PROFITABLE PURSUITS? RURAL INDUSTRY AND MORTALITY IN THE PROTO-INDUSTRIAL WEST RIDING 1650–1830

Steve King

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Since The Population History of England, the demographic variables of nuptiality and fertility have been firmly installed as the engine of eighteenth and nineteenth-century population revolution.1 While there has been an explosion of work on nineteenth-century mortality regimes to complement this picture, the role and character of eighteenth-century mortality trends has been substantially under-researched.2 Pre-1800 perspectives on mortality have tended to concentrate on burial crises or on the nature and role of urban mortality, with limited attempts at detailed contextualisation of mortality figures.3 Peter Razzell’s claim that there is a strong case for re-emphasising the role of mortality decline in the English population revolution, stands as a continuing rallying call for more studies of local mortality regimes and the context in which life and death events were played out.4

Nowhere is this rallying call more necessary than in the demographic study of English rural industrial areas, where there has been a dearth of literature after the initial reconstitution work of Levine in the 1970s.5 European scholars have a long tradition of research on the connections between rural industrialisation, health and mortality but this has yet to be duplicated in England. A very brief review of some of the European findings may help to highlight key issues. On the negative side, Braun, Lehning and others associate proto-industrialisation with overcrowding, community disruption, deteriorating diet, child neglect, high rates of maternal mortality and substantial risks of occupational illness and deformity among industrial workers.6 On the positive side, European rural industrial areas appear to have had more dense kinship networks than either rural or urban areas, and this may have been the basis for better childcare or enhanced economic security. Transport, credit, and retail systems also appear to have been relatively highly developed in rural industrial areas, ensuring consistent food supplies from an early date.7

The observations of eighteenth and nineteenth-century local historians and other contemporary commentators in English proto-industrial districts suggest that we could undertake a similar balancing of positive and negative influences on health and mortality. For the West Riding, Joseph Lawson, taking a retrospective look back from the 1880's characterised rural industrial areas as places with streets
full of filth, poor quality and interrupted water supply, houses badly lit and undrained, a diet overwhelmingly dependent upon oat cakes, brown bread, porridge, milk, potatoes and home brew, and endemic chest diseases associated with the need to dry woollen cloth in the house during damp spells. In 1822 Parsons observed that more children were born in the West Riding than in either the North or East Ridings but that fewer survived to the age group 45–50, drawing a clear association between industrial work and health. Loss of common and waste land, and technological redundancy in many traditional female tasks in woollen cloth production, must have exacerbated these negative factors.

On the other hand, and in line with European experience, English rural industrial areas appear to have generated dense kinship networks, sophisticated credit networks for food and to have witnessed co-operation between families on a scale not apparent elsewhere. Lawson, talking of the West Riding proto-industrial township of Pudsey, for instance, noted that: 'It is pleasing in these rude times to see the mutual good will and friendship there is, notwithstanding the occasional back biting, tittle tattle and ill-will. They watch and nurse each others families when sick and borrow and lend almost anything in the house, though I am not aware that they equal the folk in a neighbouring village where it is said that they borrow basins of broth and pots and plates of porridge'. Such communality even extended to mutual self-help in the building of mills.

Clearly, the experience of public health, illness and death in English rural industrial areas is likely to be a complex topic, and one which deserves more attention than it has thus far received. The rest of this article will present some of the initial mortality figures from a large scale reconstruction study of textile villages in the West Riding between 1650 and 1830. Centring on individual and family histories carved out of parish registers using family reconstitution, the aim of the study is to provide an aggregate picture of demographic conditions in rural industrial areas, and then to stray below the level of aggregate figures to provide individual and familial context. In particular the analysis will focus on the parish of Calverley (Figure 1), whose 14,000 inhabitants in 1821 were largely concentrated into four township groupings (Calverley-cum-Farsley, Pudsey/Stanningley, Idle and Bolton). The township of Calverley-cum-Farsley (1821 population 2,600) was the location of the parish church and has been subject to intensive community reconstruction, with the linking of tax, landholding, apprenticeship, poor law and a variety of other data to 1,600 family, and 5,000 individual, demographic life-cycles. Multiple source record linkage of this sort allows the detailed determination of social status, and all families in the township were consigned to one of five social groups on the basis of the balance of indicators over the life-cycle as a whole. These ranged from lifetime proletarians (category one) to substantial landholding groups from all trades (category five), and it is information like this which will be used to highlight the context of aggregate mortality figures.

During the eighteenth century the increasing dominance of the West Riding in national broad cloth output was reflected in the prosperity of the Leeds area, with Calverley participating in substantial output growth. The independent
landholding clothier, rather than the wage dependent putting-out worker familiar in the production of worsted cloth around Halifax, dominated the male occupational structure of the parish throughout the eighteenth and early nineteenth centuries. Between 60 and 80 per cent of all occupational ascriptions in the parish registers for this period were 'clothiers', with textile trades in general dominating the occupational profile of the parish. The relationship
Table 1  Infant and childhood mortality (rate per 000) in each township 1700–1799

<table>
<thead>
<tr>
<th>Township and period</th>
<th>0–1</th>
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<th>10–14</th>
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<tr>
<td>Calverley cum Farsley (1700–49)</td>
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<tr>
<td>Calverley cum Farsley (1750–99)</td>
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<tr>
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<tr>
<td>Pudsey (1750–99)</td>
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<td>Idle (1700–49)</td>
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<td>Idle (1750–99)</td>
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<tr>
<td>Stanningley (1750–99)</td>
<td>199</td>
<td>149</td>
<td>63</td>
<td>47</td>
</tr>
</tbody>
</table>

Note:  Figures based upon 2,003 infant deaths and 1,970 child deaths.
Source:  Family reconstitution.

between landholding and rural industry throughout the eighteenth century is exemplified by the experience of Calverley-cum-Farsley. Here, between 45 and 70 per cent of landholders at any point in time were aged 50 plus, with land gradually released to younger generations as parents and relatives effectively retired. Landed independence for the cloth producing artisan was thus something to be attained well over thirty, preceded by an extensive period of working land controlled by the older generation.

By the early nineteenth century wage dependency had increased in all townships. Pudsey and Stanningley became centres of proletarian production in workshops, while worsted, cotton and shoddy work were present in both Idle and Pudsey by 1800. This was part of a flowering of the range of trades in the parish from the 1770s onwards. Nonetheless, the production of woollen cloth by small independent clothiers remained the mainstay of the parish and social climbing was still very much a reality in 1806, when the enquiry into the state of the woollen industry dealt with few witnesses who were not smaller clothiers producing textiles using family labour. By 1822, the parish had a third more men engaged directly in the production of woollen cloth than the neighbouring and bigger parish of Birstall.

Table 1 reproduces infant and childhood mortality figures for the parish as a whole. There appears to have been a significant upward movement in all mortality categories and for all of the townships during the eighteenth and early nineteenth centuries. This contrasts with the 'national' picture from 26 family reconstitutions, where infant and childhood mortality peaked between 1700–49 and then fell. In part, what we might see here is the inevitable consequence of population growth. However, since Calverley shared the characteristic of rising mortality levels with all other proto-industrial areas which have so far been subject to family reconstitution, there is a case for linking deteriorating public health and mortality and rural industry more widely. Moreover, as Table 2 shows, there were important differences in mortality levels between Calverley and other proto-industrial areas, and between Calverley townships and national
Table 2  Calverley infant and childhood mortality (rates per 000) in perspective

<table>
<thead>
<tr>
<th>Place and period</th>
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<td>National sample (1775–99)</td>
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<td>National sample (1800–24)</td>
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<td>Shepshed (1750–1824)</td>
<td>154</td>
<td>94</td>
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<td>Methley (1700–99)</td>
<td>199</td>
<td>101</td>
<td>32</td>
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aggregates.\textsuperscript{20} With the exception of Pudsey, infant mortality rates were below the national average during the eighteenth century, notwithstanding the trend differences between the two samples. However, where we confine the analysis just to proto-industrial areas, Calverley townships seem to be on the high side of infant and childhood mortality, at least until the opening decades of the nineteenth century and more generally, it is clear that childhood mortality at all ages was substantially worse than the national average.

Detailed reconstruction of the context to these mortality patterns for the township of Calverley-cum-Farsley can reveal much. Using the social status categorisation of families outlined above, Figure 2 shows that lifetime proletarians and those struggling on the margins between wage dependency and independent production experienced the highest rates of infant and childhood mortality.\textsuperscript{21} This is perhaps little more than one would expect, but it is clear from Figure 3 that enhanced mortality among these social groups was not a simple reflection of health conditions in cloth producing households. The families of weavers, combers and others in the waged-textile sphere experienced higher infant and child mortality than the families of clothiers in the aggregate, but it was families engaged in service and craft occupations (masons, publicans, blacksmiths and grocers) who had the worst experience.

What even this sort of disaggregation masks however is a significant and marked familial concentration of childhood mortality in particular.\textsuperscript{22} Some 320 Calverley-cum-Farsley families experienced 614 child deaths (1.6 per family). Within this however, 117 families experienced multiple child deaths, recording 355 (2.6 per family) and 31 of these families recorded at least two child deaths and at least two infant deaths. Even where we control for the depletion of families by previous infant mortality, there was a distinct tendency for certain families to have an extremely poor child mortality experience.\textsuperscript{23} John Wood (married in 1704) lost two children under one, one child at age two and another at age nine. William Walker (married in 1713) lost three children as infants, and children aged two, three and eight. James Wade (married in 1780) lost four children as
Figure 2  Social status distribution of infant and childhood mortality in Calverley-cum-Farsley, 1650–1800

Source: Family reconstitution.
Notes: Social status 0 – families where there were not at least three social status indicators, excluding poor relief receipt.
Social status 1 – families dependent on wages and consistently delineated as low social status through sources like housing surveys.
Social status 2 – families which experienced marked variation of occupation over the life cycle and who could be traced to the lowest level of quantitative indicators, such as paying on one hearth in the hearth tax or paying poor rates intermittently. Mainly marginal clothiers, moving backwards and forwards between landed independence.
Social status 3 – families who had a consistent experience of small landholding, who paid tax of between one and two hearths or who consistently paid local taxes at low levels. These people never appear in sources which would confirm middling to high social status, such as newspapers or lists of people from whom Sir Walter Calverley borrows money.
Social status 4 – families which held between 15–30 acres, who paid tax on 2+ hearths or who paid more than £1 and less than £3 toward poor relief in any year. These families might appear in qualitative indicators of high social status, such as newspapers or lists of members of the Court Baron. In occupational terms, these were mainly husbandmen, yeomen, the service and craft trades and middling clothiers.
Social status 5 – families which held 30+ acres of land, who paid tax on more than 2 hearths and who contributed more than £3 to poor rates. Such families and their individual members consistently appear in sources which provide a qualitative confirmation of high status, such as people invited to dine with Walter Calverley before local elections.
Figure 3  The occupational distribution of infant and childhood mortality in Calverley-cum-Farsley, 1650–1800

Source:  Family reconstitution.
Notes:  See Figure 2.

Figure 4  The seasonality of infant and childhood mortality in Calverley-cum-Farsley, 1650–1799

Source:  Family reconstitution.
infants, two children aged one, a child aged three, a child aged nine and a child aged fourteen. All of the townships shared this experience of concentrated mortality. In Pudsey for instance, 58 per cent of childhood mortality was concentrated in just 18 per cent of families.24

Clearly there is much here to explain: rising infant and childhood mortality at the same time as national indicators were falling, intensive familial and social status concentration of mortality and levels of childhood mortality in particular which were well above the national average. It will always be impossible to talk with full confidence, but a number of potential influences are discernible. First, plotting the seasonality of mortality in Figure 4 highlights the fact that for most of the period considered here, the township shared the winter peak in mortality apparent in many other local studies.25 Such seasonal concentration might suggest that chest diseases and diseases of association such as typhus were the main drivers of mortality.26 Certainly the influence of town based diseases was limited. Creighton traces the eighteenth-century emergence of two childhood diseases – measles and scarlatina – in the Leeds area, but peaks in infant and child mortality at parish level could not be associated in any simple way with the occurrence of urban disease. Child burials rose in 1727 and 1729 at the same time as Creighton was identifying relapsing fever rife in West Yorkshire. Burials also rose with the advent of an intense typhus epidemic in Leeds in 1779, and with smallpox outbreaks in Leeds and Bradford in 1721. However, smallpox outbreaks in Leeds in 1773 and 1781 were accompanied by a lull in child death, as was a widespread measles epidemic in 1726.27 Rather, Calverley parish shared much in terms of mortality characteristics with the local cloth producing country, and it is here that we should look for the operation of an interwoven demographic system.

Second, there may be some relationship between the changing residential patterns of children and their susceptibility to disease. Thus, apprenticeship as a means of controlling long term poverty was more common after 1750. The clear rise in mortality between the ages of 10 and 14 in all townships might thus reflect the fact that the tendency for apprenticeship to take particularly poorer children out of their own families and deposit them in new production and care units increased the risks of accident, neglect, overcrowding and poor sleeping and working conditions in the reception household for children in this age group.28 Could the mortality rise in the other age groups be explained in a similar way? Orphaned children were more common after 1750 than before, and while in some cases the parish went to considerable lengths to ensure that such children were cared for in the houses of people who were at least of a comparable social status, many others found themselves boarded out with people who were themselves either pauperised or ill. Potentially this had plenty of negative implications for childcare and dietary standards.

Thirdly, much of the rise in infant and early childhood mortality during the course of the eighteenth century seems to have been generated by higher mortality among children aged between 10 and 18 months. This may have reflected two key changes in female demography. On the one hand, the experience of maternal mortality appears to have had an effect on the life
chances of infants and young children. Maternal deaths in Calverley parish were running at a higher level after 1740, demonstrating a marked contrast in trend and level with wider national figures. Deaths of this sort not only put a new-born infant at grave risk, but in creating disruption to family income and childcare routines also endangered young children. On the other hand, there is some evidence that a trend towards earlier weaning developed over the course of the eighteenth century. Thus, the average female life-cycle in the later eighteenth century contained more very short intervals than it had done before and the non-susceptible period for the Calverley-cum-Farsley sample as a whole fell by almost 45 per cent over the course of the eighteenth-century. Using the methods deployed by Wilson, this suggests that there was a fall in the mean age at weaning from 12–14 months to perhaps 9–11 months. Some confirmation of this influence comes in the form of the seasonality of infant and child death. As Figure 4 shows, during the course of the eighteenth century the winter peak/summer trough pattern was supplemented with a secondary early summer/late summer peak reflecting mainly the experience of very young children who were perhaps subjected to the rigours of gastric diseases by the practice of early weaning.

Can we link this experience to the changing economic position of the household? Tentative evidence suggests the validity of this approach. Thus, those potentially most susceptible to crises in the family economy, for instance those on the margins between landed production and proletarianisation, had the worst experiences of infant and childhood mortality. Moreover, diary evidence, poor law data and advertisements in Leeds newspapers suggest that progressive technological redundancy from 1750, allied with greater susceptibility to trade fluctuations in the later eighteenth century, obliged some women to engage more frequently and intensively in income generation after 1750 than before.

We could of course also review a whole range of other potential influences on the infant and child mortality picture. Foremost among them might be the experience of poor health of parents and the resulting deterioration of childcare. Or we might draw some association between migratory status, access to credit networks for food, and health and mortality conditions. The full explanatory framework for infant and child mortality conditions in the parish must still remain unclear. Yet, the observation that Calverley looked ‘different’ from the national picture and that there were fundamental familial and social status concentrations in mortality experience, carries important implications for the debate over the character of demographic regimes in proto-industrial areas, to which we return below.

The question of adult mortality in proto-industrial areas meanwhile is one that has been only fitfully explored. Generating adult mortality figures is beset with technical difficulties. Since English parish registers do not regularly give reliable ages at death, calculation of death rates depends upon detecting and linking baptisms and burials for individuals in the process of family reconstitution. The dangers of the small sample sizes generated in this process have been emphasised by Ruggles. Even a sample of the size employed here is not immune from such difficulties. Thus, between 1700–70 there were 8,864 distinct
marriage partners in Calverley parish; of these, 4,187 (47.2 per cent) had both baptism and burial dates detected.35 Excluding those marriages where Calverley was only a nominal residence, 54 per cent of all marriage partners could be assigned an age at death based upon detection of their baptisms. This is better than the experience of some other family reconstitution studies, but still means that a bare majority of people would be represented in adult mortality calculations. A more accurate estimate would depend upon including the experience of two distinct sets of people – those who were baptised in a parish, but had no burial data because they migrated but were at risk of death until they left, and those who migrated inwards and had a burial date but no baptism and were therefore at risk for an unknown period.

Wrigley’s solution was to create a range of mortality estimates within which the ‘true’ figure must lie, extrapolating the mortality experience for those without burial dates from that of those who were buried in the parish. Thus, the most pessimistic picture of adult mortality would be created by assuming that none of the people without a death date lived past sixty-nine, while the most optimistic picture would assume that none of them died before sixty.36 Blum advanced alternative but related measures; his ‘high mortality’ model assumed that eventual migrants died at the date of the last event which they recorded. A more optimistic picture would assume that eventual migrants left immediately before the vital event they would have registered had they stayed.37 As Ruggles notes, however, the tendency for donor families to demonstrate earlier deaths and shorter intervals to the next event than the general population could lead to overstatement of mortality.38 More recently, Wrigley, Davies, Oeppen and Schofield have proposed further modifications to the methods deployed for coping with those who migrate outwards in the calculation of life expectancies.39

Unfortunately, these solutions only cover one of the problems surrounding missing events. In both continental and English populations, rural industrial incursion allowed more native people to spend more of their life-cycles in a parish by generating more residential and work opportunities, but also stimulated substantial in-migration. Certainly in Calverley it is people moving in, rather than people moving out, who do most to upset adult mortality calculations. To deal with these cases, we might assume that everyone who married and had no baptism, married at the average age, calculating age at death from age at marriage rather than baptism. In practice, the differences in mean age at death between a sample which includes all marriage partners with known baptism and burial dates (54.6) and one in which the baptism dates of the very same people have been eliminated from the life-cycle template and the assumption on age at marriage employed (55.7) are very small indeed. This reflects an emerging tendency for marriage ages to be relatively concentrated in rural industrial areas.40 Adult life expectancy figures calculated along the lines of these different approaches appear in Table 3, while Table 4 provides some comparative perspective. Most of the estimates suggest that the Calverley adult death experience was worse than that of Shepshed, Terling and a range of other parishes and townships, with the deviation particularly marked in young adulthood. There were also significant later eighteenth century differences from ‘national’ estimates, with life expectancy in the mid-twenties fluctuating between 35–37 during this period.
### Table 3  Adult life expectancy figures (from ages given, in years) Calverley parish 1700–1770

<table>
<thead>
<tr>
<th>Methodology</th>
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<tr>
<td>Combined (High)</td>
<td>29.6</td>
<td>22.3</td>
<td>17.1</td>
<td>12.0</td>
<td>7.7</td>
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<tr>
<td>Combined (Low)</td>
<td>31.3</td>
<td>23.8</td>
<td>18.2</td>
<td>12.4</td>
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<td>1.4</td>
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</table>

**Note:** The figures under ‘combined’ are derived by adopting the Wrigley method for dealing with people who have missing burials and the standard age at marriage approach outlined in the text for those marriage partners without baptisms. The period 1700–1770 was chosen to minimise the impact of the upper cut off point which effectively closes life-cycle observation.

**Source:** Family reconstitution.

### Table 4  Calverley adult life expectancy figures (from age given, in years) in perspective

<table>
<thead>
<tr>
<th>Place and Period</th>
<th>25</th>
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**Sources:** Terling, Colyton, Bottesford and Shepshed, Levine: Family Formation, 125, 14, 100, 72; Methley: Yasumoto, Industrialisation, 12.

To some extent this situation was a reflection of persistently high maternal mortality, but there were also other influences at work. One possibility for instance is that the landholding profile might have impacted upon adult mortality conditions. We have already seen that in Calverley-cum-Farsley access to land was controlled by ageing landholding figureheads, such that a couple marrying when the man was aged 25 could probably not hope to get a foot formally on the landholding ladder by leasing or buying land until he was at least in his early thirties, with sub-tenancy common. Those in the early stages of the childbearing life-cycle thus had restricted access to land and the benefits which it conferred, while those towards the end of the life-cycle were losing this benefit through early retirement. For those in the middle of the family life-cycle, renewed control of land was the precursor to better nutrition, more credit and,
often, a move of residence. If access to land and mortality risks were correlated, then it should be those at the start and end of the married life-cycle who experienced the greatest mortality risks, which is exactly what we see here.

Could there also be a relationship between health, mortality and migratory status? All of the Calverley townships experienced surges of in-migration from the 1750s as people attempted to take advantage of the landholding opportunities created by enclosure of wastes and commons. Such in-migrants, often young couples, created pressure on traditional landholding and occupational networks and on housing, usually experiencing downward occupational mobility for at least a period as they strived to become integrated members of their reception communities. They suffered disproportionately in infant mortality terms and also themselves paid the price of movement through enhanced risks of illness and mortality, something which can clearly be traced in poor law records for the parish.

Finally, Figure 5 details adult burial seasonality in the parish as a whole, and is perhaps suggestive of a relationship between mortality risks and increasingly intensive cottage production of wool textiles. There was a clear concentration of burial peaks in the winter and spring months, the pattern which one would have expected to emerge where tuberculosis and diseases of association were major killers. Could we argue then that among those of lower social status, among in-migrants and among those without control of land, increasingly intensive proto-
industrialisation and its associated drawbacks of pressure on water supplies, uncertainty of yearly income and overcrowding might be seen to have exacted a heavy seasonal toll?

This article raises more questions than it answers. Much more could be said about the similarities and differences between individual townships within the parish of Calverley. There is also more to uncover about the relationship between the likely nutritional status of families and individuals in proto-industrial areas, and prevailing mortality regimes. Nor has it proved possible in the space available to conduct a detailed analysis of the relationship between proto-industrialisation, housing quality, and the mortality experience of individual families.

However, it is possible to draw two important conclusions which may help to shape the way in which we view the demographic systems of rural industrial areas. First, it does not appear that there was a distinct mortality regime associated with proto-industrial development. The mortality regimes of all of the Calverley townships contrast strongly with the experience of Shepshed for instance. Second, aggregate figures mask important characteristics of mortality in rural industrial areas which should not be ignored. In particular, the concentration of childhood mortality in a restricted number of families, and the way in which adult mortality was disproportionately large at the start of the family life-cycle. How far Calverley parish is in turn representative of other proto-industrial areas organised along classic putting out lines remains to be seen, but emerging evidence does not suggest wide differences.41

NOTES

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8. J. Lawson, *Letter to the young on progress in Pudsey during the last sixty years*, (Stanningley, 1887).


15. For more on this, see King and Hudson, 'A sense of place'


18. I am grateful to Roger Schofield for providing the figures which underlie much of the discussion which follows.

19. I am grateful to May Pickles for discussion of these issues.

20. I am grateful to Roger Schofield for sending me the (then) proofs of the mortality sections of the new Cambridge Group book on population history from family reconstitutions. Figures drawn from this source form the bedrock of Table 2. See E. A. Wrigley, R. S. Davies, J. E. Oeppen and R. S. Schofield, *English population history from family reconstitution* (Cambridge University Press, 1997).


24. Familial concentration of infant mortality was accompanied by a marked geographical bias in the location of high mortality families, but the same is not true of childhood mortality. Explanations relating concentrated mortality and features such as poor water supply thus have little validity in this context.


30. R. S. Schofield, 'Did the mothers really die? Three centuries of maternal mortality in “The world we have lost”', in L. Bonfield, R. M. Smith and K. Wrightson eds, *The world we have gained: histories of population and social structure*, (Oxford, 1986), 231–60 advanced ‘national’ maternal mortality rates of 16:1000 1650–99, 11.3:1000 1700–49 and 7.7:1000 1750–99. The latest findings based upon 26 family reconstitutions suggest that the figure for 1700–49 should be 12.5 and that for 1750–99 9.1. In Calverley the figure for 1750–99 was 14, significantly above these ‘national’ figures.


32. For a review of similar continental experiences, see J. L. Flandrin, *Families*. 39
33. Age at death statement for Calverley starts in relatively comprehensive fashion from the 1790s.
35. The dates were chosen to minimise bias. Those marrying at the average age of 23–24 in 1770 would have been over eighty at the upper cut off point.
37. A. Blum, ‘An estimate of local adult mortality based on family cards’, *Population*, 44 (1989), 39–59. To work out the length of this extra period of observation a ‘donor’ with a similar family size at a similar time is found and the interval to their next event substituted for the missing event on the part of the migrant.
38. Ruggles, ‘Migration’.
39. Wrigley, Davies, Oeppen and Schofield, *English population history*.
40. See Carpenter, ‘Peasants’.