

## SEARCHING FOR THE POPULATION IN AN EARLY-MODERN FOREST

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### Introduction

Early-modern improvement writers thought that most of the land within royal forests was not exploited to its full potential and argued that conversion to cultivation would render that land more productive and its inhabitants more industrious.<sup>1</sup> During the first four decades of the seventeenth century various improvement projects were thrust upon the community at Duffield (Derbyshire), culminating in the 1630s in the disafforestation and enclosure 'by agreement' of Duffield Frith, a forest belonging to the Duchy of Lancaster. Not surprisingly, many of the inhabitants opposed this project, their most violent objections taking the form of a series of riots in the Frith during the early 1640s.<sup>2</sup> When studying such riots it is necessary to explore the nature of the community concerned both before and after the enclosures were constructed in order to understand their full implications both for the legal commoners and for the remainder of the inhabitants. This exploration necessarily comprises the reconstruction not only of the local economy, including occupations, landholding, customs and common rights, but also of local demographic and social structures. This article will examine estimates of Duffield's population during the sixteenth and seventeenth centuries.

As readers of *LPS* are well aware, the sources that historians use when attempting to ascertain the population size of early-modern communities were not always produced originally for that end but were generated by various officials for fiscal, ecclesiastical, military or other purposes, and so require careful handling when being manipulated to estimate the population. Furthermore, although the people being recorded or assessed belonged by default to a particular local community, the definition and boundary of that community varied according to the type of record being made: ecclesiastical assessments were based on the parish; fiscal assessments might be based on the parish or township; and military assessments could be based on the manor, township or constablewick. Eligibility for inclusion depended on certain assessment criteria and therefore some inhabitants might have been omitted deliberately from a particular listing; others might have been omitted because

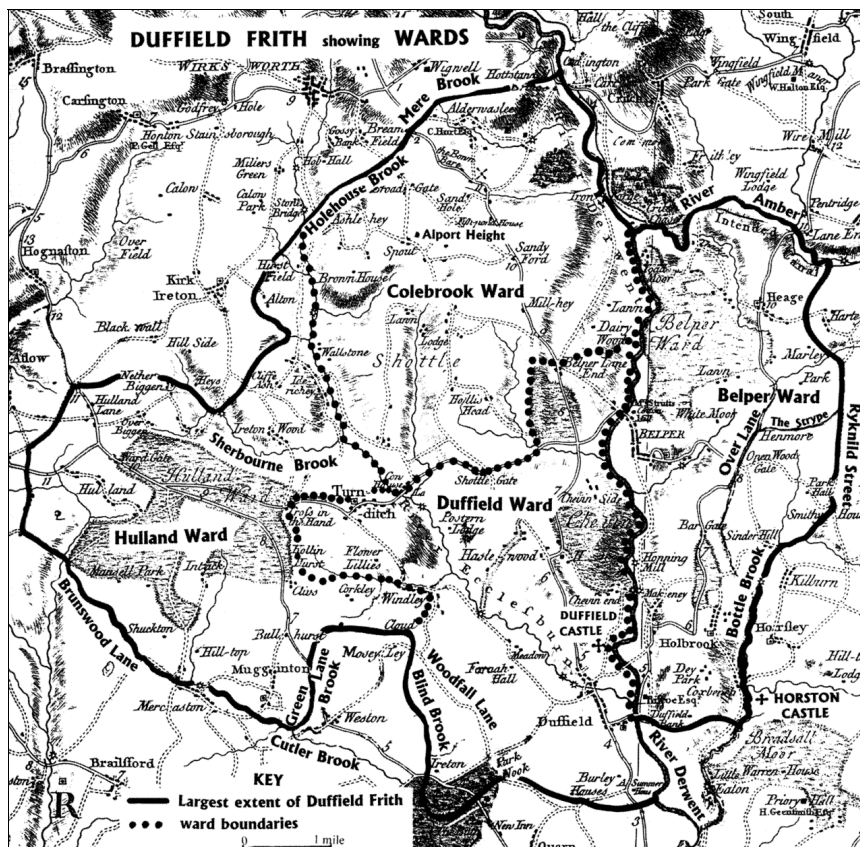
assessors had literally failed to locate them; others might be missing from listings because records have been damaged or lost subsequently; and yet others might be missing through evasion of assessment or enumeration.

In addition to these practical difficulties, historians must accept the possibility that throughout the centuries a sizeable, but unquantifiable, proportion of England's population lodged in the interstices of the figures produced by tax assessors because, intentionally or otherwise, people created space for themselves in which they could escape tithes or tax obligations. Forest areas in particular presented acute problems for the institutions of local and central government. Alan Everitt has noted that 'there was a continuous tendency for landless people to drift towards the woods and wastes and establish a toehold for themselves if they could, especially on the boundaries of parishes, townships or tythings, where jurisdictions might be ill-defined or uncertain'.<sup>3</sup> With regard to Duffield in particular, analyses of many returns, whether produced for taxation, military or ecclesiastical purposes, suggest that when its people were enumerated or listed, officials entrusted with the task, whether local men or outsiders, frequently failed to record every settlement within the locality. Consequently, not only did various returns from Duffield assess inhabitants according to different criteria, but also they might include or omit different combinations of the dispersed settlements within the area. When attempting to estimate the early-modern population of Duffield, therefore, the figures calculated from such sources are at best tentative, and at worst downright misleading. But historians of local demographic change are not necessarily limited to evidence found in official listings: contemporaries were well aware of in-migration, and several sources survive from Duffield which clearly indicate that various inhabitants had definite knowledge, as well as intuitive perceptions, that the population there was increasing rapidly during the late sixteenth and early seventeenth centuries. This article will therefore argue that such qualitative sources as contemporary observations might urge us to be cautious about relying exclusively on official listings for estimates of population change. Furthermore, as well as raising questions about methodology, evasion from official listings also has implications for the possibility that there were differential growth rates between the taxable and non-taxable sectors of the population.

### **The geography and boundaries of Duffield**

Situated in the east of Appletree Hundred, the parish of Duffield, within the deanery of Derby and diocese of Lichfield and Coventry, lay on the cusp of fertile south Derbyshire and the barren Peak District. Linking two very different landscapes and covering approximately 16,000 acres, the topography of this large parish ranged from rolling hills to riverside plains. The main settlement, situated upon flat gravelly soil on the west bank of the Derwent, lay about four miles north of Derby, on the road to Chesterfield. In the early eighteenth century, Duffield itself was described as 'a large and very good country town and the best in this part of the hundred'; there was 'good land on the lower parts of the Derwent and the River Ecclesburn which runs through it'. In

Figure 1 Map of Duffield Frith



**Note:** Map of Duffield Frith, based on Burdett's map of Derbyshire (1767), showing its largest extent and the medieval ward boundaries. The shaded areas within the wards (under the italicised ward names) are those still subject to forest law in the early seventeenth century.

**Source:** Reproduced from Mary Wiltshire, Sue Woore, Barry Crisp and Brian Rich, *Duffield Frith: history and evolution of the landscape of a medieval Derbyshire forest* (Ashbourne, 2005), 9, by kind permission of the authors.

contrast, Belper, the next largest settlement, three miles north of Duffield on the Derwent, had 'but bad and ancient forest land'. Hazelwood, in the south of the parish, contained 'some good land ... in a pleasant valley', whereas to the north, Postern and Shottle comprised 'mostly stony, indifferent land except here and there in the valley and by the rills [small brooks] thereof'.<sup>4</sup>

Lying within and astride the boundaries of the parish were several manors, the most extensive being that of Duffield itself. As part of the Duchy of Lancaster, a

steward administered the manor of Duffield on behalf of the crown, reporting initially to duchy officials based at Tutbury Castle (Staffordshire), about 12 miles away. The manor, which was sold by the duchy in 1627, was frequently referred to as 'Duffield *cum membris*'. These 'members' were the sub-manors of Belper, Biggin, Hazelwood, Heage, Holbrook, Hulland, Idridgehay, Makeney, Southwood, Turnditch and Windley.<sup>5</sup> The villages and dispersed settlements that comprised the manor lay mostly within the medieval boundaries of the forest of Duffield Frith (see Figure 1). These boundaries changed over time but at their largest extent they measured some 30 miles.<sup>6</sup> The medieval Frith had contained four wards, Belper (or Beaureper), Chevin (or Duffield), Hulland and Colebrook but the last passed into private ownership during the reign of Henry VIII.<sup>7</sup> Although the Frith was also part of the duchy, the areas of the wards under forest law were managed separately from the manor. In 1633 legal forest areas of Belper, Chevin and Hulland wards covered a total of 5,005 acres.<sup>8</sup> Regarding the relationship between the boundaries of the wards of the Frith and of the local parishes, Chevin and Belper wards lay wholly within the parish of Duffield, whereas the majority of Hulland ward lay physically within the boundaries of Mugginton parish, although Hulland ward itself was an extra-parochial liberty. Postern and Shottle, partly in Colebrook ward, lay in Duffield parish. This study is primarily concerned with the inhabitants of the settlements within Duffield parish, which comprised Belper, Hazelwood, Heage, Holbrook, Makeney, Postern, Shottle, Turnditch and Windley, together with the main settlement of Duffield.

### **Locating the population**

Among the principal objectives of the study of enclosure riots has been the reconstruction of the identity, place of residence and social status of those accused of destroying property. On 16 May 1642, the Attorney General, acting on behalf of Edward Syddenham, esquire, owner of the enclosures within the Frith, accused by name 215 men and two women of entering the enclosures 'in a violent and tumultuous way' and of levelling the hedges and fences.<sup>9</sup> The survival of muster rolls for Derbyshire, drawn up in December 1638, together with a list of the trained bands, including armed 'private men', drawn up sometime in 1639, might be thought a considerable advantage when trying to confirm the identity and place of settlement of those named by Syddenham only four years later.<sup>10</sup> In total, some 17,300 men were named in the muster rolls and the lord lieutenant reported that in December 1638 there were some 965 trained soldiers in the county, of whom 442 were privately armed.<sup>11</sup> In theory the muster roll listed the name and place of settlement all men in the county aged 16 years and over who were 'able and fit for the wars', apart from those already enrolled in the trained bands, the latter usually accounting for only two or three men in each township. However, in this instance, rather than providing names additional to those in the muster rolls, the lists of the trained soldiers and private men partly overlap the rolls: for some townships as many as a quarter of the men are also named in the muster and not all of these were 'private men'.<sup>12</sup>

Problems associated with locating the population of Duffield are clearly illustrated in an analysis of the contents of these two lists. Since they were drawn up less than four years before the enclosure riots took place, and since they supposedly name all able-bodied men within each community, both in the muster and the trained bands, logic dictates that the vast majority of the 215 men alleged to have been rioters in the Frith would have appeared in the 1638 muster rolls or 1639 lists of trained men, and that it would thus be possible to identify in which townships they dwelt. However, of these 215 men only 115 were named in the muster rolls for either Appletree Hundred or for the neighbouring wapentake of Wirksworth.<sup>13</sup> Of the 'missing' 100, nine were named as 'private' armed men. In all, therefore, 124 could be identified in the two lists but 91 (42 per cent) could not. Furthermore, of those 91 men even the surnames of 51 of them did not occur in the lists from Appletree hundred. Given that the thrust of Syddenham's suit against the alleged rioters was that they were all legal commoners, whose representatives had signed agreements concerning the creation of the enclosures, it is likely that the majority of them would have been local men who actively commoned in the Frith.<sup>14</sup> Indeed, all but 13 of the 'missing' 91 could be identified as local men in other documents. Why, then, were some 42 per cent of the alleged rioters absent from the records of the muster and trained bands?

There are several possible solutions to this conundrum. Firstly, those summoned could appoint substitutes or claim exemption.<sup>15</sup> Secondly, the definition of 'able' had become more stringent over the years, leading to fewer able-bodied men being listed.<sup>16</sup> Thirdly, the petty constables for the Duffield area had failed to return complete lists for the general muster because they had omitted to visit some of the dispersed settlements. Fourthly, some men had evaded inclusion. Fifthly, the cause might be a combination of these four. Although muster rolls were not compiled for fiscal purposes, it is possible that in view of the increasing levels of taxation in the late 1630s, particularly the controversial Ship Money, and of the muster of the trained bands in early December, some inhabitants had sought to avoid future assessments for militia rates by evading inclusion in the muster rolls.<sup>17</sup> Whether this actually would have enabled them to evade any subsequent taxation is another matter entirely. Even though, as Wrigley and Schofield have noted, the quality of muster rolls deteriorated after 1522, nevertheless, the absence of 91 alleged rioters from the muster rolls and lists of the trained bands is suggestive of evasion and/or omission by officials, and illustrates the problems encountered when trying to identify the inhabitants of Duffield.<sup>18</sup> This article will, nevertheless, attempt to draw some tentative conclusions about the early-modern population of the area. These conclusions will also be considered in the light of research on other forest communities.

### **Counting the parishioners of Duffield**

By the early-modern period, three chapelries at Belper, Turnditch and Heage had been formed within the parish of Duffield. In 1563 records were submitted from every diocese to the Privy Council counting the number of households in

**Table 1 Population estimates for the parish and its chapelries from ratios of the Compton Census to Hearth Tax returns**

Parish/ chapelry	A Households 1563	B Minimum & maximum population 1563	C Compton Census 1676	D Change B to C %	E Minimum households in HT	F Cc:HT (min)	G Maximum. Cc:HT households in HT	H Cc:HT (max)	I Population total	J Change B to I %
Duffield	353	1,589–1,765	1,800	13.3–2.0	306	5.88	358	5.02	1,800	13.3–2.0
Belper	102	459–510			118		135			
Heage	54	243–270			73		77			
Turnditch	30	135–150			55		55			
Total	539	2,426–2,695	1,800	(25.8)–(33.2)	552	3.26	625	2.88	2,700	11.3–0.2

**Notes:**

- A: 1563 diocesan returns;
- B: Calculated using the multipliers 4.5 and 5.0;
- C: Unclear whether this referred to the main parish only or to the parish and its chapelries;
- D: Percentage changes in population between 1563 and 1676;
- E: Minimum number of households in Hearth Tax returns of 1662M and 1664L, based on Table 2, Column F;
- F: Compton Census to Hearth Tax ratio, based on E;
- G: Maximum number of households in Hearth Tax returns of 1662M and 1664L, based on Table 2, Column G;
- H: Compton Census to Hearth Tax ratio, based on G;
- I: Based on ratios in columns F and H. Figure for main parish assumes that Compton census counted all inhabitants; figure for parish and chapelries assumes that Compton Census counted all adults, multiplier 1.5 used;
- J: Percentage changes in population between 1563 and 1676.

**Sources:**

- Riden, 'Population of Derbyshire in 1563', 63–64;
- Edwards, 'Population in Derbyshire', 113;
- Whiteman, *Compton Census*, 446;
- Goose and Hinde, 'Estimating local population sizes', 82, 85;
- TNA: PRO: E179/94/405, 1664 Lady Day Hearth Tax assessment, Appletree hundred;
- TNA: PRO: E179/245/8, 1662 Michaelmas Hearth Tax assessment, Appletree hundred.

each parish. These can be used to estimate the population at that time.<sup>19</sup> No returns were made for extra-parochial liberties, which included Hulland ward in Duffield Frith but, according to Riden, this particular omission would not skew population estimates too much since such forest areas were thinly populated.<sup>20</sup> In 1563, there were a total of 539 households in the whole of the Duffield parish, with 353 households in the town itself. Regarding a suitable population multiplier, in their national study of the 1563 returns Dyer and Palliser recommended a range of multipliers from 5.0 to 6.0.<sup>21</sup> Goose and Hinde have recently suggested a range from 4.5 to 5.0.<sup>22</sup> The latter range provides an estimate of somewhere between 2,426 and 2,695 for the ecclesiastical population in 1563 of Duffield and its chapelries (see Table 1).

From the diocesan returns, the parish appears to have been one of the most populous in Derbyshire at that time. Riden calculated the ratios of acres to households in all Derbyshire parishes and commented on the unusually high population density of Duffield.<sup>23</sup> He suggested that the picture might have been distorted by 'a heavy concentration of population in one community in a large and otherwise thinly populated parish'. This seems a credible explanation for the high figures because even in the sixteenth century there was a concentration of population in settlements in the corridor along the River Derwent north of Derby, which included the settlements of Duffield and Belper, the latter having a nascent nailing industry. Dyer and Palliser also commented on the high returns for Duffield and suggested that they may have been a return of communicants rather than of households.<sup>24</sup> They calculated that, when expressed as a ratio of households per square mile, the figure for Duffield was two or three times that achieved in most neighbouring parishes, although they conceded that 'this may reflect the local economy; certainly each of the chapelry returns for this parish shows the same characteristic'. Indeed, industrial activity was not confined to the larger settlements. Coalmines were situated in Chevin and Belper wards.<sup>25</sup> There were also stone quarries in Chevin ward and elsewhere in the parish.<sup>26</sup> Iron ore had been extracted and smelted within the Frith over a number of centuries.<sup>27</sup> Although not situated within the main Derbyshire lead field, lead ore was processed within the Frith.<sup>28</sup> This part of Tudor Derbyshire was indeed part of the phenomenon of 'industries in the countryside' that Joan Thirsk has identified.<sup>29</sup> Furthermore, contemporary anecdotal evidence also suggests that during the late sixteenth century there was a large population in the Duffield area. In 1587, in a petition to the queen from 'the inhabitantes and borderers of the Queene her Majesties Chase called Duffelde Frith', petitioners claimed that living in and around the Frith were 'Coppie houlders freeholders & auncient Cottagers & housholders In number five hundred & nine and of their wives, Children & families in number eightene hundred'.<sup>30</sup> Although some of these people may have belonged to the adjacent parish of Mugginton, the figure of 509 householders seems to confirm that in 1563 the vicar had indeed counted households rather than parishioners.

Since the returns of the 1603 survey of communicants within the diocese of Lichfield and Coventry have not survived, the next available ecclesiastical

records that allow population estimates of Duffield are those of the 1676 Compton Census.<sup>31</sup> The figures for Duffield are: 1,795 conformists, one papist and four nonconformists, giving a total of 1,800, a suspiciously round number.<sup>32</sup> The returns do not specify whether the term 'Duffield' encompassed simply those living in the main parish or whether it also included parishioners living within the chapelries of Belper, Heage and Turnditch. The following calculations will consider both possibilities, and in conclusion will discuss the most plausible definition of 'Duffield' in the context of the Compton Census.

Precisely which members of a parish were counted in the Compton Census is difficult to determine, not least because, as Whiteman has noted, 'nothing is known of the form in which the questions were circulated in many dioceses'.<sup>33</sup> She has suggested that, in general, unless the surviving returns overtly stated or implied anything to the contrary, 'those over 16, and of both sexes' were reported (presumably she means '16 and over').<sup>34</sup> Furthermore, her detailed analysis of returns from the various dioceses has enabled her to modify this generalisation according to her findings for each diocese; however, her conclusions regarding the ecclesiastical jurisdictions that included Duffield are somewhat contradictory. Referring specifically to the diocese of Lichfield and Coventry, she calculated that only 11 per cent of parishes reported both men and women over 16, and therefore that 89 per cent reported male communicants only.<sup>35</sup> However, this calculation was based on an analysis of returns relating exclusively to parishes within the archdeaconry of Coventry and not to those within the archdeaconry of Derby, which included Duffield. Regarding the latter archdeaconry, she concluded that the returns had been made 'with considerable inconsistency'.<sup>36</sup> She made no specific comments about the returns from Duffield, other than to suggest that they *may* include the figures for the chapelries.<sup>37</sup> Given this uncertainty regarding the inclusion or exclusion of women in the Derby archdeaconry returns, before attempting to produce an estimate of the number of parishioners in Duffield based on the returns of the Compton Census, it is necessary to investigate further exactly who was enumerated there. Whiteman has suggested that by comparing the 1676 figures with evidence extracted from other sources 'it is possible to discover, or to make a reasonable conjecture about, what part of the population was included'.<sup>38</sup> Hearth Tax returns are the most obvious comparative source for this. Arkell has devised a method based on ratios, whereby the ratio produced by dividing the 1676 figure by the total number of households in the Hearth Tax indicates which category of parishioner was counted in the Compton Census.<sup>39</sup> Where the boundaries of parishes and the relevant Hearth Tax enumeration districts, frequently townships, were coterminous, the application of this method is reasonably straightforward, but problems might arise where boundaries were not the same or where Hearth Tax returns were less than complete.

In 1982, using ratios based on Arkell's method, Edwards produced a statistical analysis of the population of Derbyshire in the reign of Charles II.<sup>40</sup> Regarding the figures achieved for Duffield, based on the Hearth Tax returns of Lady Day 1664 (hereafter 1664L), Edwards concluded that in 1676 the vicar there had



counted the *total number* of parishioners, including those residing within the chapelries, rather than the number of communicants; that is, that the Duffield returns included every man, woman and child of any age, rather than only those aged 16 and over.<sup>41</sup> This particular part of his analysis raises more questions than it answers, because it suggests that in 1676 the total population of Duffield parish including its chapelries was only 1,800 and therefore that the population had nose-dived from somewhere between 2,426 and 2,695 in 1563 to a mere 1,800 in 1676, a decrease of between 25.8 and 33.2 per cent (see Table 1). According to Edwards's reckoning, even if we allow for the possibility that inhabitants living in the chapelries had been omitted in 1676, his figures would still suggest that the population of the parish of Duffield alone had not increased significantly: 1,800 in 1676 is only 2.0 to 13.3 per cent more than the estimates for 1563 (see Table 1). Closer examination of his work, however, reveals that he made certain incorrect assumptions about the Duffield 1664L (Lady Day) returns; close scrutiny of these returns also reveals that they were defective.

In the 1664L assessment, the returns from Postern and Shottle are badly damaged, those from Belper are slightly damaged and there are none from Hazelwood, Turnditch or Windley.<sup>42</sup> Edwards had assumed that the returns from Hazelwood, Turnditch and Windley had been subsumed within those from Duffield, but none of the names that occurred in those three places in the 1662M (Michaelmas) returns occurred in the 1664L Duffield returns.<sup>43</sup> However, since the 1664L returns also list those inhabitants whose property was exempted from the tax, whereas those of 1662M do not, the former returns, although defective, cannot be ignored completely as the Compton Census to Hearth Tax ratio should cover all inhabitants rather than taxpayers only. In order to ascertain the number of households represented in the Duffield Hearth Tax returns for comparison with the Compton Census figure, following careful analysis, the returns 1662M have been conflated with those of 1664L (see Table 2). The results provide the minimum and maximum number of households recorded in the Hearth Tax (columns F and G) to use with the Compton Census figure to provide a ratio that should, in turn, suggest which parishioners were counted in 1676. As it is not clear whether, in 1676, the vicar of Duffield included parishioners in the three chapelries in his figure of 1,800, it is necessary to consider two sets of ratios, the first based on the assumption that the chapelries were included and the second on the assumption that they were excluded.

Assuming that the chapelries were included in the Compton Census, a range of ratios between 3.26 and 2.88 is achieved by dividing 1,800 by the minimum and maximum numbers of households assessed in the Hearth Tax within the whole parish (see Table 1). According to Arkell's method, this range suggests that all adults in the parish were counted in the Compton Census.<sup>44</sup> When calculating the total population where the returns included women, Whiteman has suggested the multiplier 1.5, assuming that children under 16 constituted 33 per cent of the population.<sup>45</sup> If there were 1,800 communicants of both sexes in the parish and its chapelries, this would give a total population in 1676 of

**Table 2 A comparison and analysis of the Michaelmas 1662 and Lady Day 1664 Hearth Tax returns for the Duffield area**

Place	A Both	B Same surname	C 1662M only	D 1664L only	E Illegible in 1664L	F Minimum assessed	G Maximum assessed	H Min. assessed population	I Max. assessed population
Duffield	56	3	12	61	2	132	134	568	576
Holbrook	20	0	2	15	0	37	37	159	159
Postern & Shottle	39	5	58	35	50	137	87	589	04
Total main parish	115	8	72	111	52	306	358	,316	1,539
Belper	44	4	33	37	17	118	135	507	581
Heage	32	1	21	19	4	73	77	314	331
Hazelwood, Windley & Turnditch	0	0	55	0	0	55	55	237	237
Totals	191	13	181	167	73	552	625	2,374	2,688

**Notes:** A: Taxpayers/householders appearing in both the 1662M and 1664L assessments (1664L includes those exempted);  
B: Taxpayers not present in 1662M but appearing in 1664L with the same surname as someone present in 1662M but absent from 1664L (four were widows);  
C: Taxpayers only appearing in 1662M (and not included in column B);  
D: People assessed only appearing in 1664L (and not included in column B);  
E: Names illegible in 1664L;  
F: Minimum total number of people assessed: A+B+C+D, assuming that *all* of the names illegible in 1664L appear in 1662M;  
G: Maximum total number of people assessed: A+B+C+D+E, assuming that *none* of the names illegible in 1664L names appear in 1662M;  
H & I: Totals calculated using mean household size of 4.3.

**Sources:** TNA: PRO: E179/94/405;  
TNA: PRO: E179/245/8.

2,700, suggesting that the population there had scarcely increased, the increase from 2,426 in 1563 being 11.3 per cent and that from 2,695 being 0.2 per cent. Alternatively, assuming that the returns excluded the chapelries, using the Hearth Tax returns for the settlements of Duffield, Holbrook, Postern and Shottle only, the range of ratios achieved is between 5.88 and 5.02. According to Arkell's method, this range suggests that all inhabitants were counted in the Compton Census.<sup>46</sup> This would mean that the population of the main parish alone had increased from between 1,589 and 1,765 in 1563 to 1,800 in 1676, an increase of 13.3 per cent at most.

Both sets of ratios appear to suggest that the population of this parish, which was notably large in 1563, had barely increased during the following century. Indeed, the numbers of households in 1563 and in the Hearth Tax in the 1660s (columns A, E and G in Table 1) also seem to suggest that the population had not increased by much, particularly in the main parish. Since estimates for the country as a whole during the period from 1563 to 1676 suggest that the national population had increased by some 64.1 per cent, these trends in the Duffield population appear improbable.<sup>47</sup> How might they be explained? Regarding the population in 1563, the possibility that all inhabitants had been counted rather than households only has already been discussed and dismissed. It seems likely, therefore, that the problem lies with the Hearth Tax figures used to calculate the ratios. Although the numbers assessed in 1662M and 1664L were carefully analysed and conflated, given the extensive nature of the parish it is possible that some of the parishioners who lived in dispersed settlements were assessed for the Hearth Tax in townships other than those considered here, particularly those parishioners living in the upland areas in the north and west of the parish.

By applying various multipliers to the figure for 'Duffield' in the Compton Census, alternative estimates for the population of the parish can be produced. Given the uncertainty regarding the inclusion or exclusion of women in the Derby archdeaconry returns, four sets of estimates have been calculated: the first assumes that the returns included both sexes in the parish and its chapelries; the second that they included both sexes in the main parish; the third that they included only males in the parish and chapelries; and the fourth that they included only males in the main parish (see Table 3). Taking 1,800 as the number of communicants of both sexes in 'Duffield', the multiplier 1.5 gives a total population in 1676 of 2,700. If this figure referred to the chapelries as well as the main parish, it suggests that the population there had scarcely increased, the increase from 2,426 in 1563 being 11.3 per cent and that from 2,695 being 0.2 per cent.<sup>48</sup> Alternatively, if the returns for all communicants applied only to Duffield parish itself, the population had increased from between 1,589 and 1,765 in 1563 to 2,700 in 1676, an increase of between 53.0 and 69.9 per cent. For returns counting only males, Whiteman suggested a multiplier of 3.0, that is, double to allow for women plus 33 per cent for children under 16 years old.<sup>49</sup> Therefore, if there were 1,800 male communicants, this would give a total population of 5,400 in 1676. This would suggest either that the population in the parish and its chapelries had increased

**Table 3 Population estimates for Duffield parish and its chapeltries based on the Compton Census**

Parish / chapeltry	A Population 1563	B Compton Census	C Change A to B %	D Population if all adults in Compton Census	E Change A to D %	F Population if males only in Compton Census	G Change A to F %
Duffield	1,589–1,765	1,800	13.3–2.0	2,700	69.9–53.0	5,400	239.8–205.9
Belper	459–510						
Heage	243–270						
Turnditch	135–150						
Total	2,426–2,695	1,800	(25.8)–(33.2)	2,700	11.3–0.2	5,400	122.6–100.4

**Notes:** A: Calculated using the multipliers 4.5 and 5.0;  
 B: Unclear whether this referred to the main parish only or to the main parish and its chapeltries.  
 C: Percentage changes in population between 1563 and 1676 based on Edwards's assumption that figure referred to all inhabitants;  
 D: Population estimate assuming all adults counted in Compton Census, calculated using the multiplier 1.5;  
 E: Percentage changes in population between 1563 and 1676 based on D;  
 F: Population figure assuming males only counted in Compton Census, calculated using the multiplier 3.0;  
 G: Percentage changes in population between 1563 and 1676 based on F.

**Sources:** Riden, 'Population of Derbyshire in 1563', 63-64;  
 Edwards, 'Population in Derbyshire', 113;  
 Whiteman, *Compton Census*, 446;  
 Goose and Hinde, 'Estimating local population sizes', 85.

by between 100.4 and 122.6 per cent since 1563, or that the population of the main parish had increased from between 1,589 and 1,765 to some 5,400 in 1676, an increase in the range of 205.9 to 239.8 per cent. These four possible estimates for change in the ecclesiastical population of Duffield between 1563 and 1676 vary considerably, ranging from almost no change to an increase of well over 200 per cent. Which estimate seems most plausible? Given that the national population had increased by some 64.1 per cent, perhaps the most likely population estimate for 'Duffield' in 1676 is that which shows a percentage increase of 53.0 to 69.9 since 1563, the estimate for the total population of the main parish alone, assuming that the Compton Census return counted all adults there.

### **The taxable population of the townships**

The survival of taxation returns from Duffield enables the production of a second set of population estimates, albeit of the taxable rather than the total population. Although multipliers have been suggested for estimating the total population from taxation records, initially this discussion will focus on the taxable population since estimates of taxable population serve as demographic indicators in their own right. Furthermore, it seems reasonable to compare *trends* in population estimates based on taxation returns made by township or constablewick with those estimates based on ecclesiastical returns from a parish. Thus the rate of change in the taxable population might gauge the validity of the various estimated rates of increase in the total population of the parish suggested above.

Given the problems discussed previously regarding possible omissions from various listings of some of the settlements within 'Duffield', before comparing any sixteenth century fiscal records with ones from the seventeenth century it is necessary to analyse several taxation assessments for Duffield to determine the most suitable returns to use. The following taxation assessments have been analysed: the second payment of the 1523 lay subsidy (assessed in 1525); the first payment of the 1543 lay subsidy; the 1662M Hearth Tax and the 1664L Hearth Tax.<sup>50</sup> Hoyle has commented that the 1543 subsidy returns have largely been ignored by historians despite the fact that the low threshold for taxation on goods worth £1 effectively equates with the 1523 threshold of wages of £1 *per annum*.<sup>51</sup> To make the most meaningful links between the sixteenth and seventeenth-century assessments, those selected must cover the same categories of taxpayers and the same settlements within Duffield. It is also necessary to determine when communities have been omitted completely and when they have been subsumed within others. The places used in the calculations are Belper, Duffield, Hazelwood, Heage, Holbrook, Makenev, Postern, Shottle, Turnditch and Windley.<sup>52</sup> The absence from the 1525 subsidy assessments of the inhabitants of Heage, site of one of the three chapels, suggests that it would be preferable to use the 1543 assessments. Moreover, even excluding those from Heage, the 1543 assessments include 32 (27 per cent) more taxpayers than those of the 1525 subsidy (see Table 4). The increase in numbers corresponds with Sheail's findings that the 1543–1545 returns from northern counties contained

more names than the 1524–1525 returns.<sup>53</sup> However, Hoyle has cautioned that the increase probably indicates a moderate increase in prosperity rather than in population size.<sup>54</sup>

There is some disagreement over whether Tudor lay subsidy returns include only taxable males aged 16 and over, or represent households.<sup>55</sup> Returns from the Duffield area for the first payment of the 1543 subsidy name 174 taxpayers, including 13 women. Eight of these women are specifically described as widows, one is denoted as '*uxor*' (wife), and the other four have no status ascription. The taxable goods of these women range in value from 20s to £10. Their inclusion in the returns suggests that they were heads of their household and therefore that these returns might represent taxable households in the community.<sup>56</sup> Alternatively, within the returns are nine pairs of taxpayers with the same surname who appear next to each other in the listing, suggesting that these particular pairs dwelt in the same house and therefore that one of them was not the household head but an adult male over 16. In two pairs the men are specifically designated 'senior' and 'junior'; another pair is probably a widow and son; three pairs have been assessed on goods of the same value; of the remaining three pairs, only William and Henry Smith had markedly different assessments, at £9 and 20s respectively. This scant evidence seems to suggest that adult males over 16 were being assessed at Duffield. The 1543 returns, therefore, appear to contain heads of households *and* males over 16. Clearly a range of multipliers is advisable to calculate the taxable population: for males aged 16 and over, the multiplier 3.2 is recommended; for households, 4.75.<sup>57</sup> In 1543 there were 174 taxpayers, giving a total taxable population of between 556 and 828 (see Table 4).

As already noted, the most suitable Hearth Tax returns for comparing the *taxable* population of Duffield in the 1660s with that of 1543 are those for 1662M, because the 1664L returns are defective. Indeed, when the exempted householders are deducted from the 1664L total, there are 80 fewer taxpayers than in 1662M (see Table 4). For calculating population totals from the Hearth Tax, Arkell has suggested a mean household size of 4.3 in both rural and urban areas outside London.<sup>58</sup> In 1662, the number of taxpayers in the Duffield area was 385, thus the taxable population was some 1,656. Superficially these figures suggest that the taxable population of Duffield more than doubled between 1543 and 1662, rising from between 556 and 828 to approximately 1,650.

Given the problems encountered by officials when assessing the dispersed settlements that comprised the community of 'Duffield', and given the omissions and combinations of different communities shown in Table 4, estimates of such a dramatic rise should be qualified. Slack has cautioned that local assessors of both the lay subsidy and the Hearth Tax made subjective judgements regarding qualifications for exemption, and that perceptions of who should be exempt tended to be narrower in the Hearth Tax.<sup>59</sup> This observation suggests that in the lay subsidy, in particular, fewer people were taxed than ought to have been and therefore that the taxable population in the sixteenth century was greater than that which was actually taxed. The anecdotal evidence quoted above which stated that there were

**Table 4 The taxable population of Duffield in the lay subsidies of 1525 and 1543 and the Hearth Taxes of 1662M and 1664**

Place	Total taxpayers in 1525	Total taxpayers in 1543	Taxable population in 1543	Total charge-able taxpayers in 1664	Total taxpayers in 1662	Taxable population in 1662
Belper	31	37	118–176	75	81	348
Duffield	34	50	160–238	72	71	305
Makeney	7	11	35–52	[with Duffield]	[with Duffield]	
Hazelwood & Shottle		40	128–190			
Hazelwood	12					
Turnditch	9	[with Duffield]				
Windley	9	2	6–10			
Hazelwood, Windley & Turnditch				[missing]	55	237
Heage	[missing]	24	77–114	47	54	232
Holbrook	16	10	32–48	19	22	95
Postern & Shottle				[damaged] c. 92	102	439
<b>Total</b>	<b>118</b>	<b>174</b>	<b>556–828</b>	<b>c.305</b>	<b>385</b>	<b>1,656</b>

**Notes:** Taxable population in 1543 calculated using the range of multipliers 3.2 to 4.75; Taxable population in 1662 calculated using a mean household size of 4.3.

**Sources:** TNA: PRO: E179/91/95 & 92/176, 1523 lay subsidy, second assessment, Appletree hundred, February 1525; TNA: PRO: E179/91/152, 1543 lay subsidy, first assessment, Appletree hundred, November 1543; TNA: PRO: E179/94/405, 1664L hearth tax assessment, Appletree hundred; Arkell, 'A method for estimating population totals', 101–2; Goose and Hinde, 'Estimating local population sizes', 79.

some 509 householders in and around the Frith in 1587 seems to confirm Slack's observation. Although some of these householders might have been assessed in other townships and others might have arrived since 1543, the considerable difference between 174 and 509 suggests that a sizeable proportion of households were not assessed for the lay subsidy. All of this indicates that any calculated increase in the taxable population by the 1660s would be greater than the actual increase and therefore that the apparent doubling of the taxable population at Duffield should be treated with caution; nevertheless, it is clear that the taxable population had increased markedly in the intervening 120 years, even if the exact increase is unclear. These findings concerning a forest population chime with Pettit's analysis of the populations of the villages within Salcey and Whittlewood Forests. Comparing figures derived from the 1524 lay subsidy returns and 1670 Hearth Tax assessments, he found, for example, that the median number of householders in villages in those forests rose from 34 to 77.<sup>60</sup>

#### The total population of Duffield derived from taxation returns

In their recent discussion of multipliers for estimating total population figures from early-modern taxation returns, *contra* Slack, Goose and Hinde have

argued that regarding the Tudor lay subsidies of 1524–1525, the numbers evading the tax, or exempted from it, might well have been considerably lower than the oft-suggested figure of 30 per cent.<sup>61</sup> Nevertheless, to produce a tentative total population figure from the taxable population in 1543, allowance should be made for possible evasion and exemption.<sup>62</sup> Applying to the 174 taxpayers in 1543 multipliers of 4.57 and 6.79, the former for returns listing taxable males of 16 and over and the latter for returns listing heads of households, the estimated total population of Duffield in 1543 was somewhere between 795 and 1,181. When the returns from 1662M and 1664L are conflated, the resultant minimum and maximum numbers of assessed households are 552 and 625 respectively. Using the multiplier 4.3, these figures suggest total population estimates of between 2,374 and 2,688 (see Table 2). These estimates based on fiscal sources suggest that the number of inhabitants in the settlements in and around the Frith had increased from somewhere between 795 and 1,181 in 1543 to somewhere between 2,374 and 2,688 in the 1660s, and therefore that the overall population had more than doubled. Even considering Slack's concerns about omissions from the lay subsidy, the overall upward trend is undeniable. Furthermore, the actual number of households in the Duffield area was probably higher because some people living within the Frith may not have been listed in the Hearth Tax returns even as exempt. Apart from the possibility that such people's houses were inadvertently omitted by tax-assessors due to their inaccessible location, squatters' cottages might have no hearth or chimney that could be assessed, just a crude fire, the smoke from which escaped through a hole in the roof.<sup>63</sup> At first glance, the estimate for the total population of Duffield in the 1660s appears to confirm the estimate for the parish's population in 1676: the former, derived from the Hearth Tax assessments for the settlements within the Duffield area, falls between 2,374 and 2,688 and the latter, based on the returns of the Compton Census, is 2,700 when it is assumed that the vicar counted all adults. However, the earlier calculations regarding ratios demonstrated that the parish and Hearth Tax townships were not coterminous. Moreover, if the population of the main parish alone was 2,700 in 1676, this figure is virtually equal to the total population of all of the settlements in the 1660s based on the Hearth Tax returns, including exemptions.

The varying rates of change suggested by the fiscal and ecclesiastical population estimates also need to be considered. Firstly, regarding the number of parishioners, if the figure of 2,700 relates to the parish and chapelries, it suggests that the increase in the ecclesiastical population since 1563 was no more than 11.3 per cent; whereas if the figure relates to the main parish alone, it suggests an increase of between 53.0 and 69.9 per cent. Secondly, estimates for the taxable and total population based on fiscal records suggest that they may have doubled between 1543 and the 1660s. For the ecclesiastical population to have doubled from its 1563 figure of 2,695 to some 5,400 in 1676, the Compton Census figure would have to have counted only males in the parish and its chapelries (Table 2). Furthermore, the figure of 5,400 parishioners seems too high: although it has now been demonstrated that the parish, including its chapelries, covered a greater area (and included a greater



population) than the area covered by the Hearth Tax townships selected for this study, it is not feasible that the upland areas of the parish contained as many parishioners as the townships. Since the various multipliers that have been used were produced by historians following careful analysis of the sources in question, the evidence presented here suggests that the estimates from the fiscal and ecclesiastical returns from the Duffield area are not directly comparable, for when numerical totals appear to concur, rates of change are incompatible and *vice versa*. Based on the surviving fiscal and ecclesiastical evidence, perhaps the best that can be said about the population of Duffield Frith between the mid sixteenth century and the late seventeenth century is that the taxable population of the settlements had almost doubled, whereas the number of parishioners had increased by somewhere between 0.2 and 53 per cent, but possibly more.

Whilst every effort was made to include in this study each of the dispersed settlements within the Duffield area, problems associated with missing returns and elusive inhabitants have been noted. Evasion is another factor that needs to be considered: the multipliers used on fiscal records have been calculated to allow for some evasion, whereas the ecclesiastical multipliers have not. Goose has suggested a multiplier of 6.33 to allow for under-enumeration in the 1563 returns but this has not been used here because Whiteman's multipliers for 1676 do not allow for under-recording.<sup>64</sup> It is possible that some Duffield parishioners attempted to evade such enumerations because they feared that there might be implications for the payment of tithes. In the 1740s, during a dispute over tithe obligations within the parish, residents within the Frith claimed that all three wards were extra-parochial, not just Hulland ward, and that accordingly they did not owe tithes to the rector.<sup>65</sup> It is possible, therefore, that the apparently slower rate of growth of the ecclesiastical population may be attributable in part to under-enumeration.<sup>66</sup>

### **Contemporary perceptions of demographic pressure in Duffield**

Early-modern writers such as John Norden, as well as historians such as Alan Everitt, have observed that forest areas, frequently situated on the boundaries of different jurisdictions, attracted landless migrants. In such areas these individuals might find it easy to evade enumeration or might be exempted legitimately from fiscal assessment by reason of their poverty and/or the low annual value of their dwelling. In demographic calculations, although multipliers that allow for the non-taxable population can be suggested, it is highly likely that this sector of the population was growing more quickly than the taxable sector. Moreover, the size, and therefore growth rate, of the non-taxable population cannot be calculated with any kind of accuracy. Anecdotal evidence supplied by contemporaries in Duffield indicates that they were conscious of a rapidly expanding population within the Frith itself.

In the late sixteenth century, Anthony Bradshaw, deputy steward of Duffield Frith, observed that it was 'overcharged': its commons and their readily available fuel supply were attracting more incomers than could be sustained

adequately.<sup>67</sup> In 1618, it was reported that in Postern and Shottle the number of households had increased from nine in 1580 to 66 in 1618. Nearly all were so successfully engaged in 'husbandry' that they were selling corn on the market and maintaining 'great families'.<sup>68</sup> In 1641, Robert Smith, a Duffield weaver, identified 41 people who had made encroachments in the Frith anything up to 30 years previously.<sup>69</sup> Of these encroachments, at least 28 (68 per cent) included a cottage or other dwelling. From the wording of his evidence, it is likely that the people named by Smith were the current occupiers, rather than the owners, of the properties. Finally, in the 1650 Commonwealth survey of Duffield Frith, commissioners valued 127 illegal encroachments in the Frith, of which 109 (86 per cent) included a dwelling.<sup>70</sup> Some people named in this survey were substantial manorial tenants but most of these would have rented their newly erected dwellings in the waste to squatters and incomers.<sup>71</sup> This anecdotal evidence from Duffield is comparable with the findings of Buchanan Sharp in his study of riots in the west of England between 1586 and 1660. He did not attempt to quantify forest populations but used the returns of several government commissions to demonstrate that the populations within various forests had been expanding throughout the period. For example, in 1610 it was reported that there were 137 newly erected dwellings bordering on Blackmore Forest (Wiltshire) and 76 bordering on Chippenham Forest (Wiltshire). Of these, 167 had no land attached.<sup>72</sup> As at Duffield, according to official reports, these forests were attracting incomers.

### Conclusion

Statistical analyses of the various early-modern ecclesiastical and fiscal returns from Duffield appear to produce contradictory results, since the former suggest a much lower rate of population increase than the latter.<sup>73</sup> Indeed, the suggestion that the parish's population might have scarcely increased seems to confirm Riden's comment that extra-parochial forest areas, and by extension forest areas in general, were sparsely populated.<sup>74</sup> Analysis of the fiscal population, however, suggests that the number of inhabitants in the Duffield area increased markedly between the 1540s and the 1660s and this is comparable with Pettit's findings concerning forest populations in Northamptonshire. Local inhabitants and Commonwealth surveyors had noticed a large number of new dwellings in the area around Duffield and had recorded them in varying detail. These particular observations arguably provide conclusive evidence for increases in the population in the Frith during the late sixteenth and early seventeenth centuries because many of the people mentioned in them were recent incomers and squatters—the sort of people who may have been overlooked by tax assessors and ecclesiastical enumerators. Indeed, such people came into such areas precisely *because* they were often outside ecclesiastical and civil jurisdictions. This would suggest that although, in general, statistical evidence serves a useful purpose, it needs to be handled with care, particularly when dealing with areas comprising dispersed and remote settlements. The value of anecdotal evidence from such places is clear: although such evidence does not permit the calculation of rates of population increase, it convincingly demonstrates the significance of the arrival of incomers who might not necessarily be found in official enumerations.

## NOTES

1. For example, see the views of John Manwood and John Norden reproduced in J. St John, *Observations on the Land Revenue* (London, 1787), Appendices I and II.
2. These riots, together with enclosure riots that occurred at Whittlesey (Cambridgeshire) during the 1640s, formed the subject of my PhD thesis, 'Custom, resistance and politics: local experiences of improvement in early-modern England' (University of Warwick, 2007).
3. A. Everitt, 'Common Land', in J. Thirsk ed., *The English rural landscape* (Oxford, 2000), 210–35. Here at 218.
4. C. Glover and P. Riden eds, *William Woolley's history of Derbyshire*, Derbyshire Record Society, 6 (Chesterfield, 1981), 89–93.
5. For holdings in the manors, see, for example, The National Archives (hereafter TNA): PRO: DL44/1147, 23 June 1635. The location of Southwood is now unknown. Biggin and Idridgehay were not in Duffield parish.
6. M. Wiltshire, S. Woore, B. Crisp and B. Rich, *Duffield Frith: history and evolution of the landscape of a medieval Derbyshire forest* (Ashbourne, 2005), Chapter 1, 'Setting the scene'.
7. W. Page ed., *The Victoria history of the counties of England, a history of the county of Derbyshire* (hereafter *VCH Derbys*), 1 (London, 1907), 418.
8. TNA: PRO: DL44/1127, September 1633.
9. TNA: PRO: DL1/370 (unnumbered), 16 May 1642.
10. TNA: PRO: SP16/405, part 2, general muster rolls for the county of Derby, December 1638; SP17/E/14, muster roll of the trained bands of Derbyshire, including private men and their arms, 1639.
11. TNA: PRO: SP16/409/1, letter from William Cavendish, earl of Devonshire, to the Council, 1 January 1639, with which is enclosed a 'view of the forces and arms of the county of Derby', taken in December 1638.
12. For example, analysis of the 33 men from Duffield and Belper named in the list of trained soldiers and 'private' armed men shows that eight of them were also named in the muster roll, including one of the soldiers.
13. It is possible to identify the two widows accused of rioting and even to locate their husbands' wills.
14. For example, William Blutworth, one of the signatories to the enclosure agreements in 1632 and who held over 45 acres in the manor of Duffield, was accused of rioting but was not named in either roll.
15. Substitution and exemption usually applied to the militia or trained bands rather than the general muster. The most comprehensive account of the militia and of muster rolls is to be found in L. Boynton, *The Elizabethan militia, 1558–1638* (London, 1967), although the discussion of the 1638 rolls is somewhat cursory.
16. Boynton, *Elizabethan militia*, 45–7.
17. For the raising of militia rates, see A. Hassell Smith, 'Militia rates and militia statutes 1558–1663', in P. Clark, A. G. R. Smith and N. Tyacke eds, *The English Commonwealth 1547–1640: essays in politics and society presented to Joel Hurstfield* (Leicester, 1979), 93–110, especially 107. For the military build up prior to the first Bishops' War, see K. Sharpe, *The personal rule of Charles I* (London, 1992), 797–8.
18. E. A. Wrigley and R. S. Schofield, *The population history of England 1541–1871: a reconstruction* (London, 1981), 569.
19. The originals are in British Library: Harleian MS 594, ff. 156–60. They have been published in A. Dyer and D. M. Palliser eds, *The diocesan population returns for 1563 and 1603* (London, 2005). The returns for Derbyshire have been tabulated and analysed in P. Riden, 'The population of Derbyshire in 1563', *Derbyshire Archaeological Journal* (hereafter *DAJ*), 98 (1978), 61–71. Here the main parish of 'Duffield' includes the communities of Hazelwood, Shottle, Windley and Holbrook.
20. Riden, 'Population of Derbyshire in 1563', 61.
21. Dyer and Palliser, *Diocesan population returns*, 'General introduction', 1.
22. N. Goose and A. Hinde, 'Estimating local population sizes at fixed points in time: Part II – specific sources', *LPS*, 78 (Spring 2007), 82. Goose, based on research on the town of Cambridge

- and county of Hertfordshire, also warns that these returns might under-enumerate the population by 25 per cent (*ibid.*).
23. Riden, 'Population of Derbyshire in 1563', 66.
  24. Dyer and Palliser, *Diocesan population returns*, 105, n.23.
  25. Page ed., *VCH Derbys*, 2, 349–52. Derbyshire Commonwealth surveys indicate that the Duffield coalfield was by far the most important in the county at that time.
  26. TNA: PRO: E134/1659/East27: deposition of John Burgine of Shottle, waller.
  27. Page ed., *VCH Derbys*, 2, 356–9.
  28. In 1552, the German Burkhard Cranich had erected a stamp mill for crushing lead near Duffield. It is unclear whether the lead came from Duffield or from elsewhere. (H. R. Schubert, 'The first stamp mills in English industry', *Journal of the Iron and Steel Institute*, 157 (November 1947), 343–4.)
  29. J. Thirsk, 'Industries in the countryside', reprinted in J. Thirsk ed., *The rural economy of England* (London, 1984), 219–20.
  30. TNA: PRO: DL44/305, f.5, petition of 'the inhabitantes and borderers of Duffylde frythe', 2 September 1587.
  31. The returns have been published in A. Whiteman ed., *The Compton Census of 1676: a critical edition* (London, 1986). The Derbyshire returns were first published in J. C. Cox, 'A religious census of Derbyshire, 1676', *DAJ*, 7 (1885), 31–6.
  32. Whiteman, *Compton Census*, 446.
  33. Whiteman, *Compton Census*, xxxvi.
  34. Whiteman, *Compton Census*, xxxvi.
  35. Whiteman, *Compton Census*, lxii and Table A on lxiii.
  36. Whiteman, *Compton Census*, 433.
  37. Whiteman, *Compton Census*, 446.
  38. Anne Whiteman, 'The Compton census of 1676', in K. Schürer and T. Arkell eds, *Surveying the people* (Oxford, 1992), 86.
  39. T. Arkell, 'A method for estimating population totals from the Compton Census returns', in Schürer and Arkell eds, *Surveying the people*, 97–116. The ratios are given in Tables 2 and 3.
  40. D. G. Edwards, 'Population in Derbyshire in the reign of King Charles II: the use of hearth tax assessments and the Compton Census', *DAJ*, 102 (1982), 106–17. (Arkell had supplied Edwards with pre-publication details of his method.) In his analysis, Edwards used the hearth tax assessments that he had previously published in D. G. Edwards ed., *Derbyshire hearth tax assessments 1662–70* (Derbyshire Record Society, 7, Chesterfield, 1982).
  41. Edwards, 'Population in Derbyshire', 113.
  42. TNA: PRO: E179/94/405, Lady Day 1664 Hearth Tax assessment, Appletree hundred.
  43. Edwards, *Derbyshire hearth tax assessments*, lviii, lxix; TNA: PRO: E179/245/8, Michaelmas 1662 Hearth Tax assessment, Appletree Hundred. Although it is possible that the assessments for Hazelwood, Turnditch and Windley are missing because the relevant membranes have since been lost, given the layout of the originals, it seems more likely that these settlements were omitted by the assessors for 1664L.
  44. Arkell, 'A method for estimating population totals', 104.
  45. Goose and Hinde, 'Estimating local population sizes', 85.
  46. Arkell, 'A method for estimating population totals', 104.
  47. Wrigley and Schofield, *The population history of England*, 207, figure 7.1; 531–2, Table A3.3, have calculated that between 1563 and 1676, the total population of England grew from 3,048,188 to 5,003,488.
  48. This estimate is based on the same calculations as the first ratio above.
  49. Goose and Hinde, 'Estimating local population sizes', 85.
  50. TNA: PRO: E179/91/95 & 92/176 (1523 lay subsidy, second assessment, Appletree hundred, February 1525); E179/91/152 (1543 lay subsidy, first assessment, Appletree hundred, November 1543); E179/245/8 (1662M, Appletree hundred); E179/94/405 (1664L, Appletree hundred).
  51. R. Hoyle, *Tudor taxation records: a guide for users* (London, 1994), 26.
  52. No lay subsidy returns have survived for Postern; Shottle was not assessed in 1523 but was assessed together with Hazelwood in 1543; in the Hearth Tax returns Postern and Shottle were assessed together.

53. J. Sheail, 'The distribution of taxable population and wealth in England during the sixteenth century', in J. Patten ed., *Pre-Industrial England* (London, 1979), 59, quoted in Hoyle, *Tudor taxation*, 26.
54. Hoyle, *Tudor taxation*, 26.
55. Goose and Hinde, 'Estimating local population sizes', 79.
56. See A. L. Erickson, *Women and property in early modern England* (London, 1993), especially 23–6.
57. Goose and Hinde, 'Estimating local population sizes', 79.
58. Arkell, 'A method for estimating population totals', 101–2.
59. P. Slack, *Poverty and policy in Tudor and Stuart England* (London, 1988), 40–1.
60. P.A.J. Pettit, *The royal forests of Northamptonshire: a study in their economy 1558–1714* (Northamptonshire Record Society, 23, Gateshead, 1968), 141–5 and Appendix IV, 197–9.
61. Goose and Hinde, 'Estimating local population sizes', 79–80.
62. Goose and Hinde, 'Estimating local population sizes', 79.
63. Discussion with Professor Margaret Spufford, 'Vernacular buildings and the Hearth Tax' conference, Oxford, 29–31 October 2004. See also G. E. Fussell, *The English rural labourer: his home, furniture, clothing and food from Tudor to Victorian times* (London, 1949), 10, 12.
64. Goose and Hinde, 'Estimating local population sizes', 82, 85.
65. TNA: PRO: E134/18Geo2/Mich1, Davenport *versus* Lygon, 1742.
66. Also, Whiteman has suggested that in the interests of encouraging royal toleration, nonconformity was not necessarily fully represented in the Compton Census but the extent of nonconformity in the Duffield area is unknown: Whiteman, *Compton Census*, i–xli.
67. DRO: D2402 A/PZ 2/1, George Bradshaw's book on customs and liberties 1792 (unpaginated), 'A Friends due comendacion of Duffeld Frith', stanza 36.
68. A. Wood, *The politics of social conflict: the Peak Country 1520–1770* (Cambridge, 1999), 94.
69. TNA: PRO: DL4/99/10, deposition of Robert Smith, 23 September 1641.
70. TNA: PRO: E317/Derb/18, Survey of Duffield Frith, 19 August 1650.
71. Between them Smith and the commissioners reported 137 recently erected dwellings. Seven people are named in both lists, but even if the other 21 occupiers identified by Smith were tenants of those named in 1650, at least 109 new dwellings had appeared since 1610.
72. B. Sharp, *In contempt of all authority: rural artisans and riot in the west of England, 1586–1660*, (London, 1980), 163. Cottages were also erected in the Forest of Dean (Gloucestershire), 181–3.
73. In his work on the forest of Arden, following his analysis of various fiscal and ecclesiastical assessments to find population figures, V. Skipp, *Crisis and development: an ecological case study of the Forest of Arden, 1570–1674* (Cambridge, 1978), Appendix II, also arrived at apparently contradictory results.
74. Riden, 'Population of Derbyshire in 1563', 61. Of the 127 encroachments recorded by the Commonwealth surveyors, 44 were in Hulland ward. (TNA: PRO: E317/Derb/18).