DEBATES

The Dispersion of Holdings in the Open Fields: an Interpretation in Terms of Property Rights[1]

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A widespread phenomenon of the rural life of England from early in the medieval era was the dispersion of the individual peasant's arable holdings in many small strips scattered throughout the open fields.[2] A variety of explanations, not necessarily mutually exclusive, have been offered for this phenomenon, including equality, partible inheritance, and risk aversion.[3] One prominent explanation of this pattern of scattered holdings was that developed by the Orwins from a hypothesis advanced by Seebohm.[4] This essay points out some unresolved problems in this explanation and proposes that the difficulties may be eliminated by incorporating

[1] I am indebted to Philip R. P. Coelho and V. L. Koromzay for helpful comments on an earlier draft.

[2] The term "open fields" here is to be understood to refer to land held in unenclosed strips. It is a more inclusive category than that of the "common fields", which refers to only those open fields for which there existed common rights over the arable, pasture, meadow, and waste, and community regulation of these common activities. The distinction has been stressed by JOAN THIRSK in *The Common Fields*, « Past & Present », 29 (December 1964). For the present analysis, it is not important whether the open fields were also common fields or not.

[3] See, e.g., PAUL VINOGRADOFF, *Villinage in England* (Oxford, 1892), pp. 231-241; THIRSK, *op. cit.*; IDEM, *The Origin of the Open Fields*, « Past & Present », 33 (April 1966); DONALD N. MCCLOSKEY, *The Enclosure of Open Fields: Preface to a Study of Its Impact on the Efficiency of English Agriculture in the Eighteenth Century*, « The Journal of Economic History », XXXII, no. 1 (March 1972), pp. 16-20.

[4] FREDERIC SEEBOHM, *The English Village Community* (London: Longmans, Green, 1905); C. S. and C. S. ORWIN, *The Open Fields* (Oxford University Press, 3rd edition, 1967).

a plausible hypothesis about institutional arrangements with respect to property rights in land.[5] Following the Seebohm and Orwin works, this essay does not attempt to go beyond England to the situation on the Continent, but its possible applicability there is not ruled out.

The system of scattered holdings has called forth attempts to explain its existence because it appears to have very significant disadvantages. Travel between strips would consume time and energy. The greater boundary area would produce more frequent encroachments and disputes There would be a greater probability of weeds being sown on one peasant's land by seed blown from a more careless neighbour's land. The necessity of coordinating cultivation among the different holders in the common fields would deter an individual from innovation on his own holding.

I

Among the characteristics of the English open-field system noted by Seebohm[6] were:

(1) The land was divided into long, narrow strips, usually either one or one-half acre in size.

(2) Each peasant's holdings consisted of numerous such strips scattered throughout the open field area, almost never with any of his strips adjoining any others.

(3) The order of possession of a sequence of strips exhibited a high degree of regularity; specifically, most of peasant A's strips might have a strip belonging to peasant B adjoining it on one side and a strip belonging to peasant C adjoining it on the other. While the pattern of holdings was not rigorously systematic, a fundamental regularity was discernible. It is not certain when this system of scattered strips originated, but it was definitely well established by the tenth century.[7]

The Orwins, building upon a suggestion by Seebohm,[8] explained these

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[5] The effect of institutional change and associated changes in property rights on the economic development of Europe has been stressed recently in the work of Douglas C. North and Robert Paul Thomas. See their *An Economic Theory of the Growth of the Western World*, « Economic History Review », 2nd serv., XXIII, No. 1 (April 1970), and *Thqe Rise of the Western World: A New Economic History* (Cambridge: Cambridge University Press, 1973).

[6] SEEBOHM, *op. cit.*, pp. 2-4, 7-8, 24-28, 113.

[7] H. P. R. FINBERG, *Anglo-Saxon England to 1042*, in idem, ed., « The Agrarian History of England and Wales », I, pt. II (Cambridge University Press, 1972), pp. 487, 489.

[8] C. S. and C. S. ORWIN, *op. cit.*, ch. III; SEEBOHM, *op. cit.*, pp. 122-23. For an excellent short summary of the revolutionary developments in agriculture in the Anglo-Saxon period see M. M. POSTAN, *The Medieval Economy and Society* (London: Weidenfield and Nicholson, 1972), pp. 15-18, 44-49.

phenomena by the characteristics of the heavy mould-board plow, which came into widespread use in England sometime during the Anglo-Saxon era. The introduction of the mould-board plow permitted the cultivation of low-lying, heavy soil, which could not be cultivated adequately by the previously used scratch plow. Compared to theh scratch plow, the mould-board plow offered much greater resistance to the soil and hence required large teams of oxen, particularly when used to cultivate virgin soil or areas recently broken to the plow. The existence of long strips can be explained by the difficulty of turning the large, awkward plow team and by the fact that the mould-board plow, because it so thorughly turned over the soil, eliminated the necessity of cross-plowing. Since the mould-board plow required a large team, which few peasants would have been able to supply individually, plowing was carried out cooperatively. This practice required some method for sharing out the results of group plowing. It would not do to give one peasant all the plowing of, say, the first week, the next peasant the plowing of the second week, and so on, for the last peasant would have to sow all his land late and would have a poor crop the following summer. Therefore, a single day's plowing was chosen as an easily determined and reasonably equitable unit of division. Thus, if there were 12 shares in a plow team, each share would receive one day's plowing every 12 days.[9] If the plow team continued one day where it had left off the last, this would explain both the scattering of strips and the regularities in the pattern of holdings. The holder of, say, the third share in a plow team would have for neighbours of all his strips the holders of the second and fourth shares. If there were 12 shares in the plow team, he would receive strips 3, 15, 27, 39 . . .

The Orwin thesis, as outlined above, is open to several objections. First, if the plow team did not continue one day where it had left off the previous day, the strips need not be scattered. A separate area could be selected for each share in the plow team and on the day allotted to that share, plowing would take place in the associated area, giving each share a consolidated holding. A second objection was raised by Vinogradoff, who pointed out that according to the theory sketched above, peasants who individually could supply their own plow teams would be expected to have consolidated holdings, but in fact held dispersed holdings.[10] The Orwin's

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[9] *Ibid.*, pp. 39-42; SEEBOHM, *op. cit.*, pp. 117-25. An individual might have more than one "share" in a plow team; e.g. if he contributed two oxen to the team, he would receive two shares.

[10] VINOGRADOFF, *op. cit.*, p. 254. One might try to meet the first objection to the Orwin thesis, but not the second, by the argument that it would be too difficult to move the plow to a different field each day. However, since the plow was a valuable capital good, it is very unlikely that it would have been left in the fields overnight If the plow lacked wheels, it would have been carried in a cart or on the backs of men or animals.

answer to Vinogradoff's objection was that not only did there exist alternation of strips between shareholders in a plow team, but there was alternation between teams, so that even the individual holder of a complete plow team would hold scattered strips.[11] But this resolves one question only to raise another, more fundamental, one: why would different plow teams plow adjacent strips each day? Why would not each team set aside a field for itself and alone plow in that field day after day of the plowing season?

II

These difficulties of the Orwin analysis may be resolved by a theoretical model in which property rights in land are delimited in such a way that the plowing of a strip of land was the effective means by which rights in that strip were appropriated, at least temporarily. Where an institutional arrangement of this sort prevails, it would be likely that on the first day of plowing all the plow teams of the village would go to the best area of land and plow there, that on the second day all the teams would plow the best area of the land still unplowed, and so on. This would lead to alternation of strips among plow teams, because on a given day all teams would be plowing in the same area, the area of the best land still unplowed on that day. The plow teams would not only be plowing, but simultaneously would be appropriating a scarce factor, good land, and the implicit differential rent accruing to it.[12]

The existence of such a system for appropriating land would resolve both objections to the Orwin thesis. To an individual cultivator or to a single plow team, but not to the community as a whole, the ability to appropriate differential land rent would compensate for the inefficiencies inherent in the dispersion of holdings. Under this arrangement land has some common-property aspects, but it is not a common-property resource in all respects. Like other common-property resources (e.g., fisheries), the common-property aspects of land under this institutional arrangement entail some divergence between private and social costs (returns). In this case the community would receive no benefit corresponding to the individual appropriation of differential rent, for the process simply involves the dis-

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[11] C. S. and C. S. Orwin, *op. cit.*, pp. 9, 40-41. Such a system of alternation of strips among plows has been found in parts of Ireland. See Desmond McCourt, *Infield and Outfield in Ireland*, « Economic History Review », 2nd ser., VII, no. 3 (1955), p. 373.

[12] During the Anglo-Saxon period land in general was not scarce, since much potentially arable land was uncultivated. But land is not a homogeneous factor of production. Even though some land had a zero economic value, higher quality land did, of course, possess scarcity value. Because of the danger of robbery and warfare, proximity to the village would be one of the most important sources of scarcity value.

tribution of the rent among the members of the community with no effect on the total of land cultivated by the community as a whole. The result is the dispersion of individual holdings with the several inefficiencies that entails. However, this does not necessarily mean that the community has chosen an inferior institutional arrangement, for it may prove to be optimal when account is taken of the costs required to devise and enforce an alternative arrangement.[13]

According to the Orwin hypothesis, the amount of plowed land allocated to an individual depended upon his contribution of resources to the operation of plowing. This implies that the availability of resources for plowing (especially the supply of draft animals) generally set the effective limit to the extension of cultivation. In these circumstances, the costs of formal regulation of land allocation would be minimized if the plowing process were allowed to determine not only the magnitude, but also the location, of each individual's open-field holdings. This would be the case if there simply were no community regulation (except perhaps for a community decision setting the starting date of the plowing season), thus leaving each plow team free to plow where it wished. Such a land allocation arrangement would be a natural one to adopt if the distribution of holdings in the open fields was subject to frequent change. At least in the early stages of its development, a village community would have had little incentive to preserve throughout the fallow year the land divisions which were established during the period of cultivation, when to do so might involve costs for maintaining boundaries and for preserving records of individual holdings. After the harvest there would be no need to delimit possession of the land again until the land was plowed in preparation for sowing another crop.[14] Hence, the plowing process would have been the natural means by which to determine anew the division of the field among the members of the community.

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[13] Even if the institutional arrangement were in fact sub-optimal, this still would not necessarily mean that the individual members of the community were irrational. A measure may be adopted even though it is harmful to the community as a whole, if it is beneficial to a politically powerful sub-group and if there is no feasible way for the rest of the community to "bribe" the sub-group to adopt the more efficient arrangement. (For example see the discussion of the Mesta in North and Thomas, *The Rise of the Western World*, loc. cit., p. 4). In the present instance, however, there is no apparent sub-group that would benefit significantly from this arrangement as compared to plausible alternative institutional arrangements.

[14] Since the fallow was plowed, one possible reason to retain the divisions of the fallow land would be to permit persons to plow their own land, thereby eliminating the tendency to shirk when plowing someone else's land. However, this consideration probably would have been of minor importance. Since plowing was a cooperative operation, the tendency of the plowman to shirk when plowing another's land would have to be dealt with in any case.

Both Seebohm and the Orwins believed that an early phase of impermanent land allocation was highly probable, and Seebohm presented evidence for his view from Saxon laws regarding tithes for the church.[15] In the early phase of village development there are enough advantages to a system of impermanent land allocation to render its existence highly credible. A new member could be admitted to the community without having to take all of his land on the periphery of the area currently cultivated. (In the early phase of village development additional members probably would be greatly desired even if they had to be taken in on equal terms with existing members, for they would contribute to commonly used services with scale economies or externalities, such as defence, justice, and religion). Similarly, if an existing member of the community were able to add to his stock of plow beasts, the additional land that he could now cultivate would not all have to be located on the fringes of the existing arable. Thus the land system would have a degree of flexibility that would be highly desirable in pioneering communities in a state of flux.[16]

It is easy to imagine that as a community expanded in size, a point was reached when this process of land reallocation disappeared and the existing pattern of dispersed holdings became permanent. When all land within reasonable distance of the settlement was cultivated, the value of the land to members of the community would rise sharply and it would become desirable to undergo the costs of establishing more permanent holdings. Furthermore, with local land now scarce, individual peasants would be more anxious to assume their landholding for future years; they would no longer be eager to admit a newcomer to the community at the cost of giving him an equal share in the now valuable land of the village.

An alternative explanation of the origin of dispersed holdings attributes the phenomenon to the desire of the community to achieve equity among its members by giving each cultivator shares in both the good and the bad land.[17] The Orwins rejected this explanation: « Is it not more likely that the business of keeping alive was the first and most serious consideration and that the land system was evolved solely out of this necessity? ».[18] The equity argument is not in conflict with the hypothesis offered here. If the unregulated process of plowing served to determine the allocation of holdings, dispersion of holdings and an equity of the « first come, first served » variety would have been achieved, but without the necessity of formal allocation.

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[15] SEEBOHM, *op. cit.*, pp. 113-17; C. S. and C. S. ORWIN, *op. cit.*, p. 42.

[16] It should be recalled that the Anglo-Saxon period experienced very great extension of the cultivated area and establishment of new settlements. See POSTAN, *op. cit.*, pp. 15-18.

[17] E.g., VINOGRADOFF, *op. cit.*, pp. 231-241.

[18] C. S. and C. S. ORWIN, *op. cit.*, p. 7.

It is easy to see how this system could come about if the village community were composed solely of freeholders. However, tenantry was an important, and probably the predominant, form of landholding from early in the Anglo-Saxon period.[19] At first glance, the existence of tenantry might appear to reduce the likelihood of dispersed holdings, for if the peasants owed dues for the use of land, a landlord might form the land-holdings into consolidated units and vary the dues according to the quality of each holding, which would eliminate individual appropriation of differential rent as a motive for the scattering of strips.[20] But would a landlord be more likely to adopt a system of unified holdings than would a village community of freeholders in otherwise similar circumstances?

Whether a system of consolidated holdings will be adopted or not depends upon a comparison of the benefits derived from unified holdings with the costs of establishing such an arrangement of property rights. It is probable that the costs and benefits of the system would have been essentially the same to a landlord as to a freeholding village community, so that whether the peasants were freeholders or tenants would not have affected the choice between dispersed and consolidated holding arrangements. Regardless of which land allocation arrangement was chosen by the landlord, he would have been able to appropriate any returns to his land in excess of the minimum necessary to retain his tenants. This minimum was determined by competition for labor from other landlords and by the general inability to enforce legislation against runaway serfs.[21] Thus, the benefits accruing to the landlord from consolidation of holdings would have been those arising from the increase in technical efficiency of production, which are precisely the same benefits that would accrue to a freeholding community from a system of consolidated holdings. Similarly, the costs of establishing a system of consolidated holdings would have been essentially the same for a landlord as for a community of freeholders. There is little reason to expect the costs of maintaining boundaries and records of holdings for a system of consolidated units to differ between a community of tenants and one of freeholders. The advantages of a system of regular redistribution in facilitating the admission of new cultivators probably would be at least as great to a landlord as to a

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19 FINBERG, *op. cit.*, pp. 446-448; T.H. ASTON, *The Origins of the Manor in England*, « Transactions of the Royal Historical Society », 5th ser., VIII (1958), pp. 59-83.

20 It is the existence of tenantry that matters for this question. It is irrelevant whether the landford held seignorial legal jurisdiction over the tenant.

21 The limitation of a lord's ability to exploit his serfs set by competition from other lords is emphasized by DOUGLASS C. NORTH and ROBERT PAUL THOMAS in *The Rise and Fall of the Manorial System: A Theoretical Model*, « Journal of Economic History », XXXI, no. 4 (December 1971), p. 788.

freeholding community, for the landlord would benefit from the dues rendered by additional tenants. Thus, it appears that a system of scattered strips was as likely under tenantry as under freeholding.

III

According to the hypothesis proposed here, open-field land tenure originally had both common-property and private-property elements, due mainly to the necessity of cooperative plowing. Yet the village community apparently did not take the further step to fully collectivised cultivation of the open fields, whereby all operations, not just plowing, would be carried out collectively and each peasant's income would be determined as a specified share in the harvest of the entire village.[22] Under such a fully collectivised arrangement, there would be no reason at all to divide the arable into individual holdings.

It is not difficult to imagine why a fully collectivized arrangement did not come about. One major obstacle to the adoption of collectivised cultivation is the difficulty of determining equitable shares under collective farming when individuals were likely to contribute in different proportions to different operations. Suppose one person contributed two oxen to the plowing and another contributed one, but they both contributed equally to sowing, weeding and harvesting. To establish their shares in community output would require at least implicit determination of the relative reward to be assigned to the different activities, hardly an easy task.[23] The problem of determining a satisfactory reward structure is especially difficult in the case of agricultural activities because agricultural inputs are less standardized than inputs into industry.

A second obstacle to collective cultivation is the problem of assuring the level of inputs when it is possible for an individual member of the collectivity to conceal a reduced input contribution. Because collective cultivation reduces the connection between an individual's input and his

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[22] While the community may have decided when and how such operations as sowing and reaping were carried out, the operations were carried out by an individual on his own land, or possibly by an individual as an employee on another's land, but generally not as collective operations. And as a corollary of this individual cultivation, the return received by an individual landholder was determined by the harvest on his own lands, not by that on the lands of others.

[23] The situation will be familiar to those acquainted with the labor-day (*trudoden*) system of the Soviet collective farm (*kolkhoz*), whereby according to a pre-determined schedule, a day's work in one activity may earn twice as large a share as a day's work in a different type of activity. The difficult part is to establish differences in relative rewards that correspond with differences in contribution to the production (or other goals) of the collectivity.

reward, he has an incentive to covertly reduce his inputs (i.e., to shirk), the incentive being greater the smaller is his share in the collective output.[24] This problem is especially serious in the case of agricultural activities. Since most agricultural operations are not standardised, but vary with such conditions as weather, soil and type of crop, it is difficult to establish standards of comparison. Furthermore, the geographical dispersion of many agricultural activities renders it very costly for a monitor to observe them with a high degree of frequency.

These disadvantages of joint cultivation might be offset if the cultivators could sufficiently increase their productivity by working together as a team.[25] However, the only important activity of medieval cultivation that offered sizable increases in output from team operation was plowing, and that only required joint cultivation within the plow team, not between plow teams. Little advantage was to be gained from team activity in operations such as sowing or weeding.[26] Hence, in view of the difficulties associated with collective cultivation there was no reason to collectivise more than the plowing process.

IV

This essay has argued that one of the most widely accepted explanations of the dispersion of open-field holdings is logically incomplete. The gap can be filled by hypothesizing the existence of a system of land allocation based upon the unregulated plowing process. To refer to it as a system may be misleading since its characteristic is precisely the absence of any formal system of regulating land allocation. The absence of formal land allocation is plausible simply because the benefits of formal regulation probably were small during the early stages of land settlement and its costs must have seemed high to a community living close to the subsistence level.

According to this modified version of the Seebohm-Orwin thesis, intermixed open-field holdings originated partly as a by-product of a land

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[24] Even if there were no problem of shirking, and rewards for each operation were related to the contribution of that operation to production, there would still be another problem with collective cultivation: if individuals were allowed to determine the level of their own inputs, there would be a tendency toward excessive inputs arising from the fact that an additional unit of input entitles its contributor to an additional share in average output, which will exceed the contribution to output of the marginal input.

[25] For a general discussion of the implications of team production for economic organization see ARMEN A. ALCHIAN and HAROLD DEMSETZ, *Production, Information Costs and Economic Organization*, « American Economic Review », LXII, no. 5 (December 1972). The disadvantages of joint production mentioned here represent what Alchian and Demsetz call in a more general context the « metering problem », the problem of « metering input productivity and metering rewards » (*ibid.*, p. 778).

allocation arrangement which was appropriate when land was abundant and communities were taking in new members. As time passed, these conditions became progressively less prevalent, and correspondingly, this motivation for the dispersion of holdings must have become progressively weaker. Since the gains from more efficient utilization of a resource tend to increase as the resource becomes more valuable, we would expect that population pressure and land shortage, by making land more valuable, would tend to induce land consolidation. However, some aspects of increasing population density actually may have retarded consolidation. Population pressure during the thirteenth century probably lowered the real value of labor time and real wages,[27] thereby reducing one of the major costs of scattered strips, the costs in labor time of moving between dispersed holdings. Increasing population pressure may have acted to retard consolidation in another way, through reducing livestock holdings and expanding the practice of communal plowing. As population increased, wasteland which had been used to graze livestock was converted to arable, reducing the supply of fodder. By the thirteenth century village livestock holdings probably had reached their lowest level for a considerable period before or since.[28] This development would tend to expand the practice of communal plowing. Since the disadvantage of scattered holdings is less under communal plowing than under individual plowing, the result would be to deter a shift to unified holdings.

Land consolidation appeared at least as early as the thirteenth century,[29] by which time increasing population had made land shortage acute. Yet in much of England, particularly in the central and northern areas, dispersed holdings in the open fields remained the norm until the eighteenth century. McCloskey has observed that the Seebohm-Orwin thesis and most other explanations of scattered holdings, while they might explain the origin of scattering, cannot account for its continuation beyond the medieval era, and he has suggested that one motive which can explain this persistence

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[26] It was generally desirable that all holdings in a particular area be harvested at the same time, but this did not require that harvesting be a team operation. The disadvantages of harvesting as a team would not have been very great, however, since the operation is relatively standardized and since it is relatively easy to observe other members of the team working nearby. Thus, it probably would not have made much difference whether harvesting was carried out by teams or by individuals.

[27] M. M. Postan, *Medieval Agrarian Society in its Prime: England*, in idem, ed., « The Cambridge Economic History of Europe », I, « The Agrarian Life of Middle Ages », 2nd ed., (Cambridge: Cambridge University Press, 1966), pp. 566-67.

[28] Idem, *Village Livestock in the Thirteenth Century*, « Economic History Review », 2nd ser., XV, no. 2 (December 1962).

[29] B. H. Slicher Van Bath, *The Agrarian History of Western Europe, A.D. 500-1850*, translated by Olive Ordish (London: Edward Arnold, 1963), p. 164; George Caspar Homas, *English Villagers of the Thirteenth Century* (New York: Russell & Russell, 1941), p. 18.

is risk aversion.[30] Because peasant communities lived close to the subsistence level and because food storage and borrowing would have been costly when possible at all, peasants must have been very concerned to reduce the risks from year-to-year fluctuations in the harvest. Their risks could be reduced by dispersion of holdings. In dry years lowlands might produce the better crops; in wet years, the uplands. To spread his risks and reduce the chance of disaster, a peasant would want to hold some of each type of land, dispersed over as wide an area as possible.

There is every reason to believe that the desire to reduce risk was an important motive for the existence of scattered holdings. By itself, this motive does not conflict with the Seebohm-Orwin or other explanations of scattering. It is doubtful that the desire to reduce risk can serve as the sole explanation of the scattering of strips to the exclusion of other explanations. The scattering of an individual's holding in a dozen separate strips undoubtedly would have reduced his risk significantly in comparison with a holding in only one, two or three parcels. But it was not uncommon for holdings to consist of forty or more, sometimes many more, separated strips.[31] It is difficult to believe that so many strips, often quite close to each other, could have reduced the degree of risk significantly below that of only a dozen or so separate parcels. To substantially reduce risk by further separation of parcels, it must be possible to locate them in areas with significant differences in weather or soil conditions. The question calls for further research, which will not be easy, but on the face of it, it seems unlikely that the limited area of the typical community's arable land offered sufficient variation in conditions to justify separate parcels in such large numbers.

In all probability, to seek a monocausal explanation of the dispersion of open-field holdings is to pursue a chimera. Open-field systems varied both in place and in time as circumstances varied, and these variations can be understood only as the result of the interplay of a variety of charging forces, some favoring dispersion, others consolidation.[32] Neither the modified form of the Seebohm-Orwin thesis advanced in this essay nor any other explanation of the scattering of strips should be expected by itself to explain all the variations in open-field landholding patterns. In particular, the Seebohm-Orwin thesis, whether modified or not, is an explanation of the origin of scattered holdings and is not an explanation of their persistence into the post-medieval era.

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[30] McCloskey, *op. cit.*, p. 17-20.

[31] Seebohm, *op. cit.*, pp. 24-28; Howard Levi Gray, *English Field Systems*, Cambridge: Harvard University Press, 1915, ch. 1, and p. 443-444, 529, 549.

[32] This point has been made forcefully by Alan R. H. and R. A. Butlin, *Conclusion: Problems and Perspectives*, in idem, eds., « Studies of Field Systems in the British Isles », Cambridge: Cambridge University Press, 1973, p. 628.