Modern Surveys of Medieval Field Systems

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SUMMARY

Techniques for surveying Medieval fields and the earthworks left by ancient field boundaries are described. It is possible to compile complete furlong maps for any settlement, which show that all the land except the flooding meadows was cultivated. Supporting historical studies show that the field systems were completed by the early fourteenth century. It is demonstrated that fourteenth century village sizes are related to the area of good quality arable soil; from this relation it should be possible to calculate the size of any Medieval settlement so giving a new method of population assessment.

INTRODUCTION

The present work is part of a programme to record as much as possible of the pre-enclosure landscape of Northamptonshire, before it is destroyed by towns, quarries, and intensive agriculture. Each parish receives a field by field archaeological survey of the pre-enclosure field system, along with a study of ancient field and other names. The area surveyed in the first instance is the Higham Ferrers Hundred, Northamptonshire, and a few adjacent parishes. Some fifty thousand acres have now (1972) been completed.

Supporting historical studies have shown that these field systems are substantially unchanged since at least the medieval period. Thus application of the survey techniques can be used to prepare open-field maps for anywhere in the country which does not possess them.

This paper will restrict itself principally to Wollaston and Strixton, which are typical examples of pre- and post-conquest Midland villages.

FIELD SURVEYS

In many parts of the country there are modern fields of pasture which are not flat, but present a "corrugated" or ridged aspect (pl. 1, 2a). Detailed examination shows they are built up from a basic unit which is a strip of average dimensions 206 by 8yd (0.34 acre), ridged up to about 1ft down the centre long axis. There is considerable variation in the size, between 15 and 400yd. The strips are not straight, but form an elongated mirror image of an 'S'; i.e. when viewed from the centre the ends have a left-handed twist (pl. 1a, 2a). At each end there is a small mound or heap piled rather higher than the top of the ridge (pl. 2a).

Strips are found together in groups forming essentially rectangular areas, but much modified in shape by roads, brooks and parish boundaries. The average area of a group is about 25 acres, but most are larger than this, the average being reduced by a few very small groupings. They are set out so that the ridges run down a gradient; thus sometimes there will be two or more groupings with strips in the same direction (pl. 1a), and in other cases strips will run at right angles (pl. 1b).

From a consideration of these grass fields, it is evident that they must have aquired their characteristics by ploughing at some stage. Since the present hedges frequently cut across strips they must have been formed before enclosure when agricultural practice was known as "open field". In this part of Northamptonshire where only a few permanent grass fields survive, most being arable and planar, it was of interest to try and determine the extent of the strip system. When a ridged field is ploughed flat in the modern way not all traces disappear; the positions of the ridges are still visible (for 50 years or more, depending on the soil) as light subsoil marks; and the piled up ends of the strips are not much flattened, but remain smoothed together as a ridge or bank of soil. Thus wherever a group of strips met another set, either oriented in the same direction or at right-angles, there will remain a bank of soil when the whole area is ploughed out. A survey of these banks in an entire parish allows the complete pattern of strip groupings to be deter-

Fig. 1   Scheme for ploughing a land.

mined. Care must be taken when examining a modern arable field not to confuse the results of modern ploughing with the older earthworks. However, generally ancient boundaries are too large to be confused with modern ones; some soil banks are very broad, especially on gravel soils, and are often confused with Roman roads by the inexperienced. The largest bank in Wollaston is 50 yards wide and 3ft high in the middle.

Surveys are easiest to make in spring, when fields have been worked smooth. It is best to work from a permanent grass field containing undisturbed strip ridges and boundaries.   Banks in arable fields are often easier to see when the rows of corn just come through (pl. 2b, A-A). Actual strips can often be seen surviving as soil marks, particularly in fields ploughed for the first time in the modern way during 1940-45. Aerial photography is a useful supplement to ground surveys, since strips may show crop marks, but the soil banks are not usually visible from the air. Parishes which were enclosed before about 1725 usually have hedges set along strip boundaries; differences in soil levels, and changes in the orientation of the strips have to be sought.

When surveying for medieval fields the remainder of the parish naturally comes under review; i.e. roads, meadows, and village. Ancient roads in undisturbed grass fields are worn down ways between the strips, and often run along the bottoms of slades, presumably to keep out of the way of plough-lands. Where roads have been ploughed over they usually disappear without trace. Often the enclosers deliberately tried to obliterate a road by digging a ditch along the length, or disguising under newly planted hedges and spinneys. Modern roads following the course of ancient ones are easily recognised by the inflections and neat way of fitting in with the strip patterns (Wollaston-Wellingborough).

The ancient meadow is defined as that land never under ridge and furrow. It also happens to be the land which was not ploughable because of the annual floods of brooks and rivers.

Where a modern village has not expanded over all the area of the medieval vill the ancient remains can be seen. The strips stop and give way to earth works representing the abandoned houses and garden plots. Such earth works are visible on the south west of Wollaston, and on the north west and south east of Strixton.

DETAILED STRUCTURE OF STRIPS

The most obvious features of strips are the ridges, the terminal mounds, and the curving shape.

The ridges are easily accounted for as the result of ploughing towards the centre more times than towards the outside.

The heads, likewise, are the result of ploughing towards the centre; the plough moves a small quantity of soil in the direction it travels, and when taken out of the ground at the end of a strip, deposits the excess on the left hand side. The effect is cumulative. Heads are thus not symmetrical, but are 'one-sided' heaps. (fig 3, pl. 2a).

The left curve of strip ends undoubtedly derives from the problem of turning a team of beasts in a tight circle.[1] By swinging left some yards before strip end, the turning circle is enlarged to bring the plough in position for the return furrow. Ideally the team would start to veer left at a distance not less than its own length away from the sharp right hand turnabout, otherwise it would be in an inefficient contortion.

The scheme illustrated in fig. 1 accounts for the observed features of a strip. It seems that the plough was lifted for the first few cuts (whilst there was still room on the head to man-handle the team, without trampling the ploughing), and kept in later.

Strip sections can be deduced from first principals; the first complete ploughing would give a section as in fig. 2a, several ploughings as in fig. 2b, leading eventually to equilibrium conditions as shown in fig. 2c. In practice, of course, the furrows and ridges will not be pointed, but rounded off. The smoothing over is further helped by the growth of turf since the time the strips were last ploughed. A strip at Strixton furlong 25 was sectioned (under archaeological conditions) and found to be as anticipated (fig. 2d).

The most noticeable prediction of fig. 2c is the horizontal level of subsoil underneath the centre half of the ridge, and this is clearly evident in the

excavated example. When strips are ploughed out this ancient level of subsoil is reached by the deep modern ploughing, and gives rise to the characteristic marks of freshly flattened ridges. The modern ploughs do not normally reach down to the depth of the ancient furrow once the ridge is levelled; thus when topsoil is carefully stripped off a modern field the subsoil is found to be furrowed.

The ancient ploughing transfers all the original topsoil to the centre of the strip, and this eventually is buried by subsoil ploughed up from the furrows. Thus along the entire length of a land there is a 'conveyor-belt' system moving soil from furrow to ridge, at right-angles to the direction of ploughing. In the ridges excavated at Strixton it was not possible to distinguish the inner mass of buried topsoil from the rest.

The degree of ridging, (i.e. the difference in height between the ridges and the furrows) is a function of the strip width and the depth of ploughing.

Strips which lie on a slope with an appreciable gradient at right-angles to their length appear asymmetrical. Measurement of such strips at Wollaston furlong 5, show that this is an optical illusion. The highest part of the ridge is in the middle of the strip measured on the cross-slope, but on the ground the eye tends to see the maximum height of the ridge in an absolute sense, i.e. shifted up the cross-slope a little. However, ridges on steep slopes have very large mounds at the bottom and small ones at the top because soil is more easily dragged down than up.

RESULTS OF FIELD SURVEYS AND PRE-ENCLOSURE TERMINOLOGY.

The pre-enclosure field systems of Strixton (fig. 3) and Wollaston (fig. 4) were surveyed during 1961-3. On the maps the thin continuous lines represent boundaries visible at that time, while broken lines are used where the boundaries are no longer clear. Because of the scale of the maps it is not practical to mark each strip (even if they were all known), the real number of strips is about four times the number drawn. These plans were drawn entirely as a result of observation and measurement; there being no assumptions about the nature or antiquity of the pre-enclosure systems.

For Strixton there is a remarkable pre-enclosure, or open-field map of 1583[2] (pl. 3). Plate 3 is reduced far too much to read the details, but the overall pattern is evident. The similarity between
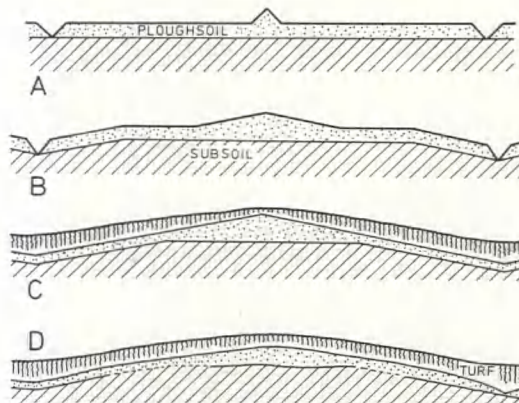

Fig. 2a   Schematic section of a land after the first ploughing.

2b   Schematic section of a land after several ploughings.

2c   Schematic section of a land at equilibrium conditions (showing accumulated turf).

2d   Section of a land in Strixton furlong 25.

plate 3 and fig 3 is so great that we must assume that the Elizabethan surveyor was looking at the same system of earthworks as we were. Therefore the strip system still surviving at Strixton is unchanged since at least the sixteenth century.

From the close-up of the 1583 map (pl. 4) we may infer that the strips were called *landes* (because the group strips called *7 landes f* contains seven strips, and similarly *9 landes f* contains nine). Each group of strips or lands was called a *furlong*. From a similar open field map of Higham Ferrers[3] it is evident that furlongs were grouped together to form areas called *fields*.

This term should not be confused with the modern one; pre-enclosure fields were usually hedgeless and often of several hundred acres in extent. Before enclosure the only hedges were usually around small areas of land near the village called *closes* (plate 4 is slightly ambiguous being in black and white; furlong boundaries are in brown ink on the original, and the hedges surrounding the closes are in green).

Lands were ploughed individually, usually beginning at one end of the centre long axis, and going round clockwise until the outside was reached and the whole land completed. In a fallow year this sequence might be reversed,[4] but since soil was ploughed towards the centre more often than away, the lands became ridged up.

In addition to lengthwise ridging, the plough dragged soil forward, and on lifting to turn, soil

was deposited at the ends of the land. The heap formed was called a *head* (fig. 3, pl. 2a). Where two furlongs with lands set at right angles met, the first land of one was made up of the smoothed out heads of all the others, and so was called a *headland* or *hades* (fig. 3, pl. 1b). As a consequence of ridging it was necessary to set lands out so that furrows drained downhill. To assist the plough team to turn round, each end of a land had a slight twist to the left when viewed from the centre, thus giving lands their characteristic mirror image — S shape[1] (pl. 1a).

The above are the principal and most common terms found on open field maps and in documents (terriers). Others are given by Fowler[5] and the Orwins;[6] the meanings of terms may be worked out for Northamptonshire by comparing the 1728 copy of the 1567 land terrier for Higham Ferrers[7] with the 1788 open field map,[3] and from the Wollaston land terriers.[8]

Lands set out at right angles to a road or boundary were said to be a *butting, bearing, or shooting* on or out from it; e.g. "two lands shooting above thatchway" (Wollaston, furlong 17). The Latin equivalents are abbutta(n)t and lancea(n)t.

When a land was left unploughed for a few years, and laid down to grass, it was called a *ley*.[9] *Meadow* is the unploughed grass land by the river, *pasture* is the upland grass in the bottoms of the slades, and may possibly include some leys.[10]

Occasionally, in a furlong going round a corner because of a gradient change, a land only reaches one side, finishing in a point halfway up the furlong. The triangular shape formed was called a *gore* (fig. 5).

Very short lands were called *butts*, because they consisted of two ends (heads) with almost no long part.

According to Orwin, a *stint* is a right of 'trespass' on to another man's land so as to complete ploughing;[11] thus all headlands are stints, and the western headlands of the 'furlong next pinchback' at Higham are called *stints* in the terrier.[7] On the other hand these two lands are shorter than the rest of the furlong, and the term may be referring to this.

Between groups of lands were permanent grass strips called *balks*. Examination of the lands of Strixton furlongs 16 and 27 (before the 1965 ploughing), which are marked as balks on the 1583 map,[2] showed that they are identical to any other land except that they were narrow and not ridged so high. On plate 4 balks show best as the separ-

ated dark strips in *Buttes furlong*. The ridging of these must have been done by ploughing at some time, but balks cannot have been ploughed in later centuries because they are invariably mentioned as standard reference points in land terriers. This use can be traced back to 1340.[12] The term 'balk' was not found in a detailed examination of *Carte Nativorum*,[12] which is a collection of several hundred documents, mainly of the period 1250-1320. The earliest recorded use of the word in Northamptonshire[13] is 1237. The Strixton court roll of 1360[14] shows that balks were not fixed public rights of way in the fourteenth century, when several people were fined for 'making a common way at the hullebalke' (fecer.nt co.em viam ap.d le hullebalke). From the fifteenth century onwards 'common balks' are frequently mentioned. We shall assume that balks were not a normal feature of the open field system before the fourteenth century and were not in great use until the fifteenth.

Balks were probably formed by ploughing back before leaving to grass over. Several clear cases of this occur at Strixton, e.g. furlong 28, where the balk lies on the side of a land rather than in between two lands. The Court orders for 1695[15] at Wollaston requested balks to be made between every seventh rood, everyone allowing an equal proportion of land; but apparently this was not done for long, or it would still be visible. There is no evidence that there were ever balks between every land.[16]

There were other modifications. Thus at Higham in 1788,[3] there is a note that several lands had been ploughed together e.g. 'four lands now two' in Fullwell hill furlong. At Strixton in 1583,[2] furlongs 30 and 31 are rather confused because the boundary between them was ploughed over in several places to make short lands into long ones.

The Medieval Latin equivalents of the principal terms are:

field	campus
furlong	cultura
lands	seliones
headland	forara

DATING OF MEDIEVAL FIELD SYSTEMS

Regarding the antiquity of the open fields, we have so far shown that the furlong system still surviving in Strixton is at least as old as 1583 (pl. 3, c.f. fig. 1). All the furlongs except No. 36 are identical. In this single case no doubt the Elizabethan surveyor is in error; part of the furlong was
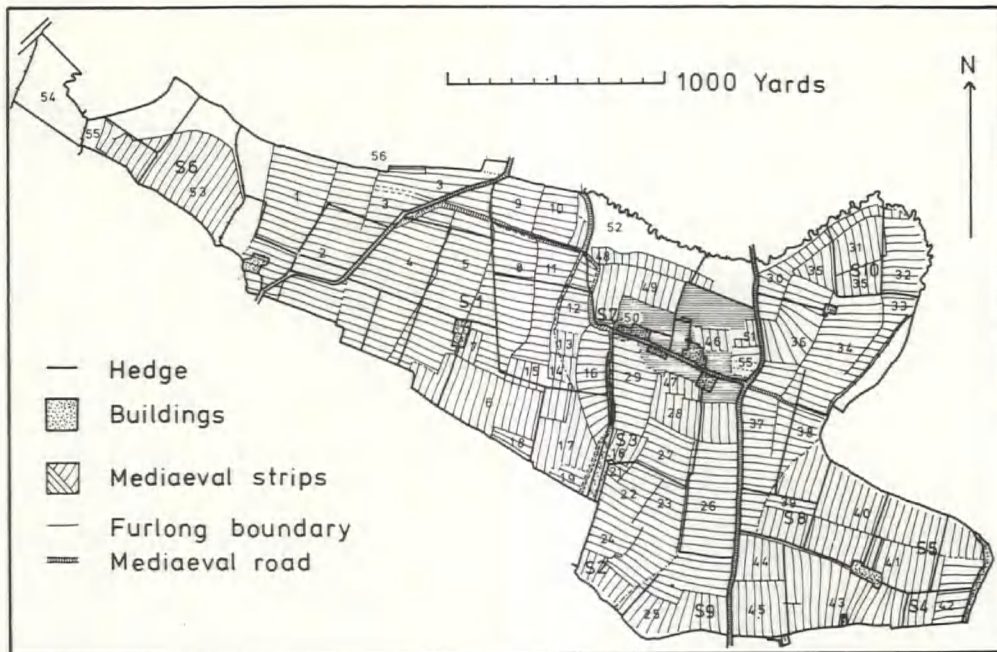
Fig. 3   Strixton furlong plan: modern features correct to 1966.

enclosed and the remainder all belonged to the same owner, so it is probable that it was never measured in detail. Before 1965, furlongs 16, 27, 28, 29, and 47 were unploughed and could be seen to correspond land for land to the Elizabethan plan.[17]

Similarly there are open field maps for Higham Ferrers[3] (1788), and Raunds[18] (1789) which agree exactly with their respective modern surveys. For Higham there is a terrier of 1567 which agrees exactly with the map, so like Strixton the furlong system can be confidently traced back to the sixteenth century. It is hoped to trace furlong names of all the parishes from Irchester to Ringstead to the thirteenth century using the comprehensive series of Duchy of Lancaster Court Rolls.

For Wollaston there was an open field map of 1774,[19] which is now lost. However a fairly complete list of furlong names can be drawn up from the enclosure documents of 1788,[8] and this is substantially the same as the list obtainable for 1430.[20] In this 1430 terrier there is a copy of a terrier of about 1370 which refers to 24 of the furlongs evenly distributed over the parish.[21] Thus it is clear that the Wollaston open field system is at least datable to the fourteenth century, and is therefore truly medieval. Furlong 88 (fig. 2) is

mentioned in about 1225[22] (wodeweye); since this is on the heavy clay to the far south east of the parish it suggests that the whole system was complete by this date, it being unlikely that the fertile lighter soils in the western part of the parish near the village would be uncultivated.

For Strixton there is a scarcity of medieval documents, but a few of the furlong names can be traced to the fourteenth and fifteenth centuries.[23]

The date for the beginning of the open field system is of course undocumented. It is certainly after the fourth century A.D. because the Romano-British sites scattered over the whole area have lands ploughed over them. Orwin took the view that the system began with the Saxons.[24] More recently Titow[25] also considered the open field system to have been the same in essentials throughout the Saxon-medieval period. Thirsk[26] has challenged this, saying that possibly some furlongs or areas were first set out and individually cropped, then at a later date they became fragmented into strips and eventually an organized communal system developed. In the absence of written evidence it is difficult to be sure of the open field beginnings. At Sherington, Bucks., Chibnall takes the Saxon origin of the furlong names to mean the land was cultivated before the conquest,[27] but naturally

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Saxon names persisted in usage well into the medieval period. At Wollaston the Saxon element in names is very strong, and includes personal names. This is in accord with Wollaston being a Saxon settlement; it is mentioned in Domesday, and coins and pottery of the eight-ninth centuries have been found.

From the physical evidence we can be sure that there has only been one furlong system for each village; had there ever been a fresh start with lands and furlongs, then two systems or more would be visible as crop marks — but these have not been observed. Thus in this area the open field system appears to be complete by the time of the earliest documentary evidence in the thirteenth and fourteenth centuries, and there is circumstantial evidence that it has Saxon origins where a settlement is that old. This is not the case for Strixton, it differs from Wollaston in being a late settlement, and is not mentioned in Domesday, being first recorded in 1100-1135.[28] No pottery earlier than the twelfth century has been found there by excavation, and the philology of the furlong names suggest they are Middle English rather than Saxon in origin. The parish boundaries are not smooth lines, but reflect changes in the furlongs on either side. All this suggests that Strixton was not settled until the twelfth century, and so the open field system will have begun at that date.

It may be deduced that the furlong system had reached its maximum, i.e. the parish boundaries, by about the beginning of the fourteenth century. The period 1100-1300 has been established as one of economic expansion,[29] which means that villages and furlongs were also expanding. Declining population and depression was characteristic of the years 1300-1475.[30] The population numbers recovered later on, but with the effects of the New World trade and eventually the industrial revolution, villages did not necessarily have to supply all their own food. Therefore not since the early fourteenth century has a village had to support the maximum population that its fields could produce food for. This date for the end of medieval expansion is confirmed by Beresford's work on town plantations, which activity falls off in 1300-20, and there are no new towns during the period 1368-1613.[31] The year 1300 is also the date chosen by Chibnall for his reconstruction of Sherington furlongs.[32]

The furlong patterns of fig. 1 and 2, will thus be assumed to have been completed by about 1300. Documentary evidence before 1300 is scarce, but Wollaston furlongs 38, 40 and 41 are mentioned in about 1225[22] showing that land close to the village was still under the plough.

In the late thirteenth century the demand for land was great, so great that every available piece was ploughed. Wollaston furlongs 31 and 39 must have been additions to the system during this time, when every possible area was cultivated. By 1426 furlongs 31 to 41 were enclosed or set down to pasture,[10] and the remainder had many balks: i.e. lands left as permanent grass. These effects must have been a result of the depression beginning in the fourteenth century; with the decline of population there was land enough to spare for balks and small enclosures near the villages.

It has been assumed that each furlong was cut out from wasteland when more ploughland was needed.[33] If this is true then furlongs should spread out from the previously existing features, i.e. the roads and villages, towards the parish boundaries. The most convenient way of setting out a furlong would be to make the lands parallel, or at right-angles to the road, according to the gradient. This principle can be seen in fig. 2. Where furlongs spreading out from adjacent roads meet, they form irregular shapes in the block of land between, this is particularly evident for Wollaston furlongs 70 and 74. The same principals apply to parish boundaries; Wollaston furlongs 81, 82 and 87 come up to the boundary giving rise to awkward angles and lots of butts, which demonstrates that the boundary was there before the furlongs. Thus we may conclude that the furlong pattern does show the 'growth' of furlongs from the village and roads towards the boundaries.

The suggestions that all the area available was not ploughed,[34] and that some of the ancient woodlands were not cleared for agriculture until recently,[35] are untenable for this area at least. All the Higham hundred was ploughed to its outermost limits. With the exception of Horn-wood at Easton Maudit, every modern wood and copse in the hundred is set on ridge and furrow still visible; very few modern woods are older than the eighteenth century. Indeed the woodland cut down by the Saxons to make furlongs can only have grown up since Romano-British times, because all the hundred contains a fairly uniform distribution of Iron age and Romano-British agricultural sites.[36]

All the preceeding discussion concerns the *physical* aspects of lands and furlongs: by suggesting these have changed very little, we do not wish to imply that the organization of furlongs into fields and the method of crop rotation did not change.
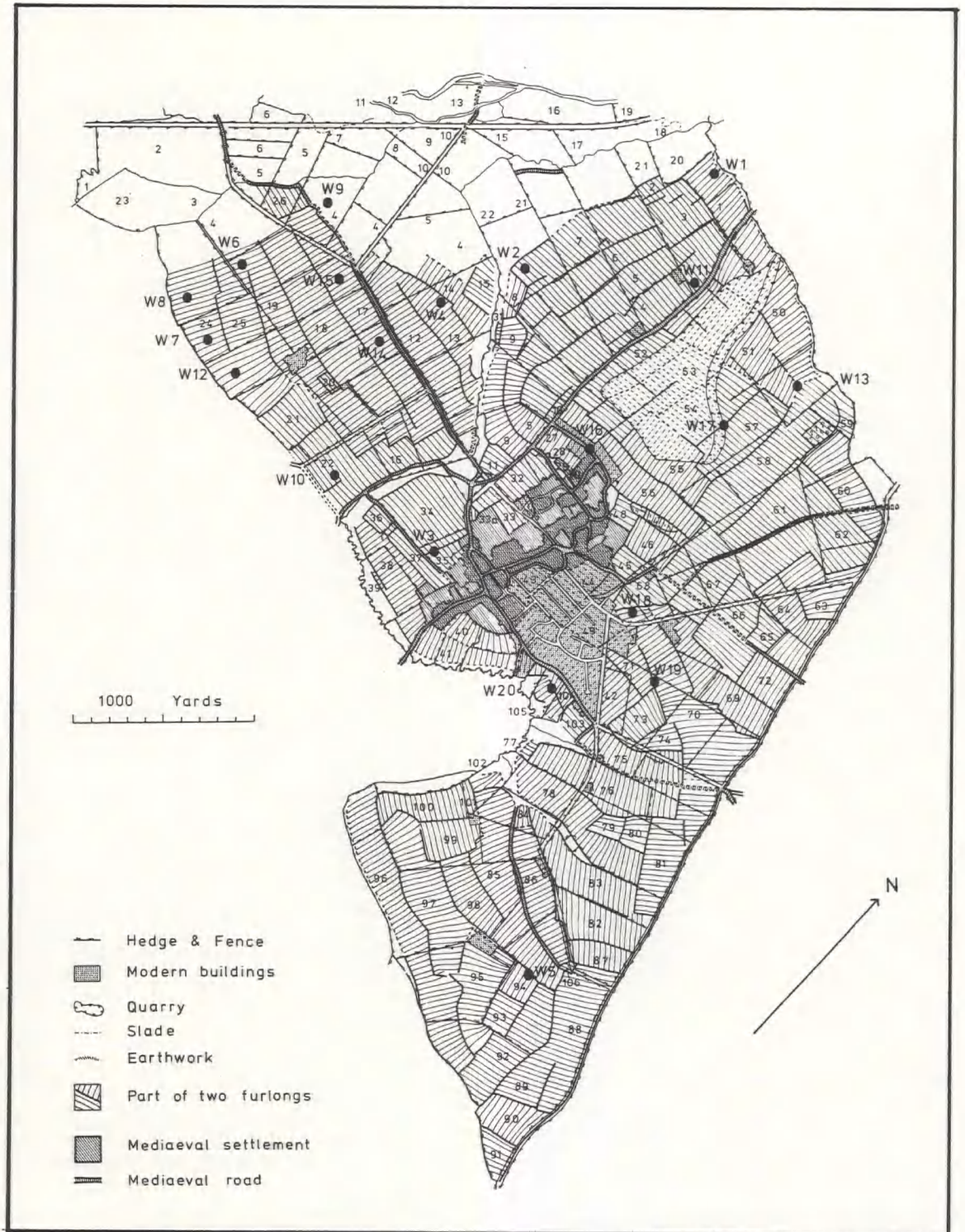
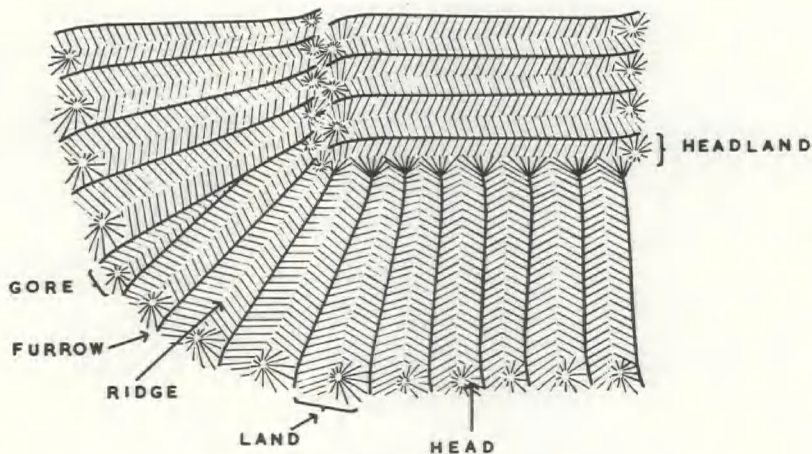Fig. 4   Wollaston furlong plan. Modern features correct to 1966

Fig. 5   Details of part of two furlongs

Elsewhere there is abundant evidence that the numbers of fields were changed[37] but this does not affect the physical state of the furlongs. For Wollaston the number of fields remained three from about 1370 to their obliteration in 1788. The particular furlongs in each field changed only slightly; in 1430 and 1788 the *nethirfeld* comprised furlongs 1 to 27 (fig. 2), the *Higham weyfeld* in 1430 (alias Millfield 1788) furlongs 28, 24, and 46 to 75, the *ouerefeld* in 1430, furlongs 76 to 106, this became the mill field by 1788, furlongs 76 to 106 and 43. The inlands were made up of furlongs 34 to 39: there is no information how these were worked with the three great fields. The existence of the three fields in the fourteenth century suggests there was already a communal system of crop rotation by then. There are no actual details of agricultural practise until the end of the seventeenth century,[15] when court orders attempting to improve the husbandry are almost identical with those of Sherington.[38] For Strixton there is no field information.

Apart from small enclosures near the village in the fourteenth and fifteenth centuries, and their minor changes, the furlong systems at Wollaston and Strixton continued until the general enclosure and farming in the modern way. For Wollaston this was not until the parliamentary enclosure of 1788.[8] Strixton was enclosed privately sometime between 1583 and 1720,[28] probably about 1600 by the local encloser Edmund Aprece who lived there,[39] and in 1619 by Robert Parkhurst.[40] In the sixteenth century at Strixton land tended to be collected into blocks under a single owner;[2] but at Wollaston, right through until 1788 the lands of each owner were scattered in ones, twos and threes, throughout the parish.[8]

DISCUSSION

APPLICATIONS OF THE SURVEYS

As already indicated, much can be deduced from complete surveys, such as the relative antiquity of roads and parish boundaries, and the maximum extent of the village and plough-lands at about 1300. The philological study of the furlongs and other field names gives information on the approximate period of settlement of the villages.

The village surveys confirm the recent suggestion[41] that the earthworks of the shrunken village are common, and no township in the Higham hundred is without them. (The scale of figs. 1 and 2 does not allow the marking of these earthworks, but detailed maps of the medieval villages are being prepared.[17])

A deserted village not previously recorded has been found at Grendon (SP 875610). It is about 12 acres in area, and consists of the usual earthworks, building stone and sunken roads. From the modern field name it appears to have been called Cotton. Cotton and the earthworks of the other villages all yield pottery of the thirteenth and fourteenth centuries, suggesting that the date of their destruction was the fifteenth century.

The extent of the separate open field unit of

Knuston has been found and also most of the boundaries of the open-field area belonging to the three Cottons, now in Ringstead and Raunds. These small deserted vills are Mill Cotton, 20 acres, at SP 971745; Mallows Cotton, 20 acres, at SP 976-733; and West Cotton, 13 acres, at SP 976725.

The areas of the ploughlands etc. of some of the villages so far surveyed are given in table 1. They were measured using a planimeter, and are accurate to the nearest acre. The extent of the glacial clay was measured referring to the Ordnance Survey Geological sheet 186 (1958).

Since the figures in table 1 represent equilibrium conditions with village size and area of arable at a maximum, it is expected that there will be some interactions. The most likely relation is one between village size (V) — which is proportional to the number of people, and the area of arable (A) — which has to produce most of the food. However a plot of V against A does not give the expected straight line graph, but only a scatter of points, suggesting the relation is no more than approximately true.

From table 1 it can be seen that the settlements away from the river (Bozeat and Newton Bromswold) are small, and those near the valley on the light easily-worked soils tend to be large, irrespective of parish size.

From this it is likely that geology plays a part, as the heavy claylands do not give such good yields as the light soils.

Let the arable (A) be split up into glacial clay soil (C), and the good soil (R), (A = C + R).

Let the yield per acre per annum from clay soil be unity, and the yield from good soils x (x is greater than 1), then the yield p.a. is $C \times 1 + R \times x$.

The population and hence the village size must be proportional to the yield, thus

$V = k(C + Rx)$, where k is a constant,

dividing by A, i.e. expressing the village and clay area as fractions of the total arable,

$v = k(c + \dfrac{R}{A}x)$, and since R = A - C

$v = k(c + x(1-c))$, rearranging

$v = k(a - x)c + kx$

Thus if the village size is proportional to the area ploughed and if the geology affects the yield, then a plot of v against c should be a straight line. Fig. 6 is such a plot. The point for Higham is not very accurate, because of the area of modern disturbance and building. The remaining points fall on a fair line; therefore the relation derived is likely to be correct.
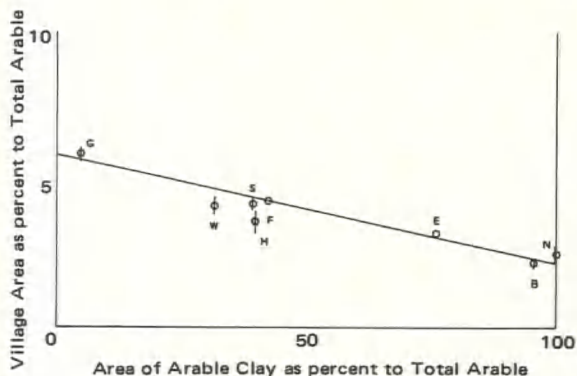

Fig. 6   Relation of village size to the arable in 1300.

From the intercepts of the plot (fig. 6), it can be calculated that the maximum village size for arable consisting of good soils is 7.0% of the arable; and for villages with all clay arable 2.6%. The yield on good soils is 2.7 times greater than on clay (x). This value is rather high, but must be of the correct order. The only way of altering the values is to reassess the area of clayland. This could be done by adding to the area of the glacial clay the areas of Jurassic clay, which would have the effect of shifting all the points along the 'clay' axis of fig. 6 but would not greatly affect the constants.

That the claylands posed more of a problem agriculturally than the good soils is reflected in the small size of the Overfield at Wollaston compared with the other two:—

Overfield	552 acres
Highamway field	791 acres
Nether field	640 acres

The Overfield is predominantly clay, and the other two are composed mainly of lighter soils.

For some of the villages the village size is proportional to the area of meadow. This is fortuitous, and again arises because of the geology. Good soils are mostly on the valley slopes, thus the large settlements near the river have also a large area of meadow. The high clayland villages have very little meadow and are small because of the infertile soil.

The surveys also brought to light ancient sites, these are recorded on fig. 1 and fig. 2 and are discussed elsewhere.[36] They do not affect the furlongs in any way except that around the Roman villa at Wollaston (W.3) they were called Waltonacre, and the boundary of furlongs 54 and 57 is aligned over the ditch-rampart system of an Iron age enclosure (W.17). At Easton Maudit and Irchester, Iron age and Roman earthworks survive, and the furlongs are modified.

TABLE 1. LORDSHIP STATISTICS (ABOUT 1300).

Lordship	Total area (acres)	Settlement (V acres)	Settlement as % of total arable (v)	Meadow (M acres)	Total arable (A acres)	Glacial clay arable (C acres)	Clay arable as % of total arable (c)
Bozeat	2331	50 – 73	2.34 – 2.86	145	2113–2136	2031	95.1 – 95.6
Easton Maudit	1791	56 – 57	3.73 – 3.80	175	1499	1136	75.8 – 75.9
Farndish (Beds.)	694	32	5.14	40	622	263	42.3
Grendon	1715	85 – 91	6.82 – 7.34	384	1240–1246	57	4.6
Higham Ferrers	1925	61	3.76	244	1620	646	39.7
Irchester		63 – 96		199			
Chester	2792	7	3.74 – 5.72	37	2279–2325	316	13.6 – 13.9
Knuston		17 – 27		147			
Newton Bromswold	875	35	2.65 – 3.31	64	799	799	100
Higham park	601	6		13	582	582	100
Strixton	1012	42 – 45	4.83 – 5.25	110	857– 860	336	39.1 – 39.2
Wollaston	2840	99 – 114	4.56 – 5.30	566	2160–2175	681	31.3 – 31.5

The only parish with any woodland is Easton Maudit with 60 acres.

Notes for table 1.

The meadow is the unploughed floodland. The arable is the maximum area of all the furlongs, except those known to have been part of the crofts (i.e. a furlong enclosed to form garden plots).

The village area is the maximum extent of the earthworks hemmed in by the furlongs. Where the modern village has spread beyond the medieval settlement there is necessarily some uncertainty. For the Higham hundred reference to eighteenth century maps is useful, because where it is still possible to check, the eighteenth century vill never spread beyond the medieval. *Grendon.* The village size includes the 12 acres of Cotton. *Higham.* The settlement area is estimated from the 1788 plan. The plan also shows that 15 acres of Newton Broms-

wold are erroneously included on the modern Ordnance maps. *Irchester.* There is still some uncertainty about the boundary between Irchester and Knuston. The expected line does not agree with the 1791 map.[42] Thus the whole area has been taken together. It is difficult to be sure of the area of Knuston vill because of the combined effects of emparkment, and later occupation by the army (1939 to 1945). The extent of Chester is taken from the 1756 map,[43] it is also included with Irchester on the table.

Newton and Higham Park. It was not supposed that furlongs would be found in a Norman deer park, however it has been ploughed anciently. The area was deemed to be part of Newton originally.

The area of the park lodge-house has not been

added to Newton vill, as it was not considered to be a self supporting agrarian settlement. The two fields either side of the Yelden (Beds.) road, now marked as Bedfordshire have been included in Newton, because they obviously contain part of the village.

Strixton. The lordship is taken as its size in 1583; at present part is administered as Wollaston. Where the unploughed village area and meadow run into each other, the dividing line is taken as the winter flood line. The vill includes furlong 47 because it forms part of the crofts in 1583 (pl. 2b).

Wollaston. The north part of furlong 33, and the east part of 28 have been included in the vill area because they have fourteenth century occupation remains on them.

CONCLUSIONS

Archaeological field work techniques have enabled plans of pre-enclosure field systems to be made. In the Midlands, at least, these ancient fields prove to be medieval. Thus open field maps can now be obtained for those many areas without them. The surveys show that most villages are still near or less than their greatest medieval size (in the early fourteenth century), this allows fourteenth century village statistics to be compiled. There is then found to be a relation between village size and open field area, showing that under conditions of a natural economy the population was controlled by the available land. Using this relation it should be possible to estimate the size of any medieval settlement, knowing the nature of the terrain. It is very probable that different constants will be required for soils with different underlying geology.

It is a matter of some urgency to record the earthworks left by medieval fields, because they are fast disappearing under the influence of intensive agriculture, especially on light soils.

APPENDIX

The furlong and other names of Strixton and Wollaston.

a) Strixton.

Very few medieval documents relating to Strixton have survived, but the map of 1583[2] gives all the furlong names except those enclosed or put down to permanent grass. A few names are given in the court rolls,[14] and others can be gleaned from the Wollaston documents (q.v.).

The fields; in 1583 they were — the west feelde — midle feelde, and (probably) grene feelde. The exact extent of each is not known. The furlongs are shown on table 2 (overleaf).

b) Wollaston

The sources are terriers in the Register of William Wulston;[20] various terriers of the sixteenth and seventeenth centuries;[44] [45] and the 1788 enclosure documents.[8]

Space does not allow the detailed discussion of the identification of furlongs. Consideration of the order of names in land terriers, the ancient field they formed part of, and the orientation of the lands (E–W, or N–S), taken along with ancient and modern field names, and the map (fig. 2), leads to the identifications known at present. Much uncertainty would be cleared up if the lost open field map of 1774 could be found.[19] In some cases it is known which of the great fields a furlong or name belonged to, but its exact location is not.

The fields: Nether feld (1430) and various spellings to Nether field (1788); Higham wey feld (1430) etc. changing to Mill feilde (by 1695), and (Wind) mill field (1788) Ouer feld (1225) etc. changing to Woodfeild (by 1607), and Woodfield (1788).

i The furlongs in Nether field

In 1788 this consisted of furlongs 1 to 27, 31 and 32, i.e. 28 major furlongs not counting 10 and 31. There is no reason to suspect that its size was any different in 1430 (this being the date of the most complete list of furlong names).

No. on fig.4	Name of furlong (in 1430, unless otherwise given).
1 or 21	bradmere
4, (south)	lamcoteslade; (lampost slade by 1788)
4, (north)	pytweie; (Wellingborough way by 1634)
8 or 9	fullewelle
11	hill (at mededyth); (redhill by 1788)
12 and 17	thatchweie
15	oldbrook
20	crossefurlonge
22 and/or 16 (south	hamton weie or northamton weie.
23	ryholme
24	cryngil
26	holmweie
31	? litelborowse
33	gerscroftdythe (grass croft 1788)

ii The furlongs in Highamway field or Mill field

In 1788 this field consisted of furlongs 28, 42, and 46 to 75.

No. on fig.4	Name of furlong (in 1430, unless otherwise stated).
42	hokerespath; (Hookhams path from 1726 to 1968).
46	elderstubrill
49	berry hedge (1623)
50 or 51	red pits (1788)
50 (east)	mores
52	lamscoteslade; (Wellingborough way by 1788).
54	stonedelfwong; (furlong shooting below lime kiln joint 1788).
55	breydisweie
56	gyndale
58	hieheueden
60	northirn
61	nether highamweie
62	(above) highamweie, and the longe; (upper Higham way long, 1788)
63	claylondys
64	bridlowe (1654); (burlows, 1788)
65	spytchehokes
66	farnddys crosse; (Farndish patch, (1788).
67	the furlong above farndish patch (1684)
68 (south)	windmill joint (1788).
70	wronge
73 or 74	pudswell (In the Overfield in error in original document)
75	hynewykeweie

iii The furlongs in Overfield or Woodfield

In 1430 this consisted of furlongs 76 to 106; it was the same to 1788 with the addition of furlong 43.

TABLE 2 – FURLONGS IN STRIXTON

The furlongs:

No. on fig.3	Total no. of lands	No. of balks	Name in 1583.
1	67	2	Sandy f. (furlonge)
2	67	2	whitegrounde f.
3	40	3	the furlonge buttinge on whitegrounde.
4	98	1	the furlonge shoutinge in the hill balk.
5	101	4	midle f.
6	73	4	the windmill furlonge (in the west feelde and midle feelde).
7	15	—	little briery f.
8	88	1	hill balke f. (hullebalke in 1360)
9	25	—	cringlewaye f.
10	31	—	walneacre f.
11	79	4	stonebridg f.
12	47	1	towneponde f.
13	22	—	botome slade.
14	17	—	midle furlonge in ye botome of ye slade.
15	43	—	the midle furlonge that the mill furlonge doth butt on.
16	76	6	stonilandes f. (stonylons in 1429)
17	37	2	cakestones peece.
18	9	—	nine landes furlonge.
19	11	—	water forowse f.
20	11	—	the furlonge at Easton path.
21	10	—	the furlonge that hadeth stonelandes.
22	21	—	Easton path peece.
23	51	5	claye f.
24	25	—	shouldbread f.
25	92	5	Bosiat slade f.
26	93	6	crabtre f.
27	40	3	twinywayes f.
28	25	1	towne furlonge.
29	53	3	buttes f.
30 (west)	26	—	bridge furlonge at gimple leys.
30 (east)	42	5	gimple f.
31	—	—	(confused with 30 (west), see text).
32	51	3	blakedike f. (thathdyth in 1429).
33	38	—	ryeholme f.
34	56	2	townehadland f.
35	52	1	midleclaye f.
36	62	—	beanholme f.
37	78	3	millhedge f.
38	33	2	grenehill f.
39	7	—	sevenlandes f.
40	129	8	ball pit slade f.
41	82	5	midle f.
42	32	1	feeldes end f.
43	79	1	longe gallantre f.
44	40	3	longe smythy & short smythy f.
45	45	5	potters balk f.
47 (west)	6	—	the furlonge at Peers close.

Total number of furlongs 53.

The meadows:
54   water meadowe.
55   the holme.

Field road:
56   cringle waye

No. on fig.4	Name of furlong (in 1430, unless otherwise stated).
76	shitburslade; (shepherds slade by 1788)
77	wellewong
78 and 83	dunstale; (black dunstons slade by 1788)
78 (part)	netherwhynes
79	middelwhynes
80	ouerwhynes
81	hoboldisdythe
82	puddeswell
85 and 96	middelslade
87	Hinwick hedge (1788)
88	wodeweie
91	strete; (streetway 1788)
92	pubblywong
93 or 94	blacklond
95	gorbrode
96 (west)	slideris = abbottiswell; (obersons slade 1788)
96 (east)	dokeford
97	hayrigges
98	buskys; (kings or ragged bushe 1634)
100	Strixton slade
102	halywelle (1250 & 1430) = thathdyth (1430); (Blakeditch by 1634)
105	sewellefurlonge

iv. Furlongs in the ancient enclosures (close the the village)

Furlongs 34 to 41, 44 and 45, and that part of 68 across the ancient Irchester road from 45, are enclosed and confused from the fifteenth century onwards and are not included in the three great fields. Furlongs 34 to 39 comprised the inlands, and furlongs 45 and 68 were coney garths in 1788.

No. on fig.4	Name of furlong (in 1430, unless otherwise stated).
34	longeleye
35	dufhouswonge
36	nethir walton acre
37	upper walton acre
38	furlong abbutting walton acre
40 and 41	sudcroft (1250)
43	baxstonys (Highamway field); backside 1788 (Wood field)
44	kichcroft (1612)

Wollaston meadows

A complete list of these is given in 1788 and although many of these can be traced back many centuries the 1788 names will be used here on account of their completeness.

No. on fig.4	Name in 1788
1	Ladyholme
2	Fleetholme (or fleethorn)
3	Ryeholme
4	Mare hay common
5	Meadow
6	Sykes meadow
7	Summer leys
8	Little meadow
9	Nightholme
10	Wet holme meadow
11*	Osier bed
12*	Pentelowe holme
13	Mill Holme
14	Roundabout
15	Scort holme (or scortum)
16	Bull tongue
17	Kitty holme
18	Northolme
19*	Woodlake
20	Priest meadow
21	Netherfield out meadow; (outmede in 1430)
22	Horse hay common
23	Southholme

* These are actually in Doddington parish (adjacent).

Other names located:

Luxwynns ashe corner (1426), near f.34
mathenysmore (1426), near f.38
knapperdiswelle (1250), middle of ff.40/41.
gympole (ford) (1426), east of f.41
osewellemore (1430), near f.34
Jefferies more (1788), below f.105

NOTES

1 C S and C S Orwin, *The Open Fields*, 1938, 34.
2 Northamptonshire Record Office, Delapre Abbey, Northamptonshire (N R O): Strip map of Strixton, 1595 copy of 1583, photostat.
3 Public Record Office (P R O) map MR 205, by T Bainbridge, 1788.
4 R Plott, *The Natural History of Oxfordshire*, 1705 second edition, 244.
5 G H Fowler, *Qto mem B H R S* 2, 1, 1928, 3.
6 Orwin and Orwin, 1938.
7 N R O: Fitzwilliam (Milton) MSS vol 47.
8 N R O Parliamentary Enclosure of Wollaston, 1788: Petitions to the Commissioners and Terriers of 1686, 1743 and 1788.

9   J Morton, *The Natural History of Northampton-shire*, 1712, 92.

10 Leicester Museums, Archives Dept; Register of William Wulston, Court Roll of 1426.

11 Orwin and Orwin, 1938, 125.

12 *Carte Nativorem* edited by C N L Brooke, [*Northants R S* 20, 1946], no. 551, 'herberdbalk'.

13 J E B Glover, A Mawer, F M Stenton, *The Place-names of Northamptonshire [E P N S* 10, 1933] 260.

14 Leicester Museums, Archives Dept: 26 D 53, Court Roll 1795 (1360)

15 N R O: Wollaston Orders, 4 April 1695, in book of Court Rolls in Ellesmere (Brackley) Collection.

16 Orwin and Orwin, 1938, 44.

17 D N Hall and N Nickerson, 'The Earthworks of Strixton', *J Northampton Mus* 6, 1969, 22-34.

18 Duchy of Lancaster Records Office, Raunds Enclosure, map 1798

19 A Whichello, *The Annals of Wollaston*, third edition, 1930, 34.

20 Leicester Museums, Archives Dept: Terrier of 1430 in Register of William Wulston.

21 Nethirfeld: blackmanlond, brakfurlonge, colman brigge, fullewelle, haybalke, hill, holmweye, howpyng, milneweye, pitteweye grene, and thatchelwisknoll. Higham weiefeld: bakstones, besell, elderstubrill, higham weie, hynewykweye, mores, pochouerheueden, tyndal, wrong. Ouerfeld: brokeswell dunstale, nether whynes, peryns, sewelle furlonge, shitburslade, wodehille.

22 Leicester Museums, Archives Dept: Grant by Roger of Newburgh to William, son of Seier, c 1225, in Register of William Wulston.

23 Hullebalke (1360); stonylons (1429); thathdyth (1429); gympole (1430).

24 Orwin and Orwin, 1938, 194.

25 J L Titow, in *Past and Present* 32, 1965, 86.

26 J Thirsk, in *Past and Present* 29, 1964, 3.

27 A C Chibnall, *Sherrington: Fiefs and Fields of a Buckinghamshire Village*, 1965, chapter 1, *passim*.

28 J Bridges, *The History and Antiquities of Northamptonshire*, 1791, 2, 196.

29 B H Slicher van Bath, *The Agrarian History of Western Europe A D 500-1850*, 1963, 132.

30 *Ibid*, 87, 137.

31 M Beresford, *New Towns of the Middle Ages*, 1963, 331.

32 Chibnall, 1964, map 4.

33 M Beresford, *History on the Ground*, 1957, 77.

34 Orwin and Orwin, 1938, 61.

35 Orwin and Orwin, 1938, 17.

36 D N Hall and N Nickerson, 'Sites on the North Bedfordshire and South Northamptonshire Border' *Beds Arch J* 3, 1966, 1-6; and further work forthcoming in *Beds Arch J;* see above pp.00-00.

37 J Beckwith, in *Agric Hist Rev* 15, 1967, 108; see also n.26.

38 Chibnall, 1965, Court Rolls on pp 235 and 283 et seq.

39 Henry E Huntingdon Library, San Marino, California, microfilm at N R O and prints in Scott Bader Commonwealth, Wollaston: 1311/2-5 Edmund Apprice enclosure dispute, 1583; 1311/20 indenture of 1615 referring to 'Edmund Aprece of Strickston'.

40 *VCH Northants* 4, 1937, 55.

41 K J Allison, M W Beresford and J G Hurst, *The Deserted Medieval Villages of Northamptonshire*, 1966, 30.

42 N R O: Map in deeds YZ 8056 (1791),

43 N R O: Map 605 (1756).

44 Henry E Huntingdon Library, San Marino, California, microfilm in N R O: 1131/8 Court Roll of 1623 with terrier; various indentures of 1634 (6783/5; 6768/5, 11, 12, 18, 18a) and also of 1623 (6772/2; 6782/10) and of 1612 (6783/1).

45 N R O: Wollaston Glebe Terriers, 1684-1783.