

Alternate Husbandry and Permanent Pasture in the Midlands, 1650–1800

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RECENT discussion of agriculture in the period 1500–1800 has been much influenced by Dr Kerridge's *Agricultural Revolution* which, in his own words, consisted of 'the floating of water-meadows, the substitution of up-and-down husbandry for permanent tillage and permanent grass or for shifting cultivation, the introduction of new fallow crops and selected grasses, marsh drainage, manuring, and stock breeding'.¹ The importance of these changes has been generally accepted by his critics, but they have stressed the slow diffusion of these techniques and have doubted the quantitative effect on the economy before the eighteenth century at the very least. This paper examines 'the backbone of the agricultural revolution', 'up-and-down husbandry' (otherwise known as alternate husbandry or ley farming), in the midlands, where Dr Kerridge found its introduction 'revolutionary'.² It argues that while up until about 1650 Dr Kerridge is probably right in stressing the role of up-and-down husbandry, economic considerations and technical changes and difficulties after that date tended to encourage the development of a new brand of permanent pasture farming in many parts of the southern and eastern midlands at the expense of convertible systems.

I

The use of leys and alternate husbandry was part of the process by which a higher proportion of land was used to support increasing numbers of livestock in many parts

of England. By alternating arable and pasture on a given piece of land farmers almost eliminated the need for fallows between their grain crops and were able to control the quality of their pasture by sowing grass seeds. Such systems have a faultless intellectual pedigree: historically they were consistently advocated by agricultural writers from Fitzherbert onwards, and have been shown by Slicher van Bath to have played an important part in agricultural improvements on the North German Plain and in the Netherlands; agriculturally they have been extolled by twentieth-century soil scientists as the best way to keep high fertility on both arable and pasture and to retain excellent soil texture and composition.³

In sixteenth- and seventeenth-century England there is plentiful evidence that despite rising grain prices and land hunger, new arable/grass rotations were introduced quite widely. Mr Havinden and Dr Thirsk have shown how portions of the open fields were turned over to temporary grass, making possible the rise in livestock numbers found in Oxfordshire and Lincolnshire farm inventories by the late seventeenth century.⁴ Dr Kerridge argues that a move towards mixed farming was also taking place on the old enclosed permanent pastures of the later middle ages, and on the increasing number of sixteenth- and seventeenth-century enclosures. This was particularly important in the midlands because there the rising sixteenth-century population caused economic

¹ E Kerridge, *The Agricultural Revolution*, 1967, p 40.

² *Ibid*, pp 39, 180. I would like to thank Dr Peter Brandon, Dr Carolina Lane and Dr Joan Thirsk for their comments and helpful suggestions on an earlier draft of this paper.

³ B H Slicher van Bath, *Agrarian History of Western Europe*, 1963, pp 249–54. R G Stapleton and W Davies, *Ley Farming*, 1948.

⁴ M Havinden, 'Agricultural Progress in Open-Field Oxfordshire', *Ag Hist Rev*, IX, 1961, pp 73–83. J Thirsk, *English Peasant Farming*, 1957, chs 4, 8, 13.

and social tensions. The density of settlements, lack of wastelands into which cultivation could expand (except in forest areas like Arden, Barnwood and the Leicestershire and Northamptonshire forests), and fifteenth-century enclosures for sheep all contributed to a situation in which governments had to regulate the tillage laws, send intermittent commissions to examine the enclosure problem, and, on occasion, deal with popular disturbances. The introduction of up-and-down husbandry, Dr Kerridge suggests, helped solve the problems of the midlands by providing a measured pasture and arable rotation which not only produced the same amount of grain on a much reduced area, but broke the agrarian cycle of diminished returns by allowing more sheep and cattle to be kept, animals whose dung maintained the fertility of the arable. Long leys of perhaps seven to twelve years were particularly relevant to the midlands where, within considerable soil variations, there are large areas of heavy clays whose suitability for arable or pasture is fairly equal, and whose natural productivity is not particularly high.

Dr Kerridge's arguments assume that this process gathered momentum in the sixteenth and early seventeenth centuries and was completed by the eighteenth. However, his interpretation lacks an economic dimension. As far as the midlands are concerned, there are good arguments for the spread of alternate husbandry on the kinds of lands indicated by Dr Kerridge up until about 1650. The slow transition from a mainly open-field, semi-subsistence farming in which market influences were largely local, to a market economy whose prices were dictated by the needs of urban populations, was not a painless process. The simultaneous pressures of a growing rural population on the scarce land resources of the midland plain, and the desire of landowners to rationalize land use by enclosure and by installing farmers who produced for the market and would pay higher rent for large farms, both affected farming systems. Population was a major

factor in forcing up agricultural prices, and although the basic grains rose most, demand for livestock rose only slightly less rapidly.⁵ Market forces certainly shook up the late fifteenth- and early sixteenth-century tendency to farm large sheep runs for wool, whose relative price was falling. Cattle fattening, dairying, and mutton rearing began to have a more important part to play, and required different management techniques, and sometimes smaller farming units. These needs account for much of the disparking of the seventeenth century. At the same time farmers were unwilling to over-specialize in livestock. Grain prices were generally relatively high and fluctuated substantially as grain production rose only slowly to accommodate the increasing population, and marketing inefficiencies were slow to disappear. The risk of local grain shortages, the cheapness of labour, and the higher yields claimed for both arable and livestock under the system, all favoured a relatively intensive mixed farming. In addition the gradual transition from open-field farming favoured mixed systems, for the skills necessary to manage permanent grassland systems were only slowly acquired.

What is worth examining more closely is the extent to which the 'progress' which had been made by 1650 was actually maintained in the succeeding 150 years. Dr Kerridge himself explains the difficulties of identifying alternate husbandry from the variety of mainly legal documents that constitute his major source. Legal jargon had no word to describe alternate husbandry, so the existence of temporary or permanent fences in old enclosures, crops listed in enclosed fields, and the existence of covenants against ploughing in leases are all used by him as evidence of up-and-down land.⁶ Now while it is possible to show cases where they indicate exactly that, such detective methods are not foolproof, and in many cases the evidence he seeks might

⁵ J Thirsk (ed), *The Agrarian History of England and Wales*, IV, Cambridge, 1967, pp 602-3.

⁶ Kerridge, *op cit*, pp 181-91.

also be found where alternate husbandry was not practised (for instance great sheep enclosures later divided into more practicable smaller fields), or indeed where it was no longer practised. One also wonders whether in discovering ploughed-up pasture land Dr Kerridge has necessarily found alternate husbandry, which needs to be applied as a system of careful management to bring about the kind of agricultural improvement that is claimed for it.

The problems of identifying alternate husbandry in the absence of very full farm accounts are daunting, yet there is good evidence to suggest that by about 1800 large areas of the southern and eastern midlands, particularly Leicestershire, Warwickshire, Northamptonshire, Rutland, Buckinghamshire, and Bedfordshire, had evolved a system of specialized livestock farming on improved permanent pasture in preference to alternate husbandry. The evidence is of two kinds. Firstly, thorough knowledge of local circumstances may make it possible to demonstrate a shift from alternate husbandry to permanent pasture. In Buckinghamshire two examples can be given: the parish of Middle Claydon (quoted three times by Dr Kerridge, using evidence from the 1650s) included a measure of up-and-down land at that time, yet after 1655, at the latest, the precise fields that he cited were put down to permanent grass and remained as such for the next sixty years, and probably for the next 140 at least;⁷ Creslow, which Dr Kerridge found under an up-and-down system in 1607, was being run as a grazing farm in the 1660s, and in 1813 John Westcar was quoted as ploughing 60 or 70 acres 'under no system but that of being subservient to the pasturage'. In Northamptonshire Mr Christopher Taylor has found archaeological evidence of ploughing during the sixteenth and seventeenth centuries at six deserted village

sites. The ploughing was shortlived and may amount to as little as a single year's cultivation. Literary evidence for a number of the sites suggests that they were in permanent pasture before 1547, and have probably remained so since at least 1700.⁸ Microscopic work at parish level could undoubtedly provide more examples.

Secondly, the agricultural reports and crop returns of the period around 1800, despite their deficiencies, provide good evidence of the extent of permanent grass farming and give some estimate of the importance of such husbandry to the southern midlands. Instances of parishes like Pitchcott (Bucks) and Fawsley (Northants) 'without a single blade of corn, being wholly on grass and applied to feeding' stand at the extreme end of the spectrum.⁹ Examples of wholly pasture farms for both dairying and fattening are also given in Northamptonshire by Donaldson, and these were common in Buckinghamshire parishes such as Hogshaw, Middle Claydon, Quarrendon, Hardwick with Weedon, and Fleet Marston in the late seventeenth and early eighteenth centuries.¹⁰ Looking at the midland counties as a whole, several reporters made estimates which specify the percentages of permanent grass and convertible husbandry land around 1800. For Leicestershire, Pitt in 1809 reckoned that of 480,000 acres in full agricultural use, exactly half were in 'occasional' tillage and the other half in 'permanent grass'. Of the 240,000 acres of occasional tillage, 85,000 acres were in

⁸ Kerridge, *op cit*, pp 183, 186; Glyn Mills and Co, Edward Backwell's Ledgers: Creslow accounts; St John Priest, *General View of . . . Buckingham*, 1813, p 52. I would like to thank Mr Taylor for giving me details of his finds which will be published in the forthcoming inventories of the Royal Commission on Historical Monuments for Northamptonshire. The sites involved are Onley in Barby, Glasthorpe in Flore, Upper Catesby, Sulby, and Kirby in Woodend. Preston Deanery in Hockleton Parish shows similar ploughing.

⁹ PRO: HO 67/15; W Pitt, *General View of . . . Northampton*, 1809, p 131.

¹⁰ J Donaldson, *General View of . . . Northampton*, 1794, p 25; Claydon House, Verney deeds, esp 1650s; Oxfordshire CRO: Dillon MSS, x/g/3-12, x/i/4-6, 10-12, xii/h/2-6.

⁷ *Ibid*, pp 192, 194, 199, 207; for the later history see J P F Broad, *Sir Ralph Verney and his Estates, 1630-96*, unpublished Oxford University DPhil thesis, 1973.

artificial grasses, part of a total of 170,000 acres in what are best described as fodder crops (beans and peas, oats, etc).¹¹ Prof Hoskins would go even further on the basis of the 1801 Crop Returns and suggests that Pitt overestimated the arable.¹² In Rutland Crutchley reckoned three-fifths permanent grass, two-fifths convertible land, though Parkinson's slightly later sums suggest just over 50 per cent arable.¹³ Wedge in Warwickshire computed some 154,530 acres of tillage (equating arable with up-and-down land and including 57,330 acres of seed grass), compared with 150,000 acres of pasture and feeding grounds, and 82,000 acres of meadow.¹⁴ A rather similar position emerges in Northamptonshire, where, although no acreages are given, Donaldson seems to suggest that some 100 or more of the 227 enclosed parishes were laid down to grass.¹⁵ Such figures are mainly impressionistic, but it is unlikely that they totally misrepresent the picture of agricultural life in the midlands by the end of the eighteenth century as one in which there was a great deal of permanent pasture, as well as areas of convertible husbandry, and remaining but fast diminishing open-field systems.

The Board of Agriculture Reports also help to show how soil and market conditions, amongst other factors, tended to subdivide the midlands plain into a number of farming regions, some of which favoured permanent pasture, others convertible husbandry.¹⁶ St John Priest described Buckinghamshire as follows: 'one third consists of dairy farms, of which the proportion [of ploughed land to pasture] is as one to sixteen; and one sixth consists of farms of a mixed nature, having a proportion of arable to pasture of five to

three'.¹⁷ Examination of the 1801 Crop Returns, and of Parkinson's 1808 parish estimates (which in the majority of cases square pretty well), suggest that though mixed and pasture farms are to be found in all parts of the Vale region, pasture parishes are concentrated more to the north-west, and mixed parishes in the more densely populated north-east, particularly on the sandier soils around Leighton Buzzard and the Brickhills.¹⁸

To the north, in Northamptonshire, there are similar distinctions. On the north-east Buckinghamshire border, parishes like Cosgrave, where John Franklin was fattening cattle on up-and-down land in the 1670s, seem to have been following the same kind of agriculture as the Tyrells in adjoining Castlethorpe (Bucks), though dairying seems to have been the major occupation by the late eighteenth century.¹⁹ Pitt contrasts the black and dark soils, which were mainly laid down to grass when enclosed, with the red soils, which tended to become mixed farming land.²⁰ Certainly dairying appeared to predominate in the west and south-west of the county, adjoining Buckinghamshire and Warwickshire, towards Banbury and Daventry.²¹ Warwickshire again had its contrasts, with permanent pasture playing a prominent part in the south-east of the county, below the Fosse Way, and also along the Leicestershire border.²² Rather different was the band of 'fine dry red loam' mixed with clays extending north from Stratford-upon-Avon to Warwick, Coventry and north-west to Birmingham. This was up-and-down land, while the forest of Arden was 'mostly in tillage and a much smaller

¹¹ W Pitt, *General View of . . . Leicester*, 1809, pp 5, 96.

¹² W G Hoskins, in his (ed), *Studies in Leicestershire Agrarian History*, Leicester, 1949, pp 140-1.

¹³ J Crutchley, *General View of . . . Rutland*, 1794, p 12; R Parkinson, *General View of . . . Rutland*, 1808, p 1.

¹⁴ J Wedge, *General View of . . . Warwick*, 1794, pp 11, 50.

¹⁵ Donaldson, *op cit*, p 24.

¹⁶ Kerridge, *op cit*, frontispiece, makes no divisions; Thirsk (ed), *op cit*, makes quite a number for the period 1500-1640.

¹⁷ St John Priest, *General View of . . . Buckingham*, 1813, p 5.

This means that the northern 'Vale' half of the county was in his estimate two-thirds dairy and one-third mixed, since half the county was Chiltern arable.

¹⁸ *Ibid*, pp 367-72; PRO: HO 67/15, printed by M E Turner, *Records of Bucks.*, XIX, 1974, pp 471-82.

¹⁹ T B Franklin, *British Grasslands*, 1953, p 90; PRO: C 108/373; Pitt, *op cit*, p 199.

²⁰ *Ibid*, p 131.

²¹ Donaldson, *op cit*, p 50.

²² Wedge, *op cit*, pp 8, 20, 50.

proportion of sheep are kept . . . partly from the nature of the soil, and partly from the neglect of the occupiers in not draining'.²³ In the period before 1700 Dr Kerridge has taken all his instances of up-and-down land in Warwickshire from this area, and his findings about the change in the forest of Arden from pasture farming to mixed arable have been confirmed by V H T Skipp.²⁴ Finally, in Leicestershire the same distinctions of area apply. The north-eastern vale of Belvoir saw a classic inversion of the old pattern of vale arable and hill pasture ideal for convertible husbandry, but, in Pitt's words, 'in the south, east and middle of the county are many instances of farms and occupations without any tillage lands whatsoever'.²⁵ The pasture lands of the Welland valley were particularly famous, and the predominance of pasture there is confirmed by the 1801 Crop Returns.²⁶

II

The evidence of the various County Reports suggests that something like one-half of the area involved was laid down to permanent pasture by the end of the eighteenth century. This included land in both old and new enclosures. The remainder of this paper examines the reasons for this swing away from alternate husbandry and the merits and deficiencies of the permanent grass economy that succeeded it. These reasons were partly economic, and partly technical.

The economic changes affecting agriculture after 1650 were soon evident. Population pressure generally slackened and most additional agricultural demand was provided by expanding urban centres, particularly London. Grain prices stabilized and then fell,

but the livestock sector, particularly dairy produce, held up much better in the period 1660–1760.²⁷ More important, this was the period when the light-land mixed farming systems, using previously uncultivated hillside pasture for grain production, and alternating grain with turnips and artificial grasses such as sainfoin, lucerne and clover, sustained a higher concentration of livestock, whose manure increased grain yields and general productivity per acre. Prof E L Jones has suggested that English grain prices fell less than those of her continental neighbours because, in a period of slackening demand, the production gains on the light soils were offset by a shift from arable to pasture on the heavy lands of the midlands.²⁸ Prof Jones does not elucidate the form of pasture farming in the midlands, and his thesis does not openly conflict with Dr Kerridge's on this point, since leys on the midlands clays were long, and therefore took up a high percentage of the land area, while additional pasture came into use as a result of the open field improvements.

However, one can contrast light- and heavy-soil farmers in a rather different way. On the one hand, the light-soil farmers intensified their agriculture, putting in capital and labour to increase grain output and the numbers of livestock (for both their dung and produce), and thereby maintained farm incomes. In this they were making themselves real mixed farmers with equal profit and emphasis on both types of produce. Midland clayland farmers could not follow suit: their heavy lands required much greater inputs, and could not grow so successfully the new crops that were a vital feature of light-land systems. Instead, they did two interconnected things: they specialized production quite markedly (all the late eighteenth-century writers make it clear that dairying and fattening never mixed, and the differentiation can already be

²³ Ibid, p 8.

²⁴ Kerridge, op cit, ch 3: Rowington, Knowle, Hampton-in-Arden, Kenilworth, Lillington, Great Alne, Great Packington, Brandon. V H T Skipp, 'Economic and Social Change in the Forest of Arden', in J Thirsk (ed), *Land Church and People*, 1970, pp 84–111.

²⁵ Pitt, *Leicester*, pp 14, 87.

²⁶ W G Hoskins, 'The Leicestershire Crop Returns of 1801', in his (ed) *Studies in Leicestershire Agrarian History*, Leicester, 1949, pp 127–53.

²⁷ A H John, 'The Course of Agricultural Change', in L S Pressnell (ed), *Studies in the Industrial Revolution*, 1960, p 151.

²⁸ E L Jones, *Agriculture and Economic Growth in England 1650–1815*, 1967, pp 152–71.

seen on Middle Claydon farms in the later seventeenth century), and, like their nineteenth-century equivalents in adversity, they went in for low-intensity, cost-cutting agriculture. Sustained convertible husbandry did not really fit in, as it required regular labour on the arable as well as investment in equipment and horses. The kinds of farm buildings for arable and pasture were different, even if the simplicity of construction in the later seventeenth and eighteenth centuries meant that this was not an insoluble problem. Investment in livestock, too, was an expensive business and the profitability of a farm depended crucially on getting the balance between overstocking and understocking the land just right. Lands with a high proportion of permanent pasture presented at once a cheap form of farming, in which less investment was required than on the light lands, and a specialization in the most profitable agricultural sectors: meat and dairy produce.

Not only were there good economic reasons pushing farmers towards permanent grassland systems, but their landlords also stood to gain from the process. Rents between 1660 and 1750 were generally stagnant and experienced periods of depression from the mid-1660s to the 1690s, and again from 1730 to 1750.²⁹ Stagnant and declining rentals encouraged landlords to enclose, since, as Prof McCloskey has shown, enclosure could increase rents by up to 100 per cent, with a common figure of 40–60 per cent, even where there was no change in husbandry.³⁰ However, landlords also benefited further by any conversion from arable to pasture since, as Ellis notes, pasture rents were considerably higher:

most Arable ground in this Vale lets but for seven or eight Shillings an Acre, and the best of all, for but nine

Shillings. Whereas, when such Plowed-land is got into a right full Sward, it will let for twenty or thirty Shillings an Acre.³¹

In addition, a landowner with land left unlet, gained grazing for his horses and could, with relatively low labour costs, easily keep a few cows for a home dairy.³²

Moreover, the late seventeenth and early eighteenth centuries were a time when an increasing proportion of the nation's land area was owned by the greater landowners, and the southern midlands were particularly well populated with country seats and feudal acres.³³ Consolidated estates were not at all uncommon: the Spencers owned major parts of a block of twenty-four parishes spanning the Warwickshire/Northamptonshire borders, but more common were families owning large parts of one or two parishes, in whose interest it was gradually to engross farms and install wealthy tenant farmers.³⁴ In north Buckinghamshire such consolidated estates became very important by the end of the eighteenth century, particularly in the north-western Ashendon hundred, where pasture parishes were more common.³⁵ The 1798 Land Tax Returns show that of thirty-seven parishes, only nine had dispersed land-ownership in which no-one owned more than one-third of the land by value, while in twenty parishes a single owner held more than two-thirds, and in thirteen of these more than 90 per cent³⁶ (see Table 1). In parishes of concentrated ownership at a time of stagnant or falling rent, it was therefore not surprising that landowners ensured that open fields were

³¹ W Ellis, *The Modern Husbandman*, 1750, I, Feb, p 112, almost certainly referring to the Vale of Aylesbury.

³² *Ibid.*, p 111; Ellis also quotes a Warwickshire farmer who had 'laid down a good deal of it within these few years; for Plowing has paid but ill these last years, and Grazing not much better', *ibid.*, VII, July, p 75.

³³ F M L Thompson, 'The Social Distribution of Landed Property in England since the sixteenth century', *Econ Hist Rev*, 2nd ser, XIX, 1966, pp 505–17.

³⁴ H Thorpe, 'Lord and Landscape', in D R Mills (ed), *English Rural Communities*, 1973, pp 31–82.

³⁵ Buckinghamshire CRO: Land Tax Returns, 1798, series Q/RPL.

³⁶ M W Beresford, *The Lost Villages of England*, 1954, p 237.

²⁹ See M G Davies, 'Country Gentry and Falling Rents in the 1660s and 1670s', *Midland History*, IV, 1977, pp 86–96, and G E Mingay, 'The Agricultural Depression', *Econ Hist Rev*, 2nd ser, VIII, 1956, pp 323–38.

³⁰ D McCloskey, 'The Economics of Enclosure', in W N Parker and E L Jones (eds), *European Peasants and their Markets*, Princeton, 1975, pp 155–60.

TABLE 1
**Concentration of Buckinghamshire landownership
 in northern hundreds from 1798 Land Tax returns**

Hundred	Number of parishes	No owners over $\frac{1}{3}$ tax	1 or 2 owners $\frac{1}{3}$ to $\frac{2}{3}$ tax	1 or 2 owners over $\frac{2}{3}$ tax	1 owner over 90% tax
Ashendon	37	9(24.3%)	7(18.9%)	21(56.75%)	13(35.1%)
Buckingham	29	10(34.5%)	4(13.8%)	15(51.7%)	2(6.9%)
Cottesloe	34	13(38.2%)	10(29.4%)	11(32.3%)	3(8.8%)
Newport	53	21(39.6%)	6(11.3%)	26(49.1%)	13(24.5%)

put down to grass. When the Verneys enclosed Middle Claydon in 1654–56 and East Claydon in the 1740s, the whole parish became grassland. In the latter case, two neighbouring parishes were being seeded down at the same time, and grass seed became a scarce and expensive commodity locally. When considering buying a new estate in Buckinghamshire the Verneys showed a positive bias towards pasture farming in the 1740s: 'Do you think the estate [Water Stratford, Bucks.] . . . might be turned into Dairy bargains and hold rent, and all, or all but a trifle laid down, for surely if near half is ploughed or but one fourth of it, it must needs have many barns and outbuildings to it which are great incumbrances, as we see by Adstock and Bierton.'³⁷

In Northamptonshire at the end of the eighteenth century, Donaldson made an interesting comment which reinforces the idea that early and mid-eighteenth-century enclosures were often of the cost-cutting variety, when he compared such enclosures with the 'new enclosed townships or parishes' where 'a system of alternate corn and grass husbandry is adopted; a certain portion of meadows generally allotted to each farm where it is practicable, and some farms are kept in constant pasturage'.³⁸ His

successor, Pitt, made the comparison between old and late eighteenth-century enclosure more explicit when he wrote how farms with part permanent grass and part convertible land were 'much more to be commended than that of pasture only, as yielding a greater gross product, employing more hands in cultivation, and tending to support a larger population'.³⁹ A more labour-intensive system of management was a more economic proposition with buoyant grain and livestock prices in the latter part of the century.

The technical problems of mixed farming systems on the midland plain are mainly concerned with the quality and heaviness of the soil. Badly-drained clays were extremely cumbersome to work and slow and expensive to plough. Though with careful attention they could produce high yields, they could not adopt the light soil systems being introduced in the late seventeenth century since turnips tended to rot, were hard to raise in winter, and could not be fed in the field. The new grasses, particularly sainfoin, did not grow nearly as successfully on heavy soils.

Another less obvious problem was the difficulty of raising a good grass crop after the old pasture had been ploughed up. Agricultural writers on the whole encouraged convertible systems, doubtless influenced by their success on light lands, but Hale, for instance, advocated caution and forethought before laying down old arable or ploughing

³⁷ Claydon House, Verney MSS microfilm, reel 58, esp 1741–42; Verney estate papers, bundle N4/2/3, Lord Fermanagh to John Millward, 27 January 1742/43.

³⁸ Donaldson, *op cit*, p 27.

³⁹ Pitt, *Northampton*, p 130.

up good pasture.⁴⁰ One suspects that this was because it was easy to ruin the ground by wrong treatment. Certainly Crutchley, reporting on Rutland at the end of the eighteenth century (in what Marshall considered the best of the agricultural reports), found that the techniques for ploughing up grasslands were very little understood, and concluded that four-fifths of grassland clay farms had been actually harmed by ploughing up.⁴¹ Pitt came away with a similar impression of the old pastures of Leicestershire, that if they were ploughed up it would take them forty years to return to the same quality of grass. In neighbouring Northamptonshire the same author quoted an instance of a gentleman-farmer who preferred to take on somewhat run-down pastures for seven years, rather than accept a lease in which he would plough and improve them for four years with turnips and coleseed.⁴²

Such attitudes are also exhibited on the Verney estates in north Buckinghamshire in the later seventeenth century. Although Sir Ralph Verney was conversant with the new farming ideas, as is shown by his experiments with crops and manures, the ploughing up of good pastures such as Knowl Hill was always used as a threat when he was desperate for a tenant. In practice he would always 'rather let it to a good tenant than plough it', and took such farms in hand as dairy or feeding grounds when no tenant could be found.⁴³ He did not allow his pastures to be ploughed up between 1650 and 1696, and this policy was continued by his eighteenth-century successors. On such estates the £5 an acre penalty for ploughing up pasture was undoubtedly intended as a deterrent. Other examples of hesitation in ploughing up pasture are to be found on the Cave family estates in Leicestershire, and at Wasperton in Warwickshire, which was enclosed in 1664

and the land laid down to pasture for at least thirty years.⁴⁴

Even where much of the land was permanent pasture, this did not preclude farmers from keeping a small percentage of land under arable crops, often quite separately. All six Buckinghamshire probate inventories of men who called themselves graziers or dairymen during the eighteenth century show some arable crops, but never an important proportion.⁴⁵ The logic of Dr Kerridge's arguments, that the growing of small acreages of arable crops was part of a system of ley husbandry in which the smaller the proportion of arable the longer the ley, is never made explicit and was not always the case. The late eighteenth-century agricultural reports suggest otherwise: speaking of Rutland enclosures in the 1760s Crutchley writes 'the farmers at that time laid a considerable part to grass and the remainder was kept in the same course, and nearly in every respect the like management as in the open field state', and 'grasslands meant to be improved by ploughing for a few years by drainage, and now and then a small piece of land near the graziers' house for the convenience of straw, being the only strong land that is in tillage'.⁴⁶ In Northamptonshire Donaldson found half the enclosed parishes were 'old enclosures', and these were occupied by grazing farms.⁴⁷ In general well-tended permanent pastures may have given a more consistent return than long leys, and arable and pasture in many cases remained separate and uncoordinated.

III

By the end of the eighteenth century permanent pasture farming had an important

⁴⁰ T Hale, *A Complete Body of Husbandry*, 1756, p. 10.

⁴¹ Crutchley, *op cit*, p. 13.

⁴² Pitt, *Leicester*, p. 157; and his *Northampton*, pp. 138-9.

⁴³ Broad, *thesis*, pp. 218-19; Verney MSS, Estate papers, Sir Ralph Verney to William Coleman, 22 December 1686.

⁴⁴ Claydon House, Verney MSS, Ralph Verney to Earl Verney, 18 October 1744, microfilm reel 59; M Cave to Ralph Verney, 27 November 1725, microfilm reel 57. D M Barratt, 'The Enclosure of the Manor of Wasperton', *Univ Birmingham Hist Jour*, III, 1951-52, 146-52.

⁴⁵ Buckinghamshire CRO: D/A/Wf/71/159; 73/225; 75/137; 75/146; 78/74; 78/94.

⁴⁶ Crutchley, *op cit*, pp. 10, 31.

⁴⁷ Donaldson, *op cit*, p. 24.

part to play in the agricultural economy of the southern and eastern midlands. Yet both Arthur Young (devoted to arable-based systems of management) and William Marshall (who in attacking Young expressed an equal commitment to mixed farming) condemned permanent pasture farming as a poor and regressive system of management. What they appear to refer to was unmanaged pasture, and in this case their criticisms have been substantiated by the Rothamsted grass plot experiments, which show a rapid decline in hay yields to a stable low level over 120 years and worsening grass quality for this kind of land.⁴⁸ Such management would certainly be worse than almost any alternate grass/arable rotation. Yet because Young and Marshall were preoccupied with their own interests, and many of the County Reporters were unfamiliar with the farming of the areas they surveyed, they all probably underplayed changes in the management of permanent pasture.

There were important ways in which grassland farmers could improve their pasture and replenish fertility without recourse to the plough. One was the direct application of soil nutrients to pastures. The use of fertilizers was a constant theme of seventeenth- and eighteenth-century agricultural writers, yet modern historians of the period have generally tended to emphasize their use on arable land.⁴⁹ In practice, the fertilizers advocated for pasture included dung, urban night soil, river mud, marl, lime, and potash.⁵⁰ Certainly the Rothamsted experiments

indicate that the application of farmyard manure to grassland has the effect of raising hay yields markedly compared with unmanured plots, and of holding them at a reasonably stable level.⁵¹ Moreover, farmyard manure encourages early growth more effectively than artificial manures. After regular four-yearly application over ninety years the yield of manured plots (plot 19) was more than double that of its unmanured counterparts (plots, 2, 3, 12).⁵²

How regularly and effectively farmers made such applications is difficult to determine in the absence of large numbers of detailed farm records of the period. Yet on the Verney estates in north Buckinghamshire, regular application of fertilizer is evident from the 1680s onwards. The particularly favoured source was potash provided by soap boilers, and grants of considerable quantities are a regular feature of negotiations for new leases and tenancies from then onwards. So important did they become that Sir Ralph Verney and his son made a point of keeping at least one potash maker as a tenant. He was the only man given a long lease, and it included clauses specifying the provision of considerable amounts of potash every year and an option to buy his whole supply.⁵³ Literary references to the application of fertilizers to pastures abound: the use of Somerset marl to prolong the life of clover leys, the marvels of Thomas Liveing's new manure, and of mud from streams.⁵⁴ Certainly areas within reach of growing urban centres were able to make good use of waste products from home and industry. Wedge remarked on the benefits of Birmingham to Warwickshire farmers, while Middlesex farmers were renowned for their

⁴⁸ W E Brenchley, *The Manuring of Grassland for Hay*, 1924; *The Park Grass Plots at Rothamsted* (rev K Warington), 1958; *Details of the Classical and Long Term Experiments up to 1967*, 1970. I am grateful to Dr Carolina Lane for drawing my attention to these important experiments. Plots 2, 3 and 12 are unmanured.

⁴⁹ One notable exception is J de Vries, *The Dutch Rural Economy in the Golden Age*, 1974, p 142.

⁵⁰ Ellis, op cit, I, Jan, pp 38, 84; III, July, pp 132-3; VI, June, p 32; VII, July, p 106; S Trowell, *A New Treatise of Husbandry, Gardening, etc.*, 1739, pp 42, 146-7, R North, *An Account of the different Kinds of Grasses Propagated in England . . .*, 1759, pp 2, 14, 23-33; Hale, op cit, pp 10, 85-9, 415, 422.

⁵¹ Brenchley, op cit, p 82.

⁵² W E Brenchley, *The Park Grass Plots at Rothamsted* (rev K Warington), 1958, Table 1, comparing plots 2, 3 and 12 (unmanured) with plot 19 (farmyard manure every fourth year since 1904), and pp 8, 81-5.

⁵³ Claydon House, Verney deeds, 1671, dated 19 November 1671; estate papers 1706, Potash agreement between William Stevens and Lord Fermanagh dated 1720.

⁵⁴ R North, *An Account of the Different Kinds of Grasses . . .*, 1759, pp 4-5; Hale, op cit, p 10; Trowell, op cit, p 42.

heavy use of dung on pastures, and in the mid-eighteenth century it was considered profitable to cart fertilizers such as coal ashes as far as thirty miles from London.⁵⁵ Such applications of manure were considered important on pasture lying away from rivers where floods could naturally lay down rich silt.⁵⁶ The cost of fertilizer brought from off the farm was mainly determined by transport costs and was therefore a function of distance. Ellis's limit of thirty miles may be reasonable, although already in the late seventeenth century cartloads were reaching north Buckinghamshire from London — a distance of more than fifty miles.⁵⁷ Transport costs fell with the arrival of canals, and by 1813 Priest noted that the Grand Junction was already being used to shift manure out to agricultural Buckinghamshire.⁵⁸ In addition, rural industries, particularly soap-boiling and the leather trades, provided a constant source closer to hand.

The fertility of permanent grasslands could also be maintained by other methods. In the sixteenth and seventeenth centuries it was normal to make a clear distinction between meadows, where the land was left ungrazed from January or February until a hay crop was cut, and pasture ground which was continuously fed. In the eighteenth century, if not before, this distinction was becoming blurred as more grassland was rotated between meadow and pasture. The idea of an 'upland meadow', land away from enriching river floods that could be profitably mowed, was discussed by most of the eighteenth-century agricultural writers who understood grassland farming. Hales felt that the meadow/pasture distinction was a poor one because 'both these are by the judicious Farmer mowed at times and fed at times', and

he preferred the description 'grass ground'.⁵⁹ North saw rotational mowing as a significant improvement and argued that 'Upland Meadows require manuring more than Pasture and it is much better for the Land, when it can be alternately Meadow and Pasture'.⁶⁰ Both Hales and Robert Brown advocated mowing grounds one year in three, Brown arguing that 'mowing of land too often is a very great prejudice to it' unless the land is frequently manured, a sentiment echoing Hales's statement that a hay crop can take the heart out of the ground just like corn.⁶¹ In Buckinghamshire Priest found grassland being mown in alternate years, as well as other farms where meadows and pastures were still kept separate.⁶² In the mid-eighteenth century at Middle Claydon, Ralph Verney wrote 'we generally compute one third for mowing ground, for unless the tenant can keep up a stock in winter he can't pay his rent and to buy hay ruins him'. Ninety years earlier Verney leases contained clauses of two types, some enjoining mowing one year in three, others applying mowing restrictions only to specific fields.⁶³

Rotational mowing could thus help to maintain fertility by varying the way in which the grass responded. The untreated grass plots at Rothamsted not only suffered considerable reductions in yields, but also showed a gradual reduction of the number of species of grass.⁶⁴ Yet they represent land that was mowed every year and was not even grazed after the haycut. Even where no manure is applied to pasture, the natural application by

⁵⁹ Hale, *op cit*, p 414.

⁶⁰ North, *op cit*, pp 5, 14; One example in practice in House of Lords RO: HL Committee book, vol 16, 12 February 1765.

⁶¹ Hale, *op cit*, p 427; R Brown, *The Complete Farmer . . .*, 1759, p 108.

⁶² St John Priest, *op cit*, p 234.

⁶³ Claydon House, Verney MSS, Ralph Verney to Earl Verney, 21 Oct 1744, microfilm reel 59; Verney deeds, 1656 (19 Jan 1656/57); 1658 (17 Nov 1658); estate papers, William Coleman to Sir Ralph Verney, 14 April 1689.

⁶⁴ Brenchley, *The Park Grass Plots at Rothamsted* (rev K Warington), 1958, pp 18–20; such reductions were true of all plots but the types of plant involved varied widely with the manure applied.

⁵⁵ Wedge, *op cit*, p 20; Ellis, *op cit*, I, Jan, pp 38, 84; III, July, pp 132–5; VII, July, p 106.

⁵⁶ Hale, *op cit*, p 415; North, *op cit*, p 14; Pitt, *Northampton*, p 133.

⁵⁷ Claydon House, Verney MSS, Estate papers, 1680–96; PRO: C 108/98, Wingfield-Drake papers.

⁵⁸ St John Priest, *op cit*, pp 272, 343.

feeding cattle puts some fertility back into the soil. Not that it should be imagined that eighteenth-century yields were high: Marshall speaks of yields of one ton per acre as good, and this compares poorly with the two and a half to three ton crops attained with some fertilizers at Rothamsted.⁶⁵ Nevertheless the combination of manuring grasslands and rotating meadows provided a way in which pasture farming on the midland clays could be improved independently of the new light land systems, albeit at a lower level of intensity.

Such methods reduced the problem of falling soil fertility, but there were other disadvantages associated with the physical condition of the land when pasture was not ploughed up every few years. One was the growth of very large ant-hills in the fields. Grass tended not to grow on such uneven lumps and the general state of the pasture deteriorated. The traditional method of removing such ant-hills was with a long, narrow, iron-tipped spade, but by the mid-eighteenth century a special plough had been developed for the purpose.⁶⁶ When the agricultural reports were written around 1800 the technique was noted and remarked in Buckinghamshire, Northamptonshire, Leicestershire, and Rutland.⁶⁷ Moreover, it provided a method of re-seeding old pasture with either traditional hay seeds or with new grasses, without actually ploughing up the whole field. No great claims are made for 'banking' (as it was called) as a dramatic reviver of decayed pastures, but it could prevent the worst depredations of time and allow the inoculation of grass species that had disappeared.

Another problem faced by pasture farmers on the heavy clay soils of the midlands was that of water. Winter rainfall could reduce pasture to quagmires and destroy the grass if livestock were allowed to roam. Many leases

prevented farmers from running cattle on wet fields in the early months of the year. Drainage was therefore essential, and deep drains were sunk through the clay and filled with branches and bracken. One of the greatest problems when laying down open fields to pasture was the persistence of mounded ridges and furrows, unless care was taken to level them.⁶⁸ In summer the problem was reversed. The increasing numbers of 'upland' pastures were less likely to have streams running through them for livestock to drink from, and farmers needed to dig ponds and employ drainage experts to divert streams so that they ran through the maximum number of fields.⁶⁹

IV

Whatever the success of new management techniques in stabilizing or even improving permanent pasture, an equal part in the survival of midland farming was played by the considerable degree of specialization reached by the end of the eighteenth century. Livestock farming was bound up with the expansion of a market economy and of facilities equipped to deal year round with the products of the farm. To compete with the light-land mixed farmers, with their turnip-, clover- and sainfoin-fed animals and the beginnings of stall-fed cattle, the midland livestock producer had to specialize, tailor his farming to the market, and aim for quality. Ellis, at his observation post between the light-land Chilterns and the clay Vale, was insistent that 'no artificial Grass can feed any beast so as to cause its Flesh to eat so sweet, as when it is fed on the natural Grass of Vale-Lands', and that Vale grass alone could fatten an ox or horse, whereas on the hills the farmers needed to supplement with grains.⁷⁰ In general, midland farmers had to be

⁶⁵ *Ibid*, Table 1.

⁶⁶ Ellis, *op cit*, I, Jan, p 37; VII, July, pp 38-42; Hale, *op cit*, p 418.

⁶⁷ St John Priest, *op cit*, pp 201, 203, 236; Pitt, *Northampton*, pp 136-9; *Leicester*, p 151; Crutchley, *op cit*, p 13.

⁶⁸ Claydon House, Verney estate papers, William Coleman to Sir Ralph Verney, 5 Feb 1676/7; Kerridge, *op cit*, p 37.

⁶⁹ Claydon House, Verney estate papers, Sir Ralph Verney to William Coleman, 21 July 1681, 22 Jan 1682/83, 16 Feb 1686/87, 15 Oct 1684.

⁷⁰ Ellis, *op cit*, I, March, p 80.

adaptable, and specialisms certainly changed: in the late seventeenth and early eighteenth centuries north-west Buckinghamshire specialized in cheese, one farmer in 1727 owning seventy-eight cows and holding almost two and a half tons of cheese in store; by the later part of the century the specialism had altered to double-skimmed butter for the London market. This trade was run almost exclusively by a few London dealers who organized transport and controlled prices, paying the farmers monthly, or in some cases yearly, for their produce.⁷¹ This butter area extended into the south-western part of Northamptonshire and the parishes around Whittlebury forest, of which Pitt remarked 'this country barely supplies itself with cheese, but has considerable surplus of butter and of pork fed from dairy produce', which 'have an easy conveyance, ready sale, and the returns from which quickly comes round'.⁷²

Specialization in cattle breeding was uncommon in the south midlands, and in most counties there was a vast mixture of breeds. Large numbers of cattle were bought in from the markets and fairs to the north of the area. Welsh and Hereford cattle were valued for fattening and the Holderness for dairying — partly because when milk yields fell off it could be sold off for fattening or to the metropolitan dairies.⁷³ Dairying naturally produced a surplus of calves, but on the whole these were not reared on the farm, and at least some found themselves bundled ten or twenty at a time into carts to be taken to Essex and there fattened for veal.⁷⁴ While butter-making replaced cheese as the main product in

Buckinghamshire and Northamptonshire, cheese-making was being ousted by fattening in Warwickshire.⁷⁵ Here doubtless the growth of an urban and industrial market in the west midlands had similar but less pronounced effects on agriculture to those exerted by London on Middlesex. In general, fattening was relatively specialized, found widely in all the counties of the south midlands, and often on 'old' enclosures with their larger farm sizes.⁷⁶ Cattle graziers mainly concentrated on summer-feeding spring-bought animals for sale in the autumn, or in the case of the best beasts, after Christmas.⁷⁷ Where the County Report writers differ on profitability they agree that the animals were almost exclusively grass- and hay-fed, with little outside feed bought in.⁷⁸

The specialisms within cattle farming have been used as an example of the way in which districts concentrated on products best suited to their land and markets, and changed these as tastes and price relativities altered. Midland farmers also adapted in other ways: sheep were as important as cattle and were often kept with them, while wherever cheese and butter making were predominant pigs were reared and fattened on the waste-products of the dairy. Another speciality developing at this time was horse-breeding, often associated, in particular, with Leicestershire.⁷⁹ Yet although farmers adopted the more buoyantly priced products, they still led a precarious existence. Constant adaptation to the market and the ability to judge finely the minimum needs of his enterprise were the hallmarks of success. In Pitt's words:

The grazier is a kind of merchant; and on his capital

⁷¹ Buckinghamshire CRO: Inventories, D/A/Wf/75/137; 75/146; 71/159, and numerous examples from the Verney correspondence; W Marshall, *The Review and Abstract of the County Reports to the Board of Agriculture*, IV, York, 1815, p 505; St John Priest, op cit, pp 297-9; PRO: HO 67/15 returns from Warminghall and Beachampton.

⁷² Pitt, *Northampton*, p 199; the same technique is also evident in Bedfordshire, see T Batchelor, *General View of . . . Bedford*, 1808, p 526.

⁷³ St John Priest, op cit, p 288.

⁷⁴ Donaldson, op cit, p 50; T Stone, *General View of . . . Bedford*, 1794, p 28. A possible example is given in John Cook's accounts for 1787, Northants CRO: ML 1273.

⁷⁵ A Murray, *General View of Warwick*, 1813, p 133.

⁷⁶ Pitt, *Northampton*, p 37.

⁷⁷ A H John, 'The course of agricultural change 1660-1760', in L S Pressnell (ed), *Studies in the Industrial Revolution*, 1960, p 143 finds seasonal early year rises in beef prices had gone by 1680. For one reason see *The Complete Grazier*, 1767, p 73, showing two batches of cattle fattened on a model Essex farm for sale in September and February.

⁷⁸ Crutchley, op cit, p 16; Donaldson, op cit, p 25; Pitt, *Northampton*, pp 129, 135.

⁷⁹ D Defoe, *A Tour through the Whole Island of Great Britain*, 1927 edn, II, pp 89-90.

and judicious management depends his success. . . . his profit in a great measure depends upon his laying in a judicious selection of lean stock upon reasonable terms.⁸⁰

V

In conclusion, consideration of agricultural practices in the south-eastern midland plain over the period 1500–1800 has led to certain criticisms of the part played by up-and-down husbandry in Dr Kerridge's *Agricultural Revolution*. It has been argued that different parts of the midland plain each have their own agricultural and soil characteristics which made for considerable variation in farming, and that the rise of up-and-down husbandry before 1650 does not so much mark a completed revolution as a phase of development which accorded with the economic and social circumstances of its time. After 1650, and certainly by 1800, large areas of heavy clays (perhaps one-half of the area of the six counties considered) were laid down to permanent grass. Permanent grassland farming was primarily a low-cost response to the rise of intensive light-land mixed farming, but (contrary to the views expressed by Young and Marshall) underwent some improvement by the application of fertilizers, rotational mowing, and drainage and other

techniques. Concentration on the specialities best suited to the soil and market conditions would not have been possible without the simultaneous growth of sophisticated markets and improved transport facilities. The growth of London, and later of Birmingham and the west midlands, was therefore a powerful influence.

Such a re-evaluation leaves many interesting avenues unexplored. The relationship between an increasingly pastoral economy and the rise of rural industries such as lace-making and straw-plaiting in Buckinghamshire and Bedfordshire, leather-working in Northamptonshire, and hosiery in Leicestershire, may need some re-definition.⁸¹ If enclosure between 1650 and 1760, or even 1780, led to conversion to pasture in so many areas, any accurate assessment of the financial return to the landlord from enclosure pure and simple becomes much more difficult. Finally, permanent pasture farming was as much as alternate husbandry the consequence of particular economic, social and geographical circumstances. With the Napoleonic wars and the rapid population and urban growth of the first half of the nineteenth century, these once again altered in ways which are beyond the scope of this paper.

⁸⁰ Pitt, *Northampton*, p 46.

⁸¹ G F R Spenceley, 'The Origins of the English Pillow Lace Industry', *Ag Hist Rev*, XXI, 1973, pp 81–93.

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