MILLS IN MEDIEVAL ENGLAND

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Despite a large body of archaeological and historical evidence, our perception of the medieval mill remains distorted by old assumptions and misinterpretation. The selective use of documentary references has led to its being treated outside its social context: often the more exotic uses to which the mill was put have been emphasized at the expense of its incomparably more important contribution to the production of essential foodstuffs. Even its chronology has been made to fit in with pre-conceived ideas of intellectual and moral development. In part this has happened because historians and archaeologists have failed to pursue the dialogue necessary to evolve a common agenda for research.

In the English counties surveyed for Domesday Book there were 6082 mills, distributed not according to density of population or local wealth, but (with the exception of Cornwall and west Devon) according to the availability of water resources (Darby 1977, 361; Holt 1988, 5-12). Although earlier evidence for Anglo-Saxon mills is not extensive, this looks such a well-established situation that already in 1086, we may be sure, the mill had been a common feature of the English landscape for a very long time. Nevertheless, previous generations of historians have argued that the watermill was in fact a relative newcomer to England: Margaret Hodgen's (1939) analysis of the distribution of mills in 1086 rested on the hypothesis that the watermill was, in historical terms, a recent import from the Continent. The assumption that the watermill was too complex a device for the barbarous Anglo-Saxons to cope with, except in the final years before the Norman Conquest, was shared more recently by Terry Reynolds (1983, 48-51): he confidently traced the diffusion of the vertical-wheeled mill from still quite civilized Italy in the sixth century, to reach the backwaters of Europe – England and Ireland – only in the tenth and eleventh centuries. The same assumption is to be seen in the belief that the possible tidemill at Dover – built since 1066 according to Domesday Book – was necessarily a product of French technological skill, and indeed for that reason was probably the very first tidemill to be built in England (Minchinton 1979, 777-86).

If we are now more sure that the watermill was commonly used in Anglo-Saxon England, this is primarily because of the archaeological work of recent years. The evidence of excavated mills in Ireland has confirmed the wide use of the mill that early documentary sources suggest, and has demonstrated that both the horizontal and the vertical wheel were in use in the seventh century. Mills powered by the tide were amongst the earliest of these identified Irish mills (Rynne 1989; Holt 1988, 3-4; 133; Wikander 1985, 155). So much evidence for a society whose technological and social development was little different from contemporary England's puts the much smaller body of excavated evidence from England into perspective: it is clear now that the seventh-century vertical mill on the Thames and the ninth-century horizontal mill at Tamworth were unlikely to have been exceptional in any way. Roman Europe, it has been shown (Wikander 1984, 1985), made much more use of the mill than was once

believed, and in Britain the watermill was well-established by the fourth century; like the other peoples of Europe during the post-Roman centuries, the Anglo-Saxons inherited a world in which the watermill was far from being an oddity.

In studying the mills of the post-Conquest period, the historian must rely largely upon the records of the English manor. These describe in detail how medieval mills were built and operated, and how profitable they were to the lords that owned them. But data of such quality can mislead, by diverting attention away not only from those matters which escaped documentation, but also away from periods and regions that produced few usable manorial records. Thus the ability of the historian to make very precise statements about the mills belonging to the great estates obscures the fact that the documented period is so short: from Domesday Book until the end of the fifteenth century at the longest, with the most informative material coming with few exceptions from the brief phase of carefully documented demesne agriculture – between, say, 1250 and 1400. Before that time little is known about these mills beyond their numbers and their rental values as provided by the few estate surveys of the twelfth and early thirteenth centuries, and by Domesday Book. And we need to remember that the manorial bureaucracy was interested primarily in the demesne mill, a fact which for long has tended to conceal the existence of other mills, beyond the effective control of the lord, and which appear briefly in the documentation only in a full estate survey that records each individual rent (Holt 1987). So the disputes over milling gleaned from court rolls by generations of historians are disputes over the use tenants made of the manorial mill; the role played in the local economy by the independent mills remains largely unknown, as do questions of their construction, ownership and use. In fact, there are many problems surrounding the English medieval mill that the historian can scarcely begin to address, because they fall outside the scope and the chronological range of his source material. It is crucial, therefore, that hypotheses based upon historical evidence should be tested – where possible – by excavation and fieldwork.

An illustration of the inadequacy of our documentary sources is the historians' inability to chronicle the disappearance of the horizontal-wheeled mill from England. Its presumed popularity in the Anglo-Saxon period was short-lived in historical terms, for by the later Middle Ages this simpler but cheaper mill had gone – or at any rate it was not the design employed for the manorial mill. From the copious lists of mill repairs and the occasional details of the building of new mills which are contained in the manorial accounts that exist in great numbers from the thirteenth century onwards, we know a great deal about the construction of these seigneurial mills; but we know nothing about the construction of the mills that remained, effectively, in the hands of their peasant tenants (Holt 1987). The documentation we have can tell us nothing about the process by which the change from the horizontal to the vertical wheel came about, how recent that change was in the thirteenth century, nor what regional variations there might have been in the process.

Yet if we could extend – by means of excavation – our knowledge of the eleventh-century mills listed in Domesday Book, a start might be made in answering these questions. In so doing, we might gain new insights into

the extent to which lords in the post-Conquest period reorganized their estates to enhance their profitability. The Anglo-Saxon mills so far identified have been chance discoveries, their sites having fallen into disuse; sites that continued in use must in most cases have experienced the destructive effect of later replacement and enlargement of both buildings and water-control systems. Comparison of Domesday Book with later documentation can lead us to mills that – in existence in 1086 – were subsequently abandoned. To take a single well-documented example: in the relatively dry, flat county of Huntingdonshire, Domesday Book recorded thirty mills on the Great Ouse and the Nene, with seven low-value mills at Kimbolton, Leighton, Spaldwick, Broughton, Wistow, Upton and Catworth on the lesser streams (Farley, ed., 1783, 203-207b). Yet when the Hundred Rolls survey of the county was made in 1279, watermills were to be found only on the two major rivers, while all of the seven marginal mills had been replaced by windmills (Illingworth and Caley, eds., 1812-8, ii, 591-687). Thus even in tiny Huntingdonshire seven eleventh-century mills wait to be discovered, and we know their approximate locations. Whether it is possible to go beyond that, actually to pinpoint their sites, will remain a matter for conjecture in the absence of any serious programme of fieldwork to identify them. And although for most counties there is no convenient Hundred Rolls survey, the numerous surveys and extents of individual manors from the thirteenth century together present significant numbers of mills recorded in 1086 but never again.

The technological innovation behind this replacement of low-value mills was not just the widespread abandonment of the horizontal wheel in favour of the vertical wheel. As we have already seen, in Huntingdonshire it was the windmill that was readily adopted as an alternative to watermills that had evidently never been more than marginal enterprises. Where water-resources were satisfactory, the watermill was always preferred to the windmill, undoubtedly in recognition of its greater consistency and lower operating costs; but the successful harnessing of windpower brought mechanical milling for the first time to many communities, as well as enabling lords to replace those of their watermills which were unsatisfactory – and undoubtedly thereby to increase their revenue from milling. By 1300 the windmill was in use throughout England, and in some regions – particularly East Anglia – its numbers easily exceeded those of the watermill (Holt 1988, 26-7). The windmill's chronology, unlike that of the various forms of the watermill, is well-established from documentary sources – so well-established, indeed, that little credence can be given to a recent and largely fanciful account of its introduction to twelfth-century England (Kealey 1987). We can now be certain that within fifteen years of its first recorded appearance in 1185 the windmill was to be found along the length of the east coast, and along much of the south coast, and for a considerable distance inland (Holt 1988, 20-1, 171-5). Yet it may be that for some time the windmill was not to be found in any great numbers; certainly the major lords turned to it only in the years after 1200, as if they were at first mistrustful of its potential as a revenue-earner. Even the bishops of Ely, their manors distributed throughout East Anglia and the Fens where watermilling was frequently impossible, made little use of the windmill until after 1220. Then they took to it with all the fervour of the convert, so that by 1250 this large estate now had some 32 windmills by contrast with the four of thirty years before (Holt 1988, 21-33). Thereafter there was little need

for new windmills, and when after 1350 the demand for milling receded as the population fell it seems to have been windmills in particular that were vulnerable. Their owners ceased to maintain or re-build them, a trend that was reinforced by the renewed slump in mill profits that began by 1400 in some districts, and which continued throughout the fifteenth century (Holt 1988, 159-64).

Interestingly, it has proved far from easy to relate the quite large number of excavated medieval windmill sites to this chronological profile. The main problem has been the difficulty in dating the meagre remains of post mills, which were unusual structures in that they literally had no contact with the ground except through the single post on which they turned. Sometimes windmill sites are marked by a massive post-hole from which radiate the four slots that held the base of the supporting pyramid of timbers; more usually only evidence of the horizontal timbers, set cross-wise, remains, the post itself having rested upon them (Holt 1988, 137-42). Without any accompanying debris of domestic occupation, such traces have in the past been virtually impossible to date with any degree of precision. How realistic now, however, is the prospect of an accumulating body of dendrochronologically-determined dates from surviving foundation timbers? If a dating sequence to compare with that derived from documentary sources could be produced, it would at last demonstrate whether or not the variations in construction of medieval windmill foundations represented a genuine process of improvement over time; though whether we could go on to deduce any corresponding development in the design of the mills themselves remains doubtful. It seems (to this historian) impossible that archaeological techniques will ever advance very far our knowledge of the structure of the post mill.

Not lack of evidence but the misapplication of it has hindered our understanding of the extent to which waterpower was applied to industrial processes other than corn-milling. Documentary references to the adaptation of the mill for working metals, for grinding bark and particularly for fulling cloth are not uncommon (Reynolds 1983, *passim*), although a general failure to place these references into a wider context and to make any serious assessment of the economic impact this mechanization might have had has allowed any number of exaggerated views to be expressed. It is deeply unfortunate that archaeologists and historians, with their expertise in handling the different sorts of medieval evidence and with their specialist knowledge of medieval society and material culture, have failed to challenge preposterous but often well-publicised claims for the extent to which medieval industry was mechanized. The view that the Middle Ages underwent a power revolution has often been expressed, along with the claim that a virtual industrial revolution occurred, involving widespread mechanization (Smith 1980, 38-9; Reynolds 1984, 108-16). Assertions of this sort by writers who themselves have used no primary evidence, but instead have relied on secondary sources written by others of like mind, are emphatically no substitute for a rational and informed dialogue between all those - from whatever discipline - able to contribute the results of their own original research.

The conclusion to be drawn from documentary evidence, that industrial mills - despite their high profile - were in fact both sparse on the ground and individually quite short-lived, needs to be refined and tested.

The scatter of references to mills that hammered iron or worked the bellows of forges, or which sharpened knives, or ground bark for tanning, remains just that – a scatter; we lack a systematic survey of the distribution of these mills in the landscape, and of their dating. Mechanization of the forges of the iron industry of the Weald was beginning only at the very end of the fifteenth century (Cleere and Crossley 1985, 106-8, 309-67). How typical was this late application of waterpower to smelting, while on the other hand how typical was the mill that the monks of Bordesley Abbey were using to work up iron into finished articles as early as the late twelfth century (Youngs, Clark and Barry 1986, 153)? What contribution – if any – did this classic example of Cistercian enterprise make to economic growth? Is it to be seen as a step along the winding road to industrialization, or was it rather a curiosity, one of history's many false starts?

Among these industrial mills, it seems that the only economic success was the fulling mill. These were common where water resources were plentiful, although where access to waterpower was limited it was reserved for corn milling, which was always more profitable (Holt 1988, 152-8). But the historical sources may be partly at fault in this respect. Because woollen cloth was manufactured in every district of England, we may suppose that the potential distribution of the fulling mill was as wide as that of the corn mill; the use of waterpower for smelting metals, by contrast, would have been localized in the ore-producing parts of the country which already specialized in smelting. The mountainous districts of the west and north that were rich both in ores and in waterpower are poorly documented for the medieval period, and so whilst the fulling mill will be, by-and-large, as well-represented in the surviving documentation as the corn mill, the same cannot be said for mills used in smelting – which inevitably must be under-recorded. In this case, and perhaps also in that of some other applications of waterpower to industrial processes, the documentary record has an inherent bias that fieldwork and excavation do not. Only a combined exercise by both disciplines will determine finally the chronology of the various types of industrial mill in the Middle Ages, the extent to which they were used, and – we may hope – the contribution that mechanized enterprises made to total production.

Given the range of key questions about the medieval mill that still remain to be answered, therefore, a concerted effort by both archaeologists and historians is called for. That is nothing new, of course: the work of recent years which has taken our understanding of the medieval economy and society so much further than would once have been thought possible has been an achievement in which both disciplines have shared. But historians and archaeologists are used to addressing separate problems each in their own individual way; here are specific problems that require an agreed, joint agenda for research. Excavation, fieldwork and documentary research need to be co-ordinated – or at least conducted with an awareness of the common end in view – if we are to make significant further progress in understanding the changing role of the mill in the Middle Ages. Much of the speculation of the past about medieval man's use of, and attitudes to, windpower and waterpower has now been shown to be incorrect; nevertheless, we have not yet constructed a coherent alternative to put in its place. Much research still has to be done, and many questions answered, before a balanced appreciation of the mill prevails.

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