

Selion Size and Soil Type

By H. M. CLARK

IN recent years the work of Professor Beresford has shown, from comparisons of strip maps with aerial photographs of the same areas, that ridge and furrow may be equated, under certain reservations, with the 'lands' or 'selions' of the former open fields.¹ It has, therefore, become possible to use air photographs together with documentary evidence to throw light on open-field farming.

The frequent use of air photographs as illustrations may perhaps have drawn attention to a point which has not so far received much notice. In many of these photographs the ridge and furrow rises and falls with monotonous precision, with apparently no variations in width to interrupt its regularity. In others, however, one or more ridges of noticeably greater or less width than the general are abruptly interspersed. Alternatively, the general width in one area varies widely from the general width in another. Dr Mead in his investigation of Buckinghamshire ridge and furrow found widths varying from 4 to 18 yards, with 9-10 yards as the most common. This variation in the size of selions is in any case familiar from documentary sources.

The varying size of selions or lands has been explained by the Orwins as a consequence of soil type.² In ideal conditions on a flat field with a light soil,

¹ M. W. Beresford and J. K. S. St Joseph, *Medieval England: An Aerial Survey*, 1958, pp. 21-40.

I have throughout this article used the terms 'selion' or 'land' for the basic unit of ploughland, or the single ridge, and 'strip' as the term for the unit of tenure in one place, which might contain one or more selions. This in spite of the plea for a revised terminology made by Professor Beresford, who suggested 'strip' for the single ridge, and 'block of strips' for the unit of tenure (*Economic History Review*, N.S., VII, 1955, p. 392). I have done so partly because it is essential to have two terms in frequent use in order to avoid confusion between the two concepts, and 'block of strips' seems a little cumbersome. It also seemed to me that if the revised terminology were adopted, the 'strips' of 'strip' maps would automatically be taken to represent individual ridges. In fact 'strip' maps fall into several categories: some show individual selions and give an indication of the tenure of each; some show units of tenure with an indication of the number of selions within each; and some show units of tenure with the acreage of each and no indication of the number of selions involved. The four maps published to accompany Vols. II and III of the *Quarto Memoirs of the Bedfordshire Historical Record Society* illustrate all these types. The kind of difficulty that arises from the confusion between them was found by Dr W. R. Mead, who compared a strip map showing units of tenure in Soulbury with ridge and furrow on the ground, and found that the two did not correlate.—*Geographical Journal*, CXX, 1954, pp. 34-42.

² C. S. and C. S. Orwin, *The Open Fields*, 1954, pp. 34, 43, 101.

the width of a ridge would not exceed 22 yards, because this is the distance at which it becomes uneconomic for beasts to traverse the top of the ridge each time in order to plough down the other side. On heavy, poorly drained soils, on the other hand, it might not exceed three yards, because the ridge should be much narrower to allow for better drainage off each 'top'. So the width of a land is dependent on the nature of the soil, which dictates the desirability of frequent or infrequent drainage, and also the ease with which it can be ploughed, and so the size of the unit which can most conveniently be ploughed.

This explanation seems to be generally accepted. It was not possible to test it until soil maps became available to local historians, and the first of these, of Wem in Shropshire, only appeared in 1954. During work on the field system of Longstanton, Cambridgeshire, I examined the correlation of the soil type with the selion size given in terriers. Single selions were of widely differing areas from $\frac{1}{8}$ to 1 acre, with the half acre predominating over the rood selion as the commonest unit of plough.¹ Air photographs showed ridge and furrow of a maximum width of 16 yards and a minimum width of 5 yards. According to the Orwins' theory, the narrower ridges should have been on the heavy, poorly drained clays, which are well represented in Longstanton, and the wider ridges on the imperfectly or freely drained sandy clay loams developed on the valley gravels on which the village stands. In fact, a comparison with the incomplete soil survey map of the parishes showed that no such correspondence existed.

It therefore seemed worth while to undertake a detailed examination to test the generalization in another region. The work of the Soil Survey of England and Wales still covers only a very small part of the former open-field zone,² and not all of the third edition sheets now being issued are based on mapping on the scale of six inches to one mile. Moreover, sheets appearing from now on, in the seventh edition, will mainly be mapped on a reconnaissance basis, so that any extensive field-by-field comparison of pre-enclosure parish land utilization and soil-type will be impossible. This is a disaster for the local historian, to whom large-scale soil maps would be invaluable.

The present survey of ridge and furrow was limited, then, to the few open-field areas for which six-inch soil maps existed, and I could not choose a region where little arable farming had taken place since enclosure, which would have been ideal for such a study. However, the parishes of Breadsall, Spondon, Mackworth, Markeaton, and Allestree, near Derby, were covered

¹ Cambridgeshire Record Office, R.56.5.85; R.52.18.86; R.52.18.85; R.52.18.90.

² Agricultural Research Council Soil Survey Research Board, *Soil Survey of Great Britain*, Report No. 11, 1958.

by a six-inch soil map, and proved to have enough pre-enclosure ridge and furrow to justify investigation. I also carried out more cursory investigations in the parishes of Ockbrook (enclosed in 1772) and Hopwell immediately east of Spondon, and Woughton-on-the-Green (enclosed in 1768) and the Brook End of Shenley (enclosed 1762) in Buckinghamshire, both of which were partially covered by a six-inch soil map.

Much enclosure in Derbyshire took place in the eighteenth century. The three manors of Allestree, Markeaton, and Mackworth, which made up the estate of the Mundy family, were enclosed in 1760 by an owner anxious to apply the methods of the New Farming,¹ but enclosure in Breadsall did not take place until 1815. The only Act surviving for Spondon, on the other hand, deals with under 200 acres, not including open-field arable, in 1792, and the very striking strip-like configuration of the fields round the village suggests much earlier enclosure. The only strip map which survives is that dealing with Allestree manor, and this satisfactorily confirms that the surviving ridges are pre-enclosure. Elsewhere, no ridge and furrow was worked on which could not be shown on the ground to ante-date the existing hedge pattern.

The principal mapping unit employed by the Soil Survey is the "soil series" which is defined as "a group of soils with similar profiles derived from similar material under similar conditions of development."² In the parishes under consideration, the soil series were derived from the Upper Carboniferous beds of the Millstone Grits, the Coal Measures, and the Triassic sandstones and marls, which to the east and south of Derby lie unconformably on the Carboniferous, together with some Triassic and Carboniferous drifts. The only points with which this study are concerned, however, are the differing drainage and texture of the various soil series, since it is the drainage and texture which should affect the size of the selion. The drainage and texture of the soil series is in no way related to the age of the parent material, but only to its chemical and physical composition. The soil represented may then be tabulated as shown on page 94.

Each parish provided examples of contrasting soil type both within itself and when compared to the other parishes. Mackworth and Markeaton contained the largest area of freely drained soil, but considerable outcrops of Hodnet

¹ Derby Borough Library, Derbyshire Collection Nos. 9354, 9743.

² The material of this and the following paragraph is taken from the manuscript of the memoir on the soil map (Sheet 125, Derby). I am particularly indebted to Mr E. M. Bridges for allowing me to use in this paper manuscript material both from the map and the memoir, as well as for his help and criticism. I am also indebted to Mr R. S. Seale, Mr C. A. H. Hodge, and Mr D. W. King of the Soil Survey, who have put much time and information at my disposal.

<i>Drainage Class</i>	<i>Soil Series</i>	<i>Texture</i>	<i>Parent Material</i>
Free	Kirkby Overblow	Sandy loam or loamy sand	Millstone Grit s.s.*
	Seacroft	Fine sandy loam	Millstone Grit or Coal Measures s.s.
	Bridgnorth	Medium grained sandy loam	Bunter s.s.
	Bromsgrove	Fine sandy loam or silt loam	Keuper and Bunter s.s.
Free to Imperfect	Hodnet	Silty loam or fine sandy loam	Interbedded Keuper s.s. and marl
	Risley	Sandy clay loam	Sandy and gravelly drift of Triassic origin
	Worcester	Silty clay loam	Keuper marl
Imperfect	Alton	Silty clay loam overlying shales	Limestone Shales
Poor	Windley	Silty clay loam overlying silty clay	Limestone Shales
	Hazlewood	Silty clay loam over clay	Millstone Grit Shales
	Hulland Ward	Sandy clay loam or silty clay loam	Mixed drift of Carboniferous and Triassic origin
	Dale	Silty clay loam	Coal Measure Shales

* s.s. = sandstone

and Worcester series lay next to the Bromsgrove series, and in the north of Allestree, the old Duffield Field lay on the Windley series. Breadsall had patches of Bromsgrove, Bridgnorth, and Kirkby Overblow series, but the poorly drained soils were much more strongly represented by the Dale, Hazlewood, and Hulland Ward, and the intermediary groups also appeared. Spondon provided the strongest possible contrast to Mackworth and Mark-eaton, the largest part of the parish lying on the Hulland Ward, but the Hodnet, Worcester, and Bromsgrove series also appeared, chiefly to the north of the parish. Ockbrook and Hopwell, immediately to the east of Spondon, lay almost entirely on free to imperfectly drained soils, with very small areas of the freely drained Bromsgrove series. The surveyed areas of Shenley Brook End and Woughton-on-the-Green were entirely covered by the poorly drained Hanslope series, developed from the Chalky-Jurassic

Boulder Clay, and the provisionally named Oak series developed from Jurassic Boulder Clay.

Investigation showed first that abrupt changes in selion size and width of ridge took place on the same soil series. The range of widths found in all the parishes varied from 11 to 4 yards, and on the Bromsgrove south of Mackworth widths from 11 to 5 yards were found. There were sudden variations from an average of 8 or 9 yards to small groups of ridges 5 yards wide and, in one case, the opposite. Similarly, on the single patch of Dale, ridges 5-8 yards wide were found. It seemed possible then that although the local variations could not be ascribed to soil type, the general tendency might be for ridges to narrow on the Hodnet and Worcester series (Fig. 1).

When, however, the small area of Allestree which suburban development has left uncovered was examined this general tendency in favour of the

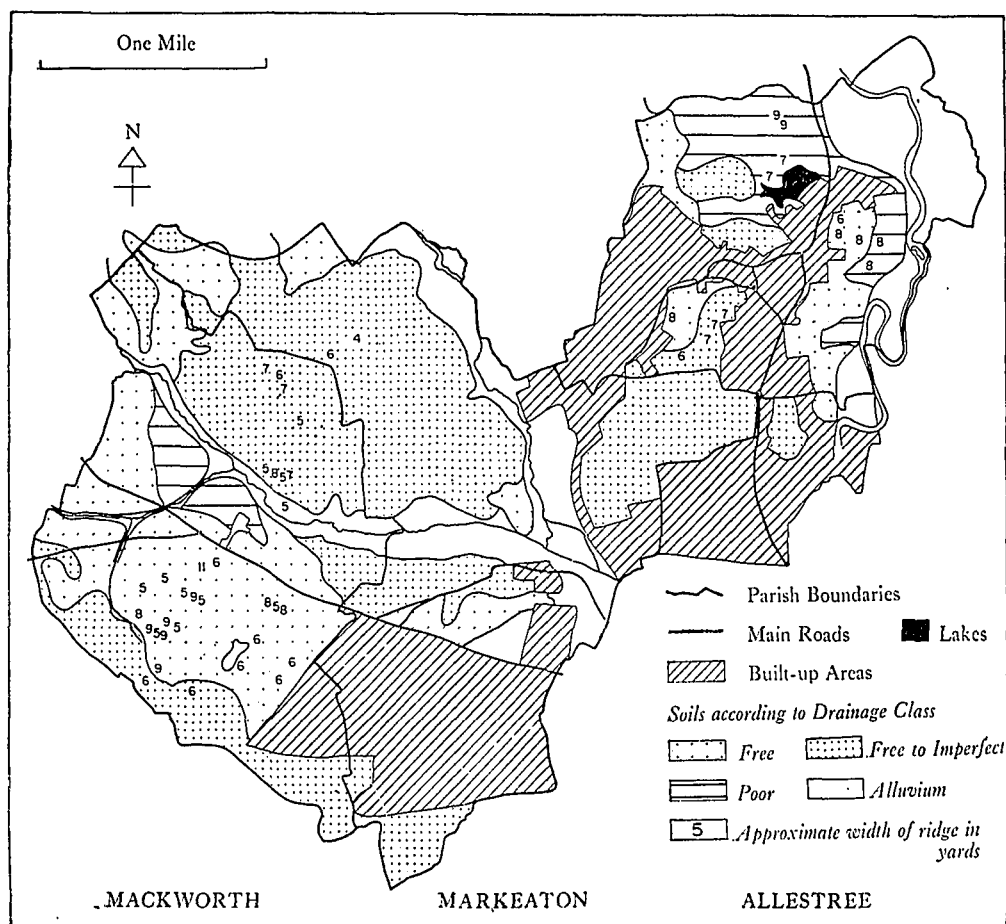


FIG. 1

Orwins' theory seemed refuted. Ridges 6 and 8 yards wide were found on the freely drained Bromsgrove, ridges 7, 8, and 9 yards wide on the poorly drained Windley. Similarly, in Breadsall, ridges 5 and 9 yards wide were found on the Bromsgrove and ridges 5, 6, 7, 9, and 11 yards wide on the Hulland Ward, Hazlewood, and Dale series (Fig. II).

Particular attention was paid during the field work to angle of slope, since obviously a steeper angle might compensate a poorly drained soil with better natural run-off, and so lead to wider ridges than might otherwise be the case. In most cases ridge and furrow lay up and down the slope, and so sudden variations in the widths could not be ascribed to slope. Where this was not so, particularly in Breadsall, which lies at the confluence of two brooks in valleys with sides rising some 100 feet, and also includes the scarp of the Derwent river-terrace, there appeared to be no correlation between steeper slopes and wider ridges on poorly drained soil. The narrowest ridges, of five yards, on the Hazlewood, lay on the steepest part of the slope nearest the Ferriby Brook. As the slope levelled off upwards, the average width of ridge rose. The 9-yard ridges on the Hazlewood lay on an almost level field.

Examination of Spondon appeared to disprove that any general tendency existed in the group of parishes towards narrower ridges on heavier soils (Fig. III). Immediately north of the village, on the Hulland Ward, the average width of ridge was 9, 10, or 11 yards, with isolated examples running up to 12 yards. The fields are low-lying, and have not much surface slope. On a

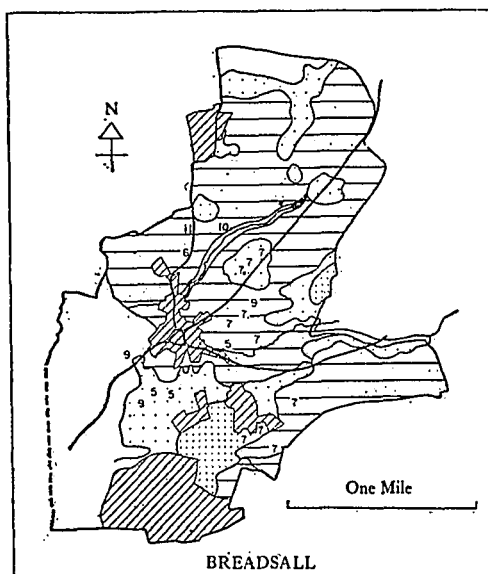


FIG. II

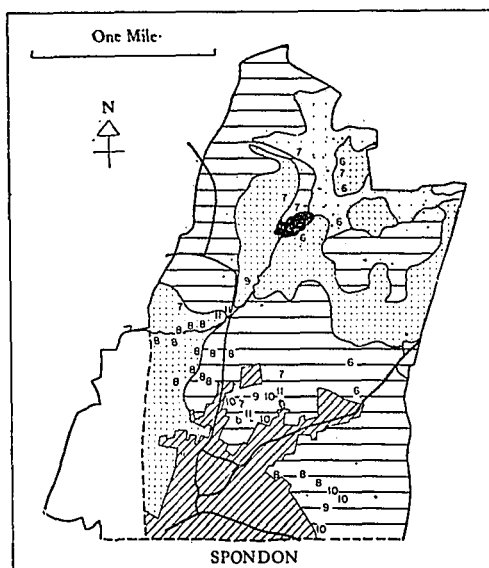


FIG. III

poorly drained soil, with little natural run-off, a rather greater average width is obtained than on a freely drained soil in an area with greater surface slope south of Mackworth. Elsewhere in Spondon, narrower ridges are found on the Hulland Ward, but the general average only falls noticeably in the north on the imperfect to freely drained soils. This fall is continued on the free, or free to imperfectly drained soils in Ockbrook and Hopwell, where the general range was from 7 to 5 yards. The classic theory is thus reversed.¹

Work in Buckinghamshire was inconclusive. Ridges tended to be wider in Shenley Brook End and Woughton than in any of the Derbyshire parishes except Spondon, from 8 to 10 yards. There were few abrupt local variations, except for one small area of ridges approximately six yards wide in Shenley. Outside the part of Shenley covered by the soil survey, ridge and furrow did exhibit sudden changes from 10 to 5 yards, but no useful observations could be made on this in the absence of a soil map, although the Hanslope is said to outcrop consistently over the whole region. It seems then that here the width of ridge is almost as unvarying as the soil types, and all that can usefully be said is that the ridges in these two parishes on poorly drained soil are often wider than on the areas of freely drained soil examined in the Derbyshire parishes.

This survey shows, first, that in two Cambridgeshire and seven Derbyshire field systems, local variations in the width of ridge and furrow are not caused by variations in soil type, and secondly, that there does not appear to be a tendency towards narrower ridges on poorly drained soils, although much more extensive field work would be needed to establish the second point with certainty.

Conclusions based on so small a region must necessarily be extremely tentative, and can only apply to the region itself. It is not, of course, surprising that there is not a minute correlation between the width of selions and soil type; to expect this is to expect a remarkable degree of sensitivity and science from the Anglo-Saxon peasant or his predecessors in the process of laying out lands at the first clearance. What one would expect are certain changes in selion width from area to area of the open fields where soils vary widely, as the limitations of environment made themselves so strongly felt that custom and habit became aware of them and made conscious steps to meet them. On the basis of observations made so far, these general changes did not take

¹ The air photographs on which these conclusions were based were taken from Sortie 58/RAF/1096, Library Number 1438, in the Air Photographs Library of the Ministry of Housing and Local Government. My thanks are due to the Air Photographs Officer for permitting me to make frequent use of the Library, and also to Miss Janet Brice for helping me with the field work which was a necessary adjunct to the use of the air photographs.

place, whereas other local changes apparently unrelated to the environment did. It seems that an explanation for these changes must be sought in custom rather than environment.

It is difficult to account for local custom which leads to an apparently haphazard arrangement of varying selion sizes within the same parish. Two possible explanations which might be explored are that lands may have been laid out irregularly at the clearance, or that the irregularity is connected with the late medieval consolidation of holdings. It is hard to imagine the irregular pattern emerging as a product of co-aration, unless the 'acre', or day's work, represented the individual holding, as is often suggested. In this case the 'strip' must frequently from the beginning have contained more than one selion, since selions even approaching 22 yards in width are so rare. It is just conceivable, then, that an individual might have been able to vary selion width within his own 'acre', originally. As to consolidation, it is true that if the selions of a parish as originally laid out were approximately equal and of a size well below the maximum possible for the environment, consolidation would permit the individual to subdivide further, or to plough two or three as one, at will. Examples of amalgamation and subdivision of this kind have been found at Longstanton and at Mackworth in positions where furlong shape did not demand it, and in which it was an interruption in the common pattern. Such suggestions can only stand, however, until an adequate solution to the problem is found.

Letter to the Editor

SIR,—May I make two comments on Dr Chaloner's review of my book on Dartington Hall? I hold the opinion that I am perfectly entitled to call the book "the history of an experiment," but of course it is also implied that it is the history *so far*. The experiment continues in various forms, not necessarily with the same emphasis, however. Secondly, in the unpublished report, upon which the

book was based, and which I also wrote, complete financial accounts are rendered of every aspect and activity of the estate. For various reasons, it was considered undesirable to publish these, but they are available (subject to the permission of the Trustees) to serious enquirers.

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