditions of the period from 1750–1850, with improving transport, growing demand, expanding markets and a range of new ways to enhance the productivity of land, an enclosed farm was a much more attractive proposition for the commercially-minded farmer seeking to maximise his income.

Parliamentary enclosure generally occurred in two phases: the first starting from 1750 and peaking in the 1770s, which chiefly affected the Midlands and the enclosure of former arable land to create new pasture, and the second from the 1790s into the early 19th century,

during the grain shortages caused by the Napoleonic wars. The latter was chiefly concerned with the enclosure of common wasteland to expand areas of arable agriculture in light soil districts, such as the southern chalk downs. Around 1.8 million acres of common land (heath, down, fen and moor) were enclosed in the period up to 1836 by acts that were exclusively concerned with common land, and a further half a million acres were subsequently enclosed (Williamson 2002, 15).

The impact of Parliamentary enclosure in the Thames Valley region was variable. In Buckinghamshire, enclosure was strongly concentrated in the northern part of the county. Only 10% of the land in the Chilterns was affected, compared to less than 30% in the Thames Valley in the south of the county where enclosure of commons and waste took place during the Napoleonic War years of high grain prices (Turner 1977). These were the areas where irregular fields, woodland and pasture predominated, and where it is likely that much land had been enclosed by agreement at an earlier date. Oxfordshire was one of the most heavily affected counties with about half the available land becoming enclosed in this way (Parry 2010). In total, 184 Awards resulted from 190 Acts passed between 1758 and 1882. The first phase, from 1758–1784, was concentrated in the rich marlstone redlands around Banbury, and on the limestone uplands in the west. It is possible that this was driven by landowners who were keen to exploit opportunities here to raise the productivity and rents of their land, and this was usually by means of increasing pasture. The period of the high grain prices of the Napoleonic wars may have encouraged the enclosure of more marginal vale land to increase arable, while the poorest land, where woodland was a key part of the local economy (particularly in the Chilterns) was the last to be enclosed (Fig. 2). Widespread conversion to pasture, however, came only in the depths of the agricultural depression in the early 20th century, when dairying for the supply of milk by rail to Oxford, Reading and the Midlands became increasingly important (Tiller 2010a).

At the start of the 18th century, rather less than half of Berkshire had been enclosed, and only two acts were passed before 1770 (Durrant 2012). Thereafter, there were 12 enclosures between 1770 and 1779, with the peak reached between 1800 and 1820, when 59 acts were passed and 74 awards completed. The earliest enclosure acts were heavily focused in the north and west of the county, in the downland parishes of Lambourn and East Garston, and in the Vale of the White Horse. During the second decade of the 19th century the focus had moved to the Kennet Valley, the Downs and particularly East Berkshire, where the huge Windsor Forest enclosure affected 15 parishes and was mostly carried out between 1815 and

1817. Later enclosures were more widely spread throughout the county, although with a notable concentration in the north-east. The impact of Parliamentary enclosure was variable, since many parishes were enclosed piecemeal and had already seen some earlier enclosure by private agreement. One of the most comprehensive enclosures, however, was that of Didcot, on the very fertile greensand belt, where 94% of the parish was enclosed in 1852.

By contrast, Surrey had an irregular field system, and had seen a good deal of earlier enclosure. Late-surviving open-field systems were generally in the northern half of the county, mainly near the Thames (Tate 1943, 133). Enclosure made heavy inroads by the 18th century, as shown by the 1794 General View of the agriculture of Surrey which listed the remaining open field in the county. Only a few hundred acres still surviving in the Thames region at Weybridge and Walton, Thorpe, Egham and Runnymead (ibid., 135). By the end of the 18th century, there were some 73,940 acres of unenclosed land in Surrey, the great majority of which comprised commons and heathlands, with only some 8000 acres of open-field arable remaining (Parton 1985). The first peak of Parliamentary enclosure occurred in the early 19th century, applying to both arable and common pasture and heathland. A second wave of enclosure took place in the middle of the 19th century, by which time there was very little unenclosed arable surviving. Although some of Surrey's poorer land, particularly on the North Downs, was hardly worth the effort of enclosing, there were determined attempts to reclaim the extensive heathlands in the west and south-west, including the sandy heathland of the Bagshot area (ibid., 53). The cost of bringing such land into arable cultivation, however, was considerable. It required paring, burning and trenching, followed by heavy application of lime and manure and a preparatory crop of clover. High grain prices at the start of the 19th century seemed to justify this level of investment, but when prices fell back to more normal levels newly enclosed land in the area might be left as largely unimproved heath. At Windlesham, near Bagshot, for example, 50 years after the enclosure of 4000 acres in 1814, most of the enclosed fields remained heathland, with a few conifer plantations and nursery gardens (ibid., 55).

The spread of the railways created new opportunities, as the light sandy soils were ideally suited to the growing of market garden crops, such as peas and carrots, and acid-loving garden plants, such as azaleas and rhododendrons (ibid., 56). Closer to London, there was increasing pressure for the enclosure of land for new building, although much of it was subsequently found to be of such poor quality that it required extensive drainage and preparation before construction was possible. As London spread outwards, concern grew for the preservation of commons as a public amenity. The Egham Enclosure Act of 1814 provided

for an open and unenclosed green to remain 'for the pleasure of the inhabitants and the adornment of their residences on the said green'; in 1835 the residents of Clapham, then a fashionable district, took on the leases of their common, drained and improved it and made it into a public park (ibid., 57). The Commons Open Spaces and Footpaths Preservation Society, was formed in 1865, followed by the passing of the Metropolitan Commons Acts of 1866 and 1869, and the subsequent preservation of many of south London's open areas, including Tooting, Wandsworth, Wimbledon and Putney commons (ibid., 58).

Agricultural change in the Thames Valley

The period up to the mid-18th century had seen an increase in agricultural specialisation, driven by fluctuations in prices for agricultural produce, transport improvements and more efficient marketing networks, the diffusion of new ideas about agricultural improvement, and growing demand from towns, particularly London. Nevertheless, the agricultural landscape of England remained one of a complex patchwork of regional systems that reflected persisting custom and convention, the limited spread of innovations, and the exploitation of a diverse range of local resources by relatively small local communities in a variety of different ways. By the middle of the 19th century, the changes had been profound and widespread. In 1852, James Caird showed a transformed national agricultural landscape in which arable farming has become concentrated in the east of the country, where the warmer, drier climate favoured cereals, and the improved farming techniques had enabled the growing of cereals to spread onto previously marginal areas such as the fens and heathlands of East Anglia (Williamson 2002, 160, 175). Conversely, the cooler and wetter climate of the Midlands and the north and west favoured the growing of grass pasture and here, and most notably across the midland champion lands of the Middle Ages, pastoral farming had replaced the cultivation of grain. The strongest concentrations of arable farming on the light limestone and chalk uplands, and into the claylands of the Middle Thames, while arable land has declined to less than 30% across much of the clay vales.

The extent to which arable was ultimately replaced by pasture in the clay vales of our region is neatly illustrated by the mapping of ridge and furrow earthworks recorded by the RAF aerial surveys of 1946 (Williamson 2002, 39, fig. 10). Across the Midlands, arable farmers had cultivated their land by ploughing it in ridges and furrows. The survival of ridges and furrows

from the last ploughings of these lands marks the point at which they were laid down to permanent grass. The earthworks of medieval and post-medieval ridge and furrow remained extensive in 1946, although many have subsequently been destroyed. These records 'vividly indicate the extent to which, in the course of the late medieval and post-medieval periods, the English Midlands moved out of arable agriculture and into pasture farming' (Williamson 2002, 38). Even the impressive extent of 'fossilised' ridge and furrow is likely to underestimate the process, since even by 1946 some areas of earthworks would have been removed by renewed arable farming in the 19th century and during the two world wars. The absence of ridge and furrow from south Buckinghamshire reflects the fact that the system was rarely used in these areas.

By contrast, the most far-reaching effects of improvement were to be found in the districts of generally poorer soils. On the limestone uplands of the Cotswolds and the chalk of the Berkshire Downs enclosure enabled land to be taken in from the extensive heaths and downland sheep pasture to increase arable production; marling, liming and the growing of legumes improved soil chemistry, cropping followed the new rotations with turnips and other roots grown for animal fodder, and large arable farms proliferated everywhere at the expense of smallholdings. To the south of the Chilterns, enclosure had a less dramatic impact in the 'ancient' countryside, where much land had been held in this way for centuries. Here, enclosure was largely concerned with eliminating the common pasture and the associated rights of commoners. Acid heathland pasture on the dipslope of the Chilterns and in east Berkshire and west Surrey (notably Bagshot Heath and Windsor Forest) was almost invariably enclosed by Parliamentary act during the Napoleonic wars, and chalk and lime were widely applied to improve acidity. In such areas, the rectilinear fields and straight hawthorn hedge of the enclosed commons often contrast strongly with the irregular fields and mixed hedgerows of the anciently enclosed land around (Williamson 2002, 92). Another result of the drive to increase production in these areas was the grubbing up of many old hedgerows that had enclosed old, oddly shaped and often small closes to amalgamate them into larger fields that were easier to cultivate (ibid., 94–5).

By the 19th century, regional diversity was much less significant than previously, as new techniques for improving the fertility of soil meant that its natural condition was much less of a constraint. Moreover, farmers were now producing with a view to the market, rather than to satisfy a range of local needs, and this would encourage a tendency for production to be concentrated on what could be readily sold for a good price. Some of the new crops which

had been introduced into the Thames Valley with optimism a couple of centuries earlier seem not to have survived long into the 19th century. Most of the small hopyards which had sprung up in the 16th and early 17th centuries disappeared during the 18th and 19th centuries as production became more concentrated in the hands of specialist farmers in Kent, Herefordshire and north-western Worcestershire. Imports of cheaper oilseed from abroad after 1800 led to a terminal decline in the cultivation of rape between 1800 and 1830, and it did not reappear on any scale in England until the second half of the 20th century, through EEC encouragement. Farmers concentrated on maximising outputs of their best cash crops: dairy produce in the western part of the Vale of White Horse, livestock (particularly cattle) across the clay vales, wheat and barley on the uplands, oats and hay in the London region, and fruit and vegetables near all the large towns. William Cobbett's *Rural Rides* (first published in 1830) commended the farming of the Upper Thames Valley: 'The land here, and all round Cricklade, is very fine. Here are some of the finest pastures in all England, and some of the finest dairies of cows, from 40 to 60 in a dairy, grazing in them'. At Coleshill he saw 'chiefly grazing land… the making of cheese and bacon is… the most profitable part of farming here'; and at Mr Arkall's farm at Kempsford 'we saw a fine dairy of about 60 or 80 cows, and a cheese loft with, perhaps, more than 2,000 cheeses in it; at least, there were many hundreds' (Cobbett 1967, 357, 362–3, 407).

High Farming

Improved farming reached its peak in the middle decades of the 19th century, known as the period of High Farming. Although High Farming was considered by contemporaries to mean excellence, it is also a period of high inputs to achieve high outputs. Overton (1996, 193) has characterised it as a system of intensive mixed farming based on the principles of the Norfolk four course rotation of wheat, turnips, barley and clover, but by now extended and intensified. Up to this point, agricultural improvement had meant finding more efficient ways of processing and recycling materials produced on the farm itself, using relatively high inputs of labour (Williamson 2002, 139). It was essentially a closed cycle, although lime and some manure might be brought in from outside. High farming, by contrast, used inputs such as fertilisers and animal feed that were brought in from outside the farm; machinery and other technological improvements such as permanent drains and more sophisticated farm buildings were increasingly substituted for labour, and improvements drew heavily on a more scientific

approach to farming (ibid.). High farming was primarily associated with arable farming and was characteristic of large farms on lighter land. The use of bought-in oil cake to feed animals increased rapidly from the 1840s, although it never displaced the use of roots; national consumption rose from around 24,000 tons in 1825 to 160,000 by 1870, as cake became cheaper and much more readily available with the development of the railways (ibid., 140). Once farmers could supplement home-grown fodder with bought-in feeds it became possible for them to keep more animals, and livestock production expanded to meet growing urban demand for meat. A much wider range of root crops for animal feed were now grown in short fallows between major crops, including swedes, turnips, rape, vetches, kale, mangolds, rye grass, clover, cabbages, sainfoin and kohl-rabi (Overton 1996, 193). Artificial fertilisers included guano, imported from South America, and superphosphates, developed from bone-meal to which mineral phosphates were added. The second half of the 19th century saw a rapid take-up of agricultural machinery as it became more widely available. Seed drills and threshing machines (increasingly steam- rather than horse-powered) were widely adopted in arable areas by the 1850s. In the same decade, a new American invention, the reaping machine, came onto the market, and steam traction engines were being used for ploughing on some larger farms as early as the 1860s.

This period also sees significant development in the provision of farm buildings. Williamson (2002, 141) suggests that the provision of new buildings was driven in part by landowners' need to attract the best tenants, and the fact that government loans were now available for drainage schemes and other improvements. In some cases, entire new 'model' farms were constructed, sometimes on an industrial scale. Rationalisation of layout was a particular goal, so that feed, straw and manure could be moved around in the most efficient ways, and labour time could be saved. As a result, there was a marked tendency for new farmsteads to be more regularly arranged, with buildings located around one or more yards. As transport improvements ended reliance on local building materials, slate and cast iron were increasingly used. As steam-threshing was more widely adopted barns declined in importance and few new ones were built (ibid., 143).

The development of cylindrical ceramic drainage pipes in 1842, which were subsequently mass produced, underpinned a major campaign for the improvement of poorly drained land. This was supported by government schemes to provide loans for land improvement. Although the drainage of farmland was not new, the finance and cheap pipes meant that it now proceeded at an unprecedented pace, and it has been suggested that some

4.58 million acres of poorly draining land (or around 35% of the total) were drained in the second half of the 19th century (ibid., 145). In some parts of the Midlands, heavy land that had been put down to pasture in the 18th century was drained and brought back into cultivation in the middle decades of the 19th century, although in some cases this was to produce livestock fodder.

The High Farming middle decades of the 19th century have often been regarded as a golden age for English agriculture, but recent scholarship has questioned whether there were any real advances in output or efficiency despite the increasing range of expensive new inputs. Nevertheless, in contrast to the last quarter of the century, it was a time when people were enthusiastic and optimistic about farming and the possibility of further progress, though by the 1860s there were signs that things were changing. Prices for grain remained good, and those for wool, meat and livestock grew substantially, up to the mid-1870s (Collins 2000b, 75–6). Labour costs appear to have been going down, as people moved out of agricultural employment and farmers (particularly those with large arable farms) were increasingly able to replace labour with machinery; this is thought to have made a considerable contribution to maintaining farmers' profit levels over this period (ibid., 128). By 1880, as much as two thirds of all grain was harvested, and over four fifths threshed, by machine, with widespread adoption of steam power (ibid., 129). But there were signs of problems to come. By the 1860s it was already clear that artificial fertilisers would not increase crop yields indefinitely, nor would they remove the need for the traditional processes of soil improvement through liming, marling and manuring (ibid., 125–6). The new animal feeds were costly, and it is possible that 'high feeding' was in fact a relatively inefficient use of bio-resources (ibid., 126). It may indeed have been the case that a ceiling had been reached in what was possible with new inputs, given the limited understanding of the period in areas such as soil chemistry and plant and animal biology. By the 1860s much of the farming community was losing interest in agricultural science, and much poor farming practice persisted throughout the period, with a notable decrease in the quality of pasture grass in dairying districts. It was, perhaps to a considerable extent, a period of complacency. The social value of land remained as high as ever, and much of the profit on many large estates and tenant farms was directed towards maintaining expensive country landowner lifestyles rather than maximising reinvestment in the farm. Moreover, although the repeal of the Corn Laws in 1846 had removed the protection of tariffs, the development of agriculture in other countries, of fast, reliable shipping and of refrigeration was not yet sufficient to bring agricultural imports to Britain in significant quantities. In the words of E J

T Collins (ibid., 131), 'the third quarter of the 19th century was one of unparalleled good fortune, in which the full impact of free trade was postponed, and agricultural inefficiency compensated by rising prices. It was an age of serendipity'.

By the middle of the 19th century, the population of London had reached 2.5 million; its power as the nation's greatest market had only been enhanced by the railways, which connected it with all the nation's other main ports, and it completely dwarfed all the local markets in its region (Holderness and Mingay 2000). By the outbreak of the First World War, however, population growth in the hinterland of the capital and in major surrounding towns had also created other important centres of consumption at Reading, Oxford and Guildford. The diverse character of the Thames Valley region meant that its agriculture remained comparatively varied, with mixed arable and livestock farming across the clay vales and on the sheep-corn lands of the Downs, the Cotswolds and the Chilterns, while the riverside pastureland of the Upper Thames supported beef cattle and dairy herds. A marked feature of the period is the expansion of liquid milk production from the 1860s, facilitated by the railways. Milk supplied to London rose from 7 million gallons in 1866 to 20 million in 1880, and was being brought by rail from distances up to 150 miles (Coppock 1976, 315–16). The Great Western Railway carried more than any other; farmers began to deliver their milk to wholesalers' depots at the local stations where it would be taken to the capital by newly introduced fast milk trains; 'milk churns could be seen at every station between Maidenhead and Faringdon' (ibid., 316). Milk was much cheaper to produce in its liquid form than processed into butter and cheese, domestic production of which had fallen sharply by the early 20th century, with specialisation in cheese focused on areas such as Cheshire, Somerset and Caerphilly, and an increasing share taken by imports.

Another crop that flourished with the coming of the railways was watercress. Watercress *(Rorippa nasturtium-aquaticum*) is a native plant which grows around springs, alongside flowing water and in ditches.Although vulnerable to frost and flood, it is one of the few edible plants likely to be available all year round. It had probably been collected in the wild over many centuries, but rarely seems to have reached urban markets, and for this reason hardly ever figures in household accounts. There is no evidence that it was deliberately cultivated in the middle ages, though it may have become more readily available through its colonisation of millpond and fishpond margins, leats and moats. Its consumption leaves no trace in the archaeological record.

Watercress deteriorates rapidly once picked, and for this reason was not worth cultivating on any significant scale until the advent of rapid transport made it possible to bring it to metropolitan markets. The idea of commercial cultivation of watercress is believed to have been introduced from Germany, and was first taken up in 1808 by William Bradbery at Springhead near Northfleet on the south shore of the Thames estuary (Glenny 1897). Rickmansworth became an important centre of watercress production, with extensive beds in the valleys of the Colne, Gade and Chess. The coming of the railways encouraged the development of new centres of cultivation through the second half of the 19th century, in the Upper Thames Valley particularly at Ewelme and Letcombe. Here artificial watercress beds, fed by streams rising on the chalk, took the form of long narrow ponds in which the water level could be regulated. The plants were rolled beneath water level with wooden rollers when frost threatened, and regular raking and brushing was necessary to remove duckweed which would otherwise overwhelm young plants. Watercress beds had rather similar requirements to bedwork water-meadows, and, on occasions, replaced them (B Hawkins pers. comm.). One group of watercress beds in the upper Kennet valley was superimposed before the 1880s over an abandoned set of 17th-century floated bedwork water-meadows by Park Town near Ramsbury (Cowan 2005, 25–7).

The Agricultural Depression

The last quarter of the 19th century, the agricultural depression, was very different. By the end of the 1870s it was widely felt that English agriculture was in crisis. A run of poor years culminated in a disastrous harvest across southern and eastern England in 1879. Grain yields were down and livestock were widely affected by outbreaks of disease. Unlike in previous years of shortage, however, prices were no longer rising to compensate and there was a downturn in prices of both grain and animal products (Turner 2000, 303, fig. 3.18). Although this was to some extent the result of monetary factors, the chief cause was increased international competition. Prior to 1870, Britain had imported limited quantities of food, and primarily from Europe, but from 1870 onwards the balance shifted to the New World, principally the United States, Canada, Australia and New Zealand. It is estimated that world trade in grain rose from 3.8 million metric tons in 1854–8 to 17.3 million by 1884–8, and 37.7 million by 1901–13. Transport improvements kept pace with increased production, with the

cost of transporting wheat by sea and land falling by two thirds between 1868–72 and 1910–13 (Collins 2000a, 39). At the same time, improvements in the technology of freezing and refrigeration meant that perishable products such as meat, cheese and butter could now also be safely transported across the world (ibid. 41, table 1.1). As a result, low food prices persisted for most of the late 19th century and were a critical factor in the contemporary improvement in the standard of living of working-class families. A notable feature of the period is the increasing industrialisation of food processing with factories producing jam, jellies, bottled and canned fruit, pickles and sauces for growing consumer markets. By the early 20th century some 70–80% of bacon was made in factories in the main pig-producing areas, but factory production of cheese and butter remained limited. Milling was increasingly taking place on a large scale at the ports where grain was imported, and malting was increasingly dominated by the big brewers.

For farmers and landowners, however, low prices were very bad news. Moreover, agricultural workers' wages were rising and returns on many of the expensive high-farming inputs were beginning to decrease as soil became exhausted. The south and south-east of England was the worst affected area, because it was here where the drive to reclaim and improve poor quality land and expand arable cultivation had been strongest. It was a notable feature of the depression that large arable farms depending on high levels of inputs were much more vulnerable than smaller family farms specialising in horticultural crops, milk or livestock, with a more moderate output but lower costs. Thus, it was reported in 1898 that most of the clay arable in southern and eastern England was acutely depressed, while much arable land on the Downs and the Cotswolds, and on the stony soils of the western Chilterns, had been returned to pasture. The smaller family farms of dairying and stock raising areas, however, were much less affected and output declined by 20% in Oxfordshire and Berkshire and 13% in Middlesex (Turner 2000, 161, table 2 B.2). The region saw a high turnover of farmers, and many of those who made a success of farming in these difficult years were those who had entrepreneurial and business acumen and focused on reducing costs and improving profitability. On the light soils of the Downs, there were notable cases of numerous untenanted farms being absorbed into huge estates farmed with a minimum of labour.

George Baylis, of Wyfield Manor near Newbury, was representative of a new type of extensive farmer; said to be the largest barley grower in England, he kept only horses and used only artificial fertiliser for his grain. Farms of 2000–4000 acres became common in this region, formed from the amalgamation of up to 15–20 formerly independent holdings (ibid., 165).

Many of the tenancies on the Lockinge estate were surrendered (Havinden 1966). Where there had been 9 tenant farmers in Ardington and Lockinge in 1863, by 1891 only one remained, and 13 of the farms were in hand. The home farm was correspondingly expanded, and by the end of 1893 it amounted to 4427 acres. By November 1895, Lord Wantage was farming nearly 13,000 acres, including nearly 6000 acres of newly-acquired land over the Berkshire Downs. With the old staples of wheat, barley and wool fetching reduced prices through competition with cheap imports, he decided to convert some of the arable land to pasture and to concentrate on cattle and horses. The farm was reorganised and mechanised to take advantage of new ideas and developments in agriculture. Water was pumped by windmills from the scarp-foot springs up to reservoirs on top of the Downs, which by 1899 were supplying water to 3000 acres, previously used only for unprofitable sheep grazing. About 200 acres of this land became a large enclosed cattle-ranch; a famous horse stud was established; woods, copses and shelter-belts were planted over the Downs, heightening the contrast with neighbouring parishes outside the estate, where the Downs remained bare. While the costs of these investments were considerable, Lord Wantage's profits remained sufficient to underpin his social policies, developing the idea of profit-related bonus payments, providing estate housing of markedly superior quality, offering allotments, providing social and educational facilities, supporting a co-operative store and a bakery, developing saw-mills, and providing workshops for carpenters, blacksmiths, painters, wheelwrights and other craftsmen, which broadened the employment opportunities while supporting the general maintenance of the estate. This large enterprise was later able to benefit from the post-war agricultural revival in a way which landlords who had let their farms could not.

At Kelmscott, in Oxfordshire, a successful enterprise specialised in milk production and stock rearing, with an international reputation for Dairy Shorthorn cattle and Oxford Down sheep (Turner 2000, 185). On a smaller scale, there was a marked trend for successful tradesmen and dealers to take on farms as part of a portfolio of interests, or with money made in trade; such people often had considerable business acumen and 'spent little, but made farming pay' (ibid., 172). Another group attracted by the prospects of southern farms at low rents were young men from the pastoral districts of the north and west, with a notable influx from Scotland and south-west England into the Thames Valley. They had a much more direct approach to farming, carrying out most of the work themselves and with unpaid family labour, and were focused on reducing costs and maximising profits for reinvestment. They were regarded as particularly important in the development of the railway milk trade in south-eastern

Britain (ibid., 175). At the opposite end of the spectrum, however, the social value of land ownership remained high, and the lifestyle of the country landowner retained its appeal for the wealthy. Increasingly, however, by the late 19th century landowning families were selling off outlying land to raise money, and investing in equities to provide greater security of income. Similarly, men who had made a fortune in manufacturing still looked to make the all-important transition to the socially exclusive ranks of country landowners, but increasingly would only use part of their fortune to buy property, while keeping the rest invested elsewhere. Often such acquisitions were used for hunting and shooting parties, and weekends, rather than permanent residence. Some preferred to do without the risks of farming altogether, and bought small estates with a country house, or land to build one, or a villa on the suburban fringe (Beckett 2000).

The impact of falling prices for agricultural products led to significant and almost universal reductions in farm rents from the beginning of the 1880s, with falls of 50% on the thin soils of the Oxfordshire Chilterns between 1880 and 1893 (Coppock 1961, 6). Arable farmers economised by reducing the labour costs associated with expensive high farming rotations, and there was a progressive increase in the amount of land laid down to grass, even if this was often intended only as a short-term measure in anticipation of a rapid recovery that was, in the event, not to materialise. Although the extent of farm abandonment may have been exaggerated, numerous farms were taken in hand by landowners such as the Duke of Bedford, to prevent neglect by tenants, and it was reported that only two tenants out of thirty remained on Lord Camoys's estate in the Oxfordshire Chilterns in 1882 (ibid., 9). Farming standards fell, and in some places, particularly on poor arable clays and very light land, fields were abandoned to self-sown grass and weeds. The abandonment of arable was most marked on mixed farms on the clays and on the steep slopes and stony soils of the western Chilterns, particularly in Oxfordshire (ibid., 10–11). Sheep, no longer needed to fertilise arable fields, were widely replaced by dairy cows and livestock for fattening, and farms with easy access to railway stations turned increasingly to milk production. This served London demand, but also local towns and enterprises such as the condensed milk factory at Aylesbury and the biscuit factory at Reading (ibid., 12). Many farms were taken up by farmers who had moved from Scotland, Devon and Cornwall. Oats replaced wheat across most of the western Chilterns, and there was an increase in market gardening along the Thames terraces in south Buckinghamshire (ibid., 13–14). Some areas of poor soil were taken out of arable cultivation and planted with trees, usually conifers. Many former small parcels of arable in the western Chilterns were planted in

this way, and Coppock notes that they are distinguishable from the surrounding beechwoods by their conifers, their straight boundaries, and their names, such as Jubilee Plantation at Hambleden (ibid., 15).

Woodland decline

The profitable management of traditional coppice woods depended upon a continuing demand for polewood from skilled craftsmen such as wood-turners and hurdle-makers, and the market for domestic firewood, charcoal for industrial purposes and byproducts such as bark for tanning. The expansion of the canal and railway network had made cheap coal widely available, undercutting the firewood and charcoal trades, while there was a declining demand for poles, hurdles and similar products as other materials replaced them. There is evidence of a decline in coppice management after about 1870, though coppicing continued to be widely practised into the early 20th century. English woods had continued to meet the increased demand for shipbuilding timber well into the 19th century; there are records of felling several hundred timber trees in Wychwood Forest for naval use between 1791 and 1810. The first significant imports of foreign oak for shipbuilding occurred in 1809, and a significant rise in the price of naval timber is evident after 1815; but this demand was relatively short-lived, as ship-building in timber was in decline by the 1860s. By the late 19th century new industrial requirements for commodities such as paper pulp, matches and telegraph poles generated an enormous demand for softwoods, but during the 20th century that demand was increasingly met by imports from Russia, the Baltic, Scandinavia and America rather than from home plantations.

RURAL SETTLEMENTS: FARM, VILLAGE AND ESTATE

by Anne Dodd

By comparison with the effort expended on researching, excavating and understanding medieval settlement, the villages of the post-medieval centuries remain relatively under-explored. Nevertheless, until the middle of the 19th century, the countryside was home to most of the population, and not until the second half of the 19th century was the situation reversed with some 77% of the population living in towns at the time of the 1901 census (Waller 1983,

1, table 2). It is widely recognised that the development of rural settlements is complex, reflecting not only changing agricultural practice, but also change in ownership and social structure, transport and technology, and political and social attitudes. It can be said that through the complex interrelationships between these and other factors, the history of every village is unique (Rowley 1994, 2). In broad terms, however, research has shown that the Thames Valley contains two distinctly different types of rural settlement pattern. Nucleated villages were predominant in the mixed farming areas of the clay vales and the sheep-corn country of the Cotswolds and the Berkshire Downs, while the Chilterns and the Middle Thames Valley had more dispersed settlement patterns of hamlets and isolated farmsteads, with nucleated villages appearing again towards London in western Middlesex and along the Thames and the lower reaches of its tributaries in northern Surrey. These settlement patterns are associated with patterns of agricultural land use, with nucleated villages being characteristic of regions of extensive arable organised on a common-field system, while dispersed settlement patterns are associated with more irregular field systems in areas of more extensive pasture, heath and woodland.

The rural settlement patterns of the region developed in the medieval period and persisted into the 20th century; indeed, it is often the case that our first evidence for the form of regional rural settlement landscapes comes from late 18th- or 19th-century surveys and mapping. In some cases, such as the comparatively well-documented reorganisation of the landscape for the creation of the country houses of the gentry and aristocracy, with their associated gardens and parks, there is clear evidence for an abrupt and wholesale transformation of the earlier settlement. In most cases, however, the way in which rural settlements changed over the post-medieval centuries is much less obvious, and may only become evident through detailed study of buildings, topography and documentary sources at a very local level. The chronology of settlement shift and shrinkage may often only be clarified where excavation is possible. In the absence of opportunities for substantial excavations, however, there has been increasing interest in the use of test pits in the context of community projects to recover dating evidence (eg Jones and Page 2006). Surveys of the historic character of individual villages are increasingly being undertaken for planning purposes, notably in conservation area assessments and guidance, and in village and parish plans. Recent volumes of the *Victoria County History* have also included much more research into the historical and topographical development of rural settlements and their agricultural context. Nevertheless, post-medieval rural settlement remains understudied in the region.

Several factors are likely to have been important in the evolution of the region's rural settlements (Williamson and Bellamy 1987). The increased prosperity of the husbandmen, yeomen and local gentry of the late 16th and early 17th centuries led to widespread rebuilding of farmhouses, and Williamson and Bellamy comment that by the 17th century, most farmers probably had a good house of stone, brick or timber (ibid., 157). By the early 17th century in the Oxfordshire region the average yeoman's house contained at least six rooms, and the average husbandman's four or five (Portman 1960, 54). This period of the 'great rebuilding' is a phenomenon that was first identified by W G Hoskins (1953), although subsequent research has led to modifications of his views, and a greater emphasis on regional variation. Airs (2010) suggests that the process began in the timber-framed areas of southern Oxfordshire around 1550, spreading to the limestone uplands by the early 17th century, and that most of the county's medieval housing stock had been radically remodelled by the outbreak of the Civil War. Characteristic modifications included the introduction of enclosed fireplaces and chimney stacks, the insertion of upper storeys, ceilings and staircases, the creation of internal kitchens replacing earlier detached buildings, the introduction of glazed windows and an increasing emphasis on the decoration of the new well-lit and smoke-free rooms. Totally new houses in lowland Oxfordshire were often of the lobby-entry plan, with two storeys, a chimney stack placed centrally directly opposite the entrance, with a staircase on the opposite side, and heated rooms to either side on both floors. Houses of this kind were initially built in timber, but increasingly in the 17th and 18th centuries in brick, flint and stone.

In the ironstone and limestone country of north Oxfordshire, new two-storeyed stone houses were built on the medieval tripartite plan, with a through passage from the entrance leading to a yard behind, a kitchen to one side, and to the other a hall with a parlour beyond. By around 1680 a third house type was widely adopted throughout the county, with symmetrical rooms either side of the entrance passage, the services in a lean-to outshut at the back, and chimneystacks in the gable-end walls. This type of plan allowed for greater elaboration of the entrance hall and central staircase and, together with the lobby-entry plan house, was found throughout the region. The lobby-entry plan was also widely adopted in Berkshire (Cormier 2012). Here, timber-framing was gradually replaced by building in stone, flint or brick during the 17th century, although timber continued in use for barns and out-buildings until the 19th century. Corallian limestone was often used in north-west Berkshire to enclose or replace timber frames, but in the chalk areas where good building stone was not readily available a mixture of chalk-stone, earth, flint and sarsen were used in varying

combinations, particularly by poorer people. Brick came into use for lesser buildings from the late 17th century, being adopted first in the south and east of the county and becoming ubiquitous from the 19th century. Stone was used in the northern part of the county for the more expensive roofs, and straw was widely available for thatching; both were gradually superseded by clay tiles, with Welsh slate beginning to arrive in the region in the late 18th century. Despite the increasing adoption of standard building materials from the 19th century, however, the use of locally-available building materials in early post-medieval vernacular architecture is still one of the most dominant features of the visual character of most villages, and that distinctive local character changes quite rapidly as one moves from one part of the Thames Valley to another, depending upon the local geology.

Rowley (1994, 120) suggests that much unrecorded alteration of village topography is likely to have occurred because of the widespread rebuilding of rural houses during the early post-medieval centuries. He notes that widespread reconstruction is almost always associated with redesign of the layout not only of individual buildings, but also groups of houses and even whole communities (ibid.). Change in the form and fabric of the village inevitably reflected the changes that were underway in farming and the social structure of rural communities. Where substantial farmhouses survive from the early post-medieval centuries they are likely to reflect the presence of prosperous farmers with both the wealth and the security of tenure to make investment in expensive new buildings worthwhile.

In the Oxfordshire village of Little Milton, a nucleated village where the farmhouses and their associated yards still lined the streets in the middle of the 20th century, the typical medieval farmhouse had been of modest size and simple plan, and constructed in timber (Portman 1960). Two houses in the village provided evidence for the updating of medieval farmhouses in the late 16th and early 17th centuries. Surviving timber framing at Hill View suggested it originally had a hall open to the roof, built in timber with wattle and daub infilling. The house had been updated with a stone facade at the front, and with the insertion of a chimney stack and a first floor and staircase, probably in the late 16th or early 17th century. A second substantial medieval survival, Well Cottage, was half of a smaller and later timber-framed house, subsequently subdivided, that originally consisted of two rooms to either side of a through passage, and probably dates from the late 16th century. The house had been updated with a limestone rubble facade and a large chimney stack built into the north gable end. Many village yeomen and husbandmen, however, seem to have rebuilt their houses completely. The best preserved of these at the time of Portman's survey was the house known as The Garage,

dating from around 1600. It was built from rubble limestone to an unusual T-shaped plan, with a hall, buttery and parlour on the ground floor, three chambers on the first floor, and a well-lit attic above. A centrally placed chimney stack served four fireplaces, two on each floor. The Greystone Stores was slightly later, built to an L-shaped lobby-entry plan, with the hall and parlour to either side of the entrance and chimney stack and a buttery behind the hall. Fletcher Farm House was built in 1638, on a lobby-entry plan, with a massive central chimney stack, a hall and parlour to either side, a narrow staircase leading to two chambers on the first floor and a loft above. Houses built in the later 17th century, after the Civil War, seem to have been of inferior construction. These houses, Frogmore Cottage and the two Wells Farm Cottages, were of rectangular plan with two rooms on both floors and lofts above; the chimney stacks were built into one or both gable walls, and the staircase was built at the back of the entrance passage. Portman concludes by noting that several of these 16th- and 17th-century houses had been abandoned by the farmers in the 19th century and subdivided for the occupation of labourers and their families.

The changing nature of social relations in the countryside was one of the key factors behind the way in which villages developed over the post-medieval period. On the one hand, there was an increasing trend for landowners to distance themselves from their tenants (Rowley 1994, 120–21). This might be achieved by building a new house set in an extensive private park, on a new site at a distance from the old village. Alternatively, a village inconveniently situated too close to the landowner's house might be removed completely. In the late medieval period and the 16th century this might be done with no attempt to rehouse the evicted villagers. From the 17th century, more effort might be made to rehouse at least some of the villagers in newly-built settlements located out of the landowner's view. Examples of new 17th-century villages are rare, although the first stage of Great Tew, Oxfordshire, is of this period (ibid.), but the process of emparkment accompanied by the reconstruction of a village on a new site became much more common from the 18th century, when the fashion had taken hold amongst the wealthy for vast earthmoving operations to create gardens that imitated Italian classical landscapes. Resited villages tend to be characterised by regular layouts with straight roads and uniform garden plots, often both in front of and behind the houses. The houses themselves tend to be architecturally uniform and semi-detached, often built as regular rows along a diverted road at the edge of the landowner's park (ibid., 122).

One of the most celebrated examples of this process can be found at Nuneham Courtenay. The estate was bought in 1710 by Sir Simon Harcourt for £17,000, apparently

initially as an investment; it seems to have been considered a very good bargain (Batey 1968). Sir Simon's grandson, the first Earl Harcourt, decided to abandon his other homes at Stanton Harcourt and Cokethorpe in favour of a new seat overlooking the Thames at Nuneham, and in 1756 his new Palladian house was constructed on foundations built with stones brought from the ruined Stanton Harcourt down the Thames by barge. Earl Harcourt was a founder member of the Dilettanti Society, and from 1760 he set about landscaping his gardens to create a classical composition, which required the complete removal of the village community of at least 50 families to a new site. The old village is shown on an estate map of 1707, and this was overlain onto the Ordnance Survey map to show how extensively the streets, houses and closes of the village had been reworked to form the new designed landscape (ibid., 115, 118, figs 25 and 26). The new village was built along the Oxford-Dorchester turnpike road a mile away. It consisted of two identical rows of semi-detached brick cottages, one row on each side of the road; the cottages were of a single storey with attics, a garden, and a verge separating them from the road. At the north end of the village, two larger buildings provided a new inn, the Harcourt Arms, and a blacksmith's forge, to replace lost facilities on the old site. The old village church was demolished by the Earl, who replaced it with an austere Greek temple, in a move endorsed by the Bishop of Oxford as 'highly reasonable'. This was, perhaps, to be the least successful of the Earl's innovations, as attitudes soon changed. The second Earl, whose tastes ran to the newly fashionable Gothic, regretted the loss of the medieval building and was obliged to commission an architect to build him a new ruin. It is widely believed that Nuneham Courtenay is the village described in Oliver Goldsmith's poem 'The Deserted Village', in which he deplores the destruction of productive land and the traditional homes and resources of the poor for the 'barren splendour' of a rich man's garden. Nevertheless, Batey (ibid., 124) concludes that there is no evidence that the removal of the village caused any actual hardship or depopulation, and the villagers were said to have been well pleased with their new accommodation. The village continued to thrive as a Harcourt estate village, with the addition of new cottages in the same style in the 19th and 20th centuries, together with a school from 1809 and a new Victorian Gothic parish church.

The creation of new estate villages continued into the 19th century, and landowners could turn to increasing numbers of pattern books for the creation of new communities (Rowley 1994, 123; Darley 1978, 276–302). Victorian paternalism favoured the creation of ornamental estate houses for stewards, gamekeepers and gardeners (Batey 1968, 119) and new estate housing would often reflect landowners' tastes for the rustic and picturesque. Very many

villages now contain elements of estate building dating from this period, and Williamson and Bellamy (1987, 163) note that the extensive house-building programmes of the 18th and 19th centuries in villages were often made necessary by the poor condition and low standard of earlier housing. Thus, it is often the case that few very old houses survive in estate villages, which are dominated by 18th- and 19th-century building of a relatively uniform kind, but usually of a higher standard than is often found elsewhere.

The other key social factor in the evolution of the post-medieval village was the place of the poor. Over the course of the post-medieval centuries, cottage holdings and common rights had been steadily eroded, creating a growing gulf between farmers and landless agricultural labourers. As the landless population rose in the late 16th and early 17th century new regulations were introduced (notably by the Settlement Laws of 1662) to restrict parish liability for poor relief to those with a strong claim to 'settlement' in the parish by birth and parentage, marriage, apprenticeship, long service or substantial property holding. In parishes where control was strongly concentrated in the hands of one or two landowners, the numbers of poor people entitled to claim settlement could be reduced by eliminating smallholdings through the demolition of cottages and the transfer of the associated land and common rights to larger tenant farms, and by expelling those without settlement rights who attempted to move into the area. In parishes where landownership was more diverse these restrictions could not so easily be applied; the populations of these parishes increased and many small landlords benefited from letting cottages, often in very poor condition, to the increasing numbers of poor inhabitants. These different types of settlement are generally known as 'closed' and 'open', and by the 19th century the abuses associated with the development of this distinction had become a source of major controversy amongst social and agricultural reformers (Holderness 1972; Banks 1988). The usefulness of this distinction has been questioned by some writers, who have suggested that the differences may have been exaggerated by contemporaries who were strongly motivated by opposing views on the way in which the Poor Law was operating (Banks 1988). However, in a relatively recent review of evidence from Oxfordshire, Song (2002) has argued that the distinction between open and closed parishes was real, although perhaps more graduated.

One of the results of the 'open' and 'closed' system was that closed parishes frequently had too few resident labourers to carry out the necessary farm work, and relied on labourers travelling daily from nearby open parishes. In a review of the evidence, Tiller (2010b) maps parishes with labour surpluses and deficits in the county in 1851. The results, similar to those

of Song's analysis, suggest that the labour surpluses characteristic of open villages were more widespread in Oxfordshire, but these were intermingled with numerous parishes with labour deficits. Closed parishes were often estate dominated, with relatively small populations, concentrated landownership, controlled development, large farms, low poor rates, limited but high-standard tied housing, strong Anglicanism and few crafts, trades, shops or pubs (ibid.). Open parishes had larger populations growing rapidly to around 1851, diverse ownership, more and smaller farms, high poor rates, plentiful but poorer-quality rented housing, more religious Nonconformity and less social deference, more small industries and crafts and more shops and pubs. Williams and Bellamy comment that open villages often have houses that range widely in age and are often irregular in form as a result of alterations and extensions over the centuries. Many open villages also contain large old houses that were subdivided to form cottages in the 18th and 19th centuries, when the farmer occupants moved out into new farmhouses (Williamson and Bellamy 1987, 163). Closed villages tend to be most common in areas where early depopulation and concentrated landholding encouraged relatively early enclosure. Numerous examples can be found in the limestone upland areas of Oxfordshire, particularly in the Cotswolds and on the borders with Buckinghamshire and Northamptonshire (Rowley 1994, 128). Conversely, closed villages tend not to occur in forest districts and were generally rarer in areas of southern and south-eastern England (Holderness 1972, 134).

Farmsteads and farm buildings

A variety of different types of farmstead layout can be identified, reflecting the considerable diversity in of farming practice both over time and in different areas (HE 2006, 42, fig. 16). Simple linear plans, with the farm buildings attached in line with the house (including the classic longhouse), are generally typical of upland areas and rarely found in the south east. There are no longhouses in the region, but linear plans occur in the Cotswolds. The L-shaped plan, with the house fronting the village street and a barn attached at right-angles may formerly have been a much more common plan for small farmsteads, but there is now little surviving evidence for them. Dispersed groups of buildings displaying no evidence of a formal planned layout are most typical of areas of small farms with few buildings, and may occur, for example, on the fringes of heathland. The loose courtyard plan is the predominant farmstead type in the

region, and comprises a collection of detached structures arranged around a yard, with the farmhouse usually located on one side.

These loose plans evolved over time, as new buildings were added. Barns were often extended and had porches added as grain output increased, and second barns might be built. A separate cow house and stable block are typical additions, and new free-standing granaries were added from the 17th century, but increasingly from the 18th and 19th centuries. New walls might be built connecting the buildings to create yards for the winter shelter of animals, and livestock shelter sheds were typically added between the late 18th and the late 19th centuries facilitating the easier collection of manure. Regular courtyard plans are typical of the model farms of large estates with their integrated buildings; although the region contains some notable examples such as Prince Albert's farms at Windsor and the Earl of Radnor's model farm at Coleshill, model farms do not occur in high numbers in the region.

The region has good survival of barns, reflecting the continued importance of arable agriculture. On the chalk downlands, barns could be ten or eleven bays in length with two threshing floors, although barns of five or six bays with a central threshing floor were more typical across the whole of the region. Most had large, opposed doors to the threshing bay, but porches were often a later addition. Within the Thames Valley, aisled barns are particularly concentrated in Berkshire, and all the earliest barns here are of this form. The expansion of arable agriculture led to the widespread building of new barns and the modification of older structures from the 18th century, and barns of this date on the chalk downlands are usually either large, unaisled timber framed buildings with slate roofs, or brick and flint combination barns. Staddle barns, raised on mushroom-shaped staddle stones as protection from damp and vermin, are a characteristic regional development of the chalk downlands and are found in Berkshire; they tend to date from the mid to late 18th century, but the type was not widely adopted. Mechanised threshing was not widely adopted in the region until the later 19th century, probably because of the continuing wide availability of cheap labour; during the second half of the 19th century farmers tended to make use of portable threshing machines powered by horses or mobile steam engines. Horse-engine houses are known to have been added to a small number of barns in Berkshire, but few survive, while the use of fixed steam power tended to be limited to the very largest model and planned estate farms.

Grain was often stored in the lofts of farmhouses and barns, particularly before the middle of the 18th century, but free-standing granaries came into use in the later part of our period, and free-standing granaries on staddle stones are known in Berkshire. By the early to

mid-19th century granaries were more commonly incorporated into combination ranges and built above cart sheds. Cart sheds were usually built close to the stables and roadways, and were often built facing away from the farmyard, with direct access to the fields beyond. They are commonly single- or double-storey detached timber buildings with one open side, ranging from two to six or seven bays in length. The sheds were used for the storage of carts, wagons, harrows, ploughs and other agricultural machinery and their size tends to reflect the scale of arable agriculture, with more implements and larger cartsheds being needed where arable cultivation was most extensive. They survive quite widely within the Thames Valley. Hay barns, in contrast to corn barns, were open-sided to allow air to circulate freely. They tend to be rare in the Thames Valley until the introduction of the mass-produced metal Dutch barn in the late 19th century. Early cattle buildings are rare in the region. Barnwell and Giles (1997) did not locate any that could be securely dated to before 1800 in their study of south-west Berkshire. Cattle housing becomes more common in the region from the late 18th century, with the appearance of cattle sheds in the form of open-sided single-storey shelters on one or more sides of the courtyard, often attached at one end to the barn. In Berkshire, cattle shelters were often built against barns; covered yards are not generally found in the region except on large estates, where they tended to be constructed from the late 19th century. Dairies for the making of butter and cheese were usually incorporated into the farmhouse, but these rarely survive in recognisable form.

The region has relatively good survival of pre-1800 stables, as the use of oxen gradually declined in favour of horses. Horses were kept in very large numbers, and it was estimated that one horse was needed for every 20 acres. Stables are often the oldest building on a farmstead after the barn, and were typically well built, often near to the house, with easy access to the fields. Stables were usually two-storey buildings with a first-floor loft for hay and accommodation for labourers; floors were cobbled or (later) built of engineering bricks, with a drainage channel, and the interior space was divided into stalls. Stables were often converted into dairies following the introduction of electrically-powered milking and cooling machinery from the 1950s. There are numerous examples of surviving stables in the region dating from the 18th and 19th centuries, typically built of brick or local stone. Some farms on the Berkshire Downs became dedicated stud farms in the later 19th century, focusing on the breeding and training of horses for racing and hunting. Despite the importance of sheep rearing in the region, and documentary evidence suggesting that they were relatively common in the medieval

period, there is now little surviving evidence for sheep housing in the region. Dovecotes were usually associated with gentrified or manorial farms, and were often decorative buildings.

Barnwell and Giles (ibid., 11–13) noted that most farmstead in south-west Berkshire had buildings of a variety of dates, resulting from a protracted process of piecemeal addition. Few complexes, however, survive in anything like their pre-1800 form. Farmstead layouts with the heavier shading showing the location of barns, which were almost invariably the oldest surviving buildings (ibid., 16–17, fig. 2.4). The simpler plans had the main farm buildings ranged along two sides of a yard, with the farmhouse set a little apart, either in-line or on a third side. In more complex arrangements, buildings were grouped around three or four sides of a large yard which was often irregular in shape (ibid., 15). These were usually dominated by the barn or barns by the middle of the 19th century. In some places, the second half of the century saw the addition of livestock sheds and yards. Despite the presence of some notable integrated model farms, most Berkshire farmsteads remained largely traditional or unimproved, and estates may have been unwilling to invest in largescale rebuilding, particularly on smaller farmsteads where cheap labour meant that costly redesign to increase efficiency was not an urgent priority (ibid., 16).

Barns were timber-framed well into the 19th century and their form changed little. The commonest type was an aisled, weather-boarded building under a hipped, thatched roof (ibid.). Unaisled barns and brick construction became more common in the 19th century. Barns were provided with full-height opposed doors with a threshing floor between; many farms had more than one barn, with many examples of two barns and some with three and even five. The increasing number of barns might reflect an expansion of arable cultivation, or the provision of additional facilities for the processing of different cereal crops. A small staddle barn was recorded by Barnwell and Giles at Holt Lodge, Kintbury. Granaries were also common on the farmsteads of the region and were often provided with lockable doors and sited close to the farmhouse for security. Most were small structures, often timber-framed, but sometimes of brick, and set on staddle stones. In other cases, granaries were located on a first floor over a cartshed (ibid., 28–9). Most stables in Berkshire date from the first half of the 19th century. Typically, they are built of brick, emphasising the importance attached to providing good accommodation for horses. Stables commonly had a hayloft on the first floor. Most stables in the region were small, accommodating four to eight horses, but the size of the stable would increase with the size of the farm and at South Stanmore Farm, Beedon, there was stabling for as many as 12 horses for a holding of 133 hectares (330 acres). Conversely, the provision of

cattle shelters was a feature of the High Farming era, when the greater importance attached to manure production led to more intensive management of cattle and increased use of cattle housing and yards. Cattle sheds were usually open-sided shelter sheds connecting with a yard, and usually timber framed on a brick plinth, although examples completely built in brick were not uncommon, especially on larger farms (ibid., 33, 34, fig. 24). Cow houses for dairy cattle did not survive well in Barnwell and Giles' survey area, but they appear to have been single-storey buildings that were often completely enclosed and frequently small in scale. There was generally little evidence for specialised buildings or structures associated with sheep housing, although a possible sheep shelter was recorded at Easton Farm, Welford (ibid., 38, fig. 2.28). There was no evidence anywhere for buildings related to pig production on a commercial scale, and the typical provision was a small range of sties for a couple of pigs kept for domestic consumption (ibid., 35–8). The cartsheds recorded in the survey were generally of the early 19th century or later, and comprised single-storey open-sided sheds, usually of timber framing though sometimes of brick; they were frequently detached, and in a courtyard plan would face outwards. Evidence was seen in places for the addition of larger bays for the accommodation of the machinery that was increasingly adopted during the second half of the 19th century (ibid., 40–41).

THE RURAL LANDSCAPE IN THE 20TH CENTURY

by Trevor Rowley

Introduction

The rural landscape of the Thames Valley is still characterized by marked local differences, but regional variation is now often 'masked by first the influence of the capital and then by spreading urban landscapes' (Roberts and Wrathmell 2000, 42). Today, the Chilterns mark the western boundary of the area subject to the immediate impact of London. The Thames Valley to the west of Goring Gap remains more obviously rural, but the influence of the capital and of other urban centres on the surviving rural landscape can be traced everywhere, not always in obvious ways. During the 19th century the Thames Valley countryside absorbed the railway and the process of suburbanization had accelerated, but in 1900 the region had still to meet the revolution of the motor age. During the 20th century parts of the Thames Valley changed at an

unprecedented rate. The principal agents of this change were housing, industrialization, quarrying, roads, recreation, and a dramatically transformed farming base. House building and collateral development have steadily pushed out farming and horticulture, and by the end of the century conventional farming had largely disappeared completely from the Middle Thames Valley.

Changes in agricultural practice radically altered the way the land was farmed as the century advanced. The agricultural depression of the first part of the century gave way for the need to produce more food during two world wars. This led to the development of a more efficient agricultural industry, and the impact of technological change on farming was enormous. Political and administrative changes also had a profound impact on British agriculture. Government intervention through the Agriculture Act 1947 and other price support systems, and later the European Community's Common Agricultural Policy (CAP) after 1974, encouraged the expansion of productivity and concentration on specific highly subsidized crops. Farming became increasingly mechanized, with a very small workforce, and by 2001, 75% of England's land area was given over to agriculture, but in the Thames Valley counties of Surrey, Berkshire, Buckinghamshire and Oxfordshire only 1.1% of the population was engaged in agriculture, hunting and forestry (Census 2001, National Report for England and Wales).

The Thames Valley was still largely agricultural in 1900, though farming was economically much less important than it had been a century earlier. Two major factors were at work during the first forty years of the 20th century: outer London continued to expand westwards, while at the same time the agricultural depression brought down land prices. To the east of the Chilterns, the two worked together to fuel the growth of light industry and suburbia as the depressed price of land encouraged the spread of relatively cheap housing and new factories. To the west of the Chilterns, the character of the agricultural depression was very similar to that found in other parts of the country, apart from around Oxford, where new industry fuelled large-scale urban expansion.

In the western area, things remained much as they had done during Victoria's reign. The Enclosure movement was over and the Thames Valley was an enclosed region of fields, hedges and country roads. One anomaly was the survival of open fields at Eton, where, in 1900, North Field and South Field were still divided into strips—remnants of the medieval field pattern. An attempt to enclose the fields by act of parliament in 1826 was defeated by a petition by parishioners and an intervention by the Crown, which held one of the two Eton manors. It

was not until 1902 that agreement between the two manors resulted in the landholdings being rearranged. The land, however, remains technically unenclosed (Hunter, 1994). Most common land in the region had been swallowed up by Parliamentary enclosure. Where they survived, commons were often used in a traditional way. In other respects, however, a quasi-feudal social structure survived well into the century in several rural communities. For example, at Woodstock in Oxfordshire as late as the 1920s, 'most ... villagers worked for Squire Ashurst, lived in his cottages and were ruled by him'. At Goring 'on the last day of school the local gentry came round and offered jobs' (Howkins 2003, 57).

Up to the First World War, thirteen-year-old boys taken on to the land after leaving school in the Oxfordshire Cotswolds could expect to earn 2s 6d (12.5p) for a twelve-hour day, seven-day week. Farm wages rose during the war, but dropped sharply afterwards. In 1908, when a farm worker fell ill in Enstone, his wife and mother of four small children was obliged to walk five miles each way to confront the Board of Guardians of Chipping Norton workhouse to plead for Parish Relief. In the event, she was awarded one loaf of bread a week. For the rural poor, the workhouse presented a real threat in times of hardship (Stewart 2003, 57). For many girls, domestic service was the only opening available. In those counties, which contained a high proportion of gentry and aristocratic households there was a strong demand for servants. As late as 1921, 16.8% of all employed women in Surrey were in 'personal and domestic service' and in Buckinghamshire the figure was 16%, compared to the national average of 11.9% of employed women (Howkins 2003, 89).

The modern period saw the appearance of some unusual new field shapes. At Lambourn and Blewburton on the Berkshire Downs, for instance, the enlargement of the racehorse breeding and training industry based there led to the growth of an unusual field pattern in the late 19th century. The area was already one of large rectangular fields because of Parliamentary enclosure; now these were lined with thick shelter belts of trees and subdivided into long paddocks, edged by plantations, to provide gallops for the horses. In addition to the gallops, many of which now have an artificial surface, there are nearly 40,000 racehorses at training yards, stud farms and liveries. The horse racing industry here employs almost 1400 full-time workers and is second only to Newmarket in importance. It now lies largely within a designated Area of Outstanding Natural Beauty (www.northwessexdowns.org.uk).

In some areas, especially close to the larger towns or where there were good railway communications, smallholdings concentrating on market gardening were created, often resulting in the break-up of existing fields into a patchwork of small plots. Many small towns

had extensive nursery, market garden and allotment areas, sometimes accompanied by large areas of glasshouse, sited just outside the built-up area. The 1898 6-inch Ordnance Survey map of Oxford shows nursery gardens surrounded by new housing as the city expanded to the south-east of Magdalen Bridge (OS Historical Sheet E236). Around many towns, such as Reading, the market gardens were interspersed with clay pits, the contents of which were used to make bricks for new suburban housing. The transition from pasture to market garden to suburbia in quick succession in the early decades of the century was a common sequence of changes close to towns of all sizes.

In the second half of the century, in an era of increased personal mobility, the Middle Thames Valley as far as the Chilterns effectively became part of a London city region. New industries, offices and housing were established on a massive scale, particularly around the edge of the towns and villages of the region. The unplanned ribbon development of the interwar years was replaced by post-Second World War planned suburban housing estates, out-of-town shopping centres and industrial estates, interspersed with green belt, conservation and recreational areas.

Local authority planning procedures played an increasingly important role in shaping the landscape, added to which there have been a steadily increasing number of national, regional and local conservation policies and initiatives to protect ecological, historical and archaeological features and to provide spaces for leisure and recreational activities. The resulting landscape in areas of greatest pressure, which tend to be those lying adjacent to high-density population concentration, is highly compartmentalized. The 2006 1:2500 Ordnance Survey map covering the ten miles or so of the Thames between Walton-on-Thames and Windsor portrays an intensively used landscape, divided up into numerous separate functions (OS Explorer Sheet 160). A casual glance reveals large numbers of lakes, reservoirs and waterworks, many of which originated as gravel extraction pits. These provide water for London, sailing and water-sport facilities, and nature reserves. There are also considerable numbers of housing estates of varying shapes and sizes, almost all of them dating from the 20th century, and there are caravan and mobile-home parks. A more considered examination of the map reveals a kaleidoscope of different land uses. There are public facilities such as hospitals, cemeteries, penal institutions, schools, colleges and universities. The area also provides a playground through its woodland and parks, marinas, playing fields and numerous other leisure amenities. There are golf courses, royal palaces, country parks and theme parks, as well as protected meadowland, common land, moorland, woodland, heathland and scheduled historic

landscapes. There are industrial, science and retail estates, film studios, and one of the largest and busiest airports in the world. There are nurseries, allotments, and a little, very little, conventional farming. Across this intensively used mosaic runs a complex network of rail and road communications, dominated by motorways.

In marked contrast, only 80 miles away at the western end of the Thames Valley region, the ten miles between Cricklade and Lechlade displays a far less intensively used landscape (OS Explorer Sheets 169 and 170). Once again, old gravel quarries have produced extensive stretches of open water, here used primarily for recreational and conservation purposes, but a conventional rural landscape of villages, hamlets, fields and country roads dominates the remaining area. There is one large extant airfield and evidence of a relic Second World War airfield on the river's northern terraces. The rural landscape here owes much to the post-Second World War planning process, and development control has restricted land-use change for the most part. However, a little to the south, the conurbation that is now Swindon incorporates many of the features found in the eastern Thames Valley. The population of Swindon grew from 4500 in 1901 to 155,000 in 2001. This occupies the whole urban and suburban area, which now measures approximately six miles east-west and five miles north-south.

Agriculture to 1939

Intense competition from North American grain, Argentinian beef, Australasian wool, mutton and lamb, and Danish bacon brought about a protracted agricultural depression in Britain, which began in about 1870 and lasted with a few brief intermissions until 1939. In the parish of Great Missenden, in the Chilterns, arable land fell from 80% of the farming area in 1870 to 50% in 1914 (Coppock 1961). In this area, not only was arable land converted to dairy pasture, but some former ploughland on hillsides turned to scrubland. In Berkshire, the area under cereals dropped by over a third between 1872 and 1922, while there also was a dramatic fall of 75% in the number of sheep in the county during the same period (Hunter 1995).

Agriculture recovered towards the end of the First World War as, under the Food Production Act of 1917, the government encouraged the expansion of arable land. The price of grain was guaranteed by the government, and land that had not been worked for a generation was ploughed up again; there followed a 30% rise in national cereal production. For a brief period, the war shielded British farmers from the effects of foreign competition.

This protection and the prosperity that came with it proved to be short lived and at the end of the war many landowners were anxious to sell before prices fell again. Despite the brief reversal at the end of the First World War, by 1937 only 40% of the farming acreage was under arable, and scrub could advance up some of the Berkshire Downs (Perren 1995, 46). In the grain growing areas of Oxfordshire, by 1923 farmers were talking of 'the great betrayal' (Howkins 2003, 46). The Chiltern agricultural landscape became characterized by weed-ridden fields and overgrown hedges. Derelict farms were found in once prosperous areas and there was considerable social tension in some rural areas, but migration to the cities or abroad helped to relieve some of the strains. The unprofitable woodlands were left to grow too tall, making the trees vulnerable to disease and wind. H J Massingham (1936) noted that in the Cotswolds, '[w]e saw more gates open than shut, more gates that could not be shut than could, more gates broken than whole, tousled heaps of straw, dishevelled combined fields, tumbled or gaping drystone walls, ivy-covered trees, indifferently ploughed fields, weedy pastures, dilapidated farm buildings, even barbed wire sagging or twisted.'

In areas that were still largely dependent on agriculture, such as the Oxfordshire Chilterns, rural depopulation was a problem. In the little parish of Crowell, the population fell from over 200 in 1871 to just 56 in 1951, a decline which was exacerbated by the collapse of the Chiltern furniture and straw cottage industries (VCH 1964, 87). Neighbouring parishes showed a similar population decline. The population of the small town of Watlington, for example, fell from 1900 in 1871 to under 1400 by 1921. Agriculture was hit again in the 1920s and early 1930s as it was once more exposed to the full force of international competition. This was particularly a problem for cereal farmers, as grain subsidies ceased in 1921. In Berkshire, for example, acreage devoted to wheat fell from 40,000 in 1918 to under 28,000 by 1930. Between 1921 and 1939 the number of agricultural workers in Britain fell by a quarter.

The agricultural depression also meant that away from the immediate influence of London many landed estates had difficulty surviving. Rural grandees were hit by increased taxation and many heirs to estates died in the First World War. The conflict was followed by the sale of country seats and estates. Massingham (1940) commented that, '…the old Catholic house of Stonor is strangled with the ivy of finance'. Land sales had increased considerably between 1910 and 1914; and from 1918 to 1922, in the wake of the war, the land market reached a level of activity unequalled since the Dissolution of the Monasteries in the 16th century. In these four years, many estates were broken up and as much as a quarter of the land of England changed hands. Most of the land that came on to the market was bought by tenant farmers, by

whom it had formerly been worked. Thus, while only 11% of the farmland in England and Wales was in owner-occupation before 1914, by 1927 this proportion had risen to over 37%. For example, in 1923 the Selsdon Vale estate in Surrey, which included a pheasant shoot, was bought by the Surrey Garden Village Trust and resulted in a plotland settlement (Howkins 2003, 56).

Nevertheless, it is possible to overemphasize the impact of the agricultural depression on the region. Before the Second World War London remained the dominant market for agricultural produce, although by the outbreak of the First World War new markets developed at expanding towns such as Reading, Oxford and Guildford. The presence of London also influenced the shape of farming in the counties along the Upper Thames: Berkshire, Buckinghamshire, Oxfordshire and the eastern parts of Gloucestershire. The pastures along the rivers supported both beef cattle and dairy cows, whose output was sold to the London wholesalers, but there was nearly as much arable as permanent grass. There were several variants in cropping rotations, as the arable provided cash from grain, folded sheep and yarded bullocks, which was the traditional pattern for the chalk uplands and the Cotswolds, or fed cows supplying winter milk. Two or three years of wheat, barley or oats followed by a year in temporary grass and another in roots, potatoes or green crops for the breeding ewes were combined into a four- or five-course rotation. Soft fruit was grown on the sandy soils of east Berkshire, where small farms were common. On the Chilterns and the Cotswolds, the large farms kept to the traditional pattern of sheep, wheat and barley, with some milking Shorthorns on the meadows. The big Cotswold sheep herds were decreasing in numbers as more farms moved to the smaller Hampshire and Oxford Downs, either pure bred or as second crosses on the half-bred ewes brought down each autumn from the Border country (Whetham 1978, 37).

The production of milk remained profitable and many downland farms became dependent upon their dairy herds. Railway companies (particularly the Great Western Railway) provided special trains travelling through the night from south-west England to London, Bristol and Birmingham, and invested heavily in the running of milk trains from pastoral England to the major cities. In the 1920s, Watlington was described as ‘the centre of an important agricultural and grazing area’, sending two truckloads of milk to London every day (VCH 1964, 231). However, although dairy farming looked attractive to many struggling small farmers, the cost of converting premises and buying new equipment was prohibitive.

During the early part of the century, ‘horsepower’ on the land meant just that. Cereal farmers were dependent on their plough horses, although there were even plough oxen working

in teams of four in Oxfordshire before the First World War (Stewart 2003, 70). Steam ploughing was employed on difficult land where large-scale earth moving was required. During the First World War a shortage of horses led to the introduction of tractors in parts of the region, but to begin with these were often cumbersome and unwieldy (ibid., 75). Because of the depression, lack of investment meant that as late as 1939 there were still ten times as many horses on British farms as there were tractors. Nevertheless, between the wars there were other signs of mechanization. Combine harvesters and milking machines were relatively unusual, but they were to become universally used and dominant in the two decades after the Second World War. An important development in the interwar era was the increased use of the reaper-binder. Before the First World War, where the corn was flat on the ground, even large farms still resorted to the scythe. The use of reaper-binders reduced the workforce required at harvest. In contrast, the combine harvester made very little progress. It was an expensive machine, temperamental in bad weather and only able to pay its way on very large farms. Dairying, pigs and poultry were the growth areas, and there were developments in animal housing which were a signpost to what was to happen in the second half of the century. The first battery housing for poultry appeared in 1933 and intensive pig housing was also introduced. Electricity had been applied to agriculture before the First World War, but its use spread only slowly between the wars. Many farms, particularly in outlying areas, had to wait until the 1950s before they were connected to the national grid or, in some of the remoter areas, to acquire piped water.

Silage had been introduced by more enterprising farmers at the end of the 19th century; then came the import of the American silage tower constructed in wood, concrete, steel or brick. The silo was the first building of the modern age to challenge the barn as the most prominent structure in the farmyard. Since the Middle Ages, these cathedrals of the agricultural world had been at the centre of the farm's activities. Increasingly, they had become irrelevant to the daily routine, often operating as little more than storehouses. Their vast size and huge, timbered roofs made them expensive to maintain; the only thing that saved them from mass destruction in the years before and after the Second World War was the fact that many farmers lacked the resources to demolish and replace them. Often when they were demolished they were replaced by Dutch barns, constructions of steel and corrugated iron; otherwise the barn was often decayed to the point of collapse. Corrugated iron, so prominent in the Dutch barn and many other 20th-century farm buildings, vied with cement as being the single most important element in the first wave of the farmyard's material transformation. It was cheaper than thatch, tiles or timber, quicker to install and easier to maintain. The fact that it was also

liable to rust, however, made it both unsightly and, more importantly, needing regular replacement. In the early 1930s, asbestos-cement sheeting began to replace it.

The other factor which affected agriculture in the Thames Valley was the inexorable outward spread of population from London. In 1901 the built-up area along the Thames extended as far as Hounslow and Hampton Court to the north and Surbiton and Molesey to the south. By 1939 an interrupted built-up area extended along the Thames as far as Windsor and Slough (Jackson 1991, 80). The new occupants moved into speculative estates, built on agricultural land for the most part. Along the river itself, larger villas, often with tennis courts and swimming pools, were built for the entrepreneurs who ran the new businesses and department stores in London. Those areas of the Chilterns closest to London saw former agricultural land and woodland transformed into houses with gardens for new upper middle-class commuters seeking a tranquil home in contrast to their frantic London lifestyles. Old farm houses and cottages were bought up by London commuters and 'hobby farming' became a feature of the region. Wealth flowed out from London into the adjacent countryside and a new form of suburban/rural settlement was created.

In the years between the wars, the rural districts of south Buckinghamshire, for example Amersham and Eton, lost all pretence of being truly rural. The newcomers had no connection with the land on which they lived. Instead, they were attracted by the prospect of being able to live in pleasant semi-rural surroundings, which unwittingly they were helping to destroy, and yet they could travel easily and quickly to London both for work and for recreation, thus developing an entirely new society and its attendant landscape. Part-time farming became increasingly popular as politicians, businessmen and those successful in the law or entertainment sought outlets for investment that would combine attractive rural living conditions, easy communication with London and distinct tax advantages (Reed 1974, 258); although most of the new, wealthy migrants wanted the advantages of the quiet rural life without the problems associated with farming (Howkins 2003). Even to the west of the Chilterns there was commuting to London between the wars, and the population of Watlington began to grow again. This was largely because of motor transport, which brought the small town of Watlington on to the edge of London's commuter belt and into closer contact with Oxford (VCH 1964, 233). By 1960, virtually the whole of the Thames Valley saw some element of commuting, either to London or to one of the smaller cities and towns in the region (Clout 1972, 45).

The Second World War and later

There were considerable differences in the fortunes of farmers within the region even in the more secure financial environment of the Second World War and after. In the Middle Thames Valley, pre-war suburban pressure soon resumed, while further west a survey of twenty-four square miles of the rural landscape in north Oxfordshire produced a more problematic picture. In 1943, the Agricultural Economic Research Institute at Oxford undertook a survey of life in a study area of countryside, including Banbury, in Oxfordshire. It showed agriculture, still faced with many problems, in a state of slow transition. It was an area of mixed farming with wheat, oats and some barley, sheep and cattle. A few farms had moved to dairying. There were still numerous small farms: 123 averaged 100 acres in extent and only six were over 300 acres. Many were awkwardly shaped with inconveniently located buildings. Not all farms had piped water or electricity, and many were still reliant on springs and wells for water and oil lamps for lighting. At that date over 25% of the employed population in the area still worked on the farm (Mander 1946). Rural poverty was still evident with a large number of unimproved tied farm cottages. In Oxfordshire, the small farms were gradually being bought up by their larger neighbours. Between 1920 and 1970 the number of farms under 50 acres fell from 2356 to 720 (www.visionofbritain.org.uk).

During the Second World War, arable farming was supported as soon as hostilities started. Farmers were provided with labour, especially young women from the Land Army, and machinery, as agricultural workers joined up. The area of arable increased, and by 1945 it was 55% more than the 1935–39 average. At the end of the Second World War, British farmers were the guardians of the countryside and they were largely exempt from the legislation embodied in the Town and Country Planning Act of 1947, but after 1945, agriculture became production orientated. In the second half of the 20th century farmers were encouraged to maximize yields using artificial inputs and improved plant and animal genetics. At the end of the war, wheat yields were about 2.25 tonnes per hectare, virtually the same as they had been in 1900. Post-Second World War mechanization and commercialization of agriculture transformed farming into ‘agribusiness’, resulting in some of the most marked changes in the rural landscape.

During the Second World War, the Scott Committee had produced a blueprint for post-war land policies. It laid down that ‘self-sufficiency in food should be a primary objective of

post-war agricultural policy' and the Agriculture Act of 1947 ensured that, in the future, agricultural production would be supported by government. These measures did not anticipate the other great changes about to overtake farming, which were effectively another agricultural revolution. Capital investment, the substitution of powerful machinery for manual labour, highly effective pesticides and abundant, cheap synthetic fertilizers all helped to transform agriculture after the Second World War. Although these developments led to more stability in agricultural prices, progressive mechanization and the practice of contracting out led to an incremental fall in the workforce. The scale of the change can be measured by the example of Rectory Farm in Northmoor, Oxfordshire. In the 1930s, forty farmworkers were employed here on a regular basis. By the end of the century, there was just the farmer and a single employee and most of the farm work was contracted out. In post-war Oxfordshire, labour-intensive farm activities such as reaping, ricking and threshing had virtually disappeared.

There were other important changes. The process of replacing horses by tractors accelerated; although there were still 300,000 horses in 1950, a decade later they had become a rarity, and with them went their grazing and the fields of oats. The area dedicated to root crops also declined dramatically. In Oxfordshire, for example, the acreage fell from 18,448 in 1930 to 5671 in 1960 (www.visionofbritain.org.uk). The last of the local windmills and watermills fell into disuse as even those that had moved over to steam were superseded by electricity; while hand milking was everywhere replaced by machines. In Berkshire between 1942 and 1950 the number of tractors doubled, while milking machines increased fivefold and combine harvesters fourfold. The decline in manual work was followed by a further fall in the number of farm workers. The impact on the landscape of a falling workforce again included deserted farms and abandoned and derelict barns, stables and dairies, many of which were bought up and converted to residential use in the 1980s and 1990s.

By 1969, about nine million acres in Britain were being sprayed with hormone weed killers that prevented weeds from seeding. Pesticides gave farmers greater flexibility in selecting crops and rotations, but the loss of arable weeds hit wildlife. New crops also made a visual impact. This was particularly true of the striking yellow colour of oilseed rape from the 1970s, and with the pale blue of flax (which was subsidised by the European Union) and the red-violet of lavender in the 1990s. The loss, fragmentation and small size of surviving habitats was a significant factor in species decline, and agrochemicals continued to have indirect adverse effects on species populations. This decline was in part stemmed by the introduction of nature reserves and conservation policies.

The changing face of mixed agriculture can be traced through the farming story of Brize Norton in west Oxfordshire. In 1914, the parish contained 50–60 sheep per 100 cultivated acres, and in 1941–2 farms maintained flocks as large as 280 head. Cattle were relatively unimportant. In 1914, less than 30% of the cultivated area was permanent pasture and only 8–12 cattle were kept per 100 cultivated acres, among the lowest proportions in the county. Dairying expanded probably between the wars. Upper Haddon farm was a dairy farm in the 1920s-1930s; and in 1941–2 dairying was a notable activity on Manor and Astrop farms, when the latter included 91 cattle and calves. Grange, Kilkenny and Grove farms had 31, 45 and 49 cattle respectively. A poultry farm was noted in 1928–31 and farms maintained large bird flocks in 1941–2, ranging up to 600 birds.

In the later 20th century, the main farms continued to practise arable farming, but by 2000 only two—Foxbury and Astrop—kept stock. Grange farm gave up dairy farming in the late 1960s and sheep in the mid-1980s and thereafter specialized in arable. In the 1950s and 60s, Grove farm kept 50–60 cattle, 1000 sheep and 200 pigs, but only a few cattle after it was sold in 1983. Around 2000, the now-smaller estate specialized in breeding racehorses. In 2003, Kilkenny farm concentrated on arable. Foxbury farm, after a period as an arable farm, reintroduced sheep from 1993. On Astrop farm, dairying was developed from the 1970s and in 2003, there were about 500 cows. In 2003, farmers used differing four-course rotations: on Foxbury farm, wheat, peas, grass (one or two years), barley, and on Astrop farm, grass, wheat, break crop, grass (VCH 2006, 235).

By the late 1980s, government and European Union policies which had encouraged increased output, particularly of cereals, so that Europe could be self-sufficient had resulted in massive surpluses. In the early 1990s, efforts were made to persuade farmers to reduce output. This, coupled with an increase in private transport and leisure time and increased public involvement in country pursuits, resulted in government and EU efforts to encourage farmers to produce less and diversify. Some farmers found golf courses, caravan parks and theme parks more profitable than agriculture.

While the mixed farming and predominantly arable areas of England became increasingly monocultural, large acreages of formerly pastoral land were converted to arable agriculture. This process had accelerated in the 1960s and 1970s, when the Cotswolds and Upper Thames Valley were once again used extensively to produce cereals. Similarly, large tracts of chalk downland were ploughed, in many cases for the first time since the Roman era. The heathlands of Surrey were also being eaten away. There was a recognition that the rural

landscape needed to be managed by farmers with the aid of environmentally orientated grants, but existing schemes tended to be marginal; they did not tackle the problems of landscape change fundamentally. The Wildlife and Countryside Act of 1981 established Sites of Special Scientific Interest, which were partly protected from 'damaging agricultural operations'.

At the end of the 20th century, agriculture again faced another crisis. EU subsidies were diminishing in size and there were problems of competition both from within an enlarged EU and from outside. Many foodstuffs were available more cheaply from outside Britain. Against that, alternative rural activities continued to multiply, and it is estimated that there were a million industrial and office enterprises in the countryside—a higher rate of businesses per head of population than found in urban areas. In many parts of the Thames Valley, wherever planning legislation allowed it, farmland was once again being sold off for 'redevelopment', which normally meant housing or light industry. Elsewhere, diversification was normal and agricultural land was being given over to a wide range of alternative uses. Llamas, ostriches and buffaloes were among the exotic species found on some farms trying for more profitable activities.

With increased industrialization, the shape and nature of farm buildings changed. Chicken farms took the form of controversial battery hangars, which, apart from the smell, in terms of design could have happily been housed on an industrial estate. The scale of many farm buildings changed the face of the countryside, with great silos the size of parish churches to be found on some arable farms. By the end of the century the general appearance of many farms resembled that of a light industrial complex, with groupings of low-rise anonymous sheds and warehouses. As the use of asbestos became suspect and plastic more adaptable, plastic sheeting of various weights, shapes and colours became a common sight on farms. The wood, stone and brick which had been ubiquitous in the 19th century were now rarities, used mainly by the rich with an eye for the picturesque. The gap between farm and factory was diminishing. Facilities for storing and drying grain became more substantial, and grain stores took over from silos in challenging the barn for pride of place. The quantities of liquid fuel that were used every year by the larger farms called for massive storage tanks, usually sited on piers beside a cement roadway.

Cornstacks and haystacks, for so long a visible manifestation of what the farm was all about, became as obsolete as windmills. If crops remained outside, they were wrapped in giant circular bales covered in black plastic sheeting. Economic efficiency called for the removal of unwanted rubbish and there was a tidying-up both in the fields and in the farmyard. Neatness

was a part of the suburbanization of the farm, along with the village. The characteristic smells of the farm also began to disappear, outside at least. Despite the intensification of effort, ironically, large areas of agricultural countryside are emptier now than they have been for many centuries. Huge areas of fields are mechanically tended by a handful of agricultural workers and much of the stock is kept permanently indoors. 20th-century agricultural developments did much to suppress the diversity of the countryside. The innumerable local variations in landscape, as well as more regional contrasts such as that between woodland and champion areas, were gradually blurred by the emergence of several very broad agricultural regions. A basic distinction between an arable east and a pastoral west gradually replaced the complex pattern of specialized farming regions that was characteristic even during the first part of the 20th century.

Plotlands

One aspect of early 20th-century rural settlement which drew universal condemnation from the Council for the Preservation of Rural England and other conservation commentators was that curious phenomenon, the plotland. These were motley dwellings in small plots, often situated by the coast or on marginal lands elsewhere. The non-tidal Thames proved to be particularly attractive to the poor and the Bohemian alike, seeking a way out of urban squalor or monotony. Plots of land were acquired cheaply during the agricultural depression, and in some cases at no cost, by squatting. The plotland dwellers used tents, old railway carriages, old buses and caravans, in fact anything that provided a roof and walls. There were at least sixteen plotlands on the Thames riverbanks, and two, Marlow Bottom and Munday Dean, a little inland (Hardy and Ward 1984, 5). The movement was prompted by greater mobility and the search for the 'rural idyll' on the river. After the initial rush by those who could afford to buy an existing building or employ a builder to erect a new one, sites were sold or leased to humbler purchasers. Farmers and landowners, as well as ordinary householders who were not actually using the riverside end of their long gardens, were willing to dispose of odd parcels of land which were hard to use for ordinary agriculture or grazing through difficulty of land access.

Lord Mayo and Professors Adshead and Abercrombie, surveying the Thames Valley in 1929, found new developments springing up. Worse than the bungalows were the shacks and huts being constructed everywhere, such as on the island between Henley Bridge and Marsh

lock, by Hurley lock (Mayo *et al*. 1929). Plotlands were to be found at Wraysbury and Horton, Bourne End and Purley Park, with inland plots above Marlow. The Thames Valley plotlands thrived between the wars despite legislation introduced with the aim of controlling riverside development. It was not until 1947 that the Town and Country Planning Act introduced more stringent controls that restricted the development of new sites. On many of the original sites, increasing land values and general affluence have seen the replacement of shacks and shanties by more conventional, upmarket housing. Others, such as Bablock Hythe, became regular mobile-home and caravan parks.

Orchards and hedgerows

The use of increasingly large machinery necessitated the removal of thousands of miles of hedgerow, seen by many as a quintessential element in the English countryside. Between 1947 and 1990 approximately 230,000 miles of hedges were destroyed, which amounted to almost half the United Kingdom total. By the end of the century, over 2000 miles of hedgerow were still being lost every year, despite conservation measures which paid for the maintenance and restoration of hedgerows. Furthermore, as agriculture became highly mechanized, there was a decline in mixed farming. Farmers were unable to invest in the plant required for both arable and pastoral enterprises, while the availability of artificial fertilizers meant that arable farmers were no longer dependent on dung as fertilizer. Farmers no longer needed to keep animals and so they had no need for hedges, as no barrier was necessary to prevent the barley from getting into the wheat. Hedges became not only redundant but a nuisance in some areas and, until the last decade of the century, financial inducements were offered to farmers to destroy them. Hedge laying, an almost dead craft, revived towards the end of the century.

The removal of hedgerows represented one of the most dramatic landscape changes in the second half of the century. From the 1950s, the amalgamation of fields and bulldozing of hedges led to the replacement of the earlier patchwork of small fields surrounded by dense hedges by large expanses of arable land. The amalgamation of fields by removal of hedgerows and copses to allow more efficient use of machinery eroded the historic fabric of the landscape. In Buckinghamshire, for example, it is estimated that between 1947 and 1985, 27% of all hedgerows were lost (NCC 1988), while Reed (1974) noted a 64% reduction in the number of farm ponds. New boundaries were often created with wire fencing. The creation of larger fields

was often accompanied by the redirection of footpaths and bridle paths or, more seriously, the obliteration of ancient rights of way. Despite much enhanced conservation measures, the quality of the rural landscape was still deteriorating at the end of the century, with field sizes increasing and modern farm buildings of standard industrial design proliferating.

Another casualty of mechanized agriculture were the orchards and market gardens that were found around most towns. Cheaper exports from Europe and elsewhere had a serious impact on home-grown fruit. In Buckinghamshire in 1900, there was a concentration of fruit farming in the south, around High Wycombe, but the orchards of cherry, plum and apple which had once been common south of Aylesbury were reduced by over 90% between 1938 and 1994.

Heathland

Since 1947, the need to produce more food has resulted in between a third and a half of our ancient woodlands being lost and 60% of wetlands drained, whilst heathlands have been severely reduced in places. There has been an 83% decrease in lowland heathland since the 1800s. In west Berkshire, heathland used to cover an area of 389km^2. By the late 19th century, the expansion of Newbury, together with the agricultural improvement of the heathland, reduced the area to 277km^2. Commercial afforestation in the early 20th century, together with further urban expansion in more recent decades, has caused further loss and fragmentation. By the end of the 20th century, it is estimated that there was no more than 58km^2 of heathland remaining.

Surrey heathlands have, in contrast, mostly survived, though their appearance has often changed dramatically because of the need for regular grazing and because of military use (Poulton pers. comm.). Chobham Common is notable in this context as it is currently preserved as a Site of Special Scientific Interest, a Nature Conservation Review site and a National Nature Reserve (www.surreywildlifetrust.org/nature-reserves/chobham-common).

Energy and the rural landscape

The Electricity Supply Act of 1919 established a national transmission grid which resulted in a rash of electricity power lines carried by ‘arms-stretched, steel giants’ across rural England.

In the early 20th century, it was fashionable to decry electricity pylons as eyesores; a notorious line of them on the western edge of Oxford, disturbing the vista of the 'dreaming spires', was subject to particularly vitriolic attacks. S P B Mais, a prolific writer and observer of the English landscape, described them as sprawling 'wantonly across our noblest landscape like a lunatic's slashings across the face of an old master'. Such services now tend to run underground or have been compressed into much less conspicuous forms of transmission. Even electricity pylons themselves have become more acceptable, partly because of familiarity, partly because they have blended with their surroundings in some areas, and partly because they are now viewed with affection by some. In areas of eastern England, in the wilderness created by prairie farming, they are viewed as a beneficial contribution to an otherwise visually barren landscape.

One of the most intrusive elements in the rural landscape were the massive cooling towers of electricity generating plants. These symbols of 20th-century power production dominate whole swathes of rural England. For example, the cooling towers at Didcot, in the Thames Valley in Oxfordshire, can be seen up to fifty miles away and from half a dozen surrounding counties. They are not, however, universally disliked, and some admire them for their grace and cleanness of line. Less popular are the smaller, but more numerous, wind turbines, which have, curiously, hit a nerve amongst some conservationists, who complain that they are both unsightly and ineffective.

Later intrusions such as oil, gas and large-scale water pipelines also tended to be hidden underground. The process of laying such services is often disruptive and destructive of archaeology and wildlife, and, by the end of the century, environmental and archaeological assessments of the damage to be caused by proposed development schemes had become a statutory requirement. The 20th century saw a rash of minor intrusions in the rural landscape. Electricity substations, telephone booster stations and pump stations are to be found in remote farmland throughout the region. They are characterized by standard one-storey brick buildings surrounded by impenetrable fencing. They form little engineering outposts in the rural scene. The satellite and digital age brought a new rash of dishes and pylons in the countryside. Such intrusions were often sited in marginal or blighted land alongside motorways or in old quarry workings, but, although they tended to be smaller than their predecessors, their appearance nevertheless frequently elicited local opposition.

Industry in the countryside

Rural activities ancillary to farming, such as milling, malting and brewing declined terminally during this period. Most of the surviving corn mills on the Thames and its tributaries had closed-down before 1939. There was a similar decrease in local brewing. Whereas in the 19th century every market town had at least one brewery, by the Second World War most of the region's small towns had no local brewery and became dependent on regional suppliers based in the larger towns such as Reading and Oxford.

During the early 20th century, many traditional rural industries declined and in most cases eventually disappeared altogether. Important industries based on local resources, such as chair making in the Chilterns, initially grew in response to the huge London market. Between 1880 and 1920 chair making developed into furniture making around High Wycombe and Amersham, providing cheaper as well as more exclusive furniture for the West End stores. In the 20th century, chair and furniture production was industrialized, with machine tools replacing handcrafting. Country-based bodgers, despite long hours for low returns, could not compete with the cost of machined, mass-produced legs. There was a 'de-skilling', and those who survived were driven to making tent pegs and brush backs.

At the turn of the century there was an even bigger problem for the Chilterns: foreign timber could now compete in the market for mass production. In 1899, three quarters of the timber used in Wycombe was from North America, and by 1905 Canadian birch was less than half the price of local beech. The Wycombe furniture manufacturers had developed the industrial impetus and adaptability to survive, but the Chiltern beechwoods were no longer required. The woods were no longer managed, and deteriorated. It was not until the latter part of the century that they were recognized as being of regional and national importance and were subject to a range of protective measures.

Another Chiltern industry both developed and died during the 20th century, leaving a much more extensive legacy, was the cement works of the Chinnor Cement and Lime Company Ltd. This was founded by E. W. Benton in 1908 who built five bottle lime-kilns and undertook quarrying of the Chiltern chalk throughout much of the century, resulting in enormous gashes in the scarpline. By 1957, the company employed 160 men and generated the expansion of Chinnor village for workers' housing. The cement works and quarries covered an area of 71.4 ha. The Chinnor works was eventually taken over by Portland Cement and was producing some 5600 tons of cement a week at its maximum. Eventually the works were closed in 1999, largely

on environmental grounds (VCH 1964, 71). There are plans to turn the quarries into a housing project and much of the cement works has been demolished. However, one of the chimneys survives and has been described by the Campaign to Protect Rural England as 'a ghastly redundant excrescence' (www.cpreoxon.org.uk). To the north, in the Buckinghamshire Chilterns, the Pitstone cement works were even larger. This complex operated between 1937 and 1991, when 300 workers lost their jobs. The site has subsequently been redeveloped for housing and an industrial estate.

At Clanfield, there was a large agricultural-implement manufacturer. L R Knapp and Co was established in the 1880s. The firm specialized in seed drills. A foundry on the site called Thames Valley Ironworks closed in 1960 when small-scale cast iron production became uneconomical. The firm continued in business, turning to structural steelwork as well as introducing new materials such as fibreglass. The workforce fell from about 40 in 1962 to 15 by 1965 and production had ceased before 1968, when the company was sold off. The premises were occupied by an agricultural machinery retailer until the end of the century (VCH 2006, 137).

As the century progressed, the waste from heavy industry was levelled, grassed over and generally tidied up. New industries such as opencast mining and quarrying tended to be more discreet, hidden behind shelter belts of trees and backfilled when operations were completed. Many of the exhausted stone quarries at places such as Wootton, near Woodstock in Oxfordshire, were used to bury domestic waste in what was known as landfill. Gigantic midden pits for a wasteful age of overconsumption were generally hidden away and covered over as soon as possible. The corporate disposal of waste represented yet another break between individuals and the land on which they lived; no longer were they responsible for or sensible of the consequences of the detritus they produced.

One of the biggest changes to the Thames Valley landscape was brought about by aggregate quarrying. The sands and gravels of the Thames terraces were in demand throughout the century for house building, road construction and industrial development. Up until the Second World War, quarrying tended to be on a relatively small scale. Often dug by hand, pits of no more than 20 square metres were sunk wherever sand and gravel was required, the gravel extracted and the pit backfilled. They can be located through field names, such as 'Sandpits' and 'Quarry Pit Field'. Such early quarries show up on aerial photographs as cropmarks, often sited within a matrix of much earlier archaeological markings. These early quarries are

sometimes characterized by traces of a ramp exiting from the pit, which was used by carts and later lorries to move the excavated aggregates.

After 1945, the scale of quarrying grew, often resulting in the wholesale removal of large tracts of sand and gravel. The resulting quarry pits were flooded and created a network of man-made lakes. Subsequently, these were frequently used for recreational activities, particularly sailing. One of the first of these marinas was created to the north of Dorchester-on-Thames and was responsible for the destruction of a large Neolithic henge and part of its associated cursus, known as the Big Rings (Whittle *et al*. 1992). A major campaign of extraction in Gloucestershire led to the creation of the Cotswold Water Park. Towards the end of the century a policy of restoring the quarried land to agriculture was generally adopted. The Thames terraces are rich in archaeological deposits, which were identified by aerial photography in increasing volume as the century progressed. As a more environmentally sensitive approach was developed, many sites in threatened areas were subject to excavation and other forms of investigative archaeology. Many of the later pits were backfilled, sometimes with landfill.

The south-east region has been one of the primary producers of land-won sand and gravel. However, towards the end of the century, planning permission for extraction was becoming increasingly difficult to obtain. Accordingly, the official reserves for the region declined by 61% from 207 million tonnes in 1995 to 81 million tonnes in 2004. The decline in reserves has been largely caused by the failure to replenish sales tonnages with new planning permissions. Reluctance to grant planning permission in the Thames Valley is linked both to environmental concerns and to increased pressure from other land users (Brown and Highley 2006).

Villages

Away from the immediate influence of London and the county towns, villages changed relatively little in the first part of the century. The first Small Holdings Act of 1892 had little impact on the region and it was only after acts were passed in 1908, 1919 and 1926 with government grants that new smallholdings made their appearance in the Thames Valley (Wild 2004, 104). A private initiative at Brize Norton in Oxfordshire expanded the village and created the new village of Carterton. Elsewhere in western Oxfordshire, there were several

smallholding developments, but for the most part these had little impact on the village landscape.

The Tudor Walters Report in 1918 and the Addison Housing Act in 1919 had established the framework for the widespread provision of council housing. To begin with, however, this was restricted mainly to urban areas. After 1926 the funding structure changed and rural council houses made an appearance, but it was not until the National Government's Housing Act of 1936 that rural local authorities were offered 80% of the cost of construction of new houses for agricultural workers. This development was often accompanied by rural slum clearance, seen by preservationists at the time as acts of 'state vandalism' (ibid., 126). The earliest rural council housing was often in the form of small-scale development within the core of the village, as can be seen at Stanton Harcourt in Oxfordshire, where fourteen council houses were built adjacent to the old village by 1936 (VCH 1990, 267–74). New council housing was normally built on the periphery of the village, either in standard terrace blocks of four to six dwellings, or as semi-detached housing grouped around a short cul-de-sac access street. This type of development became the norm for open villages in the late 1930s and again in the next surge in rural council housing construction that began soon after the Second World War. Such developments are characteristic of most of the larger villages in the Thames Valley region.

In the interwar period, several villages close to London, Oxford and Reading expanded and were absorbed into suburbia. Ribbon development on the roads leading out of villages was a common feature of the region. The villages and hamlets on the A40 between Oxford and London were particularly vulnerable to ribbon development, as can be seen at Tetsworth, Postcombe and Milton Common in Oxfordshire. Similarly, small rural settlements in the Chilterns spread along narrow valleys to the north of High Wycombe at Walters Ash, Naphill, and Downley, which now joins together with the town. The interwar development at Kidlington was described by Pevsner as follows: 'The major part of the town [sic] consists of some of the ugliest ribbon development in the county, with 1930s semi-detached houses of the most dismal kind for two or three miles along the Oxford-Banbury road' (Sherwood and Pevsner 1974, 672). Next to the church, the village school was normally the most important public building in the community. In 1902, when board schools were transferred to county councils, staff were appointed by the county education committee, thus removing another important element of patronage and control from the church and the squire. Nevertheless, in rural Oxfordshire, for example, the Church of England strived to maintain control of many village schools (Graham 1996, 6–7). For the most part neo-Gothic village schools, built in the latter decades of the 19th

century, served rural communities up to the Second World War. Conditions in most village schools remained primitive until after that war. In January 1909, the head teacher of Kingston Bagpuize School in Oxfordshire noted that the classroom temperature was 35°F (2°C). Water was supplied by an outside pump for most Oxfordshire schools until the 1950s and an outside privy often served boys, girls and staff. Electricity was not connected to most village schools until the 1950s (Graham 1996, 8). Although the school-leaving age rose incrementally from 13 in 1902 to 16 in 1973, during the first half of the century many school rolls fell. This reflected the stagnation or even fall in the rural population as people moved out of the villages. Many of these migrants were from the younger generation and their movement led to a fall in the number of village children. After the Second World War the situation was rationalized and many of the poorly supported schools were closed and sold off. The 1944 Education Act also regularized the division between primary and secondary education, with the result that most children left their primary village school and completed their secondary education in the nearest urban centre. Those village schools that survived were normally rebuilt and expanded to a standard design during the second half of the century.

Rural poverty was still a serious problem in many villages, and it was not until after the First World War that the government introduced some help as the fear of the workhouse began to diminish. Nevertheless, country teachers often complained that their pupils were exhausted and undernourished and were being raised in badly overcrowded homes. A study of rural Oxfordshire in 1920 found cases of a family of seven in a one-bedroomed cottage, and of ten in a cottage with one bedroom and a landing (Ashby and Byles 1923, 104–5).

The 20th century saw the final divorce between the village and the land. By the end of the century, most village inhabitants had little to do with the fields that surrounded their community, except for keeping ponies or using the network of footpaths and bridleways for recreation. Villages became outliers of towns in their economic and social structure. It is true that in many communities planning constraints on the older houses and conservation areas meant that the core of the village may not have changed greatly; but it became more ‘polished’. In most villages in the region there was a social revolution, with the predominantly well-off middle class of 2000 replacing the predominantly working-class profile of most villagers of 1900. Most of the older houses were renovated, extended and improved, while council houses tended to be located in a block, often some distance from the historic core. Those villages, such as Kidlington, north of Oxford, which were chosen for expansion attracted large housing estates which were indistinguishable from their urban counterparts.

The period between the two world wars was a transitional time in the evolution of village England. It saw the shoots of economic and social recovery emerging in some villages, representing islands of rural regeneration; but it also witnessed the persistence of poverty, population decline and economic decay in many others. One contributory factor was the continued polarization of manufacturing industry in the towns. Industries which had once been widespread in the countryside moved into towns and cities. The grinding of corn, for example, one of the oldest forms of rural industry, ceased to be a truly rural activity during the last quarter of the 19th century, as large mechanized mills were established in towns to deal with home-grown supplies brought in by rail. Such mills were also established in the ports to handle grain imported by ship from overseas. In the 1880s, some 160,000 chair makers had been scattered throughout the Chiltern villages; within two decades, however, the industry was concentrated in new factories in High Wycombe. Everywhere village industry and crafts were on the wane—the final phase in the life of the village as a coherent community had begun.

The rise of the motor car was responsible for the revitalization of many villages close to London. In the Edwardian era, advertisements from estate agents such as Hamptons promoted country residences especially suitable for motorists, 'being within a speedy run of town, on good roads'.

With few exceptions, the most successful villages were those that were suitably positioned for the development of a dormitory function and new economic activities. Access to a main road and proximity to a railway station or halt and a focus of employment, such as an urban centre, a large rural factory or a military airfield, were all desirable. At the same time, river villages, 'beauty spots', literary and artistic shrines and any other villages with a special tourist attraction were 'discovered' and frequented in an age when motor transport—the car, the bus and the charabanc—was beginning to make its mark. This process of opening rural and village England was, however, imposed upon a predominantly depressed and decaying countryside. In the 1920s and 1930s, therefore, there was a clear contrast between the poverty and relative backwardness of the old village life and the town with its bustle of motor cars, trams and buses.

Most village housing was unimproved, consisting of two-up two-down stone cottages with thatched roofs. Very few houses had piped water and most people were dependent on street standpipes, well, springs or even stream water. There was no mains drainage and there were few inside lavatories. Although a few villages were supplied with electricity, most houses still relied on coal fires for heating and oil lamps for light. Because of the 1936 Housing Act

some cottages, categorized as slums, were demolished and 48 council houses built. These were built to a higher standard but at this date still lacked basic facilities.

The scale of change after 1945, and particularly from the 1960s, was dramatic and was associated with the collapse of the rural infrastructure. Rural schools, shops, pubs and post offices closed, as well as more traditional services such as blacksmiths, wheelwrights and bakers. Rural bus and train services were severely cut or ended. Once crucial to a sense of community, order, hierarchy and place, rural churches were increasingly declared redundant or demolished from 1950. A few redundant churches have been conserved and remain open as historic buildings, while others have been converted into private residences, as indeed have hundreds of Nonconformist churches and chapels, both in towns and the countryside.

Alongside the persistent move away from working on the land there was a significant tide of rural repopulation coming in the other direction. Much of this was brought about by commuters seeking an urban way of life in a more tranquil rural setting. The Thames Valley countryside was also attractive to the retired, and that sector of the rural population increased greatly. Thus, due largely to commuting and retirement, the countryside became for many of its inhabitants a place of residence and leisure rather than of work. By 1951, as many as 52% of employees resident in the Abingdon Rural District Council area worked outside it. At this date commuters were still a diverse breed, ranging from the Morris Motors workers who cycled in to Cowley from the surrounding villages each day to the 'people who have amassed wealth out of ships, law, tea, pottery, ink, banking and contracting' (Brassley *et al*. 2006, 236). Commuters, the retired and second home owners came to dominate many villages and hamlets. The Stockbroker or Cocktail Belt of Surrey and eastern Berkshire has become '…a land of large drives and even larger houses. The land of cocktails and G-and-Ts and the natural habitat of the Mercedes, BMW and Range Rover set' (Hamnett 1984, 534–8). This reflected both the appeal of an image of the countryside and a shift in the character of rural life. The consequence was an effective erosion of any significant boundary between rural and suburban society over large parts of the region. There became in effect two rural environments: that of a suburban life outside the town, and that of agriculture.

Nevertheless, villages in the region were cemented by a wide range of new activities and institutions. Foremost amongst these was the village hall, which provided a more socially inclusive environment than the pub or church hall for many villagers. Although a few halls were built before the First World War, the majority were constructed after 1914. In Oxfordshire, for example, there were only three before 1914 compared to nineteen between

1919 and 1940; while in Berkshire there were three pre-war halls compared to twenty-six in the interwar years (Burchardt 2006, 26). By the beginning of the 21st century there were 280 village halls and community centres in Oxfordshire. Village halls were seen by some as an essential step in the creation of a 'new rural civilization'. In this context, the National Council for Social Service and the Rural Community Councils, two post-First World War organizations, were particularly important in working for rural communities. The RCCs derived from a group of voluntary sector organizations based in Oxford, and the Oxfordshire RCC was the first to be formed in 1921. It has been argued that in promoting the parish hall movement the Community Councils unintentionally contributed to the final eclipse of the church and chapel as the principal gathering points of English village life (Wild 2004, 123–4). The NCSS and RCCs insisted that interwar village halls should be built in traditional local building materials and styles. The Councils introduced building controls in order that new halls should be in keeping with their rural setting. At Taynton in Oxfordshire in 1938, the NCSS made a grant which permitted the hall to be built, conditional on the roof being constructed from cedar shingles rather than asbestos (Burchardt 2006, 32).

The village hall provided a venue for numerous organizations and activities for much of the century. Perhaps the most important of these were the Women's Institutes, which first appeared in 1915 under the aegis of the Agricultural Organization Society. By 1919, when the National Federation of Women's Institutes was established, there were already 1200 Institutes in existence in Britain. By the end of the century there were nearly 150 WIs in Oxfordshire and over 130 in Buckinghamshire. The NFWI bought Marcham Park, a small country seat then in Berkshire which had been used by the RAF in the Second World War, and established a national residential college there. Another post-First World War innovation were the Young Farmers' Clubs (YFC), who, like the WIs, had a strong rural educational bias. An important grassroots educational organization, the Workers' Educational Association (WEA), had its origins as an outreach network of classes for Oxford University's Delegacy of Extramural Studies. This became as strongly rooted in the small towns and villages of Berkshire, Buckinghamshire and Oxfordshire as in the industrial areas of Oxford, Slough and Reading. Numerous other voluntary clubs and associations were established in the region's villages and helped provide social cohesion during a century of unprecedented upheaval.

SUMMARY

During the period from *c* 1550 to 1900, much of the region beyond the immediate environs of London remained profoundly agricultural, in marked contrast to the changes taking place in the Midlands and the north from the 18th century onwards. However, the nature of farming and the rural landscape was transformed. Although significant changes were underway from the later medieval period onwards, the process accelerated from the middle of the 18th century, the period that is generally thought of as the Agricultural Revolution, until the onset of agricultural depression from the 1870s. In very broad terms, the Agricultural Revolution led to a reorientation of the English agricultural landscape and a prodigious increase in productivity, but at the cost of the near-complete privatisation of agricultural land by enclosure, and the embedding of a new social hierarchy in the countryside. During the medieval period, lowland England is generally seen as having been divided between broad zones that have been defined by differences in landscape and settlement type and the relative importance of arable and pastoral farming.

By the mid-19th century, the agricultural map of the country had been substantially redrawn. Arable production was now concentrated in the east and south-east, in areas where a drier, warmer climate favoured the production of cereals, and extensive land reclamation and improved farming techniques had opened large new areas for cultivation. Across much of the Midlands, the arable monoculture of the medieval period had been replaced by grass pasture, well suited to the region's heavier clay soils and more abundant rainfall. Market gardening had spread around London and the larger towns, dairy farms proliferated close to railway stations where fresh milk could be despatched to millions of urban consumers, and agricultural land was gradually being absorbed into spreading suburbs. The very last remnants of the medieval field systems were fast disappearing with the enclosure of most of the remaining common land, and the old manorial systems of communal farming had largely been extinguished. In their place was a new rural social hierarchy based on commercial relationships. Across much of the Thames Valley, large private and institutional landowners lived off the rents from large, enclosed farms leased to tenant farmers, who still employed numerous landless agricultural labourers but were increasingly rationalising processes and introducing machinery to replace them.

Mechanised technology continued to impact the Thames Valley into the 20th century. The First and Second World Wars only served to slow the rate of development which saw

dramatic advances during the inter-war and post-war years. While farming continued to be the dominant economy in the early part of the century, as it had done for thousands of years before, it was soon to be challenged by extensive house-building, quarrying, and recreation. The rise of the motorcar brought with it long stretches of tarmacked roads that cut through the Valley in every direction, changing the sights and sounds of the landscape in a very short spaces of time. Settlement expansion and infrastructure put increasing demands on space. The demand for landownership in the first half of the 20th century also witnessed the creation of new landscapes with unique characters, such as the plotlands of Marlow Bottom and Munday Dean. Despite these pressures however, the clay vales between the Cotswolds, Chilterns and the Berkshire Downs continues to support farming on a large scale today, with 50% still under cultivation and a further 25% under pasture. However, the Middle Thames Valley has changed dramatically. By the end of the 20th century, it was largely devoid of conventional farming. The spread of urban areas has now reduced agricultural land to less than 25% of the total area and farmers produce a limited range of crops and livestock. The remaining woodland in the Middle Thames, around 13% coverage, is concentrated in the north, over the clays around Windsor and Burnham Beeches, for example, but allows for the conservation of a range of wildlife. Surviving meadows and pasture in the lowland valleys support wading birds and create a demand for nature tourism, while sailing, watersports and angling are major recreational activities all along the Thames.

Overall, the Thames Valley has perhaps undergone more change over the past 500 years, and particularly in the last 100, than it has witnessed for the previous 10,000 years. The speed of development generated by technological advancements, pressure for land and economic expansion is weighed against concerns for cultural and historical preservation and nature conservation, and this has created tremendous challenges for the current and future generations to contemplate.

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