Selective Manuring in the Medieval Open Fields

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I

For those in medieval Europe who sought to make a living directly off the land, and these were the great majority, few issues could have been more important than the nature of the soils they had to work. And in their struggle to maintain and improve yields against a backdrop of increasing population and tax burdens, and potentially nutrient-depleting agricultural practices, few substances can have been more important than manure. Such observations, of course, are not new. Historians have long acknowledged the centrality of manure to the success or failure of early rural economies. As far back as 1897, F.M. Maitland could opine that globally '…the demand for manure has played a large part in the history of the human race.'[1] More recently, in seeking an explanation for the why the medieval European economy triumphed, A.W. Crosby singled out the presence here of big animals (in numbers unequally in other complex societies) providing additional traction for the plough, food to eat during crisis, and above all manure: 'Where the Far Easterners were obliged to use their own excrement for fertilizer…the Europeans could use the manure of their animals.'[2] M.M. Postan's view of the efficacy of medieval manure and manuring was more measured, stating that there can be little doubt '…that men made such use of manure as their knowledge and their resources allowed', but noting also that '[t]he main restriction on the use of manure – a restriction which got tighter as time when on – was imposed by its paucity'.[3] Any consideration of the medieval rural economy should, therefore, include the study of manuring.

The principal historical sources for the widespread use of manure in the medieval period are manorial accounts. These regularly include entries relating to the costs of transportation and spreading of muck, and the hiring of labourers to undertake this task. Consequently, few commentators on the manorial economy fail to make at least passing reference to manuring and its place in the agricultural calendar. Some have gone further, producing a rich literature on the relationship between numbers and types of livestock, the quantity and quality of dung

[1] Maitland, F.M. 1897 *Domesday Book and Beyond* (Cambridge, 1897)
[2] Crosby, A.W. 'Afterword' in D. Sweeney *Agriculture in the Middle Ages. Technology, Practice and Representation* (Philadelphia, 1995)
[3] Postan, M.M. *The Medieval Economy and Society: An Economic History of Britain in the Middle Ages* (Harmondsworth, 1975)

they could produce, and the potential effects that it might have on cereal yields if spread on the fields.[4] This can be contrasted, albeit with notable exceptions, with the often perfunctory treatment that the issue of medieval manure has received from landscape archaeologists, despite the fact that this key activity has left identifiable traces on the ground. The most visible sign of past manuring episodes takes the form of spreads of pottery sherds, derived from the practice of mixing household waste (containing broken vessels) with animal dung to increase the manure stock. Yet, where such spreads have been encountered, most subsequent reports contain no more than a simple statement to the effect that the odd stray sherd of pottery recovered in excavation or field survey represents former mundane practice. Few have been tempted to explore manuring in any further depth, in part because there is a widely-held belief that manuring produces distributions of material that are random and structureless, and thus impossible or pointless to analyse.[5]

This paper aims to counter these perceptions. It draws on a detailed survey of manuring scatters found within the open fields of a group of village communities in the English Midlands, supported by evidence from other parts of the country. It will argue that ceramic manure scatters do contain structure; that this structure has resulted from the targeted application of manure on certain parts of these fields and the conscious decision not to manure others; that how freely or carefully manure was spread changed during the course of the Middle Ages; and that this is not solely a measure of the quantities of manure available to the medieval peasant, but also how many hands could be brought to the task, and how much time could be allocated to such an undertaking. In its use of archaeological evidence, and its concentration on the soil husbandry of peasant farmers (on their own strips within the open fields), this paper also seeks to provide a counter balance to the prevailing view of the medieval farming economy offered by historians drawing evidence almost exclusively from manorial accounts. What emerges from this study, it will be asserted, is that certainly by the later Middle Ages, peasants were far more active in the management and maintenance of their land than their social superiors on their demesnes. On the eve of the Black Death, peasant soil was in much better heart than that of the lord. It follows, therefore, that to calculate cereal yields per acre on demesne accounts alone may be to under-estimate grossly actual levels of productivity across the whole rural sector.

II

[4] *Inter alia* Campbell, B. and Overton, M. (eds) *Land, Labour, Livestock: Historical Studies in European Agricultural Productivity* (Manchester 1991); Campbell, B. *English Seigniorial Agriculture 1250*-1450 , (Cambridge, 2000); Kitsikopoulos, H. 'Standards of living and capital formation in pre-plague England: a peasant budget model', *Economic History Review* **53** (2000), 237-61; Page, M. 'The technology of Medieval Sheep Farming: Some Evidence from Crawley, Hampshire, 1209-1349', *Agricultural History Review* **51** (2003), 137-54; Stone, D. 'Medieval Farm Management and Technological Mentalities: Hinderclay before the Black Death', *Economic History Review* **54** (2001), 612-38; Stone D. *Decision-Making in Medieval Agriculture* (Oxford, 2005); Thornton, C. 'The Level of Arable Productivity on the Bishopric of Winchester's Manor of Taunton, 1283-1348', in R. Britnell (ed.) *The Winchester Pipe Rolls and Medieval English Society* (Woodbridge, 2003), 109-37; Titow, J.Z. *Winchester Yields: A Study of Medieval Agricultural Productivity* (Cambridge, 1972).

[5] A problem, many argue, further exacerbated by later ploughing episodes: continued ploughing over many centuries potentially eroding away earlier material deposited in the ground and thus depriving us of essential evidence; and the effect of plough drag, moving material around so that its original depositional context cannot be firmly established.

The origin of open-field farming in England still remains a matter of contentious debate.[6] There are strong grounds to suggest, however, that in some parts of the Midlands, the system had been adopted by 850 AD and that during the course of the late ninth and tenth centuries its introduction became more widespread.[7] By the middle of the eleventh century, open-field farming was almost certainly already established as the dominant Midland farming method and would remain so until, first the enclosure movements of the late fourteenth and fifteenth centuries and finally Parliamentary Enclosure of the eighteenth and nineteenth centuries created the hedged fields that characterize the landscape today. Within the core study area, the same period saw the regular introduction of new pottery fabrics.[8] The mid-ninth century marks the transition from the use of handmade vessels to the importation of wheel-thrown pots made in the area of St Neots and a little later in Stamford. Around 1100 the pottery assemblage becomes dominated by Shelly and Sandy Wares manufactured to the east and west of the area respectively. Despite their continued production down to the end of the fourteenth century, the establishment within the study area of a major manufactory at Potterspury *c.* 1250 swamped the local market and effectively saw the end of the use of more distantly-made vessels. This situation would only change in the later fifteenth century when other pottery types such as Cistercian Ware and Red Earthenwares made their first appearance. By the distinct nature of these various pottery fabrics, chronological horizons are highly visible in the archaeological record. Consequently, and in the context of this paper critically, the addition of this material to manure and its subsequent spreading on the fields affords the opportunity to explore the level and nature of manuring in this area across the period 850-1450 within more closely dated time frames.

One means by which the intensity of manuring activity might be measured is through a quantitative approach, using the central assumption that the more pottery arriving on the open fields, the heavier the application of manure. Taking the period as a whole, three distinct periods can be identified: between *c.* 850 and *c.* 1100, little if any pottery got to the fields (despite good evidence for its use in the villages under investigation); from the beginning of the twelfth century down to the mid-thirteenth century, pottery began to accumulate, albeit in small quantities, the resultant thin spreads of pottery across the fields apparently marking the extent of the arable zone and the fact that peasants were actively maintaining its fertility; from 1250 to 1400, the quantities of pottery arriving on to the fields rises by a factor of two to three from that of the preceding century and a half, and might be seen to reflect growing efforts on the part of peasant farmers not only to preserve but also to improve soil quality.[9]

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[6] See Williamson, T. *Shaping Medieval Landscapes: Settlement, Society, Environment* (Macclesfield, 2003).
[7] Hall, D., 'The origins of open-field agriculture: the archaeological fieldwork evidence', in T. Rowley (ed.), *The Origins of Open-Field Agriculture* (London, 1981), 22-38.
[8] Jones, R. and Page, M. *Medieval Villages in an English Landscape: Beginnings and Ends* (Macclesfield, 2006)
[9] Jones, R. 'Signatures in the Soil: the Use of Pottery in Manure Scatters in the Identification of Medieval Arable Farming Regimes', *Archaeological Journal* **161** (2005), 159-88.

Complicating this picture, however, are the shifting levels of pottery usage amongst the peasantry over this period. It is certainly difficult to ignore the fact that the observed exponential build up of pottery in the fields appears to mirror the ever-increasing use made of pottery vessels by the peasantry as revealed by farmstead excavations. If it is the case that over time peasants became more active consumers in wider markets, gaining greater access to larger numbers of cooking pots, storage jars, and tableware, is it simply that the late medieval dung heap was richer in pottery sherds than in earlier periods, as a consequence of more vessels being in circulation and more being discarded after being broken? If so, it would be impossible to draw any conclusions regarding the levels of manuring activity from the rise in the number of pottery sherds within manure alone. Central in unravelling this question is the examination of field assemblages (i.e. the proportion of different pottery types present in manure scatters) alongside those recovered at source (i.e. within the villages themselves). If they match, then it would appear that the ceramic manure scatters just reveal levels of peasant pottery consumption; if there are clear differences, these must then be explained by other factors. In the core study area, where such statistics are available, there is significant discrepancy between the two. The village assemblages contain proportionately more twelfth and early thirteenth century pottery than later wares. Within the fields, the situation is reversed. From this two conclusions might be drawn. First, that during the earlier period, the full potential of available farmstead waste for manuring remained apparently under-exploited, whilst in the later period it would appear that more of this detritus was assiduously collected and carted to the fields. And so it follows, that the rising levels of pottery on the fields do indeed reflect an intensification of manuring activity from the second half of the thirteenth century.

III

It is tempting to relate this increase in manuring activity directly to the state of the soil. As the open fields were continuously worked over generations, so despite fallowing cycles and crop rotations, the nutrient reserve became depleted, forcing peasant farmers to take more drastic measures to restore its fertility and maintain yields. It might equally be conjectured that the greater efforts made to spread more manure in the later Middle Ages reflect the need amongst the peasantry to produce more crops per acre to feed a growing rural, and perhaps more importantly urban, population or to generate surplus for sale in order to meet the rising demands of local and national taxation. But if these lines are adopted, then the peasant contribution to farming is trivialized. They are reduced to being purely reactive agents, their actions dictated by the dual constraints of nature and society. To explore this further it is important to examine how peasant farmers distributed manure on their dispersed holdings. If the build up of pottery scatters within the open fields can be shown to have structure, then explanations can be sought as to how and why such patterning might have been produced.

All ceramic manure scatters within any farming territory are unevenly spread, the common tendency always being that those parts of the open fields lying closer to the principal settlement received proportionally more of the manure stock than more peripheral areas. It is in the core areas that pottery sherds are found in their greatest densities. This basic distribution of this material remained constant throughout the long period under investigation, although clearly the arable zone often grew considerably over the same time. Such patterning corresponds directly to those predicted by distance decay models, reflecting the greater costs of transporting household waste to more remote parts of the open fields, and the time required to undertake such a task. Coupled with the late intake of previously uncultivated land at the peripheries of these systems, whose nutrient pool would naturally be richer than areas that had been ploughed for much longer, this drop-off effect is easily explained. Manuring at the edge was both uneconomic and unnecessary.

Against this general background distribution, more localized variations of pottery densities can be identified. It would seem that, within some field systems, some distant furlongs were selected for more intensive manuring, revealed by their relatively higher sherds counts than found on neighbouring furlongs, despite their remote location from source. Where this positive selection can be dated, it would appear that this is a later medieval phenomenon. Conversely it is possible to identify areas within the arable core, where it might be expected that manuring would be heaviest, that seem to receive far less treatment than the distance decay and other economic models would predict. These manuring blanks are clearest during the period 1100-1250, thereafter becoming progressive more blurred as these areas received manure in later periods. One possible explanation for these gaps might have been the scarcity of manure, forcing peasant farmers to make careful decisions about how they applied a limited resource. But as we have already seen, the twelfth-century farmer appears to have had access to an ample stock. Had they wanted to manure these areas they could. So why were these areas singled out for apparent neglect? The answer appears to lie in the above-average fertility of these blocks. These were parts of the open fields which cropped well and therefore required little further attention. The source of this fertility was often former human occupation, the effect of which had been to enhance the quality of the soil through the incorporation of vegetal and burnt material. The evidence comes from comparing medieval manuring levels against the background of Romano-British settlement locations. For there is remarkable coincidence between these medieval manuring blanks and Romano-British sites, a pattern which is repeated time and again in examples drawn from across the country, from Yorkshire to Somerset. Here then we see the peasant farmer making local decisions about which parts of their holdings to manure based on an intimate knowledge of the land and its relative productivity.

The contrast could not be more striking between the sparse application of manure in the period 1100-1250, including the conscious decision not to manure some areas, and the more intensive and extensive manuring of fields after 1250, including selecting some parts of the open fields for special treatment. If the early emphasis of manuring seems to have focused on balancing nutrient levels across the arable sector, rather than further exploiting already fertile zones through the addition of even more manure, by the later period peasant farmers seem to have been actively engaged both in preserving soil fertility across the whole of their holdings, and critically enhancing this in favoured places even when these lay well away from their farmsteads. A real shift in manuring strategy can be made out here, the reasons for which almost certainly lie, not with the increased availability of manure, but in the increased amount of time peasant farmers could devote to the task. As the heavy demands of owed labour services to the demesne were relaxed or were commuted to monetary payments, so tenant farmers had greater time to devote to the management of their own holdings. And if the pottery spreads can be used as a measure of the effort expended in the act of manuring, then it would appear that much of this gained time was given over to the improvement of the soil.

To appreciate the scale of this aggressive policy of soil enhancement by peasants within the open fields only requires comparison to be drawn with the demesne. Where this was farmed separately from the village fields, allowing the archaeological traces of manuring to be directly contrasted, the differences are marked. Although the principal method by which the demesne manured its fields may have been through the folding of animals onto the fallow sector, spreading dung on the hoof rather than through the collection and distribution of domestic refuse, the near absence of pottery spreads on some demesnes seems to indicate that far less attention was paid to maintaining soil quality. Indeed, this appears to be reflected in demesne accounts too where levels of manure units spread each year can be seen to drop progressively.

IV

By placing emphasis on village fields rather than the lord's demesne, and on the use made of domestically-sourced manure stocks within this part of the arable sector, the medieval peasant farmer emerges as an industrious, intuitive, and above all knowledgeable manager of the land. This should be of no great surprise for, for the peasant family subsisting on a small number of acres, the productivity of their land might quite literally be the difference between life and death.[10] The more demands placed on the peasants' time or purse, the more resourceful they became; the early drive to sustain adequate levels of fertility across the whole of their holdings giving way to a later emphasis on soil improvement rather than

[10] For an assessment of levels of subsistence see Kitsikopoulos, H. 'Standards of living and capital formation in pre-plague England: a peasant budget model', *Economic History Review* **53** (2000), 237-61.

maintenance. Manuring became not simply an act but an art. If it was the experience of many demesnes that hired labour spread muck well, whilst tenant farmers performing their labour services did not, it is quite clear that the same did not extend to their own smallholdings. Here manure was applied fastidiously and wisely. Their success, to be counted in extra bushels per acre, is rarely recorded. But, as Stone has recently shown, glimpses from the documentary record do seem to indicate that yields from some peasant land may have surpassed those harvested off the demesne.[11] If the archaeological evidence can be relied upon, this experience may have been universal and the peasant contribution to the medieval economy more substantial than currently envisaged.

[11] Stone D. *Decision-Making in Medieval Agriculture* (Oxford, 2005), 268-9.