

Land Measurement in England, 1150-1350¹

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I

WHILE land measurement in England in the Middle Ages has attracted much attention, it has not altogether escaped some of the more fantastic speculations which have dogged the study of historical metrology.² In recent years, work on the demesne economy and on village plans and planning has begun to establish a sound basis for a review of land measurement, but the subject still remains one surrounded by difficulties.³ Most of these arise quite simply from the great amount of information scattered throughout monastic cartularies, manorial archives, and other sources, much of which appears both confused and confusing. The problem of handling this evidence is exacerbated by the different purposes for which our main sources—account rolls, surveys and extents, and charters—were used, and the different ways in which they described land. Manorial account rolls, for example, sometimes describe the sort of acre, conventional or otherwise, over which corn was sown and reaped on the demesne.⁴ In addition, they can also yield incidental detail about land measurement under conditions of practical farming. Surveys and extents, on the other hand, usually describe the demesne as a whole, sometimes very briefly,

¹ I should like to thank Miss J. A. Sheppard, Miss B. F. Harvey, and Dr P. D. A. Harvey for reading and commenting on an earlier draft of this article, without in any way committing them to the views expressed.

² P. Grierson, *English Linear Measures*, Reading, 1972, pp. 5-6.

³ J. A. Sheppard, 'Metrological Analysis of Regular Village Plans in Yorkshire', *Ag. Hist. Rev.*, xxii, 2, 1974, pp. 118-35.

⁴ In this article I refer to four different acres: the conventional acre, the fiscal acre, the standard acre, and the local acre. The differences are discussed in the text. Here it is enough to say that I use "conventional acre" to translate the Latin phrases *acre ut iacent*, *acre campestris* (acres "as they lie," "field acres"). While it may be objected that the "conventional" acre is what others have called the "customary" acre, it has been pointed out to me that later sources use the term "customary acre" to describe acres measured with a customary rod. Throughout this article, "conventional" equals "unmeasured."

sometimes in considerable detail, and they often emphasize the close link between land measurement and taxation.⁵ This can be seen most clearly in some of the earliest surviving surveys, and particularly so in Domesday Book, in which demesnes are described in terms of hides and virgates.⁶ While some surveys and extents describe the sort of acre used on the demesne, others do not, leaving us the problem of disentangling fiscal acres from conventional acres and measured acres. Having described the demesne, surveys and extents then proceed to list the holdings of the manorial tenants, again in terms which often produce the same difficulties as their treatment of the demesne. The evidence of charters is usually very different from that of account rolls and surveys and extents. Much of it relates to small parcels of land and to measurement by the perch, in particular the measurement of the width of a parcel of land. However, it is only when an attempt is made to piece together this varied material that the individual problems can be seen in a clearer light. This article seeks to establish a point of departure from which to approach the sources, and in doing so will first discuss the ways in which land was described and measured without the use of the perch, and then examine the ways in which land was measured with a perch, and the implications this had for demesne agriculture.

II

The conventional description of land which was not measured by the perch was that it lay in "field acres" (*acre campestris*) or in "acres as they lie" (*acre ut iacent*). These phrases meant that, for purposes of land measurement and land use,

⁵ A link noted by F. W. Maitland, *Domesday Book and Beyond*, Cambridge, 1897, p. 429.

⁶ In this context it is illuminating to note that ancient demesne manors had never been taxed to the geld or distributed into hides: R. S. Hoyt, *The Royal Demesne in English Constitutional History*, Ithaca, New York, 1950, p. 19, my italics.

one or more selions, the natural units of ploughing, were held to constitute an acre, regardless of how much they really measured. In fact in the Midlands and the south it seems that the conventional acre was often between two-thirds and three-quarters the size of the standard acre, and that there was a rough-and-ready identification of an average selion with a half-acre.⁷ For example, at Wootton (Hants.), a manor of St Swithun's Priory, Winchester, throughout the fourteenth century, seed was sown on the demesne on selions "as they lie," and for purposes of sowing, two selions were estimated as an acre.⁸ Selions, of course, came in many shapes and sizes, often with considerable variation within the one village, so small selions would have been reckoned as a quarter-acre (or rood) or even less, and large selions as three-quarters of an acre or more.⁹ On some manors we can see the difficulties which the reeve encountered in deciding which selions to reckon as half-acres, and so on.¹⁰ Where selions differed in

size, so the situation arose where one conventional acre was larger than another. At Stoke Talmage (Oxon.), for example, c. 1195 the monks of Thame exchanged one parcel of $2\frac{1}{2}$ acres for another of $3\frac{1}{2}$ acres, though it was noted that the second parcel was actually no larger than the first.¹¹ Contemporaries were clearly aware of the difficulties and anomalies which arose where selions varied in size. In 1253 a note was added to the account roll of Adderbury (Oxon.) that the manorial ploughmen, who were allowed to use the lord's plough at certain times to till their own land, were not to plough a larger acre on their holdings than they would on the demesne; and at Wistow (Hunts.), the custumal of 1252 noted that a virgater ploughed "sometimes one selion and sometimes one selion and a half, because they vary in size." In these circumstances, land measurement, both on peasant tenements and on demesne arable, probably meant little more than a careful counting of selions, and little search is needed to uncover estate surveys and terriers which suggest this.¹²

Alongside the conventional assessment of the size of parcels of land there existed the fiscal assessment of size. Fiscal assessment is immedi-

(Bucks.), in 1346, the reeve did not try to distinguish between the acres, for dredge was sown at 4 bu. an acre "*secundum maius et minus*": Bodl. Lib. MS. Christ Church, c. 26, Oseney roll 35.

¹¹ "*Et he tres acre et dimidia non excedunt quantitatem predictarum duarum acrarum et dimidie in mensura*": H. E. Salter, ed., *The Thame Cartulary*, 1, Oxford. Rec. Soc., 25, 1947, pp. 100-1.

¹² "*Non arabunt in terris suis maiorem acram quem acram in terra domini*": P. Hyde, 'The Winchester Manors at Witney and Adderbury. . . in the Later Middle Ages', unpublished B.Litt. thesis, Oxford Univ., 1954, p. 110; "*arabit aliquando unam sellionem aliquando unam sellionem et dimidiam vel plus secundum majoritatem et minoritatem tere*": W. H. Hart and P. A. Lyons, eds., *Cartularium monasterii de Rameseia*, Rolls ser., 1884-93, 1, p. 357. Examples of demesne surveys which list lands or selions with their acreage can be found in W. D. Peckham, ed., *Thirteen Custumals of the Sussex Manors of the Bishop of Chichester*, Sussex Rec. Soc., xxxi, 1925, pp. 127-8; and B. C. Redwood and A. E. Wilson, eds., *Custumals of the Sussex Manors of the Archbishop of Canterbury*, Sussex Rec. Soc., lvii, 1958, pp. 11, 16. In the Lincolnshire fenland a comparison of the Fleet Acre Book of 1747 with the terrier of 1315 suggests that the surveyors at both dates reached their figures by counting the rigs: H. E. Hallam, *Settlement and Society*, Cambridge, 1965, pp. 143-4.

⁷ "Field acre" is a term usually applied to customary (i.e. villein-) land, and, as such, is found throughout the Midlands: R. H. Hilton, *A Medieval Society*, 1966, p. 20; *Cat. Anc. Deeds*, vi, p. 329, no. C 6331; G. H. Fowler, ed., *The Cartulary of the Cistercian Abbey of Old Warden*, Beds. Hist. Rec. Soc., xii, 1930, pp. 252, 257; H. E. Salter, ed., *The Cartulary of the Abbey of Eynsham*, 11, Oxford Hist. Soc., LI, 1908, pp. 2-9, 61-3. *Acre ut iacent* is a term usually applied to demesne arable, and first studied in detail at Crawley (Hants.) by N. S. B. and E. C. Gras, *The Economic and Social History of an English Village*, Harvard Economic Studies, xxxiv, Cambridge, Mass., 1930, p. 30. I have found relatively little evidence identifying one acre with one selion. From among many possible examples, there are some clear correlations between half-acres and selions in R. H. Hilton, ed., *The Stoneleigh Leger Book*, Dugdale Soc., xxiv, 1960, pp. 118-21, 153-4.

⁸ G. W. Kitchin, ed., *The manor of Manydown, Hampshire*, Hants. Rec. Soc., 1895, pp. 150-3, 150; Winchester Cathedral Library, Box 55, rolls 13, 14 ("*unde ij estimantur facere j acram*"). I have to thank Canon F. Busby, hon. archivist, for permission to use these rolls.

⁹ H. M. Clark, 'Selion Size and Soil Type', *Ag. Hist. Rev.*, viii, 2, 1960, pp. 91-8. At Harlestone (Northants.), c. 1300, Henry de Bray exchanged *una butta* for *una parva dimidia acra*, presumably a small selion: D. Willis, ed., *The Estate Book of Henry de Bray*, Camden, 3rd ser., xxvii, 1916, p. 100.

¹⁰ P. D. A. Harvey, *A Medieval Oxfordshire Village*, Oxford, 1965, pp. 41-2. An identical situation arose at Gussage (Dorest) in 1311; here, the reeve accounted for the extra oats sown "on account of the largeness of the acres this year" ("*pro magnitudine acrarum hoc anno*"): Bodl. Lib. MS. Queen's College, box 38, roll 13. At Stone

ately noticeable in the "artificial uniformity" of many manorial surveys. Vinogradoff thought "we must come to the conclusion that the hide, the virgate, the bovate, in short every holding mentioned in the surveys, appears primarily as an artificial, administrative, and fiscal unit which corresponds only in a very rough way to the agrarian reality."¹³ Any neat progression in the size of tenements or a predominance of any one size of holding suggests a fiscal assessment. Thus, the "air of regularity about the acreages under dispute" in the Norfolk feet-of-fines at the turn of the twelfth century points to a fiscal rather than a conventional acreage.¹⁴ Evidence of the discrepancy between fiscal and conventional or actual acreage is best sought in individual charters rather than in manorial surveys, for the former sometimes make it clear that a fiscal assessment was used. Thus sources refer to land "to be defended" as 11 acres regardless of its real acreage, a grant of 11 acres "defended as 5 acres," and a parcel of 30 acres reckoned as 36 acres "by the plough."¹⁵ This is not to say that surveys and extents never illustrate the discrepancy, but rather that their evidence is usually harder to interpret. At Barton (Beds.), for example, the mid-thirteenth-century custumal noted that one croft was held "for 8 acres" whereas it contained "by measurement" 18 acres 1½ roods.¹⁶ At first sight this looks like a change from conventional to standard measurement, but it was probably a note of the fiscal acreage together with the conventional acreage. The extent of Kirby Moorside (Yorks.), however, leaves no doubt about the assessment of land in villeinage. Here in 1281-2 ninety tenants (*nativi*) were not holding "by the bovate but by more or less"

land.¹⁷ An interesting reassessment of what appears to be the fiscal acreage of the demesne at Runwell (Essex) occurred in 1222. The ancient inquisition claimed the hide contained 80 acres, whereas the jury now affirmed it contained 120 acres "because the land was searched and measured."¹⁸ From about 1250 onwards it becomes increasingly common to find surveys and extents recording "measured" acres on the demesne or on other parcels of land, in much the same way as the croft at Barton mentioned above. For example, the surveys of the manors of Glastonbury Abbey carried out between 1252 and 1261 recorded "measured" demesnes, yet the measurements were given in acres and half-acres, and not, as might be expected, in acres, roods, and perches. Similarly, on the estate of the Bishop of Hereford, c. 1250-70, the demesne at Ross was "measured," but only in round acres.¹⁹ Other examples, where demesne surveys listed the size of the parcels in a general way or gave the acreage in round figures, may represent conventional acres in contrast to fiscal acres. Where the terms *mensurantur*, *mensuracio*, *per mensuracionem*, or *acre mensurate* occur in such surveys, this hypothesis would give them a precise significance they otherwise seem to lack. The very form of a survey which listed the size of all the parcels would perhaps make it self-evident that it was based on an assessment other than a fiscal one, but terms such as *mensurantur* would help emphasize the contrast, especially where the survey in question replaced an earlier one.²⁰

¹⁷ "Per bouatam terre non tenentes set secundum majus et minus": W. Brown, ed., *Yorkshire Inquisitions* . . . , 1, Yorks. Arch. Soc., records ser., XII, 1892, p. 249.

¹⁸ W. H. Hale, ed., *The Domesday of St Pauls of the year MCCXXII*, Camden Soc., LXIX, 1857, p. 69.

¹⁹ C. J. Elton, ed., *Rentalia et custumaria. . . monasterii beate Marie Glastonie*, Somerset Rec. Soc., v, 1891, pp. 180-1, 195, 219, 235; A. T. Bannister, ed., 'A Transcript of the Red Book of the Bishopric of Hereford', *Camden Misc.*, xv, 1929, p. 10.

²⁰ Occasionally a demesne survey will list almost all the constituent parcels in acres, half-acres, and roods, with just one or two parcels measured in acres, roods, and perches. Perhaps the greater accuracy was used only where there was an obvious discrepancy between the groupings of selions and the "concept" of an acre. An example is the survey of Sutton (Middx.) in 1299 in which all the parcels save two in the *mensuracio* were listed in round acreages or

¹³ P. Vinogradoff, *Villainage in England*, Oxford, 1892, p. 241.

¹⁴ B. Dodwell, ed., *Feet of Fines for the County of Norfolk for . . . 1198-99 and for . . . 1199-1202*, Pipe Roll Soc., n.s., xxvii, 1952, pp. xxiii-xxiv.

¹⁵ W. H. Stevenson, ed., *Calendar of the Records of the Corporation of Gloucester*, Gloucester, 1893, p. 100, n. 4; S. A. Moore, ed., *Cartularium monasterii sancti Johannis Baptiste de Colecestria*, Roxburghe Club, 1897, 1, p. 189; *Curia Regis Rolls*, v, p. 119 (not a charter).

¹⁶ Hart and Lyons, *op. cit.*, p. 480.

III

Perch-lengths first appear in charters about the middle of the twelfth century, and they begin to be included in manorial surveys in the earlier decades of the thirteenth century.²¹ With their appearance another aspect of land measurement is brought to light: the measurement of land by a standard length. This had doubtless existed long before.²² The text of the Burghal Hidage takes the acre's breadth as a set measure equal to 4 *gyrdan*. While it does not necessarily follow that the acre was 40 *gyrdan* long, it does seem probable. If the correlations between the assessments of the Burghal Hidage and the lengths of surviving fortifications are correct, it can be deduced that a statute (? 16½-foot) perch existed in the ninth century.²³ We shall probably never establish satisfactorily the derivation of the 16½-foot perch (the statute perch), or that of other common lengths.²⁴ It has been suggested that the statute perch originated in a mnemonic devised by the ploughman as he paced his furrow, which seems rather unlikely, or that it derived from the length of the goad with which the ploughman controlled his oxen.²⁵ This may have been the

in acres and roods: St Paul's Cathedral Library, WD 16, *Liber* 1, fo. 37v. I am grateful to Mr A. R. B. Fuller, hon. librarian, for access to the library.

²¹ As in the surveys of the manors of the Bishop of Ely in 1222: B.M. Cotton Tiberius B. II.

²² It should be pointed out at once that measurement by a standard length did not necessarily mean measurement by a perch of 16½ feet. This is discussed further below.

²³ D. Hill, 'The Burghal Hidage: the Establishment of a Text', *Medieval Archaeology*, xiii, 1969, pp. 90-1. This deduction was kindly pointed out to me by Dr P. D. A. Harvey.

²⁴ The statute acre and its perch were enshrined in the so-called "statute of admeasurement": *Statutes of the Realm*, I, pp. 206-7. Its date is earlier than the 33 Edward I given in the *Statutes*; the Singer "handlist of scientific mss", box 43, "weights and measures" (B.M. dept. of MSS.) mentions thirteenth-century copies. I have to thank Dr Harvey for this information. The current state of knowledge concerning perch-lengths is summarized by Grierson, *op. cit.*, pp. 21-4. Wholesome perch-lengths may have been based on natural feet, it is difficult to see how fractions of feet arose if we postulate such a derivation for all perches.

²⁵ A. H. Dupree, 'The English System for Measuring Fields', *Ag. Hist.*, XLV, 2, 1971, pp. 124-5; E. Nicholson, *Men and Measures*, 1912, p. 71; L. F. Newman, 'Weights and Measures', *Folk-Lore*, LXV, 3, 1954, p. 137; G. C.

same rod (*virga*) which tenants, both free and servile, were sometimes bidden to bring to the autumn *precarie* to supervise their workers.²⁶ Where it has been suggested that a perch was derived from the dimensions of a building, often a church, it seems likely that the building itself was based on one particular perch, and thereafter acted as a kind of repository of the local standard.²⁷

By the end of the thirteenth century it was understood in some quarters that the normal perch was the "king's" perch of 16½ feet.²⁸ However, it is clear that there was no one normal perch in medieval land measurement, and certainly not before 1300. Thus there existed "royal" acres based on a perch of 24½ feet, a "king's" perch of 21 feet, and a "king's" perch of 20 feet in contrast to another perch of 20 feet "but not of the king's feet."²⁹ The "royal" acre and the "king's" perch appear to have taken their importance from the principle of measurement in general rather than from any one perch in particular. The "royal" acre was almost certainly what may be called a "standard" acre, that is one using a 4 × 40 measurement, regardless of the length of the perch.³⁰ It stands in contrast to the "local" acre, which was still measured, but not on a 4 × 40 basis.³¹ It is certainly dangerous to assume that an otherwise

Homans, *English Villagers of the Thirteenth Century*, Cambridge, Mass., 1941, p. 70. Homans (p. 69) quotes an example of a man fined for measuring work on the demesne "with his own rod".

²⁶ E.g. Elton, *op. cit.*, pp. 76, 115, 210.

²⁷ S. O. Addy, *Church and Manor*, 1913, pp. 345, 348-50; 'Little Johns' Grave and the Lawful Village Perch', *Jnl Derbys. Arch. & Nat. Hist. Soc.*, XLVII, 1925, pp. 206-21. But at Harlestone (Northants.) the local perch was apparently sculpted on the outside chancel wall: Willis, *op. cit.*, p. xiv.

²⁸ D. Oschinsky, *Walter of Henley*, Oxford, 1971, p. 315.

²⁹ H. E. Savage, ed., *The Great Register of Lichfield Cathedral*. . . , Staffs. Hist. Coll., 1924, p. 359; *Cal. Inq. Misc.*, I, p. 90, no. 254; *ibid.*, p. 68, no. 201.

³⁰ Other references to "royal" acres may be found in H. E. Salter, ed., *The Cartulary of the Abbey of Eynsham*, I, Oxford Hist. Soc., XLIX, 1907, p. 283; H. E. Salter, ed., *The Cartulary of Oseney Abbey*, v, *ibid.*, xcvi, 1934, p. 100; Bodl. Lib. MS. Barlow 49, fo. 99v (Shilton, Berks., later thirteenth century: a register of Beaulieu Abbey).

³¹ See below, p. 17.

unspecified reference to a "king's" perch always implies a perch of 16½ feet.

It has long been known that woodland, assarts, and other non-arable land of little value were often measured by perches longer than the 16½ feet which eventually became statutory. But measurement of land by perches of up to 25½ feet was not confined solely to non-arable. In Cheshire, Lancashire, and the north of England in general it is common to find arable measured by perches between 20 and 24 feet long.³² Possibly these longer arable perches also reflected the poorer quality of much of the soil in the northern counties. Although the longer perch-lengths were mostly used in the north, perch-lengths varied quite considerably over relatively small areas. On the Cambridgeshire manors of the Bishop of Ely, surveyed in 1251, six different perches were listed, ranging from 15½ feet at Shelford to 18 feet at Tydd.³³ In the city and county of Gloucester, the customary measure until the end of the seventeenth century was to add an inch to each yard, making a yard of 37 inches.³⁴ This was the "tailor's" or "cloth" yard, and a perch based on it can be found in places as far apart as Thaxted (Essex) and Tottington (Lancs.).³⁵ Elsewhere perches occur which appear, at first sight, to have been purely local in origin, such as that of 15 feet 1 inch at Yeovil (Som.) in the seventeenth cen-

tury, 15 feet 4 inches at Cossington (Leics.) in the sixteenth century, 15 feet 5 inches at North Leigh (Hants.) in the fourteenth century, and the double standard, 16 feet and 16 feet 2 inches, used at Brotherton (Yorks.) in the eighteenth century.³⁶ The odd lengths may represent nothing more than 15-, 15½-, and 16-foot perches subjected to strict measurement;³⁷ as precision was never a marked characteristic of land measurement in the Middle Ages we may imagine that most of the 16½-foot, 18-foot, and 20-foot perches were not *exactly* the length normally ascribed to them. Many early grants of land were far less specific, stating only that the land was measured by the perch of the monks to whom the land was given, by the perch of the village or of a neighbouring village, or by the perch of the district.³⁸ There are a few instances where measurement by one perch superseded measurement by another. At Tarring (Sussex), for example, the custumal of c. 1284 recorded that a perch of 17 feet had replaced one of 16 feet on the demesne; at Alvingham (Lincs.), at about the same time, the demesne meadow was measured by a perch of 15 feet, replacing an earlier measurement by one of 18 feet; while at Tottington (Lancs.) in 1544 there was a dispute over the length of the perch, one jury claiming a length of 7 cloth yards, another one of 8 cloth yards.³⁹ As for the people involved, little is known other than that measurement was usually entrusted to "honest men," to quote a stock phrase. Professional

³² The forest foot contained 18 inches according to H. E. Boulton, ed., *The Sherwood Forest Book*, Thoroton Soc., records ser., xxiii, 1965, p. 108; H. Robinson, 'The Cheshire Acre', *The Cheshire Historian*, v, 1955, pp. 1-6; B. Howells, 'The Distribution of Customary Acres in South Wales', *Nat. Lib. Wales Jnl*, xv, 2, 1967, p. 229; E. Smith, 'Lancashire Long Measure', *Trans. Historic Soc. Lancs. & Ches.*, cx, 1959, pp. 1-14. References to the "Derbyshire acre" occur as late as the twentieth century: Derbys. R.O.: Tideswell parish records, D1494A/PI 405. Grierson, *op. cit.*, p. 23, suggests that the 20-foot perch may represent a traditional measure in fact equal to 16½ statute feet.

³³ *V.C.H., Cambs.*, II, pp. 59-60 (but not 1277 as stated in the *V.C.H.*).

³⁴ Stevenson, *op. cit.*, p. vi. Examples using this measure may be found in W. H. Hart, ed., *Historia et cartularium monasterii sancti Petri Gloucestris*, Rolls ser., 1863-7, I, pp. 179-81.

³⁵ K. C. Newton, *Thaxted in the Fourteenth Century*, Chelmsford, 1960, p. 33; W. Farrer, ed., *The Court Rolls of the Honor of Clitheroe*, Manchester and Edinburgh, 1897-1913, III, p. 339 (in 1544).

³⁶ R. de Z. Hall, 'Customary Land Measures, Yeovil', *N. & Q., Som. & Dorset*, xxvii, 1959, pp. 241-2, and *ibid.*, xxviii, 1964, pp. 164-5; Leics. R.O.: DE40/1/3; P.R.O.: SC 11/586; W. E. Tate, *The Parish Chest*, 3rd edn, Cambridge, 1969, p. 257.

³⁷ To counter this suggestion, it would, of course, be very interesting to discover why Brotherton had a double standard.

³⁸ C. T. Clay, ed., 'The Percy Fee', *Early Yorkshire Charters*, XI, Yorks. Arch. Soc., records ser., extra ser., ix, 1963, p. 185, no. 160; W. T. Lancaster, ed., *Abstracts of the Charters... in the Chartulary of the Cistercian Abbey of Fountains*, Leeds, 1915, I, p. 182; J. Brownbill, ed., *The Coucher Book of Furness Abbey*, II, pt 2, Chetham Soc., n.s., LXXVI, 1916, pp. 392-3; C. T. Clay, ed., 'The Honor of Richmond', *Early Yorkshire Charters*, v, Yorks. Arch. Soc., records ser., extra ser., II, 1936, p. 346, no. 394.

³⁹ Redwood and Wilson, *op. cit.*, p. 21; Bodl. Lib. MS. Laud Misc. 642, fo. 40r; see above, n. 35.

land-meters must have been few and far between, though the rudiments of measurement together with the help afforded by the "statute of admeasurement," would have been known by estate stewards.⁴⁰ The routine measurement of such things as tithe acres or demesne meadow was probably the responsibility of the reeve, perhaps assisted by the customary tenants.⁴¹

IV

It was relatively easy, of course, to measure one side of a parcel of land, to measure the dimensions of buildings, or to measure out work such as hedging and ditching. The problem came in converting linear measures to areal measures, and it is this conversion which men often found so difficult. However, the measure which was of most concern was the width of a piece of land. In a furlong in the open fields or in an enclosure, the length of a parcel was the length of the furlong or close, that is a standard length. For purposes of land measurement and ownership it was the width of the parcel which mattered; once this was known, the area could be estimated. This may explain why so many grants which recorded perch-lengths were, in fact, expressed in round acreages. In addition, it may help us understand more clearly the "truly astonishing" accuracy with which the *offoldfal* of the Fens was measured.⁴² The skill with which men used the measuring rod was primarily one in linear measure. It can probably be assumed that many cases of parcels of land which were measured in acres, roods, and perches rested on a measured width. This was then the basis of the area, the length being "the length of half an acre," or

whatever it was customarily held to be.⁴³ Perhaps the main exception lay in the measurement of meadow, which as a relatively scarce commodity may have been accorded extra care. And as it was not divided into selions, meadow would have been that much easier to measure. This is apparent in the measurement of the arable, meadow, and pasture at Biddensham (Beds.), *c.* 1347, where the area of arable was estimated by the selion (*j selio iacens pro una roda*, etc.), but the area of the parcels of meadow and pasture was derived from measuring length and breadth in perches and feet.⁴⁴ At Great Barford (Beds.), *c.* 1234, a grant to Bushmead Priory included 1½ acres of meadow lying in two parcels, 5 roods and 1 rood, but the latter was "*de tribus percatis et quinque pedibus latitudinis quia longitudo eius defecit*": 3 perches 5 feet in width because its length is deficient; with meadow it was relatively simple to vary the width to compensate for the reduced length.⁴⁵ It is interesting to note that meadow was often the only part of a peasant's holding to be measured accurately.⁴⁶

V

A shift from estimation towards more accurate measurement can be traced in many manorial surveys in the second half of the thirteenth century and at the beginning of the fourteenth century. The impetus towards a stricter measurement may have arisen from the introduction and increasing adoption of the *Extenta Manerii* as a standard form for a survey in the later thirteenth century, and in the circulation of the "statute of admeasurement" at about the same time.⁴⁷ While it became com-

⁴⁰ Without the help of its table of measurements *ad hoc* measuring with any hope of accuracy must have been very difficult: E. G. R. Taylor, 'The Surveyor', *Econ. Hist. Rev.*, xvii, 1947, pp. 125-6. The author of the *Seneschaucauy* laid the responsibility for the measurement of the demesne on the steward: Oschinsky, *op. cit.*, p. 265.

⁴¹ Hart and Lyons, *op. cit.*, p. 282 (tithe acres, St Ives, Hunts., 1251); A. E. Wilson, ed., *Customals of the Manors of Laughton, Willingdon, and Goring*, Sussex Rec. Soc., lx, 1961, p. 24 (meadow, Willingdon, 1292); the demesne at North Leigh (Hants.) was measured with the help of the customary tenants: P.R.O.: SC 11/586.

⁴² Hallam, *op. cit.*, p. 160.

⁴³ This appears to have been noticed first by R. Holmes, ed., *The Chartulary of St John of Pontefract*, 1, Yorks. Arch. Soc., records ser., xxv, 1899, p. 235, n. 1. It was reiterated by Homans, *op. cit.*, p. 70. There are very many examples of this sort of measurement in charters from many different parts of the country.

⁴⁴ Beds. R.O.: TW 780.

⁴⁵ G. H. Fowler and J. Godber, eds., *The Cartulary of Bushmead Priory*, Beds. Hist. Rec. Soc., xxii, 1945, p. 162.

⁴⁶ A. C. Jones, 'The Customary Land Market in Bedfordshire in the Fifteenth Century', unpublished Ph.D. thesis, Southampton Univ., 1975, pp. 216-18.

⁴⁷ Maitland (*op. cit.*, p. 431) was sceptical of the practical

mon for surveys and extents to include a note of the size of perch used to measure the demesne, this information alone cannot be held to constitute evidence of an accurate survey. This must be sought in the description of the parcels of the demesne. Where these are recorded in acres, roods, and perches, it is clear that some form of measured survey had taken place. However, there was probably some margin of error in any survey despite the impression of accuracy which so many give. This is amply demonstrated in the survey of Thaxted (Essex) taken in 1393, replacing an earlier one of 1347. One area, previously held to measure just over 249 acres, was found when remeasured to contain an extra 8 acres. Indeed, it rather looks as if the surveyors of Thaxted expected to uncover such inaccuracies: "there is no increase because it is strictly measured and nevertheless twice is measured."⁴⁸ This comment suggests that the discrepancies were not the result of a different size of perch. When the pastures of Old Warden (Beds.) were surveyed in 1577 they were meted out in acres, roods, and perches, and the surveyor made a systematic record of how much each pasture had "lost" or "gained" against the previous survey.⁴⁹ Few medieval surveys record measurements so explicitly as those of Thaxted and Old Warden, and it is dangerous to rely on surveys alone for evidence of measurement. Account rolls remain the main means of checking whether a measured survey was put into everyday use.

The change from one system of measurement to another can be traced very clearly in the account rolls of Cuxham (Oxon.), for they reflect the difficulties the reeve faced in allocating strips to acres under a system of conventional measurement, and then in converting the measurements once the survey had been introduced.⁵⁰ Occasionally, the process of measurement can be pin-pointed by a payment recorded on an account roll, as at Farleigh (Surrey) in 1291-2, and at Sevenhampton advantages of the "statute", a scepticism shared by Professor Taylor (*loc. cit.*, pp. 125-6).

⁴⁸ Newton, *op. cit.*, pp. 35, 39.

⁴⁹ B.M.: Add. MS. 40632A, fos. 437-477.

⁵⁰ Harvey, *op. cit.*, pp. 14-6.

(Wilts.) in 1276-7.⁵¹ Elsewhere, the change from one method to another can be traced in apparent alterations in the area of arable under crop. At Witney (Oxon.), for example, 734 acres of demesne arable were cultivated in 1232, while in 1235 the area had dropped below 500 acres. However, the contraction was illusory, reflecting a shift from "conventional estimates of acreage to measurement."⁵² Such a change was often recorded in account rolls by a change in the description of the acre from conventional (*acre ut iacent*) to standard (*acre per perticam*). Attempts at accurate measurement had to be superimposed on the pattern created by ploughing. Herein lay the great difficulty. A measured survey made no difference to the layout of the fields; men had still to wrestle with the new survey in terms of selions and strips. Thus, once a survey had been introduced it did not always follow that the standard acre replaced the conventional acre for every task. Reaping, for example, was a job which, like ploughing and sowing, could easily be based on the selion. At Cuxham, where sowing was done over the acre *per perticam*, reaping continued to be based on the conventional acre, and this happened elsewhere too.⁵³ The existence side by side of the two types of measurement probably explains the situation at Hyde (Hants.) which puzzled Lord Beveridge. Here in 1371 the men who contracted to reap 146 acres actually harvested 174 $\frac{3}{4}$ acres.⁵⁴ When the problems involved are considered, it is perhaps not

⁵¹ *Ibid.*, p. 42, n. 2. However, the Farleigh account rolls (Merton College Muniments, 4807-34) recorded no change like that at Cuxham. I am very grateful to the Warden and fellows for their permission to use their records. M. W. Farr, ed., *Accounts and Surveys of the Wiltshire Lands of Adam de Stratton*, Wilts. Arch. & Nat. Hist. Soc., records branch, xiv, 1959, p. 84 ("In expensis... j. nuncio misso domino apud Rodeston' pro mensuracione dominicorum de Sevenhampton").

⁵² E. Stone, ed., *Oxfordshire Hundred Rolls of 1279*, Oxfords. Rec. Soc., 46, 1968, p. 11; changes in measurement on the manors of the Bishop of Winchester, of which Witney was one, are set out in J. Z. Titow, *Winchester Yields*, Cambridge, 1972, pp. 150-1.

⁵³ Harvey, *op. cit.*, 43-4; Kitchin, *op. cit.*, p. 148; J. S. Drew, 'The Manor of Chilbolton', 1945 (typescript, Institute of Historical Research, London), II, pp. 368-466.

⁵⁴ Lord Beveridge, 'Westminster Wages in the Manorial Era', *Econ. Hist. Rev.*, 2nd ser., VIII, 1, 1955, p. 24.

surprising that the only consistent evidence for the use of the measured survey concerns sowing, a job which, unlike ploughing, could be handled with some dexterity, and which, unlike reaping, could be handled by just one man. However, although the connection between land measurement and sowing was clearly an intimate one, it is not always easy to establish whether land was measured first and then sown,⁵⁵ or whether it was sown, and that area covered by a certain amount of seed reckoned as an acre.⁵⁶ Perhaps the use of measured acres for sowing was just one more facet of the growing concern to monitor yields which can be found on large estates at the beginning of the fourteenth century.⁵⁷

So far we have discussed the measured acre in use on the demesne in terms of the standard acre, that is one measured on a 4 × 40 basis, whether the perch used was a statute 16½-foot perch, or a local one. However, on some manors in southern England a "local" acre was also used on the demesne, that is one measured on a basis other than 4 × 40 perches. At Chilbolton (Hants.), for example, the local acre was three-quarters the size of the standard acre: the seed ratios on both types of acre show a consistent variation. That this local acre was measured and not conventional is shown by its description in the account rolls as *acra per iij perticas* or *acra per perticam iij virgarum*.⁵⁸ The same descriptions

can be found at Houghton (Hants.), and Alton Priors, Overton, and Patney (Wilts.), which, with Chilbolton, were all manors of St Swithun's Priory, Winchester.⁵⁹ These formulas imply a measured acre based on a norm of 3 perches instead of the usual 4 perches. They do not occur frequently in the account rolls of the priory, dying out towards the end of the thirteenth century, and there does not appear to be any immediately obvious reason why this local acre was used in preference to the conventional or standard acre.⁶⁰ It is quite clear from the account rolls that the local acre was used on the demesne land proper and not just on land temporarily incorporated into the demesne.

VI

Where land held by the peasantry was, for one reason or another, temporarily included in the demesne, it may be supposed that it was usually measured in the same way as the rest of the demesne when it came to ploughing, sowing, and reaping. But, as far as can be told, land which remained with the peasantry was measured either in fiscal or in conventional acres, and, as has been seen, quite startling discrepancies could occur between the conventional and the real acreage of a holding under these conditions.⁶¹ However, there were occasions when attempts were made to impose a systematic check on the size of customary holdings. Such an investigation had obviously taken place at Michelmersh (Hants.) around the year 1300 when a custumal of the manor was compiled. The nominal size of the virgate was 38 acres of arable, yet several were found to con-

⁵⁵ Sowing on the Sussex manors of Battle Abbey appears to have been over the measured acre: P. F. Brandon, 'Cereal Yields on the Sussex Estates of Battle Abbey during the Later Middle Ages', *Econ. Hist. Rev.*, 2nd ser., xxv, 3, 1972, p. 415, n. 4.

⁵⁶ Broadcast sowing could be used as a means of measuring land: Oschinsky, *op. cit.*, p. 443; Taylor, *loc. cit.*, p. 127; A. Harris, 'A Note on Common Fields in North Lancashire', *Trans. Hist. Soc., Lancs. & Ches.*, cxix, 1968, pp. 225-6. W. D. Peckham ('Customary acres in south-west Sussex', *Sussex Arch. Coll.*, lxvi, 1925, pp. 150-1) tried to show that broadcast sowing was used to estimate acreage, but the discrepancies which account rolls sometimes record between seed actually sown and the amount calculated in advance may be little more than inaccuracies in mathematics. However, this is a subject which deserves further investigation.

⁵⁷ J. S. Drew, 'Manorial Accounts of St Swithun's Priory, Winchester', *Eng. Hist. Rev.*, lxii, 1947, pp. 20-41.

⁵⁸ Drew, 'The Manor of Chilbolton', 1, p. 7.

⁵⁹ J. S. Drew, 'The Manor of Houghton Drayton', 1943 (typescript, Institute of Historical Research, London), p. 37.

⁶⁰ In the account rolls of the priory it is the *acra ut iacet* which usually replaces the *acra per iij perticas* from about 1300, where the acres are described at all. Was the *acra per iij perticas* an attempt to "measure" the conventional acre?

⁶¹ There is ample evidence in early charters that donors rather expected their land to contain perhaps more, perhaps less, than the stated acreage, and we find "compensation clauses" inserted to protect the recipient. Among many examples are those in W. Farrer, ed., *Early Yorkshire Charters*, III, Edinburgh, 1916, pp. 423, 427-8, nos. 1809, 1812-13.

tain more, in one case 12 acres, in another 20 acres, while a third virgate contained just 22 acres. A half-hide was found to contain only 53 acres of arable, 23 acres less than it should have. Then there were several other holdings where the discrepancy was much less. It is possible that the excesses represented no more than additions made by purchase or marriage, but the custom expressly stated against a number of holdings that the surplus had been found by measurement (*per mensuracionem*), which suggests that this was a check on the size of the ancient fiscal divisions.⁶² A similar vigilance on the part of the manorial authorities can be found in the extents of the manors of Bury St Edmunds made in 1357. The nominal acreage of each holding was noted together with its acreage *per parcelas*, or, in some cases, in acres, roods, perches, and even feet.⁶³

VII

Land measurement in England in the Middle Ages is a subject beset with pitfalls, and one in which we can rarely feel that the sources have been mastered entirely satisfactorily, for it provides striking illustrations of the dangers in taking information in individual records at face value. In this article enough examples have been marshalled to show that there were various ways of assessing the size of a parcel of land, and various sorts of acre: conventional, fiscal,

standard, and local. Further research may well uncover more examples of local acre to set beside those from the manors of St Swithun's Priory, as well as different sizes of conventional and standard acres. And the examples have shown how some of the differing evidence for land measurement may be approached and interpreted, and where some of the problems occur. Even so, this article has barely scratched the surface of the subject. The problem of Domesday measures has been left aside, as has that of the measurement of buildings and town defences, and that of *solskifte* and related topics.⁶⁴ For many estates account rolls remain a largely unexplored source, and there is a need for further detailed research to establish local practice and to outline a chronology of changes in measurement. There is scope, too, for much more work on charters. One problem concerns the selion. Although the description of land in selions can be traced in charters in many different parts of the country, it is particularly noticeable in eastern England, especially in Lincolnshire. Another problem concerns a change in terminology from selion to rood. At Wigston (Leics.), for example, the earlier records describe land in selions, while those after about 1300 describe land in roods. As Professor Hoskins noted, "We cannot equate selions and roods, and the marked change in the terminology of the charters in this respect . . . is very curious."⁶⁵ It would be interesting to discover why these variations and changes occurred. Scope for further work will also involve field work, trying to solve some of the problems posed by the patterns of selions preserved in the landscape. Certainly, much more work will be required before we can be sure how men laid out their land or on what basis their work was apportioned.

⁶² K. A. Hanna, 'An Edition with Introduction of the Winchester Cathedral Customal', unpublished M.A. thesis London Univ., 1954, I, pp. 191, 193-4. I am very grateful to Mrs Hanna for permission to use her thesis. The extents of Langley Abbey (Norfolk, c. 1289) included detailed terriers of the holdings of the customary tenants in which their land was distinguished as *de uillenagio, quam adquisiuit, habuit in maritagio, quam perquisiuit*, but the extents do not suggest in themselves that this was part of any general check on the notional holding (Bodl. Lib. MS. Bodley 242, fos. 22v-29v). An examination rather similar to that at Michelmersh appears to have occurred at Belchamp St Pauls (Essex) in 1222. Gilbert son of Thomas had paid 6d for 1½ acres of *forland*, but "*terra sua fuit mensurata augmentus est census ad xd*": Hale, *op. cit.*, p. 28.

⁶³ B.M.: Add. MS. 14849, fos. 6r-83r.

⁶⁴ On *solskifte*, see S. Goransson, 'Regular Open-Field Pattern in England and Scandanavian Solskifte', *Geografiska Annaler*, XLIII, 1961, pp. 80-104, and the references in Sheppard, *loc. cit.*, p. 118.

⁶⁵ W. G. Hoskins, *The Midland Peasant*, 1957, p. 66.