

# MORTALITY OF RURAL LANDLESS MEN BEFORE THE BLACK DEATH: THE GLASTONBURY HEAD-TAX LISTS

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## Introduction

Demographic studies of medieval English villages are often considered impracticable, since nearly all surviving documents were intended to help manorial lords control their property and supervise their local managers, not to record every birth or death. Only rarely did the king demand a lay subsidy from his subjects, enabling us to enumerate the better off, though not the whole population. Not until Thomas Cromwell began to create a local government system based on ecclesiastical parishes did the state concern itself with the registration of births, marriages and deaths, thereby providing us with the raw material for many local population studies. Demographic work relating to the period before 1538 depends on the survival of unusual documentation, or ingenious interpretation of indirect evidence, with a clear recognition of the assumptions behind any analysis; the validity of the results will always be limited, to social classes, age groups, regions or time periods.

Those demographic investigations that have dealt with the period 1300–1348 have been comprehensively reviewed by Richard Smith. He concludes that 'in many respects this review . . . focusing both upon population trends and the possible operation of Malthusian checks, makes for depressing reading. Our knowledge of demographic processes, if not trends, is still especially thin and uncertain'.<sup>1</sup> The disputed relationship between demography and economics remains unclear: that is, to what extent were population levels a consequence of economic progress? Were the causes of population trends exogenous (economic or climatic) or endogenous (the Malthusian checks of malnutrition and disease, or Postan's theory of soil exhaustion)? Where progress has been made is in estimating population trends at a number of manors, often using the technique pioneered by Hollingsworth of 'replacement rates', based on how many sons were living at the time of their father's death.<sup>2</sup> It seems clear that these trends were not consistent: at Halesowen in the West Midlands and Coltishall in Norfolk numbers increased until 1349, whereas on certain manors in Suffolk and Essex the population declined after about 1315.<sup>3</sup> At present it is impossible to decide which of these patterns was characteristic of rural England as a whole, and in any case the difficulties of deriving and interpreting replacement rates cast some doubt on their reliability.<sup>4</sup>

The estimation of pre-1348 mortality rates is also beset with problems and very little has been achieved. Postan and Titow used the excellent series of bailiffs' accounts for the Bishop of Winchester's manors to count the numbers of heriots paid annually between 1245 and 1348. If a heriot were paid only on a tenant's death, mortality rates should be proportional to numbers of heriots and to the number of tenancies. In practice, heriots might also be paid for *intervivos* land transfers, and the number of tenancies recorded in 1321 (1,725) is unlikely to have remained constant for a century. In this context, the mean rate of 84 heriots a year in the 1320s implies that the crude death rate among tenants was at most 84/1725, or 49 per 1,000, giving an expectation of life at the mean age of entry to property of at least 20 years.<sup>5</sup>

The publication of Razi's *Life, marriage and death in a medieval parish* in 1980 was the first realistic attempt to derive reliable demographic data from the information normally recorded in manorial court rolls. Razi used the records of 1,667 court sessions between 1270 and 1400 for the large manor of Halesowen in Worcestershire, to collect information on 5,002 named individuals, mentioned on average 15 times each. With enormous diligence he reconstituted 677 families and was able to distinguish many of the identically named persons, as well as identifying those villagers who bore more than one surname. Names which he could not positively identify were disqualified, to reduce the likelihood of counting any individual more than once. By adopting this laborious procedure he was able to overcome many of the uncertainties endemic in medieval manorial records. His analysis of the resulting data produced a variety of important demographic estimates, among which mortality will be referred to later.<sup>6</sup> This work initiated a protracted debate, led by Richard Smith and L.R. Poos, about the validity of Razi's assumptions and whether court rolls, by their nature, are likely to conceal the existence of many of the poorest inhabitants, thus precluding an unbiased reconstruction of the village community. Smith and Poos also criticize Razi's assumptions about age of entry to property and marriage, which they consider unwarranted and likely to produce invalid estimates of expectation of life at age 20. Their debate with Razi has been of great value in exposing the real difficulties inherent in court roll data, but in spite of these, court rolls will continue to be important for understanding the life of local communities.<sup>7</sup>

Population trends at the manorial level have also been derived from the rarely surviving records of tithings, whose members were liable to individual payments of a halfpenny or a penny. Titow analysed the total annual payments (of one penny per capita) between 1209 and about 1325 from every male aged twelve or over who belonged to the manor of Taunton's tithings.<sup>8</sup> As Titow then remarked, this was 'the only piece of statistical evidence on the population changes over the thirteenth and early fourteenth centuries which is non-tenurial in character', and this is still true for the period before 1270. However, he was only able to convert the number of adult males into total population by assuming that they constituted 35 per cent of the total, a figure he derived from the 1851 (*sic*) census. Good estimates of medieval population totals will always remain elusive, because children under twelve so rarely appear in medieval records; estimates of mean household size can only be

guessed at. Tithing records have also been used by Postles for Kibworth Harcourt in Leicestershire (1280–1450) and by Poos for six manors in Essex during a similar period.<sup>9</sup>

In the study that follows estimates are obtained for the mortality rates of a particular class of men, who are listed by name in the court rolls of the manors owned by Glastonbury Abbey, from the late thirteenth century until after the Black Death.<sup>10</sup> These lists were noticed by M.M. Postan in the 1950s, when he assumed that they showed the larger manors were sending out every year ‘hundreds of unmarried young men in search of employment elsewhere’. He was never able to undertake a proper investigation of their significance.<sup>11</sup> Recent work by Lori Gates and Harold Fox has shown that, in general, they are lists of landless men aged 12 and over, living on the manor, who in most cases remained on the lists until they died or acquired property. Only a handful of such lists survive for most of the Glastonbury manors, and from these it is only possible to obtain crude death rates. However, the two adjacent Wiltshire manors of Longbridge Deverill and Monkton Deverill, which Gates studied, have an excellent series of court rolls containing the relevant lists, and for these manors there is sufficient information to allow expectation of life (at age 20) to be estimated, not just the crude death rate. There being so little published work on the Glastonbury lists, it is necessary to begin by describing in some detail what they contain and how this may be interpreted.

### The Glastonbury head-tax lists

The records of the Easter hallmoot courts for the manors owned by Glastonbury Abbey in the late thirteenth and the fourteenth centuries always begin with a list of men called *garciones*. *Garcio* was a term implying low status and menial work, that only later came to mean a youth; the records suggest that these men were liable to pay a *capitagium garcionum* or annual head-tax to their lord. Harold Fox has published a definitive introduction to the significance of this tax and has pointed out the great potential value of the lists to students of the period; his own work on them has begun with a ground-breaking study of the extent of service in husbandry on two contrasting manors, Pilton and Ditcheat. An earlier study by Lori Gates of the two Deverill manors supports Fox’s interpretation of the lists but draws somewhat different conclusions relating to the availability of labour.<sup>12</sup>

The Glastonbury records do not appear to contain any complete and explicit statement about who was liable to pay the tax (in the account rolls usually referred to as *chevagium garcionum*, though ‘chevage’ normally referred to villeins who had left their manor). Fox has found for a variety of English manors documentary references, dating from the twelfth century onwards, to annual taxes on landless men. Taken together with the brief annotations on the Glastonbury lists that were intended to justify exemptions from tax, Fox derives an explanation that is both convincing and useful. In essence, the Glastonbury manors exacted an annual tax at Hocktide (the period after Easter) on the males attached to the manor, aged 12 and over, who did not hold property (the *garciones*). Those exempted (but still listed) included paupers, the sick or blind, those in the lord’s service, and young men working

for their parents (but only one of their sons was exempted at a time). Some of the later lists (for example, that for Buckland manor in 1350) describe the work done by named manorial employees.<sup>13</sup>

The court roll was evidently prepared before the Hocktide hallmoot with a list of names based on the previous year's list, and was then amended in court: first, to record the payments charged to each man; second, to delete (with an abbreviated explanation) those who were no longer liable because they held property, or had died, or had left the manor; third, to explain exemptions for the ensuing year; fourth, to add the names of those newly liable. The total head-tax payment at this court was also recorded in the annual account roll. All this detail strongly suggests that, contrary to Postan's assumption, the named men were actually resident on the manor unless stated otherwise. Changes in head-tax liability occurring after the Hocktide court were normally noted on the Hocktide list, but they can be distinguished from those presented to the court. The beginning of the head-tax list for Sowey manor in 1307, that illustrates some of these features, appears in Figure 1a (see p. 10).

References elsewhere in the court rolls provide confirmation of some of the details in the lists; in particular, the fines paid on entry to villein property may relate to a man who was later exempted from head-tax, because he held property. There are also records of youths aged 12 or more being sworn in, who then appear for the first time on a head-tax list. Fox concludes that *capitagium* in this context was a tax on labourers, normally resident on the manor and normally landless. It was rated according to their ability to earn wages, for the tax paid by individual men appears to increase with age, and none is paid by a son working for his father or widowed mother. 'Those who were outside their parents' homes must in many cases have been servants serving in the homes of tenant farmers' writes Fox.<sup>14</sup> The rarity of demographic data on this class of medieval people, who must have been among the poorest for whom we can hope to find records, together with the survival of numerous head-tax lists for the Deverill manors, makes the Deverill evidence particularly valuable.

### **The quality of the Deverill evidence**

The manors of Longbridge Deverill and Monkton Deverill lie in south-west Wiltshire near Warminster, and they were unusual among Glastonbury's possessions in being managed separately by the abbey's chamberer; perhaps for this reason their records have survived more completely.<sup>15</sup> The Poll Tax of 1377 listed 312 adults on the Deverill manors. Two kinds of court were held there, at least twice a year for each manor: the 'hallmoot' that dealt with village transactions, especially property transfers, and (on the same day) the 'hundred' court that dealt with disputes, assizes of bread and ale, and sworn entries to the tithing (elsewhere known as the View of Frankpledge). At the Michaelmas hundred court the tithings paid a fixed sum of money called the common fine. In the Easter hallmoot records there are 43 head-tax lists for Longbridge Deverill that date from 1295–1350 and 42 for Monkton Deverill.<sup>16</sup> Together they name nearly 500 different men, and some of these names appear over 40 years. In the 56 years 1295–1350 there are only three gaps of

Figure 1a Beginning of head-tax list: Sowy manor 1307

# ff Sowy, halthun to hakerthec,

cc. d.	aspiths wode fithem wode
cc. p.	cc. d. de sowy.
cc. d.	cc. p. m. Alward.
cc. m. d.	cc. d. m.
cc. p.	cc. d. m. fithem
cc. d.	cc. p. m. Emma
cc. d.	cc. d. m.
cc. p.	cc. d. m. fithem
cc. d.	cc. p. m. fithem de sowe
cc. d.	cc. p. m. fithem de sowe
cc. m. d.	cc. d. m. fithem
cc. p. d.	cc. d. m. fithem fithem
cc. d.	cc. p. m. fithem
cc. d.	cc. p. m. fithem

Figure 1b Beginning of head-tax list: Christian Malford manor 1348

**H**eremalforde **H**allm t'mm

pamp	Adm de Haghele
my s	<sup>my s</sup> Giltus le Duncro
ij s	<sup>my s</sup> Johannes Gouch
ij s	<sup>my s</sup> Giltus le capput
ij s	<sup>my s</sup> Giltus Wefelyu
ij s	<sup>my s</sup> Adm f' de ems
ij s	<sup>my s</sup> Giltus de de f' f' d' m' s' t'
ij s	<sup>my s</sup> Giltus Parnold
my s	<sup>my s</sup> Rynulphus d'neyth
my s	<sup>my s</sup> Adm f' de hony f' d' y'
my s	<sup>my s</sup> Thom f' de Wata d' m' l' o' c'
my s	<sup>my s</sup> Adm de de d' l' e' f' t' e' d' e'

one year (1297, 1313 and 1330; also 1299 for Monkton), and six of two years (1301–1302, 1304–1305, 1310–1311, 1335–1336, 1346–1347). The rolls are well preserved and legible, with the unfortunate exception of 1348 that records the subsequent deaths from plague. The head-tax lists were written in more or less the same order from year to year, apart from an important reordering in 1329–1331, so that names can be easily linked to those on earlier lists to determine the date when an individual first appears. The problems caused by identically named but different men appearing in court rolls are thus avoided, as are the occasional changes of surname.<sup>17</sup>

Losses from the lists due to death and land acquisition were normally noted twice: first as a post-Hocktide addition to the roll, and then in the following year as a reason for non-payment of head-tax (though 1349 is an exception to this, with a revised list, almost devoid of deaths). For this reason, only the second year of the two-year gaps (1302, 1305, 1311, 1336 and 1347) must, for want of information, be excluded from mortality calculations, and it can be assumed that very few death records were lost in single-year gaps. More seriously, death and land acquisition do not account for all the losses: though some are explained by the word *recessit* (he has left), other losses are unexplained and only detectable by comparing lists for consecutive years. It is assumed here that the head-tax lists would nearly always record deaths and land acquisitions explicitly, because they would be known locally, so that their calculated frequencies (as a proportion of the number of men liable to head-tax) should be unaffected by the losses from 'other causes', which may include permanent exemption and emigration.

The exceptional demographic value of the head-tax lists lies primarily in the information they provide about each man's age, if it can be safely assumed that young men first entered the list at the Hocktide following their twelfth birthday. The best evidence for this comes in the breach rather than the observance of the rule: the 1338 Longbridge list gives the ages of ten named men, ranging from 12 to 22, who entered the list for the first time in 1338. The court record states that the four who were over 14 were liable for arrears that with their 1338 payment amounted to 2d. for each year over 12; four of the remaining six, aged from 12 to 14, were working for their father and were excused payment.<sup>18</sup> The only other example of evasion was at Hocktide 1312, when the hundred court fined the Longbridge tithing 2s. for concealing William Leveboye and Edward Cleke for the previous eight years; William and Edward were fined 3d. each, but their ages were not specified.<sup>19</sup> There are quite frequent references in the hundred courts to imminent additions; in 1307, for example, 'Edward son of Walter atte Comb is entered in the tithing and chevage to the Lord is assessed at 3d. a year'.<sup>20</sup>

### **Migrant workers**

It cannot be assumed that everyone liable to head-tax was the son of a local man, and in any case the resident freemen and tenants cannot be securely identified in the absence of contemporary surveys of the Deverill manors. We therefore need some way of distinguishing between local men and immigrants in the head-tax lists. Unlike local youths who entered the tithing aged 12, after

swearing an oath of fealty to the king, and who then became the tithing's responsibility, immigrant workers might be of any age and they would be expected to find their own sureties or pledges who would be responsible for their conduct and debts. Everyone except vagrants and men of rank was required (after a year and a day) to be either in a frankpledge tithing, or in the 'mainpast' or personal pledge of a responsible local man; the word 'mainpast' refers to a household with living-in servants, fed by their employer's hand, but it also included manorial shepherds, ploughmen and carters.<sup>21</sup> The basic assumption of this study is that a head-tax payer who appears in the lists with a pledge (at any time) may have been an immigrant worker, and therefore much older than 12 years at his first appearance in the lists.

Evidence of pledges appears both in the hundred courts and the hallmoot head-tax lists. For example, the Michaelmas 1313 hundred court states that 'John Maynard and John Sarier took into their frankpledge (*in liberam plevinam suam*) John le Sarier, paying the Lord 4d. a year at Hocktide', and the head-tax lists confirm that John Sarier junior was charged 4d. between 1314 and 1329; his pledges were the two named men until 1317, and a Robert atte Mulle from 1323 to 1329.<sup>22</sup> On the other hand John le Rutherherd (possibly the village cowherd) only appears on the head-tax lists, pledged by the whole hallmoot, and paying 2d. from 1326 to his death in 1336.<sup>23</sup> The 1331 list clearly recognizes the different status of pledged *garciones*, since the 1329 list has been re-ordered to place them all at the end of the list.<sup>24</sup>

Pledged men also appear in the hundred courts as liable to pay 'while they wish to remain' (*dum stare voluerint*).<sup>25</sup> On the head-tax lists this often appears as '*dum stare*' or even just '*dum*', but the annotation disappears generally by 1320. Their payments were often not in cash but in goods, either half a pound of beeswax or a pound of cumin, replaced from 1315 onwards by 3d. in cash. The 1299 hundred court records that 'Thomas son of William Sutor gives one pound of cumin while he wishes to remain' and names his two pledges.<sup>26</sup> Another reason for paying wax or cumin appears in 1280, when seven men paid wax and eight cumin '*pro advocato habendo*', which Latham explains as 'rent paid for the protection of new settlers on lord's demesne'.<sup>27</sup> Only one of the 15 men appears on the contemporary head-tax lists, which appears to confirm that their payments were for rent rather than head-tax.<sup>28</sup>

It was also possible for villeins to purchase their right to move freely. Thomas Randen of Longbridge entered the lists in 1315, probably aged 12, and was still alive in 1350. At the Hocktide hallmoot in 1328 he paid 20s. 'so that he may serve wherever he wishes for the rest of his life' (*deservire possit quocumque voluerit*), and after 1328 he paid 6d. in head-tax.<sup>29</sup>

### The head-tax data

A quantitative description of the head-tax data may begin with the numbers on the lists for all the Glastonbury manors, excluding the two Deverills. For each manor there are lists for a number of scattered years, but we have comprehensive data for six years: 1307, 1308, 1313, 1315, 1346 and 1350, though not

all manors have data for all six years. Table 1 summarizes the numbers of men recorded as liable for tax in the years before the Black Death, together with the number of deletions from the lists due to death or property acquisition. Because 1307 and 1308 were consecutive years it is possible to check whether losses from the 1307 lists were indeed removed from the 1308 lists; this check shows considerable duplication (see Table 1), which when corrected brings 1308's estimated mortality more or less into line with the other years. It is a strong reminder, however, that individual years' data cannot be checked, and that calculated mortality rates may therefore be inaccurate. For the 11,132 named men on these five lists, the crude annual mortality rate was 23 per 1,000, and 23 per 1,000 also left the lists to take up land.

The surviving manorial extents for the Glastonbury manors show that the total number of *garciones* was of the same order as the number of tenants. According to Postan, the mid-thirteenth century extents of 32 manors record 2,046 customary tenants; the 1307 and 1308 head-tax lists for the same manors produce about 2,200 resident *garciones*. A detailed analysis by Harold Fox of the labour requirements on two manors c.1315 illuminates the factors that probably determined whether there were more or less resident *garciones*, relative to the number of tenants. In short, it appears that manors with larger villein holdings, or heavier labour services, attracted immigrant *garciones* from manors with less need for labour.<sup>30</sup>

There are 30 manors which have head-tax lists for each of the four 'years' 1307 or 1308, 1313 or 1315, 1346 and 1350. The total numbers of *garciones* in these 'years' were 2,220, 2,325, 1,895 and 560 respectively, from which average annual rates of change of 0.7 per cent increase between 1307 and 1315, and 0.6 per cent decrease between 1315 and 1346, can be estimated. Numbers increased at ten of the manors between 1315 and 1346, while at five the number of men more than halved, with Shapwick (64 down to 20) the most extreme case.<sup>31</sup> Assuming that the number of male villein holdings remained fairly constant during this period, the total adult male population would have decreased between 1315 and 1346 by about half the rate of the *garcio* population, a fall of about 10 per cent in 30 years.

Turning next to the much more continuous and reliable information for Longbridge and Monkton Deverill, the numbers involved are summarized in Figure 2 (p.16). This shows for each five year period from 1295 the maximum number of men liable in that period. This approach eliminates defective lists such as those for 1307–1309 when most of the pledged men were excluded temporarily. The three graphs in Figure 2 show how the total was divided between unpledged residents, those who paid in wax or cumin, and those who were pledged and paid cash. The number in the latter two categories increased by about one a year between 1295 and 1329, while the unpledged residents rose by about two per year until 1316. This rapid increase (in total about 3 per cent p.a.) implies a population rising faster than could be absorbed by available tenancies. Figure 3 (p.16) shows the proportion of the total number of *garciones* who were unpledged local men; in this case the *minimum*

**Table 1** Losses from head tax lists, all Glastonbury manors

Year	Total names on list	Losses by :		Rate per 1,000 man years	
		Death	Tenure	Death	Tenure
1307	2,227	49	56	22.0	25.1
1308 *	2,189	55 (67)	100 (116)	25.1	45.7
1313	2,352	55	43	23.4	18.3
1315	2,309	54	42	23.4	18.2
1346	2,055	41	18	20.0	8.8
Totals	11,132	254	259	22.8	23.3

**Notes:** Head-tax lists for the Deverill manors are excluded. Each year may include a different group of manors.

\* The figures in brackets are those recorded in 1308; they include some duplication of losses recorded in 1307.

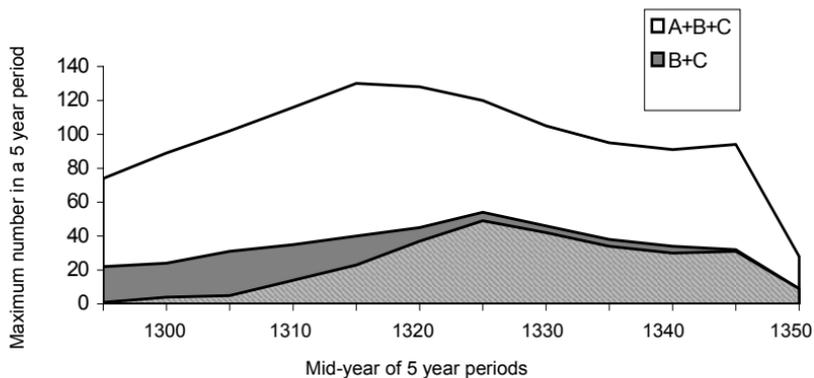
**Source:** Glastonbury estate court rolls in Longleat archives.

percentage in each five year period is used. The situation was evidently stable until 1317, when famine decimated the population and allowed many *garciones* to acquire tenancies. This encouraged a temporary influx of migrant workers, so that the proportion of unpledged *garciones* fell from 70 per cent pre-1317 to 54 per cent in 1327; by 1348 it had almost recovered its former level.

Tables 2 and 3 (pp.17–18) analyse for 11 five-year periods the flows in and out of the annual lists for Longbridge and Monkton respectively. *Garciones* who were recorded as having pledges (at any time) are distinguished from those without pledges. The year 1317 is shown separately because of the exceptional mortality at Longbridge, though not at Monkton, in that year. Based on the data in Tables 2 and 3 for 1296–1345, but excluding any *garciones* who died in 1317, Table 4 (p.19) shows total losses, average annual losses, and rates of loss per 1,000 man-years for the combined manors, together with a simple measure of the precision of these statistics. In all three tables, losses due to death, land acquisition and ‘withdrawal’ are distinguished; the third category may imply emigration. It is concluded that the crude death rate for unpledged *garciones* was about 20 per 1,000, and for those who were pledged, 21 to 22. It will be noticed that pledged men seldom acquired land and withdrew much more frequently than unpledged men, as we would expect if pledges imply immigrants.

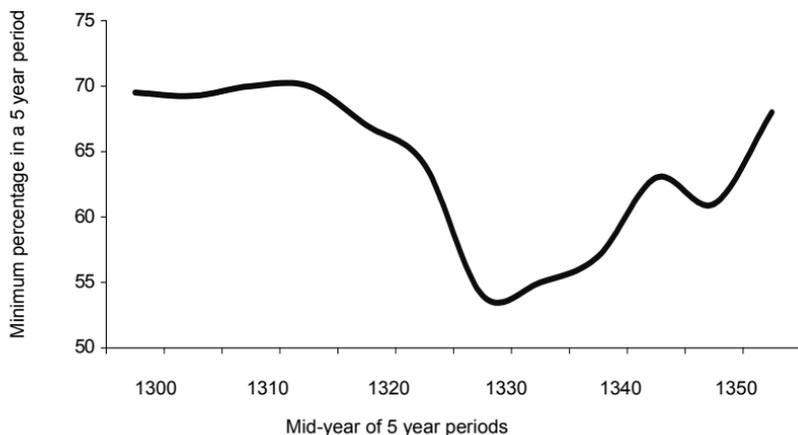
In the discussion that follows, the Deverill head-tax data will be firmly divided between the unpledged men (many of whom are known to be the sons of established families) who joined the head-tax lists soon after they were 12, and those who were pledged or paid in goods or whose names were annotated ‘*dum stare*’, whose age cannot be reliably determined. Much of the analysis will be focussed on the former group.

**Figure 2** Number of men liable to Head-tax. Deverill Manors



**Notes:** A = Unpledged men B = Paying in goods C = Other pledged men

**Figure 3** Proportion of unpledged men to total number liable to head-tax



### The unpledged *garçiones*

Before starting on the demographic analysis, it is worth putting the head-tax in an economic context, by recording the relationship between age and the amounts paid in head-tax by the unpledged men. Table 5 (p.20) refers to 145 Longbridge Deverill men who entered the lists after 1295, whose payments are tabulated 1, 5, 9, 13 ... years after entry. The proportion of those liable who were excused because they worked for a parent fell rapidly, from 41 per cent in year 1 to one third of this in year 5, and a tenth in year 13. For those who

**Table 2 Gains and losses: Longbridge Deverill****A: *Garciones* without pledges**

Years	No. of lists	Mean no. of men	Gains	Losses			?
				M	T	R	
1296-1300	4	32	14	6	3	0	11
1301-1305	1	44	17	0	2	0	2
1306-1310	4	44	10	5	4	0	8
1311-1315	3	57	31	0	3	0	2
1316-1320	5	43	15	16	18	0	2
1321-1225	5	45	13	9	4	0	1
1326-1330	4	41	7	4	6	1	1
1331-1335	4	37	5	0	4	2	1
1336-1340	4	41	15	2	2	1	1
1341-1345	5	45	16	7	4	1	0
1346-1350	3	23	3	16	13	0	8
TOTALS	42	41	146	65	63	5	37
1317		41	2	13	2	0	2

**B: All other *garciones***

Years	No. of lists	Mean no. of men	Gains	Losses			?
				M	T	R	
1296-1300	4	16	10	1	0	1	8
1301-1305	1	21	8	1	0	0	6
1306-1310	4	24	19	1	1	1	16
1311-1315	3	32	27	2	0	4	3
1316-1320	5	30	16	11	2	7	0
1321-1225	5	37	14	3	1	8	0
1326-1330	4	38	13	2	2	5	6
1331-1335	4	30	5	3	0	4	3
1336-1340	4	25	1	4	0	3	0
1341-1345	5	17	10	4	2	6	0
1346-1350	3	11	5	12	1	1	8
TOTALS	42	26	128	44	8	40	50
1317		28	2	5	1	3	0

**Notes:** 'Gains' are newly listed men in this period. 'Losses' include deaths (M for *mortuus est*), property acquisition (T for *habet terram*), withdrawal (R for *recessit*) and unexplained (?). When a man is temporarily absent from the lists, the Gains and Losses are not altered; such absences occur chiefly during 1307–1309 for men with pledges.

**Source:** Longbridge Deverill court rolls in Longleat archives.

**Table 3 Gains and losses: Monkton Deverill****A: *Garciones* without pledges**

Years	No. of lists	Mean no. of men	Gains	Losses			?
				M	T	R	
1296-1300	3	12	14	1	4	1	7
1301-1305	1	21	6	0	1	0	2
1306-1310	4	21	13	3	2	0	8
1311-1315	3	27	11	1	0	0	2
1316-1320	5	28	9	2	5	0	0
1321-1225	5	31	7	5	3	1	2
1326-1330	4	28	6	3	2	2	5
1331-1335	4	21	3	4	1	1	0
1336-1340	4	16	3	0	1	0	5
1341-1345	5	14	7	2	2	2	0
1346-1350	3	11	4	8	2	1	2
TOTALS	41	21	83	29	23	8	33
1317		27	2	2	1	0	0

**B: All other *garciones***

Years	No. of lists	Mean no. of men	Gains	Losses			?
				M	T	R	
1296-1300	3	2	1	1	0	0	1
1301-1305	1	4	3	0	0	0	1
1306-1310	4	2	0	0	0	0	2
1311-1315	3	2	1	0	0	0	0
1316-1320	5	3	1	0	0	0	0
1321-1225	5	4	3	0	0	1	0
1326-1330	4	12	11	1	0	2	1
1331-1335	4	12	3	1	0	1	0
1336-1340	4	10	0	1	0	0	2
1341-1345	5	9	4	1	0	3	0
1346-1350	3	6	0	3	1	1	1
TOTALS	41	6	27	8	1	8	8
1317		2	0	0	0	0	0

**Notes:** As for Table 2.**Source:** Monkton Deverill court rolls in Longleat archives.

**Table 4 Mean rates of loss 1296–1345: Longbridge and Monkton Deverill combined**

	Man-years	M	T	R	Precision
<i>Unpledged garciones</i>					
Totals	2,763	55	68	12	1
Per year	61.4	1.22	1.51	0.27	0.02
Per 1,000 m.y.	1,000	19.9	24.6	4.3	0.4
<i>Other garciones</i>					
Totals	1,459	32	6	43	1
Per year	32.4	0.71	0.13	0.96	0.02
Per 1,000 m.y.	1,000	21.9	4.1	29.5	0.7
<i>All garciones</i>					
Totals	4,222	87	74	55	1
Per year	93.8	1.93	1.64	1.22	0.02
Per 1,000 m.y.	1,000	20.6	17.5	13.0	0.2

**Notes:** Totals are divided by 45 (not 50), because the years 1302, 1305, 1311, 1317, and 1336 are excluded from the totals.  
 'Losses' include deaths (M for *mortuus est*), property acquisition (T for *habet terram*) and withdrawal (R for *recessit*)  
 The 'precision' shows the effect of adding 1 to M, T or R.

**Source:** Tables 2 and 3.

paid, the median payment was 2d. in year 1, 3d. in year 5 and 4d. in year 9 and thereafter. The mean payment was 2.65d. in year 1, rising to 4.8d. in years 13 to 17 and then very slowly declining with age to around 4.0d. This steady increase until a man was in his mid-twenties, followed by a slow decrease in middle age, is likely to reflect the wages earned by labourers.

On the Deverill manors, as for Glastonbury manors generally, the unpledged *garciones* had roughly equal chances of eventually acquiring land or dying first. Records in the court rolls of the entry fines paid by new tenants can be linked to 37 of the listed *garciones* who acquired land, whose ages can be estimated. Fifteen (40 per cent) entered a property by marrying a widow, who had free-bench after her husband's death. The time elapsed from entry to the head-tax lists to these marriages ranged from 6 to 19 years, with a median of 13 years. Fourteen men (38 per cent) entered a property held by a parent or same-surname relative; for these the time elapsed ranged from 1 to 19 years, with median 10 or 11 years. Finally, eight men (22 per cent) acquired property previously held by an unrelated man; they waited 8 to 20 years, with median 16 years. If these men were about 13 when they first paid head-tax, the median age for acquiring property was about 25, and no-one was older than 35 when they first acquired property. Though the evidence is scant, it is plausible that marriage was closely linked to acquiring property.

**Table 5 Relationship between head-tax payments and age**

Category	Number of years since entry (aged 12-13)									
	1	5	9	13	17	21	25	29	33	37
With father	50	14	7	1						
With mother	9	1	2	1	1					
With lord	1									
Paupers	3	3			2					
Paying p.a.										
1d	2									
2d	38	15	3	3	1	1	1	0	2	
3d	31	33	13	4	6	3	1			
4d	10	34	30	22	15	9	7	6	4	5
6d	1	18	28	23	17	9	8	4	3	
8d	0	0	2	2	1	0	1			
Number paying	82	100	76	54	40	22	18	10	9	5
Mean payment (pence)	2.65	3.73	4.59	4.81	4.75	4.60	4.90	4.80	4.20	4.00

**Notes:** Data for 145 Longbridge Deverill *garciones* to 1348 (includes only unpledged men, entering the tax lists after 1295).

### Age-specific mortality rates and expectation of life

The crude mortality rates derived from a large sample of Glastonbury head-tax lists were shown in Table 1, and the slightly lower rates from the more detailed (and more checkable) records of the two Deverill manors in Table 4, where pledged and unpledged men can be considered separately. Both suggest a crude rate in the low 20s, far lower than Postan and Titow's estimate for Winchester tenants (49 per 1,000). This is not unexpected, since the *garciones* would be generally younger than tenants. Age-specific mortality rates are clearly more significant, and the Deverill data are capable of providing these.

In order to obtain estimates of age-specific mortality rates only those 340 *garciones* who entered the Deverill lists between 1296 and 1344 are now considered, for most of whom it is possible to measure how long they stayed on the lists, at least up to 1345. The 15 who died in 1317 are first excluded, because it was a year of exceptional mortality that will be considered later. Also excluded are 46 for whom there is no definite information about why they left the head-tax lists. Those who first appear in the surviving records the year after a two-year gap are assumed to have actually started one year earlier.

For each of the 279 *garciones* that are left, the numbers of years they lived in each of the five-year periods 0-4, 5-9, . . . 40-44 years since entry are calculated, and every death is also allocated to its appropriate period. This procedure produces for each five-year period the total number of man-years at risk of death and the total actual deaths, divided between the two Deverill manors

**Table 6 Mortality of Deverill *garciones* who first entered lists in 1296–1344**A: *Garciones* without pledges

Years on list	Longbridge Deverill		Monkton Deverill	
	Man-years	No. of deaths	Man-years	No. of deaths
0 – 4	531	7	241	2
5 – 9	394	8	185	5
10–14	276	2	133	3
15–19	161	6	89	4
20–24	96	0	62	1
25–29	63	0	34	2
30–34	46	1	25	1
35–39	25	0	11	1
40–44	4	3	1	0
All	1,596	27	781	19
Mortality	1,000	16.9	1,000	24.3

B: All other *garciones*

Years on list	Longbridge Deverill		Monkton Deverill	
	Man-years	No. of deaths	Man-years	No. of deaths
0 – 4	373	8	93	0
5 – 9	256	4	68	2
10–14	179	8	35	2
15–19	91	1	15	0
20–24	35	3	6	0
25–29	19	1	5	0
30–34	9	0	5	0
35–39	5	0	5	0
40–44	5	0	1	0
All	972	25	233	4
Mortality	1,000	25.7	1,000	17.2

**Note:** This table excludes all *garciones* who died in the year ending Easter 1317.

and the unpledged and pledged men (Table 6). Because the number of deaths in any period is quite small, the age-specific mortality rates are obscured by statistical effects. The underlying age-related trend in the observed data can best be extracted from the statistical ‘noise’ by the careful use of actuarial life tables.

The Princeton life tables are the most useful in this connection, since they provide in published form a finely graduated set of tables, that include high mortality scenarios rarely experienced today.<sup>32</sup> They are based on recent observations of populations world-wide, and it is very unlikely that an actual fourteenth century population would correspond well with any of them over the complete age range. Even if a good match can be found for an adult

population, the life tables should never be used to predict medieval life expectancy at birth, or total population, since these are heavily influenced by infant mortality, evidence for which is totally lacking for the fourteenth century. As a general rule, the life tables should not be used to predict parameters for any age group not included in the actual observations. But they do provide an accessible and mathematically consistent set of functions, that may be used to find an objectively smoothed best-fit description of the observed mortality data.

The adopted procedure is to combine the man-years at risk in Table 6 with the Princeton life tables' age-specific mortality rates, so as to produce the expected number of deaths in each five-year period for each life table used. The total numbers of expected deaths are then compared with the observed total to find the most appropriate life table. For the combined Deverill manors, Princeton Model West levels 1 and 2 for males (referred to in future as PMW 1 and PMW 2) are a good match of the observed deaths, and Table 7 sets out the predicted deaths for these levels.

In Part A of Table 7 (*garciones* without pledges) it is assumed that the men's chronological age was 14 years greater than the years spent on the head-tax list. Fourteen is chosen, rather than 12, to allow for the occasional delays in recording newcomers to the list. Thus the period 0–4 years corresponds to ages 14–18 in the life tables. Since the observed deaths total 46 and the expected totals from PMW 1 and 2 are 48.0 and 43.8, a hypothetical PMW 1.5 would best match the Deverill data. Turning now to Part B (*garciones* with pledges), it is reasonable to adopt the same life table, but with an older starting age (though in fact there was no fixed starting age). PMW 1 and PMW 2 are therefore used again with several different starting ages (18, 19, 20 etc), in order to find the starting age that gives the best match between predicted and observed total deaths. In this way 21 is selected as the 'best' starting age and PMW 1.4 is then the best life table. In practical terms, the mortality of all the Deverill *garciones*, pledged and unpledged, over the age range 12 to 50-plus is satisfactorily represented by the mean of PMW1 and PMW2. The most appropriate PMW level is found to increase by one for every two years added to the starting age, and also for every 10 per cent decrease in observed deaths.

Bearing in mind the already stated warning, that life tables are not reliable predictors outside the observed age-range (here, 12 to 50 years), the PMW life tables give the expectation of life at age 20, abbreviated to  $e(20)$ , as 27.4 years.<sup>33</sup> The Deverill estimate is therefore similar to Razi's estimate of 30.2 years for 196 well-documented (and richer) tenants in Halesowen, and his adjusted estimate of 25.3 years when more weight is given to the poorer tenants.<sup>34</sup> Poos and Smith rejected so low an expectation, on the dubious grounds that it would imply an expectation of life at birth of between 18 and 22.8 years; but in doing so, they ignored the limitations of the Princeton life tables.<sup>35</sup> It must also be remembered that the heavy mortality in 1317 has been excluded from the Deverill calculations; such catastrophes cannot easily be incorporated into estimates of what was normal.

**Table 7 Deverill mortality calculated from Princeton Model West life tables and the observed distribution of man-years**

A: *Garciones* without pledges

(Chronological age = Years on list + 14)

Years on list	Man-years	Expected deaths		Observed deaths
		PMW1	PMW2	
0–4	772	9.66	8.82	9
5–9	579	10.71	9.76	13
10–14	409	8.67	7.90	5
15–19	250	6.15	5.59	10
20–24	158	4.55	4.14	1
25–29	97	3.39	3.08	2
30–34	71	2.82	2.58	2
35–39	36	1.80	1.64	1
40–44	5	0.29	0.27	3
All	2,377	48.04	43.78	46
Mortality	1,000	20.21	18.42	19.35

PMW 1.5 is the best fit to observed deaths

B: All other *garciones*

(Chronological age = Years on list + 21)

Years on list	Man-years	Expected deaths		Observed deaths
		PMW1	PMW2	
0–4	466	9.25	8.42	8
5–9	324	7.30	6.64	6
10–14	214	5.63	5.11	10
15–19	106	3.30	3.00	1
20–24	41	1.52	1.39	3
25–29	24	1.04	0.96	1
30–34	14	0.76	0.70	0
35–39	10	0.67	0.61	0
40–44	6	0.54	0.50	0
All	1,205	30.01	27.33	29
Mortality	1,000	24.90	22.68	24.07

PMW 1.4 is the best fit to observed deaths

**Notes:** The columns headed 'Expected deaths' are the result of multiplying the 'man-years' figures by death rates for the five-year period, obtained from the PMW tables (column 'm') by interpolation for age. PMW 1.5 provides the best overall fit to the observed mortality. The appropriate life table number increases by one for every two years added to the starting age of the unpledged *garciones* (e.g. starting age 13 implies PMW 1 is the best fit).

**Source:** PMW tables from Coale and Demeny (Note 32).

The crude death rate for all males aged 20 or more was 36.5 per 1,000 (the reciprocal of  $e(20)$ , i.e. 27.4), and for those aged 13 or more, 31.3 per 1,000. These rates are much higher than the crude rates in Tables 1 and 4 because the adult male population would be older on average than that part of it which was paying head-tax. The disparity between the Winchester death rate (up to 49 per 1,000) found by Postan and Titow from heriots, and 36.5 per 1,000 for the Deverill men, suggests that the heriot approach is badly flawed.<sup>5</sup>

The estimated expectation of life at age 20 of 27.4 years may be compared with those found by Hatcher for Christ Church Canterbury and by Harvey for Westminster Abbey, although these relate to the periods 1395–1505 and 1390–1529 respectively.<sup>36</sup> Their separate investigations exploited the monks' biographical details, recorded from their profession to their death. Life expectancies were calculated for 395 monks at Canterbury and 245 at Westminster and assumed the monks were 18 to 20 years old on admission. The mean values of  $e(20)$  in the period 1400–1480 were 28 years at Canterbury and 26 years at Westminster, but the expectations clearly declined between 1430 and 1500, partly because of recurrent mortality crises.<sup>37</sup>

### The crisis years

William Jordan has graphically described the course of the Great Famine that struck Britain and northern Europe, from Poland to France, between 1315 and 1322, and Ian Kershaw has dealt with the English evidence in more detail.<sup>38</sup> Prolonged and heavy rain devastated the harvests in 1315 and 1316, the winter of 1317–1318 was exceptionally severe, and in some areas the 1318 harvest was also ruined by rain. Large numbers of sheep and cattle then died from recurrent murrains until 1322. Studies of heriot payments have shown that the normal frequency (in 1313–1315 and 1319–1321) was roughly doubled in 1316–1318.<sup>39</sup> At Longbridge Deverill the magnitude of the disaster is clearly shown by the deaths of *garciones* in the year following Easter 1316; at Monkton Deverill no such effect is evident, perhaps because farming there was more pastoral than arable.<sup>40</sup> At Longbridge 18 *garciones* died, where one or two deaths might be expected in a normal year; another 20 acquired land in 1316–1320, compared with four in a normal five-year period. Increased property transactions were as much a reflection of hard times, when land was sold for food and to repay called-in debts, as of the tenant deaths caused by prolonged malnutrition and disease. The total effect was to reduce the number of Longbridge men liable to head-tax from 93 in 1316 to 71 in 1317. The 16 or 17 additional deaths in 1316–1317 imply a 17 or 18 per cent mortality among the *garciones*, a rate that appears consistent with the 10–15 per cent mortality found for certain groups of tenants elsewhere in England, for example on the Essex manors studied by Poo.<sup>41</sup>

In three other years the number of deaths recorded on the Deverill head-tax lists was significantly higher than the normal rate of two per 100 man-years. Eight deaths were recorded in the year ending Easter 1295, when 78 men were listed. Assuming that the number of deaths per year followed a Poisson distribution whose mean is the normal death rate, eight or more deaths could occur by chance once in 2,500 years.<sup>42</sup> This mortality may relate to the high wheat prices in 1293–1295 that Schofield suggests were the principal cause of a

subsequent glut of property transactions at Hinderclay in Suffolk.<sup>43</sup> The five deaths among 89 men in 1308 were only marginally exceptional (this number could have occurred by chance once in 100 years), but nine deaths among 111 men in 1323–1324 were most unlikely to occur by chance (only once in 2,000 years). The high (8 per cent) mortality in 1323–1324 may have resulted from a local epidemic, or been an indirect consequence of the severe cattle-plague in 1319–1321, that Kershaw suggests made it especially hard for farmers to recover from the preceding famine years, ‘as their efforts were rendered vain by the destruction on all sides of their means of production and livelihood’.<sup>44</sup> Finally, the bad harvest of 1310–1311 listed by Dyer coincides with a two-year gap in the head-tax lists, that hides any possible effects.<sup>45</sup>

There have been many studies of plague mortality in 1348–1349, and these include reference to a 55 per cent mortality on the Glastonbury Abbey estate, estimated from the head-tax lists.<sup>46</sup> John Hatcher’s review of the evidence for plague mortality in England gives good reasons for treating some approaches (e.g. inquisitions post mortem, heriot payments) with great caution. Hatcher also suggests that statistics derived from customary payments were over-estimates, ‘since dead men could not continue to pay but live men could take the opportunity presented by the plague to evade payment’.<sup>47</sup> However, this qualification should not apply to mortality estimates derived from the 1348 head-tax lists, since this evidence is positive (names are annotated *mort’* for *mortuus est*) rather than negative (i.e. absence from the 1350 lists). It is possible indeed that some deaths went unrecorded, so that the mortality may even be under-estimated. Figure 1b (p.11) shows the beginning of the roll for Christian Malford manor in 1348, chosen to illustrate the death toll from plague in the following year. Table 8 gives the numbers liable to head-tax at Easter 1348, the number of names annotated *mort’*, the percentage mortality, and the number remaining on the 1350 lists, for those Glastonbury manors for which this information is available. The average mortality among 977 *garciones* was 57 per cent, and at Badbury it reached 76 per cent. The Deverill hallmoot records for 1348 are unfortunately damaged, but there were probably 35 to 40 deaths among 83 men (40 to 50 per cent mortality). The effects of the plague deaths and greater opportunities to acquire land after 1348 combined to reduce the total number on the Glastonbury head-tax lists in 1350 to only a quarter of their 1315 level.

## Conclusions

The great rarity of good documentary evidence for mortality before the Black Death makes it worthwhile to analyse data which for the early modern period would be regarded as statistically inadequate. In almost every case the surviving documents also present difficulties in interpretation, since their purpose and scope were not defined unambiguously. Thanks to the work of Harold Fox, the significance of the Glastonbury Abbey head-tax lists is now reasonably well understood, and Postan’s view that they recorded emigrants can be rejected. For the majority of the Glastonbury manors, however, the deaths recorded in their infrequent head-tax lists, among a population whose age distribution is unknown, can only provide crude death rates that are of limited value.

**Table 8 Plague mortality from 1348 head-tax lists**

Manor	No. liable in 1348	Recorded deaths	Mortality per cent	No. liable in 1350
Badbury	45	34	76	7
Christian Malford	79	52	66	15
Damerham	156	100	64	57
Grittleton	43	27	63	13
Walton	31	19	61	12
Pilton	75	46	61	22
Buckland	70	42	60	22
Mells	79	46	58	19
Kington	57	32	56	9
Ashbury	20	11	55	5
Batcombe	39	21	54	9
Ditcheat	46	25	54	18
Idmiston	58	29	50	21
Nettleton	62	30	48	21
Ham	65	27	42	26
Winterbourne	24	9	38	15
Marnhull	28	10	36	9
TOTALS	977	560	57	300

**Notes:** 'Recorded deaths' counts the names that were annotated '*mort*' after the hallmoot head-tax lists were made.

The two Deverill manors, by contrast, have a nearly continuous sequence of the relevant court rolls in 1295–1345, so that it is possible to determine the year of birth for a considerable number of the named *garciones*, and also the year when they died or acquired property, or left the manor. The number is diminished by the lists including many *garciones* who were probably immigrants, of uncertain age, who must be excluded from the life-expectancy calculations. For the selected population, the observed data on years at risk and age-related deaths can be matched against the Princeton life-tables, to obtain an estimate of  $e(20)$ , the expectation of life at age 20.

Based on 46 deaths, the best estimate of  $e(20)$  for the Deverill *garciones* is 27 to 28 years. These figures would increase by one year for a 7 per cent reduction in the observed number of deaths, which is within the statistically probable range. It is concluded that the most reasonable estimate based on the available data is 26 to 29 years. It is important to note that the high mortality in the famine years of 1315–1317, that killed 17 or 18 per cent of the Longbridge Deverill *garciones*, has been excluded.

This conclusion may be compared with Razi's estimate of 30.2 years for well-documented tenants at Halesowen in the period 1270–1400 and his more

questionable estimate of 25.3 years for the whole tenant population there. Postan and Titow's work on the Winchester manors' payments of heriots in 1245–1348 produced estimates in the low twenties that must now be treated with caution. Hatcher and Harvey's estimates for the monks at Canterbury and Westminster during the fifteenth century are the best available for the late medieval period and suggest that for these monks e(20) declined from around 30 years in 1400–1430 to as low as 20 years by 1490.

The data in Table 1 for the whole Glastonbury Abbey estate are so similar to the Deverill data, in respect of crude death rates and property acquisitions, that it seems reasonable to suppose that the expectation of life found for the Deverill *garciones* may apply to all the Glastonbury *garciones*. If so, it appears, perhaps surprisingly, that their mortality rates were only slightly worse than those of the wealthier Halesowen tenants and the early fifteenth century monks. This is an important conclusion, for a class of men who must have been among the poorest for whom we can hope to find documentary evidence, and whose economic importance has until recently gone unrecognized.

### Acknowledgements

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### NOTES

1. R.M. Smith, 'Demographic developments in rural England 1300–48: a survey' in B.M.S. Campbell ed., *Before the black death: studies in the 'crisis' of the early fourteenth century*, (Manchester, 1991), 25–77.
2. T.H. Hollingsworth, *Historical demography*, (London, 1969), 375–80; also discussed in J. Hatcher, 'Plague, population and the English economy 1348–1530' in M. Anderson ed., *British population history*, (Cambridge, 1996), 30–1.
3. Smith, 'Demographic developments', 40–5; L.R. Poos, 'The rural population of Essex in the later middle ages', *Economic History Review*, 2nd series, 38 (1985), 515–30, especially Figure 2a.
4. Smith, 'Demographic developments', 45–6.
5. M.M. Postan and J.Z. Titow, 'Heriots and prices on Winchester manors', *Economic History Review*, 2nd series, 11 (1958–9), 392–417.
6. Z. Razi, *Life, marriage and death in a medieval parish: economy, society and demography in Halesowen 1270–1400*, (Cambridge, 1980).
7. The debate on Razi's methods is set out in four papers: L.R. Poos and R.M. Smith, 'Legal windows onto historical populations? Recent research on demography and the manor court in medieval England', in Z. Razi and R.M. Smith eds, *Medieval society and the manor court*, (Oxford, 1996), 298–324; Z. Razi, 'The use of manorial court rolls in demographic analysis: a reconsideration', in Razi and Smith, *Medieval society*, 324–34; L.R. Poos and R.M. Smith, 'Shades still on the window: a riposte', in Razi and Smith, *Medieval society*, 334–55; Z. Razi, 'The demographic transparency of manorial court rolls', in Razi and Smith, *Medieval society*, 355–68.

8. J.Z. Titow, 'Some evidence of the thirteenth century population increase', *Economic History Review*, 2nd series, **14** (1961), 218–24.
9. D. Postles, 'Demographic change in Kibworth Harcourt, Leicestershire, in the later middle ages', *Local Population Studies*, **48** (1992), 41–8; Poos, 'Rural population'.
10. K. Harris, 'Glastonbury Abbey records at Longleat House', *Somerset Record Society*, **81** (1991) provides a comprehensive listing of the original documents; microfilm copies are published by Cedric Chivers Ltd of Bath.
11. M.M. Postan, 'Medieval agrarian society in its prime', in M.M. Postan ed., *The Cambridge economic history of Europe: vol.I, The agrarian life of the middle ages*, 2nd edn (Cambridge, 1966), 564–5, 624.
12. H.S.A. Fox, 'Exploitation of the landless by lords and tenants in early medieval England', in Razi and Smith, *Medieval society*, 518–68; L.A. Gates, 'A Glastonbury estate complex in Wiltshire: survival and prosperity in the medieval manor 1280–1380', (unpublished D.Phil. thesis, University of Toronto, 1991). Five of the Glastonbury manors have also been studied by M.G. Thompson, 'The Polden Hill manors of Glastonbury Abbey: land and people c.1260 to 1351', (unpublished Ph.D. thesis, University of Leicester, 1997).
13. Longleat House (hereafter L.) 11222 (Buckland, 1350) lists ten such employees.
14. Fox, 'Exploitation', 538.
15. I. Keil, 'The chamberer of Glastonbury Abbey in the fourteenth century', *Proceedings of the Somerset Archaeological Society*, **107** (1963), 79–92.
16. In addition there are ten rolls between 1269 and 1283 that list men from both the Deverill manors together; these have been excluded from the detailed analysis because of the 12 year gap from 1283 to 1295. Later Deverill head-tax lists (from the 1370s) are in two parts, one for freemen and the other for villeins, but the implications of this are outside this paper's scope.
17. The problem of identification is discussed by L.R. Poos, 'Population turnover in medieval Essex: the evidence of some early-fourteenth century tithing lists', in L. Bonfield, R.M. Smith and K. Wrightson eds, *The world we have gained*, (Oxford, 1986), 1–22.
18. L.9634 (Easter 1338).
19. L.9661 (Easter 1312).
20. L.9658 (Easter 1307).
21. W.A. Morris, *The frankpledge system*, (Cambridge, Mass., 1910), 79–83; F.W. Maitland and W.P. Baildon eds, 'The court baron', *Selden Society*, **4** (1891), 37, 53, 55; exemptions from frankpledge on Glastonbury Abbey manors quoted by P. Vinogradoff, *Villainage in England*, (Oxford, 1892), 363.
22. L.9663 (October 1313).
23. L.9723 (Easter 1326).
24. L.6367 (May 1331).
25. L.9658 (Easter 1307) is an example, referring to Godfrey Spone and Henry Cissor.
26. L.10727 (May 1299).
27. L.9681 (December 1280); R.E. Latham, *Revised medieval Latin word list*, (London, 1980), 9.
28. The thirteenth century extent of the abbey's manor of Ashbury records that Andrew Chepman paid a pound of wax at Michaelmas for the right to trade in the liberty: C.J. Elton ed., 'Rentalia et customaria', *Somerset Record Society*, **5** (1891), 56. Wax payments in the 1340s by the sons of established tenants are shown in Table 5.20 of Thompson, 'Polden Manors'. The substitution of cash payments instead of wax in 1315 and 1316 may have been necessary because of the disastrous summer weather; the 1314–5 account roll (L.9645) notes that there was no wax because the reeve was charged in cash. The question of the exact nature of the payments in cumin is interesting, since true cumin was an imported spice from the Middle East and cost much more than a few pence a pound. The author suggests that the Glastonbury 'cumin' was in fact the seed of caraway, which grows wild in southern England, and is known in France as '*cumin des prés*' and in Germany as '*gemeiner Kummel*'.
29. L.8085 (May 1328).
30. Fox, 'Exploitation', 539–68; Postan, 'Agrarian society', 619–20; it should be noted that Postan's count excludes the sub-manor of Martin in Damerham.

31. The 30 manors with four sets of data are: Ashbury, Ashcott, Badbury, Batcombe, Brent (comprises four sub-manors), Buckland, Christian Malford, Damerham, Ditcheat, Doultling, Greinton, Grittleton, Ham, Idmiston, Kington, Marksbury, Mells, Milton Podimore, Nettleton, East Pennard, Pilton, Shapwick with Moorlynch, Soway or Zoy, Street, Sturminster Newton with Marnhull, Uplyme, Walton, Winterbourne, Wrington and Wythes; Thompson, 'Polden Hills', Table 4.1 gives detailed changes at five Polden manors.
32. A.J. Coale and P. Demeny, *Regional model life tables and stable populations*, 2nd edn, (New York, 1983), 34–5, 42–3.
33. The Princeton life tables comprise Models West, North, East and South and there seems no compelling reason to consider Model West the most appropriate for medieval data. Other writers have followed Poos in choosing Model West because its tables appear to give the best fit to infant and child mortality derived from early parish registers (Poos, 'Population turnover', 10). The estimated expectations of life for Deverill *garcones* at age 20 (i.e.  $e(20)$ ), derived in the same way using all four models, are 27.4 years (West), 28.0 years (North), about 27 years (East) and about 28.5 years (South). It appears that the Model West estimate is typical, but could be in error by at least one year. Errors will also arise from statistical variations in the observed death rate: the calculated expectation of life increases by one year for a 7 per cent reduction in the observed number of deaths (i.e. 3 out of 46).
34. Razi, *Life, marriage and death*, 43–5.
35. Poos and Smith, 'Legal windows', 312–3.
36. J. Hatcher, 'Mortality in the fifteenth century; some new evidence', *Economic History Review*, 2nd series, 39 (1986), 19–38; B.F. Harvey, *Living and dying in England 1100–1540, the monastic experience*, (Oxford, 1993), 115.
37. For Canterbury, Hatcher calculated  $e(20)$  for eight cohorts admitted in overlapping 25-year periods with midpoints 1407, 1417, 1477, with 70 to 90 monks in each cohort, as 31, 32, 31, 30, 27, 24, 24 and 25. Corresponding figures for Westminster (up to 1497) were 30, 30, 29, 28, 25, 22, 23, 21, 19 and 20. Hatcher also calculated the time-averaged mortality for different age-groups and found that PMW levels 3 to 5 matched most groups reasonably well.
38. W.C. Jordan, *The great famine: northern Europe in the early fourteenth century*, (Princeton, 1996); I. Kershaw, 'The great famine and agrarian crisis in England 1315–1322', *Past and Present*, 59 (1973), 1–50.
39. Smith, 'Demographic developments', 54, Tables 2.2, 2.3.
40. The Longbridge Deverill account rolls show that crop yields per acre, net of seed, of wheat, barley, oats and rye, from the three bad harvests in 1315–7 were respectively 71 per cent, 51 per cent, 48 per cent and 36 per cent of their long term average levels. The comparable figures for Monkton Deverill were 73 per cent, 66 per cent and 86 per cent (rye not sown).
41. Jordan, *Great famine*, 118–9; Titow, 'Some evidence', 220, 224; Smith, 'Demographic developments', 38; Poos, 'Rural population', 521.
42. The Poisson distribution describes the probability of 0, 1, 2, 3 ... events occurring in a time period, when the long term average number of events in that period is known.
43. P.R. Schofield, 'Dearth, debt and the local land market in a late thirteenth century village community', *Agricultural History Review*, 45 (1997), 1–19.
44. Kershaw, 'Great famine', 29. At Monkton Deverill the number of demesne oxen at Michaelmas fell from 22 in 1319 to 6 in 1320 (L.9768, L.10630).
45. Bad harvests are tabulated in C. Dyer, *Standards of living in the later middle ages*, (Cambridge, 1989), 262–3.
46. J.Z. Titow, *English rural society 1200–1350*, (London, 1969), 70–1.
47. Hatcher, 'Plague', 23.