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Source: *The Economic History Review*, New Series, Vol. 39, No. 4 (Nov., 1986), pp. 526-548

Published by: [Wiley](#) on behalf of the [Economic History Society](#)

Stable URL: <http://www.jstor.org/stable/2596482>

Accessed: 30/04/2013 08:40

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*The Alleged Transformation from Two-field to Three-field Systems in Medieval England*¹

By H. S. A. FOX

The idea that the three-field system in England was derived from an earlier two-field prototype is first encountered in Prothero's *Pioneers and Progress of English Farming*. Writing at a time when study of English agricultural history was in its infancy, Prothero could produce no support for his claim, which was little more than an extension, applied to field systems, of the Victorian view of an inevitable, steady, stage-by-stage progress in modes of production. Maitland, too, and Cunningham, toyed with the idea, but it was left to Gray, in *English Field Systems* (1915), to put forward some empirical evidence. Gray concluded that between about 1250 and 1350 an "important movement" took place, leading in many townships to a replacement of the "simpler" two-field system by one of three fields.²

Gray's conclusion is still of first-rate importance to models of medieval agrarian development. Thus if we assume that but half the townships of Leicestershire had undergone a transformation from two to three fields in the thirteenth century, then the increase in land under crops might have been great enough to support an additional population of the order of 28,000.³ Scholars who argue that certain simple types of technological progress alleviated the press of medieval population on the land would claim that here is a prime example, one of those intensifications of land-use which, according to a classic exposition, mark periods of population growth in relatively backward agrarian societies.⁴

On the whole, Gray's suggestion has been accepted widely and firmly. Tait, reviewing *English Field Systems*, could find no objection to it. Homans, referring in 1941 to Gray's examples and adding one of his own, commented

¹ I am grateful to the Marquess of Bath for allowing me to consult documents at Longleat and to Jane Fowles for much help there over many years. The Maltwood Fund for Archaeological Research and the Research Board of the University of Leicester contributed part of the expenses. I am grateful, too, to M. Aston, D. Bromwich, Margaret Gelling, M. Haggie, P. D. A. Harvey, R. McKinley, Dorothea Oschinsky and C. Thornton for advice on particular points.

² R. E. Prothero, *The Pioneers and Progress of English Farming* (1888), p. 4; F. W. Maitland, *Domesday Book and Beyond* (Cambridge, 1897), pp. 365-6 and 366 n. 3; W. Cunningham, *The Growth of English Industry and Commerce* (Cambridge, 4th edn. 1905), I, pp. 74-5, putting forward suggestions not in the 1st edn. of 1882; H. L. Gray, *English Field Systems* (Cambridge, Mass. 1915), pp. 72-82, 109, 406.

³ This is a very rough and ready calculation. I have worked with an average parish size obtained from White's *Leicestershire Directory* for 1862, and have assumed that one person's subsistence needs could be met from 1½ cropped acres, suggested by J. Z. Titow, *English Rural Society, 1200-1350* (1969), p. 89.

⁴ E. Boserup, *The Conditions of Agricultural Growth: The Economics of Agrarian Change under Population Pressure* (1965), pp. 11-4.

that “many another village must have done the same thing”.⁵ A little later the idea was endorsed by Postan, for it suggested change of that type—relatively inelastic and unadventurous, merely requiring in-width investment—which he regarded as typical of early medieval agriculture.⁶ More optimistically, one of the contentions of what might be termed the “Hallam thesis”—portraying the twelfth and thirteenth centuries as “a great innovatory period” in which a large population was comfortably supported—is that historians have “under-estimated” the degree to which field systems evolved, especially the emergence of three-field arrangements. There are echoes here of White’s claim that the coming of the system was at the crux of an “agricultural revolution . . . decisive in its historical effects” and accounting for that northwards shift in the core of European culture which occupied the attention of Pirenne.⁷

Yet our picture of the transformation in England remains rather faint.⁸ For none of the places where it has been claimed that a change from two to three fields took place have we been given more than a glimpse of what happened. Thus the first purpose of this paper is to analyse in detail the change of systems which took place on the Somerset manor of Podimore in 1333. Here a happy survival of particularly detailed documents permits close observation and allows calculations to be made for the first time of the productivity of farming under two- and three-field regimes; the manor’s sources are superior in scope to those used in the clearest published account of a new three-field system at Vaulerent in the Île-de-France.⁹ The picture remains faint, too, because, since Gray wrote, no survey has been made of the extent of the transformation in medieval England. The second purpose of this paper is to look again at what he called an “important movement” and to discuss the implications of that re-assessment for our appreciation of the early agrarian history of the midlands.

Something must first be said about the importance within the two systems of the fields themselves, because any consideration of the subject of this paper soon runs up against claims that “the existence of two, three or more common

⁵ J. Tait, review note, *English Historical Review*, xxxi (1916), p. 627; G. C. Homans, *English Villagers of the Thirteenth Century* (Cambridge, Mass. 1941), p. 57. General acceptance of Gray’s suggestion is illustrated by the following: N. Neilson, ‘Medieval Agrarian Society in its Prime: England’, in J. H. Clapham and E. Power, eds. *The Cambridge Economic History of Europe*, I, *The Agrarian Life of the Middle Ages* (Cambridge, 1942), p. 439; Sir J. Clapham, *A Concise Economic History of Britain from the Earliest Times to 1750* (Cambridge, 1949), p. 81; H. P. R. Finberg, *Gloucestershire: An Illustrated Essay on the History of the Landscape* (1955), p. 40; M. McKisack, *The Fourteenth Century, 1307-1399* (Oxford, 1959), p. 322; W. O. Ault, ‘Open-field Husbandry and the Village Community: A Study of Agrarian By-laws in Medieval England’, *Transactions of the American Philosophical Society*, new ser. 55, pt. 7 (1965), p. 9; E. Miller and J. Hatcher, *Medieval England: Rural Society and Economic Change, 1086-1348* (1978), p. 90; J. L. Bolton, *The Medieval English Economy, 1150-1500* (1980), p. 16.

⁶ M. M. Postan, ‘The Economic Foundations of Medieval Society’ (first published in 1950), in *Essays on Medieval Agriculture and General Problems of the Medieval Economy* (Cambridge, 1973), p. 18; ‘Medieval Agrarian Society in its Prime: England’, in M. M. Postan, ed. *The Cambridge Economic History of Europe*, I, *The Agrarian Life of the Middle Ages* (Cambridge, 1966), p. 583. On investment, see his ‘Investment in Medieval Agriculture’, *Journal of Economic History*, 27 (1967) pp. 581-4; *The Medieval Economy and Society: An Economic History of Britain in the Middle Ages* (1972), p. 43.

⁷ H. E. Hallam, ‘The Postan Thesis’, *Historical Studies*, 15 (1971-3), p. 219; *Rural England, 1066-1348* (1981), pp. 13, 116-7; L. White, *Medieval Technology and Social Change* (Oxford, 1962), pp. 69-78.

⁸ As pointed out by Titow, *English Rural Society*, p. 39.

⁹ C. Higounet, *Le grange de Vaulerent: structure et exploitation d’un terroir cistercien de la plaine de France, XII^e-XV^e siècle* (Paris, 1965).

fields had no significance at all in agricultural terms".¹⁰ Their ultimate source appears to be Hilton's important finding that in medieval Leicestershire the furlongs into which fields were divided, rather than the fields themselves, were the unit for the organization of cropping. Hilton concluded that "from the point of view of agricultural practice, it was of little moment whether a village was run on the two-field system or the three-field system".¹¹

Two- and three-field systems were the two main variants of what Gray called the midland system, distinguished from all other English field arrangements by the grouping of furlongs into two or three great prairie-like fields. The reality of these field divisions in the middle ages is beyond doubt. Many early charters contain terse formulae stating simply that a holding lies so many acres *in uno campo* and so many *in alio*, or in two or three named fields: what could have been the point of such abbreviated formulae (not locational in purpose) except to emphasize the grantee's stake within a *system* in which the field was of the utmost importance?¹² Countless extents and charters describe holdings split with remarkable equality between the fields, a device, surely, to maintain constant levels of cropping in a cycle driven forward by the regular fallowing of one of them each year; analyses of cropping plans in manorial *compoti* show each field returning to fallow every second or third year; leases specifying the number of crops to be taken during a stated term of years indicate regular cycles determined by the principle of the fallow field.¹³ In short, the fields of the midland system were fallowing units. The use of furlongs as units of cropping gave the system great flexibility in terms of crop combinations and further flexibility was possible in that, as an occasional expedient, a few acres (an *inhok*) might from time to time be sown in the fallow.¹⁴ But the sources leave no doubt about the fundamental reality and integrity of the great fields; in the middle ages, as in later centuries, the system displayed "a combination of inflexibility of field course with maximum freedom in cropping".¹⁵

¹⁰ C. C. Taylor, *Fields in the English Landscape* (1975), p. 72.

¹¹ R. H. Hilton, 'Medieval Agrarian History', in *Victoria County History, Leics.* 2, p. 161.

¹² A very full sample of abstracts from early grants containing such formulae is in Gray, *Field Systems*, pp. 450-509. For a charter which seems to spell out the more usual terse formula, see F. M. Stenton, ed. *Documents Illustrative of the Social and Economic History of the Danelaw* (British Academy, Records of Social and Economic History, 5, 1920), pp. 151-2. Twelfth-century surveys also contain a few terse formulae of this kind; the evidence is neatly summarized in J. Z. Titow, 'Medieval England and the Open-field System', *Past and Present*, 32 (1965), p. 98, to which could be added C. O. Bridgeman, 'The Burton Abbey Twelfth-Century Surveys', *Collections for a History of Staffordshire*, for 1916, p. 229.

¹³ For many examples of holdings divided with strict equality between fields, Gray, *Field Systems*, pp. 450-509. For the evidence of *compoti*, P. D. A. Harvey, *A Medieval Oxfordshire Village: Cuxham, 1240-1400* (Oxford, 1965), pp. 164-5; R. H. Hilton, *The Economic Development of some Leicestershire Estates in the Fourteenth and Fifteenth Centuries* (Oxford, 1947), pp. 153-5; F. M. Page, *The Estates of Crowland Abbey: A Study in Manorial Organization* (Cambridge, 1934), p. 119; D. Roden, 'Field Systems of the Chiltern Hills and their Environs', in A. R. H. Baker and R. A. Butlin, eds. *Studies of Field Systems in the British Isles* (Cambridge, 1973), p. 349. For examples of leases: *Registrum Antiquissimum of the Cathedral Church of Lincoln*, IV (Lincolnshire Record Society, 32, 1937), pp. 69-71, 233-4; V. R. Perkins, 'Documents Relating to the Cistercian Monastery of St. Mary, Kingswood', *Transactions of the Bristol and Gloucestershire Archaeological Society*, XXII (1899), pp. 204-5; *V.C.H. Oxf.* 8, p. 69.

¹⁴ It may be that, in a few cases, an *inhok* in a two-field system became a regular feature of a rotation, heralding the creation of a new field, though I have found no evidence of this. If the meaning of the word is "a corner" (suggested as a possibility by the *New English Dictionary*), this would add to the concept of *inhoks* as small deviants in more regular crop-fallow cycles.

¹⁵ E. Kerridge, *The Agricultural Revolution* (1967), p. 95.

Consideration of the origins of the midland system also serves to emphasize that fallow grazing was its determining principle. The evidence of charters indicates quite clearly that it was already well established by the late twelfth and early thirteenth centuries: except perhaps in a few localities it was not a response to the pressures of the high middle ages. Rather, there is much circumstantial evidence and a little charter evidence to indicate that the midland system evolved during a filling up of the landscape in the last three centuries of Saxon England, as ploughlands of existing settlements expanded at the expense of pastures and wastes, as severance took place in ancient interdependencies between villis which had given them access to grazing at a remove, and as new settlements were established on pastoral reserves.¹⁶ Under those circumstances a system evolved in which ploughland doubled up with pasture and which met demand for a regular supply of grazing for all cultivators: the common fields of the midland system. The great fields had two incomparable advantages as units for grazing by the combined flocks of commoners. First, operationally, their presence simplified the risky boundary between growing crops and grazing animals. Second, ecologically, a great prairie-like fallow field encouraged the “field sheep” to spread out and wander in the performance of tasks for which they were kept, grazing even the furthest grass-infested strips and transferring nutrients from grassy field-ways and field-edge pieces toward strips to be cropped in the following year.¹⁷

From whatever angle it is viewed, the midland system appears as a fallowing system, the two-field variant distinguished from the three-field by the proportion of cropland fallowed each year, one-half compared with one-third. Neither variant dictated particular crop combinations: in that department of agricultural practice the two could be very similar. But in a wider sense, whether a vill was run on two-field or three-field lines was of no small moment, for under the latter a 30-acre holding would annually carry 5 more cropped acres—enough perhaps, to support an extra three people.

I

Podimore lies two miles north of Ilchester in the claylands of east Somerset, a region which forms the most westerly extension of the zone of midland field systems. The manor belonged to Glastonbury Abbey between 966 and 1539.

¹⁶ Late arrival of the midland system in the north is suggested by E. Miller, ‘Farming in Northern England during the Twelfth and Thirteenth Centuries’, *Northern History*, 11 (1975), pp. 10-1. For other examples of late adoption of the system in localities marginal to it, see H. S. A. Fox, ‘Approaches to the Adoption of the Midland System’, in T. Rowley, ed. *The Origins of Open-field Agriculture* (1981), pp. 94-8. For twelfth- and thirteenth-century evidence, see Titow, ‘Medieval England and the Open-field System’, pp. 98-100 and Fox, ‘Approaches’, pp. 72-83. The latter, pp. 83-8, 98-102, discusses the contexts for emergence of the midland system in the pre-Conquest period, for which see also H. P. R. Finberg, ‘Anglo-Saxon England to 1042’, in H. P. R. Finberg, ed. *The Agrarian History of England and Wales*, 1, ii, A.D. 43-1042 (Cambridge, 1972), pp. 487-96.

¹⁷ For some of the operational benefits, see C. J. Dahlman, *The Open Field System and Beyond* (Cambridge, 1980), pp. 111-4. For ecological benefits, H. S. A. Fox, ‘Some Ecological Dimensions of Medieval Field Systems’, in K. Biddick, ed. *Archaeological Approaches to Medieval Europe* (Kalamazoo, Mich. *Studies in Medieval Culture*, xviii, 1984), pp. 119-58. For “field sheep” or “fallow sheep” as a special type of inferior value see M. W. Beresford, ‘The Poll Tax and Census of Sheep, 1549’, *Agricultural History Review*, 11 (1954), p. 24 and J. Goodacre, ‘Lutterworth in the Sixteenth and Seventeenth Centuries’ (unpublished Ph.D. thesis, University of Leicester, 1977), p. 154 n. 3.

Following the Dissolution, it quite soon passed to the Horner family whose "Little Jack" is renowned as a taker of monastic lands, but before this Sir John Thynne and others "had cause" to remove from Glastonbury the sources which are used in this study: account rolls for ten years between 1281 and 1334, a few court rolls from the same period, and a detailed extent of 1332.¹⁸

The agrarian system of Podimore under two-field management may best be approached through the extent of 1332.¹⁹ At the centre of the township were the crofts and messuages of Glastonbury's men (Figure 1a): freemen, villeins, sub-tenants, and, at the bottom of the scale, landless *garciones*.²⁰ In 1332 wood was limited to a spinney of $1\frac{3}{4}$ acres, a situation confirmed by Crown surveyors of woodland in the early sixteenth century.²¹ Under the heading *pastura de dominico* the extent lists a few small pieces of dry pasture, amounting in all to 23 acres: permanent several pasture was in short supply at Podimore though the place was a little better endowed than some others in the "midland" area where no pasture at all is recorded. Wet meadowlands were much more extensive, many of them lying near the "toad marsh" (Old English *pode, mor*) which, in its former undrained state, gave its name to the township itself. The rest of the area of the township—not occupied by the village, pasture or meadow—was arable land in the early fourteenth century. Names of some furlongs show without doubt that the arable pressed hard upon the manor boundary which, for most tenants, demarcated the limits of their resources.²² And the extent takes care of approximately 900 acres of arable which when added to the far smaller acreage of meadow and pasture, gives a total close to the area of the township. Podimore in the early fourteenth century conformed to the typical model of land-use in townships within the territory of the midland system: rough pastures had been eliminated at some earlier date, providing a context for the development of a system of great fields for fallow grazing.

Whenever documentation from Podimore prior to 1333 is sufficiently detailed it agrees in dividing the arable into two fields. A charter of 1272 grants land within which is subsumed a holding of 18 acres in each field "which Radulphus Cammel once held from Robert [de Middleton]", taking the evidence back perhaps to the second quarter of the thirteenth century. The system was neatly symmetrical, the two equal sectors being separated by the stout barrier formed by the village crofts (Figure 1a). And this symmetry was reflected in the composition of holdings: thus a grant of c. 1265 lists 14 widely dispersed strips, 7 acres in Eastfield and 6 acres in Westfield, implying that the fields at Podimore were of no small importance in routines of husbandry.²³

¹⁸ Longleat House MSS (hereafter L.), II,273, II,272, II,246, II,215, II,216, IO,655, IO,656, IO,766, IO,761, IO,632, II,250, IO,778, II,252, IO,770, IO,711, IO,773, IO,774, II,251, II,179; B.L.Eg. MS 3321, ff. 233-5v. For dating I have generally followed I. Keil, 'The Estates of the Abbey of Glastonbury in the Later Middle Ages' (unpublished PhD. thesis, University of Bristol, 1964) which is an indispensable guide.

¹⁹ B.L.Eg. MS 3321, ff. 233-5v. on which this and the following paragraph are largely based.

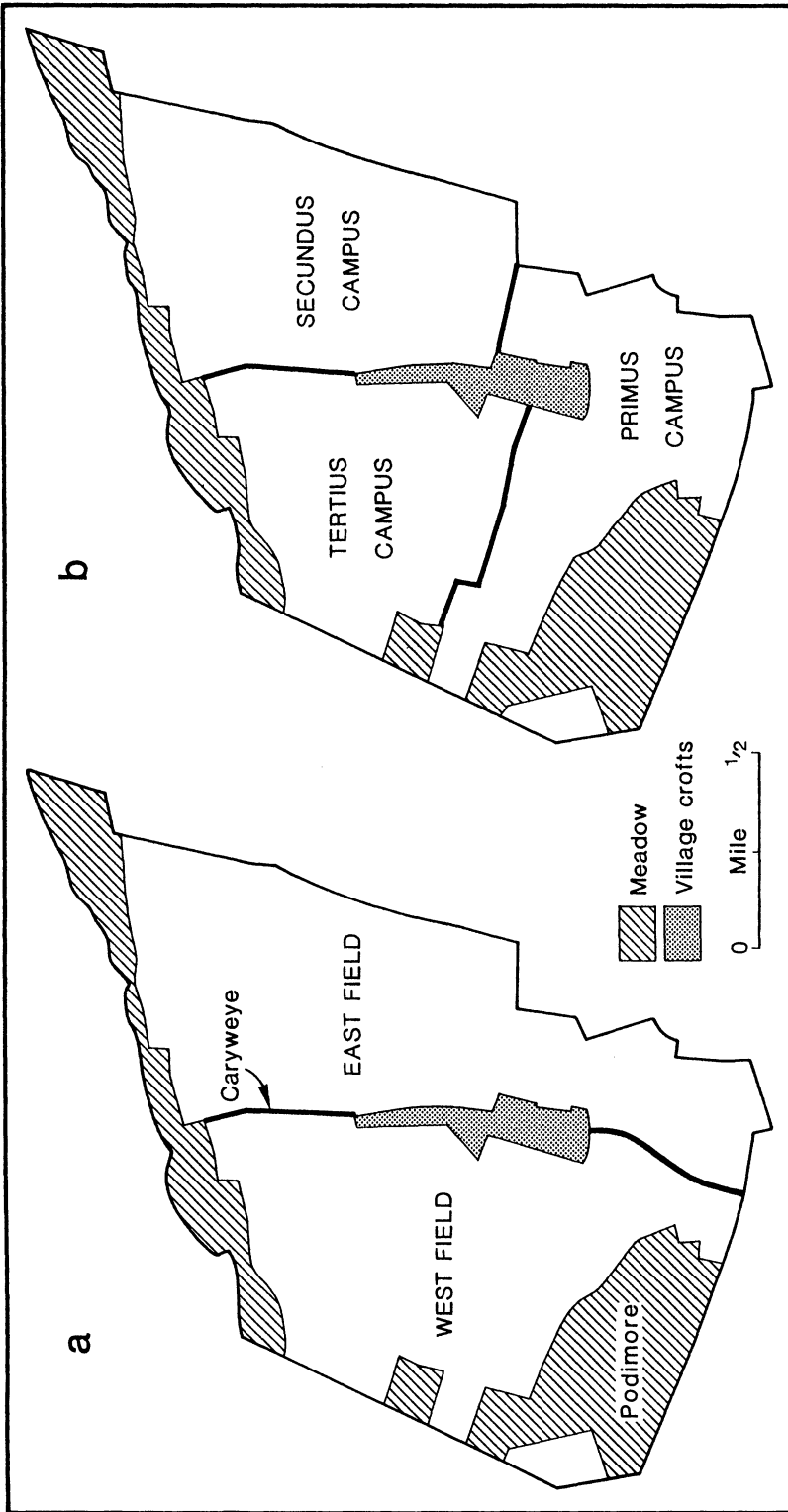
²⁰ An interpretation of Glastonbury's *garciones* which may be modified by my research in progress on this class within the estate at large.

²¹ P.R.O. E. 315/420.

²² E.g. "Streteforlang" which took its name after the Roman road (*stræt*) along the straight western manor boundary.

²³ A. Watkin, ed. *The Great Chartulary of Glastonbury*, II (Som. Rec. Soc. 63, 1952), pp. 480-2; L. IO,770, presentment of a tenant who left gaps in his croft "towards the sown field"; Watkin, *Great Chartulary*, pp. 476-7.

Figure 1. The fields of Podimore (a) before 1333, (b) after 1333



For confirmation of this last point we must turn to cropping plans in manorial accounts. The best accounts to use for this purpose are from four consecutive harvest years between 1311/2 and 1314/5.²⁴ They show clearly that the fields had a very real agrarian significance, for in each year (with the exception of 1312/13 which seems to have been unusual climatically) between 88 per cent and 100 per cent of the sown demesne acreage was in the field predicted by a two-year cycle beginning with Eastfield sowings in 1311/2.²⁵ *Inhoks* were occasionally sown in the fallow field but most furlongs underwent a compulsory fallow every second year. Account and court rolls contain several incidental references to “the sown field” and “the fallow field”. And we can see the alternation of crops and fallow by observing in the accounts the use made of a greenway called ‘Caryweye’ which lay in Eastfield (Figure 1a): when that field was sown, the lord sold pasture on the track to tenants while in the following year the track became commonable, yielding no profit *quia communis*.²⁶

Demesne husbandry at Podimore was geared to production of wheat destined for the Abbey’s bakery or markets.²⁷ Oats were consistently sown on about one-sixth of the sown acreage; beans were regularly grown in small amounts; barley, peas, and drege were sporadically cultivated. Tenants no doubt grew crops for subsistence similar to those mixed for the breads and pottages of the *famuli*.²⁸ These usually comprised a proportion of wheat or currall but also, in some years, larger quantities of barley, peas, beans and dredge; pure wheaten loaves were doled out only at boon works, as befitted occasions when tenants and lord exchanged “love” and lordly taste. It is reasonable to suppose that, for a cash crop, peasants followed demesne marketing policy and grew wheat. We can conclude that the cultivated field grew both winter-sown wheat and also a variety of spring-sown crops for subsistence.

Provision of grazing at Podimore was a closed system, for the township lies in the centre of the east Somerset lowlands and had no rights of pasturage on distant levels or moors.²⁹ If we consider this closed system at the beginning of May, and from the viewpoint of demesne accounts, meadows had already been closed off to provide hay for the next winter.³⁰ Oxen, of all animals the most essential, would therefore find themselves on the best available grazing, the small amounts of permanent several pasture belonging to the demesne.

²⁴ L. 11,216, 10,655, 10,656, 10,761, the only surviving consecutive accounts. The cropping plans name furlongs only, but with the help of the extent of 1332 most of them can be assigned to one or the other of the two fields.

²⁵ What appears to have happened in 1312/3 was that parts of the West Field, the lower of the two, were so waterlogged (“submerged”) that some of the winter wheat had to be sown in the drier East Field.

²⁶ E.g. L. 11,216, sale of pasture “in the fallow field”; L. 10,770, presentment of tenants for not repairing hedges “towards the sown field”; L. 11,216 and later accounts for “Caryweye”.

²⁷ This and the following paragraph are largely based on all surviving accounts between 1281/2 and 1330/1, listed above n. 18.

²⁸ For this assumption see Postan, ‘Medieval Agrarian Society’, pp. 600-1 and, for a modification, C. Dyer, ‘English Diet in the Later Middle Ages’, in T. H. Aston, P. R. Cross, C. Dyer, and J. Thirsk, eds. *Social Relations and Ideas: Essays in Honour of R. H. Hilton* (Cambridge, 1983), pp. 202-3, 210-1.

²⁹ M. Williams, *The Draining of the Somerset Levels* (Cambridge, 1970), pp. 89-91. Keil, thesis, pp. 126-34 for inter-manorial flock management on the Glastonbury estate, a system to which Podimore made but small and irregular contributions.

³⁰ Since 2 Feb. at Podimore and on some other Somerset manors: L. 11,273; P.R.O. E. 149/9/19, 21, 24.

In 1333, when 24 oxen (three teams) were maintained, this several pasture amounted to 23 acres, but was encumbered by rights for 26 beasts belonging to privileged tenants. In all, then, 23 acres of demesne pasture had to support 50 beasts during the summer months, about twice the stocking rate recommended in the eighteenth century.³¹ During these months the sown field was clearly unavailable for grazing except to beasts tethered on greenways and headlands. But a large flock could not have been managed in this way: its only place was the fallow field. Thus in 1313/4, when Glastonbury kept a flock of 207 sheep and lambs, demesne in the fallow field amounted to a little under 100 acres, so that a stocking rate of two sheep per acre of fallow was followed—precisely that recommended by the thirteenth-century *Rules* of the Bishop of Lincoln.³² After mid-October, pressures within the system became more relaxed, for oxen were taken care of by stall feeding and meadows were free after the hay harvest. But the meadows at Podimore could not support the whole flock at a time when the active growing season for grass was coming to an end. The new fallow field, recently emptied of grain, would need to be pressed into service in order to sustain the flock in winter.³³ This reconstruction of pastoral management finds support in occasional, stray references in the accounts. That permanent pasture was reserved for oxen is clear from references to lack of sales of herbage in closes of pasture “because the lord’s oxen pasture there”; that meadows could not normally be grazed in the summer months is shown by the occasional reference to an acre of meadow which did not yield hay because the reeve had, exceptionally, used it for direct feeding to oxen. But the most frequent references are to “pasture in the common field”, often in the form of explanations by the reeve that it yielded little profit from sale of herbage “because the sheep of the lord and the commoners pasture there”, a clear reference to the village flock on the fallow.³⁴

The animals of Podimore’s villagers are an unknown quantity. Villagers had dungheaps outside their houses; they took their oxen to the lord’s boon works. But precise figures elude us. On the one hand, when the death took place in 1346 of William Ponner his “best beast” was a miserable fowl; on the other, Walter de Couperhay, a more substantial tenant, was reported in 1313 to possess 30 more sheep than the stint allowed.³⁵ All tenant holdings, one suspects, were less well supplied with permanent pasture than the demesne, and relied all the more on grazing in the fallow field.

II

Between harvest and the autumn sowing in 1333 a three-field system was introduced at Podimore. The extent of 1332 lists demesne strips under the

³¹ B.L. Eg. MS 3321, ff. 234, 235v.; J. Billingsley, *A General View of the Agriculture of the County of Somerset* (1797), p. 239.

³² D. Oschinsky, *Walter of Henley and Other Treatises on Estate Management and Accounting* (Oxford, 1971), p. 397. Stints which allowed two sheep per fallow acre were common under the midland system, e.g. at Wigston Magna: W. G. Hoskins, *The Midland Peasant* (1957), p. 174.

³³ No *bercaria* is mentioned in a comprehensive list of manorial buildings in the extent of 1332. Accounts indicate that the meadows did provide some relief in winter, but they could be flooded or dangerously wet and, moreover, were put in defence on 2 Feb.

³⁴ Examples are L. 11,216 for closes of pasture reserved for oxen; L. 10,761 for direct feeding of oxen on a small acreage of meadow in 1330/1; L. 10,761 for the flock in the common field.

³⁵ L. 10,711, 10,761, 11,251, 10,711. Other indications of peasant livestock are: Watkin, *Great Chertulary*, p. 478, allowance of pasture for 8 oxen to the occupier of a 30-acre holding; B.L. Eg. MS 3321, f.

headings of Westfield and Eastfield, but there survives another terrier, made a few months later, this time grouping furlongs into three and headed *terra dominica divisa ad tres campos*.³⁶ Those who walked out into the fields to draw up the new terrier had the extent in front of them for the two lists of furlongs tally almost exactly even with respect to the most vernacular of the furlong names. With the extent to hand, and with knowledge of existing preparations for recasting the fields, they listed the furlongs in three new groups, as yet without popular names: *primus campus*, *secundus campus* and *tertius campus*. The three new fields appear in later documents up to the end of the eighteenth century.³⁷

Figure 1b reconstructs the three-field plan which was made in such a way that the only long stretch of new boundary needed was between the first and third fields. Part of the cost of its construction is recorded in the account for 1330/1 when 3s. 2½d. was expended “in digging out 31 ropes of ditch 6 feet wide and 4 feet deep between the furlong of Portpath and La Fosse”. According to the *West Somerset Word-book* the rope as a hedging measure was 20 feet, so that over 200 yards were dug in 1330/1.³⁸ Apart from this relatively minor work, little more needed to be done. The transformation from two fields to three was achieved without complex exchanges of land, for the widely dispersed nature of holdings before 1333 meant that there was every probability that they would end up with more or less equal acreages in each of the three new fields.³⁹

Yet despite this remarkable detail, we are still in the dark about details of decision-making at Podimore in the seasons before 1333. We see Glastonbury’s officials in the act as they order a new terrier to be made and new boundaries to be secured. Glastonbury’s steward and external cellarer were present at Podimore as usual from time to time in the first season of three-field management. More unusual, for other abbots do not seem to have had a preference for Podimore, was Abbot Adam de Sodbury’s stay there in November 1330 and again in December 1333 when he remained for at least one night and gave a gift of beans “to his villeins”.⁴⁰ Was the abbey assisting in a change of management agreed upon by the community or the vill? At Podimore, the closest we come to observing that body, so often a fleeting one in medieval documents, is when the lord’s account rolls refer to “the commoners” of the vill and when court rolls give glimpses of the existence of by-laws. The extent

234, allowance for 4 oxen to a half-virgate holding; L. 11,273, sale of pasture in 1281/2 for 160 sheep and 120 lambs, part of the tenants’ flock; L. 10,778, details of trespasses not only of “outsiders” but also of Podimore’s villagers, including one with 40 sheep.

³⁶ B.L. Eg. MS 3321, ff. 235v.-236. The terrier is undated, but must have been made after the extent of 1332 and, in all probability, before Michaelmas 1333 when the new three-field system began operation.

³⁷ B.L. Eg. MS 3134, ff. 201-12v., holdings with land in *tribus campis*, 1516; Somerset Record Office (hereafter S.R.O.), Podimore glebe terriers, 1614, 1638 and D.D. FS, box 19, particular of Podimore, 1796. There was some degree of enclosure and conversion to pasture by the early sixteenth century: B.L. Eg. MS 3134; P.R.O. S.C. 6/Hen. VIII/3101; S.R.O., D.D. X/LY, inquisition *post mortem* of Thomas Lyte. The final stages are recorded in S.R.O., D.D. FS, box 19, pocket book with details of fencing.

³⁸ F. T. Elworthy, *West Somerset Word-book* (English Dialect Society, 17, 1886), s. v. rope. “La Fosse” is the Fosse Way, the straight western boundary of the manor which, as Fig. 1b shows, adjoined the new works of the 1330s.

³⁹ B.L. Eg. MS 3134, ff. 201-12v., Eg. MS 3321, ff. 233-33v. and Watkin, *Great Chartulary*, pp. 476-7, 480-2 for widely dispersed strips.

⁴⁰ L. 10,761, foreign expenses and accounts of wheat and oats; L. 10,632, foreign expenses and accounts of wheat, beans, oats and sheep.

of 1333, as is usual with documents of its kind, was drawn up on the oath of a jury; of the jury of six, five were among the top rank of villein tenants, one serving as reeve in 1313/4 and 1314/5, and another in 1330/1 while two were to serve as the joint reeves appointed by Glastonbury to supervise the demesne in the first year of three-field management. These important members of the agrarian community at Podimore were no doubt party to the decisions which led to the reorganization of fields in 1333.⁴¹

It is equally difficult to give a firm opinion on the motives behind the reorganization of 1333. The apparently most simple answer, that there was a pressing need to increase cropped acreage in the 1330s, does not seem likely. From the point of view of demesne husbandry, during the early fourteenth century the trend at Podimore, and on the Glastonbury estate as a whole, had been for a decline in the acreage cultivated.⁴² From the point of view of peasant husbandry, both local evidence and more general models suggest that pressure of population was somewhat relaxed by the 1330s.⁴³ Nor can we see a desire to match crop courses with fields as the motive. The heading of the new terrier made in connexion with the reorganization grandly states that one of the new fields would carry spring-sown crops. Yet Podimore's two-field system, as we have seen, by no means inhibited spring sowings; and evidence from the estate as a whole, as well as a contemporary statement about medieval practice, show that the system was perfectly compatible with spring-sown crops in whatever amounts they were needed. Moreover, had Glastonbury wished to grow more spring crops in the 1330s this could have been most easily achieved on other manors where systems of husbandry were finely attuned for their production.⁴⁴ We can only conclude that the reorganization at Podimore in 1333 was needed because of some idiosyncrasy of the manor's agrarian history which the sources conceal firmly from us.

III

The documents are more useful for what they can tell us about some aspects of the economy of the systems practised at Podimore before and after 1333. The easiest figure to calculate is for crop output. Four consecutive accounts between 1311/2 and 1314/5 show that crops occupied a mean of 56 per cent

⁴¹ L. 10,761, 10,632 for "commoners"; L. 10,770, 10,711, 10,774, 11,251 for court business suggesting by-laws in the middle ages; S.R.O., D.D. FS, box 52, copy of court roll, 1658 for later by-laws. Collation of names from B.L. Eg. MS 3321, f. 233 and L. 10,656, 10,766, 10,761, 10,632.

⁴² For the estate at large, Keil, thesis, p. 105. Podimore was unusual in that part of the manor, demesne land and tenant holdings, was alienated in the twelfth century and not re-acquired *in toto* until 1328. At a time when the cultivated demesne was being reduced in area, Glastonbury therefore found itself with a windfall of new acres and services, unwanted from the viewpoint of demesne cultivation. The history of the alienation may be reconstructed from T. Hearne, *Adam de Domesham, Historia de Rebus Gestis Glastoniensibus* (Oxford, 1727), pp. 314, 568 and Watkin, *Great Chartulary*, pp. 477-86.

⁴³ Leasing of parts of the demesne must have relaxed pressure on land. The best indication is provided by the decreasing number of landless *garciones* (above n. 20) at Podimore in the early fourteenth century: L. 11,250, 10,770, 10,711, 11,251. Some reduction of pressure of population is apparent at Taunton, 20 miles away: J. Z. Titow, 'Some Evidence of Thirteenth Century Population Increase', *Econ. Hist. Rev.* 2nd ser. XIV (1961-2), pp. 220, 224.

⁴⁴ B.L. Eg. MS 3321, f. 35 and Keil, thesis, app. III for another typical example of two-field cropping on the Glastonbury estate, at Walton (Som.). Below n. 88 for a contemporary statement. Brent (Som.) was a spring-crop manor, with over 70 per cent of the sown acreage in this category in 1313/4: L. 10,656.

of the arable demesne acreage under two-field management. Only one account survives from after the reorganization, for the harvest year 1333/4 which luckily does not seem to have been exceptional in any way. From this account and from the terrier of 1333 it can be fairly accurately calculated that a mean of 66 per cent of the demesne was cropped in the first three years of the new cycle.⁴⁵ A more rough and ready calculation would suggest that the reorganization was expected to produce for Glastonbury additional crops with an annual value of about £9.⁴⁶ This is a considerable figure when compared with the initial cost of the new system which cannot have amounted to more than 21s.⁴⁷

Turning to recurrent costs, we can compare data from the accounts with the theoretical calculations of White, who was concerned to show that adoption of three-field systems released labour for other tasks. His brave calculations

Table 1. *Hypothetical Model Showing Acres Ploughed under Two-field and Three-field Systems*

	<i>Two-field System</i> (two fields of 300 acres each) <i>acres</i>	<i>Three-field System</i> (three fields of 200 acres each) <i>acres</i>
Acres ploughed before sowing	300	400
Ploughing of fallow acres	300	200
Second ploughing of fallow acres (<i>rebinatio</i>)	300	200
Total	900	800

Source: L. White, *Medieval Technology and Social Change* (Oxford, 1962), p. 72.

relate solely to ploughing and are summarized in Table 1. The result, less work at ploughing with three fields, seems clear-cut. According to White, adoption of the system gave a "major impulse" to expansion of ploughland: "forests fell; swamps were drained; dykes stole polders from the sea".⁴⁸

It is not easy to translate this hypothetical calculation into a real statement of a field system's recurrent costs.⁴⁹ The accounts at once present two problems. First, some costs are expressed as payments in kind, a problem which may be resolved through search for the prevailing prices of the items so accounted for. Second, many manorial accounts, including those from Podimore, lack detailed statements of work performed by labour services. But the fact that we do not know how many week works existed there should not

⁴⁵ Above n. 24 for the accounts between 1311 and 1315. "Demesne acreage" (cropped acres *plus fallow*) is not too difficult to calculate for under a two-field regime it is reasonable to assume that the cropped acreage in one year is the fallow of the next. Adjustments have been made to allow for *inhoks*. The figure for 1333/4 is based upon L. 10,632 for two of the fields and B.L. Eg. MS 3321, ff. 235v.-236 for the third.

⁴⁶ Figures based, wherever possible, upon crop combinations, sowing rates, and prices in the account for 1333/4.

⁴⁷ Total expenditure on ditching in 1330/1 (L. 10,761) was 7s. 1½d. An estimate of 21s. is arrived at by making the assumptions, both likely to inflate the figure, that all ditching expenditure in 1330/1 was spent on preparing the new fields and that a sum of 7s. was also spent in 1329/30 and 1331/2, for which no accounts survive.

⁴⁸ White, *Medieval Technology*, p. 72.

⁴⁹ By "recurrent costs" I mean regular expenditure necessary to maintain the system at a given level of productivity. With small changes in detail, these are similar to Prof. Hilton's "current expenditure on farming operations" which, in an important paper, he distinguished from "capital expenditure": 'Rent and Capital Formation in Feudal Society', in *The English Peasantry in the Later Middle Ages* (Oxford, 1975), p. 187.

affect calculations of the *relative* recurrent costs of the two systems so long as we can be sure that works remained a constant quantity. This was certainly the case: we shall therefore be examining "recorded" recurrent costs over and above a constant supply of labour provided by week works.⁵⁰

The recorded costs of ploughing and related tasks appear in Podimore's accounts under a number of headings. The lion's share is represented by payments in cash and kind to ploughmen and by the cost of the hay harvest, for hay was reserved almost exclusively for plough oxen. Costs of demesne horses and carts were also important, for their main tasks were closely related to ploughing: carting dung before the passage of the plough, and harrowing after it. A number of small miscellaneous charges complete the list. For the purpose of making a comparison of costs of ploughing under two-field and three-field management only two accounts can be used, those for 1330/1 and for 1333/4.⁵¹ The size of the worked demesne (cropped acres and fallow) was not identical in these two years; the figures have therefore been adjusted by the proportions necessary to make them applicable to a worked demesne of 300 acres.

Table 2. *Recorded Recurrent Costs in Arable Farming on a Demesne of 300 Acres, Based on Data from Podimore*

	<i>Two-field system</i>	<i>Three-field system</i>
	1330/1	1333/4
	d.	d.
Charges of ploughing	1799	1747
Charges of acres under crops	1315	1862

Source: L. 10,761 and 10,632.

The results are given in the first line of Table 2. They show that three fields demanded roughly the same amount of ploughing as did two. The explanation, it would seem, is simple, for White's case rested solely upon the assumption of a second ploughing of fallows (the *rebinatio*) which is nowhere mentioned in Podimore's accounts. If we dispense with it, White's model (Table 1, p. 536) may be restated to show that the two systems demanded identical amounts of ploughing:

Two-field system	300+300 = 600 acres
Three-field system	400+200 = 600 acres

The main purpose of a second ploughing of fallows was to assist in cleaning the land as a preparation for the next year's sowing. But at the same time it destroyed the feed of livestock on the fallow field and this, surely, must have discouraged its widespread adoption within the midland system.⁵² On the

⁵⁰ A sharp increase or decrease in works over a short period, which would seriously affect our calculations by deflating or inflating recorded costs, is very unlikely; nor is there any evidence for it in the documents.

⁵¹ L. 10,761 and 10,632. After 1328, when Glastonbury re-acquired part of its alienated demesne land (above, n. 42) the size of the demesne was pushed over the threshold which demanded three teams. The third appears to have been under-utilized and for this reason costs in the accounts of two-field management before 1328 cannot be used for comparison with those in the three-field account of 1333/4.

⁵² Parain and Postan regarded the *rebinatio* as an improvement which made headway in the early middle ages, but Maitland may have been closer to the mark when he doubted its widespread adoption where the only available pasture was provided by fallows: C. Parain, 'The Evolution of Agricultural Technique', in Postan, ed. *Cambridge Economic History of Europe*, I, p. 151; Postan, *Medieval Economy*, p. 44; Maitland, *Domesday Book*, p. 399 and n. 3. Mr David Postles has very kindly given me a good number of references to the practice, though the proportion of the fallow so treated is not usually clear. The subject deserves a detailed study.

Glastonbury estate it is certainly not mentioned in very detailed mid-thirteenth-century customals. By the mid-fourteenth it had been adopted on some manors but a preliminary investigation suggests that, as might be expected, it was restricted to those which had plentiful grazings beyond the arable.⁵³ Widespread adoption of a *rebinatio* over all of the fallow seems unlikely under the midland system and for that reason the three-field variant offered few benefits in terms of reduction of labour expended in ploughing.

Ploughing and related tasks are the greatest recurrent charges in any field system. But each cropped acre needed also to be sown, weeded, hoed, and reaped and its products had to be bound, stacked, carted to a barn, and threshed. The recorded costs of these tasks at Podimore are shown in the second line of Table 2 as "charges of acres under crops". Not surprisingly they were greater under the three-field system: the increase was 42 per cent, a little above what might be expected following an increase in the cropped acreage by one-third.

Because of the lack of works accounts, documents from Podimore cannot be used to give a figure for the relative *total* charges of the two systems (all charges of ploughing plus all those of acres under crops) but a calculation based upon contemporary sources indicates that a change from one to the other would increase recurrent costs by only about 12 per cent.⁵⁴

Calculations made here raise two points which are important to arguments presented later. First, the immediate returns to be gained from adoption of three fields were great when compared with the cost of instituting the new system. The change would appear to have had everything to recommend it in a period marked by population pressure and little possibility of capital accumulation. Second, the labour charges of the three-field system were only modestly in excess of those of the two-field system. We should perhaps cease to think of each system as marking a particular stage in the growth of a township, the one "simpler" than the other and from the viewpoint of labour more appropriate to smaller populations.

IV

Any assessment of what Gray described as an "important movement" from two to three fields in the century before *c.* 1350 must begin with the examples which he himself cited. His two best examples were Puddletown (Dorset) from which a memorandum of 1291/2 records that the manor's bailiffs divided two old fields into three, of 168, 177 and 175 acres, and laid down new *limes* similar to those at Podimore;⁵⁵ and South Stoke (Oxfordshire) where, according to a plea of assize of 1240/1, land "formerly divided into two parts"

⁵³ It is mentioned nowhere in *Rentalia et Custumaria Michaelis de Ambresbury, 1235-1252, et Rogeri de Ford, 1252-1261* (Som. Rec. Soc. 5, 1891). In fourteenth-century customals and work accounts it is found on some manors, e.g. at Glastonbury itself and at Zoy: B.L. Eg. MS 3321, f. 8v.; L. 10,655.

⁵⁴ It is less than one-third because the static element (charges of ploughing) formed a much greater proportion of the total than the increasing element. The figure of 12 per cent is derived from prices given by Walter of Henley: Oschinsky, *Walter*, p. 325.

⁵⁵ Gray, *Field Systems*, pp. 80-1, citing B.L. Cott. Tib. D. vi, ff. 37-37v. A detailed extent, not noted by Gray, in the same volume (f. 69), probably from 1305-6, may relate to the reorganization.

had been "divided into three parts".⁵⁶ Of the remaining cases mentioned by Gray, two must be rejected as a result of subsequent research.⁵⁷ Gray's work on field systems was outstanding for its sensitive use of sources. He did not allow himself to fall back on references to cropping in his search for examples of the transformation, knowing that both two- and three-field systems could accommodate a variety of cropping schemes.⁵⁸ And he was cautious of evidence in the form of maps which seem to show an old two-field pattern underlying a newer tripartite division; such evidence may be suggestive but is no firm guide that a change has taken place, given the great variety of ways in which both systems found expression on the ground. He therefore admitted that, for two places, the "illustrations do not take us out of the realm of conjecture".⁵⁹ The same may be said of those two examples where his evidence came from charters granting what seem to be odd pieces of holdings whose strips may well have had an eccentric distribution.⁶⁰ Dating presents further difficulties. At Drayton, for example, Gray knew only that a two-field system in the thirteenth century had given way to a three-field system by 1570/1. Research carried out since he wrote has revealed no small number of cases of changes from two to three fields in the post-medieval period,⁶¹ so that dating as "coarse" as this (in four of Gray's cases) really only allows us to say that the change *possibly* took place before *c.* 1350. Where the dating is slightly less vague, allowing the change to be assigned to either the early or the later middle ages (two cases), we can say that it *probably* took place before *c.* 1350, rather than in the ensuing period when trends in population, in demand for grains and in the profitability of livestock farming discouraged widespread adoption of a system which increased cropped acreage and reduced the amount of fallow grazing.

Although Gray discovered a relatively small number of places where a transformation could be firmly dated to before *c.* 1350, he argued his case with such conviction that subsequent generations of scholars have not found it necessary to search for further examples. Nor have many additional examples come to light accidentally; in fact, clear-cut cases from the early middle ages number only three, from the researches of F. G. Gurney, J. Z. Titow and M.

⁵⁶ Gray, *Field Systems*, p. 80, citing B. A. Lees, 'Social and Economic History', in *V.C.H. Oxf.* II (1907), p. 171. See also *V.C.H. Oxf.* VII, p. 99, and H. E. Salter, ed. *Eynsham Cartulary* (Oxford Hist. Soc. 1907-8), II, pp. 120-5.

⁵⁷ Piddington (Oxf.) and Stewkley (Bucks.): Gray, *Field Systems*, pp. 76, 80. It is now clear that the transformation at Piddington took place after 1550: *V.C.H. Oxf.* v, p. 254. Gray's Stewkley with two fields is in Bucks. but the source for his Stewkley with three fields is B.L. Harl. MS 3640, f. 52, a cartulary of Welbeck (Notts.), which takes one to Streetley in Derbys.: A. H. Thompson, *The Praemonstratensian Abbey of Welbeck* (1938), p. 55.

⁵⁸ The dangers are illustrated by discussions of Winterbourne Stoke and Collingbourne Ducis (Wilts.) in R. Scott, 'Medieval Agriculture', in *V.C.H. Wilts.* IV (1959), p. 15. Both places were certainly three-field villages in the sixteenth century. Only about half of each of these demesnes was cropped in the later middle ages, but the most likely explanation is contraction of cultivation within three fields.

⁵⁹ Padbury (Bucks.) and Stow (Lincs.): Gray, *Field Systems*, pp. 75-7. The fringes of the area which came to be occupied by the supposed third field at Padbury may well have been brought into cultivation at a later date than the land of the first and second fields, but some of the inner furlong names there (e.g. "Dunstall") nevertheless appear to be of considerable antiquity.

⁶⁰ Twyford (Leics.) and Houghton Regis (Beds.): Gray, *Field Systems*, pp. 76, 79. For further doubts about the evidence from Houghton, see G. H. Fowler, ed. *A Digest of the Charters Preserved in the Cartulary of the Priory of Dunstable* (Beds. Hist. Rec. Soc. X, 1926), p. 14.

⁶¹ Below, section V.

Table 3. *Cases of Transformation from Two-field to Three-field Systems before 1350*

	Certainly before 1350*	Probably before 1350†
Buckinghamshire	2	
Cambridgeshire	1	1
Dorset	1	
Northamptonshire	2	1
Oxfordshire	1	1
Somerset	1	
Warwickshire		1
Wiltshire	2	
Yorkshire		1
Total	10	5

* Mursley (Bucks.): F. G. Gurney, 'An Agricultural Agreement of the Year 1345 at Mursley and Dunton', *Records of Buckinghamshire*, 14 (1941-6), pp. 245-64. Thornborough (Bucks.): M. Reed, *The Making of the Buckinghamshire Landscape* (1979), p. 90, citing G. R. Elvey, ed. *Luffield Priory Charters*, 2 (Bucks. Rec. Soc., 1975), pp. 244-5, 352-4. Steeple Morden (Cambs.): *V.C.H. Cambs.* 8, p. 117. Puddletown (Dorset): Gray, *Field Systems*, pp. 80-1. Culworth and Kislingbury (Northants.): Gray, *Field Systems*, pp. 79-80. South Stoke (Oxf.): Gray, *Field Systems*, p. 80. Podimore (Som.): B.L. Eg. MS 3321, ff. 235v-236. Poulton (Wilts.): *V.C.H. Wilts.* 4, p. 15. Bishopstone (Wilts.): J. Z. Titow, *Winchester Yields* (Cambridge 1972), p. 32 n. 1.

† Eltisley (Cambs.): *V.C.H. Cambs.* 5, p. 53. Harkston (Northants.): J. Wake, 'Communitas Villae', *English Historical Review*, 37 (1922), p. 406. Bicester (Oxf.): Gray, *Field Systems*, p. 79 and *V.C.H. Oxf.* 6, pp. 25-6. Long Lawford (War.): Gray, *Field Systems*, p. 78. Marton in Dishford (Yorks.): G. C. Homans, *English Villagers of the Thirteenth Century* (Cambridge, Mass. 1941), p. 56. In addition there are the following cases (not included in the table) where we know only that the transformation took place between some date in the thirteenth century and some date after 1500; because the later covering date in many of these cases comes well into a period of radical post-medieval change in field systems, they can only be possibly assigned to before 1350. Addington (Bucks.): H. E. Salter, ed. *Cartulary of Oseney Abbey*, 5 (Oxf. Hist. Soc. 98, 1935), pp. 238-9 and Beresford, 'Glebe Terriers . . . Bucks.' p. 14. Bradwell (Bucks.): Gray, *Field Systems*, p. 454 and Beresford, 'Glebe Terriers . . . Bucks.', p. 15. Drayton Parslow (Bucks.): Gray, *Field Systems*, p. 454 and Beresford, 'Glebe Terriers . . . Bucks.', p. 17. Haddenham (Bucks.): Gray, *Field Systems*, p. 455 and Beresford, 'Glebe Terriers . . . Bucks.', p. 18. Newton Longville (Bucks.): H. E. Salter, ed. *Newington Longeville Charters* (Oxf. Rec. Soc. 1921), p. 104 n. 5 and Beresford, 'Glebe Terriers . . . Bucks.', p. 20. Westbury (Bucks.): Elvey, ed. *Luffield Priory Charters*, 2, pp. 91-2, 98-9 and Beresford, 'Glebe Terriers . . . Bucks.', p. 22. Bassingbourne, Boxworth, and Elsworth (Cambs.): M. R. Postgate, 'The Open Fields of Cambridgeshire' (unpublished Ph.D. thesis, University of Cambridge, 1964), app. I. Litlington (Cambs.): Gray, *Field Systems*, p. 78. Drayton, Evenley and Holdenby (Northants.): Gray, *Field Systems*, p. 78. Blechington, Lewknor and Wendlebury (Oxf.): *V.C.H. Oxf.* 6, p. 62; 8, p. 105 and 6, p. 342. Heytesbury (Wilts.): *V.C.H. Wilts.* 4, p. 15.

Reed.⁶² No new examples are provided by two recently published surveys based upon much manuscript and printed material.⁶³ Three further searches have been made: in the admirable sections on "Economic History" in recent parish-by-parish volumes of the *Victoria County History*, covering parts of Cambridgeshire, Gloucestershire, Leicestershire, Oxfordshire, Shropshire, Staffordshire, Somerset, Warwickshire, Wiltshire, and Yorkshire (East Riding), a very fair sample of the territory of the midland system;⁶⁴ in the printed charter evidence, and analyses of it, for Gloucestershire, Cambridgeshire, and

⁶² Table 3 gives references for these cases. In addition, Homans noted the case of Marton (Yorks.) where the villagers "ordained as best they can to cast the field into three parts". The source, B.L. Add. MS 40,010, gives no clue to what the earlier arrangement was, nor the precise date of the order. Despite doubts I have included Marton in Table 3.

⁶³ Baker and Butlin, eds. *Studies*; Hallam, *Rural England*.

⁶⁴ *V.C.H. Cambs.* v, vi, viii; *V.C.H. Gloucs.* vi, vii, viii, x, xi; *V.C.H. Leics.* iv, v; *V.C.H. Oxf.* v, vi, vii, viii, ix, x, xi; *V.C.H. Salop.* viii, xii; *V.C.H. Staffs.* xvii, xx; *V.C.H. Som.* iii, iv, v; *V.C.H. War.* xviii; *V.C.H. Wilts.* vii, viii, ix, x, xi, xii; *V.C.H. E. Riding Yorks.* ii, iii, v.

Lincolnshire;⁶⁵ and, for Buckinghamshire, Leicestershire, and Yorkshire, in Beresford's useful summaries of the evidence from glebe terriers, which have been compared with Gray's county surveys of medieval sources.⁶⁶ These yield very few additional examples. A final reckoning is set out in Table 3. The small number of cases included there, a tiny proportion of several thousand three-field communities of midland England, cannot be a result of deficiencies in the sources: charters which name or number fields are among the commonest of medieval documents while, had numerous places undergone a transformation, we would expect to find evidence from villis in divided lordship, for inter-manorial compositions touching other matters are, again, a common class of document. We must conclude that the "movement" from two to three fields which Gray outlined was nowhere as important as he imagined. Indeed, there was scarcely a movement at all.

V

To conclude that there was no important movement from two- to three-field systems at the very end of the high middle ages is to conclude, too, that the distributions of the two systems were more or less the same on the eve of the Black Death as they were in about 1200. When we come to consider the reasons for this state of inertia, despite the undoubted pressures of the age and the beneficial increase in cropped acreage which three fields offered, we shall not, I think, find the answers in what North and Thomas have called "the psychological and transaction costs of instituting the three-field system".⁶⁷ It is difficult to envisage what the psychological or mental barriers could have been. As explained at the beginning of this paper, both systems shared the same determining principle, so that a change from one to the other would not have affronted attachment to custom. As for "transaction costs", known cases of remodelling of medieval field systems suggest that the charges were relatively modest: simply the expenses of constructing new boundaries like those dug at Podimore or the new *limes* at Puddletown in 1291/2; or, if two lords were involved, the small costs of drawing up a formal agreement.⁶⁸

That more basic and immovable barriers than these prevented any great increase during the thirteenth century in the number of townships with three

⁶⁵ Principally, W. E. Hart, ed. *Historia et Cartularium Monasterii Sancti Petri Gloucestriae* (Rolls Series, 1863-7); D. Royce, ed. *Landboc sive Registrum Monasterii Beatae Mariae de Winchelcumba* (Exeter, 1892-1903); C. D. Ross and M. Devine, eds. *The Cartulary of Cirencester Abbey* (1964-77); Stenton, ed. *History of the Danelaw; Registrum Antiquissimum of the Cathedral Church of Lincoln* (Lincs. Rec. Soc. 1931-73); M. R. Postgate, 'The Open Fields of Cambridgeshire' (unpublished PhD. thesis, University of Cambridge, 1964), app. I; H. E. Hallam, *Settlement and Society* (Cambridge, 1965), pp. 231-6.

⁶⁶ M. W. Beresford, 'Glebe Terriers and Open-field Buckinghamshire, Part II', *Records of Buckinghamshire*, 16 (1953-4), pp. 5-28; 'Glebe Terriers and Open-field Leicestershire', in W. G. Hoskins, ed. *Studies in Leicestershire Agrarian History* (Leicester, 1949), pp. 77-126; 'Glebe Terriers and Open-field Yorkshire', *Yorkshire Archaeological Journal*, 37 (1951), pp. 325-68. I am grateful to Dr M. Reed for medieval references from Bucks. which I have used for comparison with Beresford's later findings from that county.

⁶⁷ D. C. North and R. P. Thomas, *The Rise of the Western World: A New Economic History* (Cambridge, 1973), p. 42.

⁶⁸ Above, preliminary section and section II. At Podimore, certainly, the change from two to three fields was not accompanied by a complex re-shuffling of strips. The same would have applied wherever holdings were much fragmented and strips widely dispersed, as at Sherington, where "no extensive give and take between owners of strips was called for" when three fields were substituted for two in the sixteenth century: A. C. Chibnall, *Sherington: Fiefs and Fields of a Buckinghamshire Village* (Cambridge, 1965), p. 222.

fields is suggested by the only contemporary comment on the subject, that of Walter of Henley. It occurs in his passages which show how an extent may be used to estimate ploughing requirements. He alluded to the two systems simply to explain that calculations would differ according to whether lands were “parted into three parts” or “parted into two—as they be in many countries [*pais*]”.⁶⁹ His brief comment contains two very significant points. First, he did not “advocate” a “more progressive”⁷⁰ three-field system; rather, he thought in terms of natural co-existence of the two systems without passing judgement on which was the superior. Second, each system was associated in his mind with certain types of countryside or *pays*. It is not surprising that the researches of agricultural historians have led to similar conclusions. Joan Thirsk, while stressing the limits of crude determinism, concluded that in the east midlands there was a general association between two-field systems and farming regions with “the most barren land”; Finberg discovered that in Gloucestershire they “prevailed over the greater part of the Cotswolds”; in early medieval Wiltshire chalkland field systems were divided into two “with half the arable always lying fallow”, while the clayland was three-field country. In Oxfordshire, lighter lands in the north (an extension of the Cotswolds) and south (the Chiltern fringe), with thin, easily leached, and sometimes stony soils, supported two-field systems; almost without exception, medieval references to three-field systems come from townships of the central belt of Oxford, Gault, and Kimmeridge clays, difficult to work and to drain but nonetheless intrinsically fertile, where they survived late enough to inspire Arthur Young’s famous passages on open-field farming.⁷¹ Writing at a more general level, and recalling Gray’s own observations, Miller and Hatcher comment that “a correlation . . . between field systems and fertility is still not entirely without foundation”.⁷² The note of caution is entirely proper, for it is a characteristic of the midlands that farming regions are rarely sharply defined: their borderlands are diffuse, while purely local circumstances could make the agricultural practices of a particular place stand out against the general patterns of its neighbours.

Any major extension of the three-field system in the thirteenth century would have brought it up against types of countryside to which it was not well suited. For if the two systems are compared, it is clear that the three-field system was the more exacting. The land is asked to produce crops more frequently, four years in six instead of three in six: a change from one system to the other accelerates output. The three-field system has a smaller carrying

⁶⁹ Oschinsky, *Walter*, pp. 312-5.

⁷⁰ This claim, often encountered in the literature, may owe something to Clapham, *Concise Economic History*, p. 81.

⁷¹ J. Thirsk, ‘Field Systems of the East Midlands’, in Baker and Butlin, eds. *Studies*, p. 257; Finberg, *Gloucestershire*, p. 40; J. Hare, ‘Change and Continuity in Wiltshire Agriculture in the Later Middle Ages’, in W. Minchinton, ed. *Agricultural Improvement: Medieval and Modern* (Exeter, Exeter Papers in Economic History, 1981), p. 3. Comments on Oxfordshire are based on a distribution map compiled by the author from diverse printed sources, beginning with Gray, *Field Systems*, pp. 486-94, the parish-by-parish volumes of *V.C.H. Oxf.* and medieval charters in the many cartularies published by the Oxfordshire Historical Society.

⁷² Miller and Hatcher, *Medieval England*, p. 90. Gray, *Field Systems*, p. 73, fully recognized a correlation between two-field systems and “the bleak, chalky, unfertile uplands” of midland England, but he believed that it was a pattern established in the thirteenth century, following transition to three fields in more favoured areas.

capacity for livestock and the land less frequently benefits from a fallow year: a change reduces inputs. When three fields were substituted for two at the Abbey of Eynsham's manor of South Stoke in Oxfordshire *c.* 1240, the abbot was brought before the assize for having deprived others of common pasture, while at Podimore there is some evidence to suggest a slight reduction in the demesne flock after the field system was altered in 1333.⁷³ If three-field systems had been introduced into countrysides to which they were not suited, the result could have been a decline in yields. And if yields are considered,

Table 4: *Hypothetical Models of Net Output under a Two-Field System (assuming a Yield Ratio of 4) and under a Three-Field System (assuming a Yield Ratio of 3.25)*

	Two-field System of 600 Acres		Three-field System of 600 Acres	
Acres sown	300		400	
Bushels sown at 1½ bushels per acre	450		600	
Yield ratio	×4		×3.25	
Gross output (bushels)	1800		1950	
Seed corn reserved (bushels)	450		600	
Net output (bushels)	1350		1350	

margins between the two systems were very narrow, as the model in Table 4 shows: a modest drop in yield ratios could entirely eliminate the benefits which should have come from the larger cropped acreage of the three-field system.⁷⁴

These facts—rendering unlikely much change from one system to the other in the thirteenth century—are basic. Moreover, they are unlikely to have altered during the last centuries of the early middle ages. It is not difficult to account for transformations from two to three fields in the sixteenth century and later: even a superficial search has revealed more cases than are known for certain from before *c.* 1350.⁷⁵ Nor is it difficult to understand a very widespread movement, especially on light lands, from two fields to four in the seventeenth century, a movement whose beginnings no doubt stretch back into the sixteenth and beyond.⁷⁶ A tumbling down of arable to grass on

⁷³ Lees, 'Social and Economic History', p. 171; L. 10,632. Too much should not be made of the reduction at Podimore which took the form of dispatch of lambs from the manor contrary to usual practice, for the event may have other explanations unconnected with the field system.

⁷⁴ In medieval Sweden, Oestergoetland law declared that, in cases of disagreement, "the party in the village shall prevail that wants to let half the land lie fallow", implying, perhaps, a cautious attitude towards changes which could be damaging to yields: S. Bolin, 'Medieval Agrarian Society in its Prime: Scandinavia', in Postan, ed. *Cambridge Economic History of Europe*, I, p. 647.

⁷⁵ Barrington (Cambs.): B.L. Add. MS 36,228, f. 2, "at Christmas 1610". Caxton (Cambs.): Postgate, thesis, app. I. Corringham (Lincs.): E. Beckwith, 'The Remodelling of a Common-field System', *Ag. Hist. Rev.* 15 (1967), pp. 108-12. Croxton (Cambs.): *V.C.H. Cambs.* 5, p. 40. Huish (Wilts.): *V.C.H. Wilts.* 10, p. 79; Kingston (Cambs.), *V.C.H. Cambs.* 5, p. 116. Liddington (Wilts.): *V.C.H. Wilts.* 9, p. 70. Old Warden (Beds.): Beds. Record Office, W2591, court of Oct. 1645, kindly supplied by Mr J. Wood. Moreton (Dorset): Dorset Record Office. D29/M4, Moreton court book 1618-26, court of 16 Oct. 1620, supplied by Dr J. Bettey. Piddington (Oxf.): *V.C.H. Oxf.* 5, p. 254. Sherington (Bucks.): Chibnall, *Sherington*, pp. 221-3. Stewkley (Bucks.): Gurney, 'An Agricultural Agreement', pp. 251-3, with an intervening four-field phase, for which see Beresford, 'Glebe Terriers and Open-field Buckinghamshire', p. 21. Toft (Cambs.): *V.C.H. Cambs.* 5, p. 132.

⁷⁶ Gray was the first to uncover this movement: *Field Systems*, pp. 125-37. An excellent discussion of the agrarian context is provided by M. Havinden, who makes it clear that "the primary object of field redivision was to reduce the area of fallow land": 'Agricultural Progress in Open-field Oxfordshire', *Ag. Hist. Rev.* 9 (1961), pp. 75-9. Two very early examples of a change to four fields are given in J. Thirsk's classic paper on 'The Origin of the Common Fields', *Past and Present*, 29 (1964), p. 22 and in C. Elrington,

some furlongs of midland field systems in the fifteenth century, acquired knowledge of clover and sown grasses in the seventeenth, and incorporation of root crops into rotations: all of these improvements allowed reduction of fallows and greater frequency of cropping because they ameliorated the number and condition of livestock and thereby improved the capability of the land. But how can we account for that small number of cases where a transformation from two to three fields *was* accomplished prior to c. 1350, in an age when these other improvements were unknown? Two hypotheses will be put forward here, each demanding further investigation.

In the first place, there were townships and regions which stood somewhere in the middle of a range of environments stretching from those favourable to three-field systems to those in which two fields were most appropriate. In other words, we can envisage “intermediate” townships which might initially have opted for the less intensive system but which, under pressure, could change to more intensive arrangements without undue prejudice to yields. It is significant in this context that the township of South Stoke, one of Gray’s best examples of the transformation, falls clearly into this intermediate category, with much alluvial as well as light land soils. It is also significant that the countryside around Podimore is diversified and variegated, supporting both systems.⁷⁷ A second hypothesis which might in a few places account for a change of systems in the early middle ages is that it was made feasible by a township’s lucky, adventitious gain of additional resources. Podimore may again be a case in point. The charter by which Edgar granted the manor to Glastonbury in 966 has a brief note about its situation, rather rare in documents of this kind: the place lay *ad boriā paludestrīa fluminis que dicitur Cary*. The same document contains other allusions to marsh, no doubt useful for fish and fowl but too wet for winter grazing. By 1086 these small but significant marshes had become “pasture”, probably still rough and wet, but of greater value as grazing land.⁷⁸ By the early fourteenth century much of the pasture had been upgraded (presumably by careful ditching) to become meadows, one significantly called “Nywemedē” in the extent of 1332. Many of these gains were made in the Podimore itself, a depression south of the village (shown on Figure 1). The croaking of its innumerable toads when the depression was still in a marshy state had given it the name which eventually passed to the township itself; later it became part “new meadow” and part “a pasture called Somerlese”. It is probable that, during or after its improvement, rights of inter-commoning shared by other nearby places were banished from that part of the Podimore which came to belong to the Glastonbury manor.⁷⁹ For a small township these were significant gains indeed. They gave it access to

‘Open Fields and Inclosure in the Cotswolds’, *Proceedings of the Cotteswold Naturalists’ Field Club*, 34 (1964), p. 39.

⁷⁷ M. Whitfield, ‘The Medieval Fields of South-east Somerset’, *Proceedings of the Somerset Archaeology and Natural History Society*, 125 (1981), p. 20.

⁷⁸ Watkin, *Great Chartulary*, p. 476; *V.C.H. Som.* 1, p. 461.

⁷⁹ The earliest reference to “Nywemedē” is in 1272: Watkin, *Great Chartulary*, p. 481. For the argument presented here to be acceptable, the final and most significant improvement of these wetlands must have taken place at a time not too far distant from the reorganization of 1333. That the Podimore may once have been intercommonable by the vicinity is suggested by B.L. Eg. MS 3134, f. 212v, which records a residual right there belonging to an Ilchester church, and by the fact that the neighbouring township of Yeovilton probably once had rights throughout the whole of the depression.

more pure grazing land in winter when fallows were at their least productive. By injecting more livestock into the township's two-field system, might they not have made possible a more intensive use of the arable?⁸⁰

VI

If basic, virtually immovable, barriers prevented any major extension of three-field systems during the thirteenth century, we are left with two alternatives. A movement from two to three fields might have taken place before 1200, when evidence relating directly to fields is very scanty. Alternatively, the distributions of the two arrangements could have been established much earlier when the midland system began to emerge in late Saxon England. Here we shall argue tentatively for the latter alternative.

The midland system belonged to countrysides which were anciently settled. It was with these lands in mind that Lennard made his famous observation on England as "an old country" which had "passed beyond the colonial stage" well before the Norman Conquest; with such areas in mind that Postan remarked on a "fully occupied" land on the eve of the early middle ages.⁸¹ Here losses of grazing rights at a remove, rather than adventitious gains, were the rule in the late Saxon period.⁸² The midland system evolved in such contexts in the last three centuries of Saxon England when pressure of population resulted in a final expansion of ploughland at the expense of remaining rough pasture, and the necessity for a doubling up of arable and grazing which was its distinguishing feature.⁸³ It is difficult to imagine that, under these circumstances, relatively populous communities in the more favoured midland regions would have opted for a system which allowed cultivation of half rather than two-thirds of the land each year; though we should not rule out a degree of initial indecision by those generations which witnessed the final petering out of reclamation, particularly in the woodland-fringe countrysides of parts of the midlands where a third field may have emerged from the last land to be assarted. Nor can it reasonably be argued that shortage of labour would have prevented adoption of three fields in some places, for the extra labour requirements of the more intensive system were relatively modest.⁸⁴

Unless we can envisage that communities in the more favoured regions would have unnecessarily saddled themselves with the less productive of the two systems, we must conclude that some three-field arrangements date from

⁸⁰ Dr T. Bayliss-Smith has pointed out to me that for this hypothesis to stand, the number of additional stock supported by newly gained meadowland in winter would have to be greater than the number dispensed with as a result of reduction of fallow acreage when three fields were substituted for two (above, n. 73).

⁸¹ R. Lennard, *Rural England, 1086-1135: A Study of Social and Agrarian Conditions* (Oxford, 1959), pp. 1, 3; Postan, 'Medieval Agrarian Society', p. 550.

⁸² For severance of pastoral ties in the late Saxon period, see W. J. Ford, 'Some Settlement Patterns in the Central Region of the Warwickshire Avon', in P. H. Sawyer, ed. *Medieval Settlement: Continuity and Change* (1976), pp. 293-4. Implications of this development for field systems are discussed in Fox, 'Approaches', pp. 98-102.

⁸³ Above, preliminary section.

⁸⁴ Above, section III. Put another way, this is the same as the argument in Boserup, *Conditions*, p. 28: if output can be raised without a great decline in the productivity of labour, "we would expect . . . intensification to take place whenever the cultivators became aware of the intensive techniques."

the time when the midland system itself was first evolving. Between that time and the beginning of the thirteenth century is a long period indeed. During these three or four hundred years, might a technical change in cropping practices have released some townships from their attachment to two-field systems, just as, in the post-medieval period, new crops and rotations precipitated widespread changes in the layout of midland systems?

It is at this point that we must confront again the relationship between field systems and crop rotations. There is a strong tendency in the literature to regard three-field systems and three-course rotations as very closely related and to portray adoption of three fields as following in the wake of an introduction of a third course into rotations (to produce a cycle of two crops and a fallow).⁸⁵ So firmly entrenched is this view that some historians have claimed that the widespread use of three-course rotations in England was delayed until the twelfth or thirteenth centuries, to accord with a supposed movement towards three-field systems at that time.⁸⁶ But there are many examples, from medieval England beyond the midlands, of three-course rotations operating in field systems which bore little resemblance to midland systems.⁸⁷ Moreover, a modified three-course rotation, with an extra fallow year between crop courses, was frequently accommodated within two-field systems, as at Podimore.⁸⁸ In these cases there is much truth in Sir John Clapham's dictum: "Crop rotation is independent of the lay-out of the fields."⁸⁹ Three-course rotations did not *demand* three-field systems from an operational point of view, but there was a sense in which introduction of three courses into a two-field, two-course system might possibly encourage reduction in the area of the fallow field and the emergence of three fields. If the new third course was a spring-sown crop added to a two-field system which hitherto had grown only winter-sown wheat, its introduction would have three ecological advantages: part of the sown field would carry a less demanding crop; part of the sown field might be fenced off in winter to give the system extra capacity for supporting livestock; and there would be benefits, too, from an alternation of different crops on the same land, which is the fundamental rationale of any rotation system. Faced with these advantages, townships marginal to the three-field system might have been encouraged to adopt it upon the introduction of a three-course rotation.

If this model is to be used to argue for some degree of change from two- to three-field systems before *c.* 1200, it must be shown that the centuries immediately before and after the Norman Conquest saw a development of

⁸⁵ Parain, 'Evolution of Agricultural Technique', pp. 136-41; White, *Medieval Technology*, pp. 70-1.

⁸⁶ G. Duby, *Rural Economy and Country Life in the Medieval West* (1968), p. 96; White, *Medieval Technology*, pp. 74-5.

⁸⁷ Thus P. Vinogradoff and F. W. Morgan, eds. *Survey of the Honour of Denbigh, 1334* (British Academy, Records of Social and Economic History, 1, 1914), pp. 4, 230; W. D. Peckham, ed. *Thirteen Customals of the Sussex Manors of the Bishop of Chichester* (Sussex Record Society, 31, 1925), pp. 127-9; A. E. Levett, *Studies in Manorial History* (Oxford, 1938), pp. 182-3, 338-9.

⁸⁸ Walter of Henley expected the sown field in a two-field system to carry a mixture of winter and spring crops: Oschinsky, *Walter*, p. 315. For how the system operated see H. E. Salter, ed. *Cartulary of Oseney Abbey*, iv (Oxf. Hist. Soc. 97, 1934), pp. 235-6.

⁸⁹ Clapham, *Concise Economic History*, p. 54. A nice contemporary example is provided by articles for visitations of St. Paul's manors, *c.* 1290, which ask separately about numbers of fields and seasons: W. H. Hale, ed. *The Domesday of St. Paul's* (Camden Society, 1858), p. cxxii.

three-course rotations in England. Much of the literature on western Europe would indeed seem to suggest such a development. Charles Parain described three-course rotations as “the great agricultural novelty of the middle ages”, tracing their diffusion from the heart of the Carolingian empire in the ninth century until they became the progressive ideal during the thirteenth. He and other writers have approached the subject by attempting to identify increasing popularity of spring-sown grains in areas which had before relied largely on an alternation of winter grains and fallow.⁹⁰ If we use this approach there can be no doubt that midland and southern England was already “three-course” country in the twelfth and thirteenth centuries: records of Angevin purveyance, the first manorial account rolls, early lists of peasant moveables, and forest regards which describe sowings on peasant assarts all point conclusively to the use of spring-sown as well as winter-sown crops.⁹¹ Moving backwards, Finberg claimed that it was a spring-sown crop, barley, which “eclipsed all other cereals” in Saxon rural economies, a fact which has been confirmed by further palaeobotanical research carried out since he wrote.⁹² Nor does evidence from Roman Britain indicate an absence of spring-sown grains; it has even been suggested that imperial experience of native practices in this and other northern provinces was responsible for incorporation of information about spring sowings in late Roman agricultural treatises.⁹³

The existence of both winter-sown and spring-sown crops is not in itself conclusive evidence for practice of fully fledged three-course rotations. That such rotations were well established in the thirteenth century is beyond doubt.⁹⁴ In a brilliant survey of Roman Britain, Applebaum expressed the

⁹⁰ Parain, ‘Evolution of Agricultural Technique’, pp. 136-40, 162-3; Duby, *Rural Economy*, pp. 90-6; White, *Medieval Technology*, pp. 69-71.

⁹¹ Thus *Pipe Roll 18 Henry II* (Pipe Roll Soc. 18, 1894), pp. 21, 71, 89, 103, 106, 123 shows how the Irish expedition of 1171 was supplied with both spring-sown and winter-sown crops from many parts of England. N. S. B. Gras, *The Evolution of the English Corn Market* (Cambridge, Mass. 1926), pp. 261-2 summarizes figures from the earliest manorial accounts. For moveables: E. Powell, ed. *A Suffolk Hundred in the Year 1283: The Assessment of the Hundred of Blackbourne* (Cambridge, 1910), pp. xxx-xxxii; A. T. Gaydon, ed. *The Taxation of 1297* (Beds. Hist. Rec. Soc. 39, 1959), p. 108; J. C. K. Cornwall, ‘Medieval Peasant Farmers’, *Records of Buckinghamshire*, 20 (1975), p. 75; J. A. Raftis and M. P. Hogan, eds. *Early Huntingdonshire Lay Subsidy Rolls* (Pontifical Institute of Mediaeval Studies, Subsidia Mediaevalia, 8, 1976), pp. 31-56; J. A. Raftis, *A Small Town in Late Medieval England: Godmanchester, 1278-1400* (Toronto, 1982), pp. 184-7. For regards, J. A. Raftis, *Assart Data and Land Values* (Toronto, 1974), pp. 108, 111-14, 120-7, 135-7, 138, 145-9, 151-3, 154-5. Two twelfth-century surveys containing inventories of crops, both spring-sown and winter-sown, are G. H. Fowler, ‘Extents of the Royal Manors of Aylesbury and Brill, circa 1155’, *Records of Buckinghamshire*, 11, no. 7 (1926), pp. 401-5 and J. E. Jackson, ed. *Liber Henrici de Soliaco Abbatis Glaston* (1882). Beyond that time we cannot go with this type of material.

⁹² H. P. R. Finberg, ‘Anglo-Saxon England to 1042’, p. 422. Later and more refined palaeobotanical work has amply confirmed his claim: M. A. Monk, ‘The Plant Economy and Agriculture of the Anglo-Saxons in Southern Britain: with Particular reference to the “Mart” Settlements of Southampton and Winchester’ (unpublished Ph.D. thesis, University of Southampton, 1978), pp. 332-40. One query should be noted here: was barley a spring-sown crop in Anglo-Saxon England? The extremely strong medieval and post-medieval tradition of a spring sowing for barley, together with Bede’s account of Cuthbert’s experience with the crop in late spring, makes us as certain as we can be that Anglo-Saxon sowing practice was the same as that of later times. For Cuthbert, see B. Colgrave, ed. *Two Lives of St. Cuthbert* (Cambridge, 1940), p. 221. Future work on the presence or absence of *Galium aparine* (a weed associated only with autumn sowings) among charred barley remains may add further confirmation.

⁹³ S. Applebaum, ‘Roman Britain’, in Finberg, ed. *Agrarian History of England and Wales*, II ii, pp. 108-13, 238-9.

⁹⁴ E.g. references to three *seisone* in extents, such as those cited above n. 87. And there are many more. For an exceptionally early lease referring to a three-course rotation, see Hale, *Domesday of St. Paul’s*, p. 128.

conviction that they were known there.⁹⁵ The evidence from Saxon England at first sight seems somewhat contradictory, for charters occasionally refer to “oatlands” or “wheatlands”, for example, while place-names of the type Ryton must be considered. Yet we should not imagine that every Ryton grew rye slavishly and exclusively: the tag indicated aptness for rye and a duty to render that crop as a food farm.⁹⁶ And, given knowledge of both spring-sown and winter-sown crops, the ease with which observation of the benefits of a chance sowing of one after the other might be translated into common and commonsense practice, the need for communities to provide a variety of foodstuffs for themselves and for renders, as well as a probable tradition from Roman Britain, it becomes logically rather difficult to banish three-course rotations from Saxon England.⁹⁷

Whatever may have been the course of development in continental western Europe,⁹⁸ it would be difficult to argue for a transition from two-course to three-course rotations taking place in England *after* the emergence of the midland system in the late Saxon period and acting as context for reorganization of two fields into three. Both two- and three-field variants of the midland system, we suggest, already co-existed in pre-Conquest England. Relatively inert, conservative from the view-point of the fallow field which was its determining principle, a product of the pressures of an earlier age, the midland system was ill-equipped to provide for the final surge of expansion of English medieval population.

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⁹⁵ Applebaum, ‘Roman Britain’, pp. 113-4, 119-20, 237.

⁹⁶ For example, D. Hooke, ‘Open-field Agriculture: The Evidence from the Pre-Conquest Charters of the West Midlands’, in Rowley, ed. *Origins of Open-field Agriculture*, p. 45. Furlong names and field names of the type “Rylands” are still very common in the middle ages when rotation of crops is beyond question. For examples, A. H. Smith, *The Place-names of Gloucestershire*, IV (Cambridge, 1965), pp. 102, 143, 167.

⁹⁷ There is a suggestive passage in the *Gerefa* whose paragon is expected to know the “time” or “season” of every crop; the wording seems to anticipate the rotational “seasons” of post-Conquest documents: Cunningham, *Growth of English Industry*, I, pp. 571-3. Three courses may also be inferred from the *Rectitudines*: Finberg, ‘Anglo-Saxon England to 1042’, p. 513 n. 1.

⁹⁸ Doubts about traditional interpretations arise from the fact that, although winter-sown grains indeed dominate figures in some Carolingian polyptyques, in others the proportions of spring-sown grains are so great that a recent innovation seems out of the question. A few of the figure are conveniently summarized in B. H. Slicher van Bath, *The Agrarian History of Western Europe, A.D. 500-1850* (1963), p. 66 and N. J. G. Pounds, *An Economic History of Medieval Europe* (1974), pp. 58-60. Nor is the end of the supposed diffusion processes readily apparent in R. Fossier’s statistical analysis of *cens* (rents in kind): *La terre et les hommes en Picardie jusqu’à la fin de XIII^e siècle* (Paris and Louvain, 1968), p. 405. On the possibly high antiquity, in favoured areas, of three-course rotations see D. Faucher, ‘L’assolement triennal en France’, *Etudes Rurales*, I (1961), pp. 12-3.