English county populations in the later eighteenth century

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Although much attention has been given in recent years to tracing the history of national population trends, regional and local growth rates have been comparatively neglected. This does not reflect disinterest but either the apparent lack of suitable data on which to base any revisions to existing estimates, or a failure to devise a better method of making use of existing data. This essay represents an attempt to provide new and more trustworthy estimates of English county populations for the period 1761-1801.[2]

John Rickman, who directed the taking of the first four censuses, was interested in attempting to trace the past history of the population of Britain no less than in recording the contemporary situation. His work has long remained the starting point for those interested in this topic; indeed, it has frequently simply been reproduced either in its original form or with slight modification. Perhaps the most widely quoted set of estimates in recent decades has been that published by Deane and Cole almost half a century ago.[3] Their county totals mirror those of Rickman, except that they argued that his estimates for Devon and Middlesex were not credible and substituted their own, and that they constrained the county totals to match national population totals which differed from those of Rickman.[4] The absolute county totals therefore differ from those of Rickman, but if a rank order of counties is drawn up reflecting the relative population growth rates between 1751 and 1801 to be found in the two series, the order of counties in the two lists is identical apart from the placing of Middlesex.[5]

Rickman based his estimates on the annual totals of baptisms, burials, and marriages secured as part of the census exercise. These returns, usually referred to as the PRA (Parish Register Abstracts) were the product of enquiries made of all Anglican incumbents. In 1801 he had asked for returns of the annual totals of baptisms, burials, and marriages not only for the immediate past but for a scattering of years earlier in the eighteenth century. These returns settled the argument about whether the population of the country was largely stationary as Malthus and others believed or whether it was increasing.[6] It was abundantly clear that there was rapid growth and in 1802 Rickman published estimates of the scale and timing of growth of

the national population and of the counties in the eighteenth century.[7] In each of the next three censuses he required returns for the preceding decade, producing thereby continuous annual totals for all three series from 1780 onwards. He had long been interested in attempting to reconstruct population totals for the whole period of parochial registration. He was very conscious of the fact that the 1801 returns were defective in that many parishes had been missed, and in any case he had no returns for any period before 1700. In the 1830s, therefore, he planned a more ambitious and better grounded exercise. In 1836 he asked incumbents for annual totals of baptisms, burials, and marriages for three-year periods centring on 1570, 1600, 1630, 1670, 1700, and 1750. He hoped that this exercise would enable him to make authoritative estimates of the size of the population at these dates. As one element in the 1831 PRA returns he had asked for information about the date from which the registers survived in each parish and he was therefore able to approach only those incumbents who possessed registers suitable for his purpose. His method in making use of the new returns was to assume that baptism, burial, and marriage rates had been constant in each county throughout the whole pre-census period; to make separate estimates of population totals at each date based on the three types of event and on this assumption; and to derive best estimates of the population total for each county at each date by averaging the three resulting totals.[8] This last step involved assuming that the parishes included in the survey had housed the same proportion of the whole population of each county in the past as they did in 1801. National totals were then obtained by summing the totals for each county.[9]

There were many potential sources of error in Rickman's procedures, of which he was well aware. A prolonged constancy in the baptism, burial, and marriage rates was most unlikely. Even if the *rates* had been constant, registration coverage was not. In particular the spread of nonconformity in the eighteenth century meant that many baptisms were not recorded in Anglican registers. Other deficiencies exaggerated the problem substantially.[10] The same was true of burials though the marked deterioration began at a later date.[11] In the seventeenth and early eighteenth centuries marriage registration was at times very seriously defective.[12] The mere fact that the population estimates derived from the three series often differed substantially implied that the assumptions underlying Rickman's method were unsound. Further, although estimates based on events over a three-year period were less liable to distortion from

shocks and random fluctuations than those based on a single year, a serious epidemic or a severe harvest failure might easily result in a misleading estimate even if the basic method had been sound. Yet Rickman's county estimates, for all their deficiencies, have been very widely used in the absence of any method or body of data which might be expected to produce more reliable results. One reason, indeed, for their continued use is that his method produced county totals as well as national totals whereas most later research has concentrated simply on the estimation of national totals.

Reliable county population totals are valuable for many purposes, especially in a period of unusually rapid population growth, such as the later eighteenth century. In this essay their value will be illustrated by considering their significance in the context of the changing occupational structure of England in the later eighteenth century.

I

The type of economic growth taking place in England in the later eighteenth century implies that its occupational structure was changing in sympathy. Agriculture remained by far the largest single industry but its relative importance was declining steadily while many secondary and tertiary occupations expanded rapidly. Adult male employment in agriculture grew only slightly in the first half of the nineteenth century and there is little reason to suppose that matters were greatly different in the preceding half-century.[13] Since many of the occupations in which numbers were rising rapidly were highly concentrated in limited areas, county population growth rates might be expected to differ substantially as a result. Change in the national occupational structure will arise from some combination of structural change in given areas and the rates of growth of population in those localities compared with other areas. The relative importance of these two factors remains to be established for England in the later eighteenth century, and this essay is intended to help to set the scene in that connection. It is possible at one extreme to imagine a situation in which occupational structure changed everywhere in a roughly similar fashion so that differences in population growth rates in different parts of the country would make little difference to the national picture. At the other extreme it is possible for there to be major

changes in the national occupational structure even though in each component area it remained unchanged, provided that the occupational structure in the component areas differed and that they experienced markedly different population growth rates.

Table 1 illustrates the possible scale of change due to differential rates of growth. It is artificially simple. An imaginary population is divided between those who make a living from agriculture and those who depend on other sources of income. In 'rural' counties 70 per cent of the population depend on agriculture, 30 per cent on other activities, while the comparable figures in the 'non-rural' counties are 20 and 80 per cent respectively. At the beginning of the period 70 per cent of the population live in 'rural' counties and only 30 per cent in 'non-rural' counties which implies that in the country as a whole 55 per cent of population depends on agriculture while the remaining 45 per cent are outside the agricultural sector. Fifty years later the population has risen by 35 per cent overall but the population in the 'rural' counties has risen only from 70 to 75 while that in the 'non-rural' counties has doubled from 30 to 60. As a result, in the country as a whole the share of the agricultural population falls to 48 per cent of the total, while the 'other' figure rises to 52 per cent. A further 50 years elapses: the 'rural' population again increases modestly from 75 to 80, the 'non-rural' population again doubles from 60 to 120, and the overall pattern changes further, with only 40 per cent of the population making a living from agriculture and 60 per cent from secondary and tertiary occupations. There has been no change in the occupational structure of the population either in the 'rural' or the 'non-rural' areas. Differential growth rates alone account for the changing balance between agriculture and other occupations.

While table 1 fails, of course, to do justice to the complexity of change in any historical economy, it makes it clear that the issue of differential growth rates is important if effective use is to be made of many of the available sources which throw light on occupational structure in the past because they often enable the *percentage distribution* of occupations to be assessed but not the *absolute numbers* involved. For example, Anglican baptism registers sometimes consistently record the occupation of the father of a child at baptism. Where this is the case the relative size of different occupations can be specified, but, though it may be clear that, say, 2 per cent of men were shopkeepers or grocers c. 1780 rising to 4 per cent 50 years later, the size of the

adult male population at the two dates and therefore the totals involved may be unknown. To the degree that there was a markedly different pattern of population growth between those English counties which were, and remained, primarily agricultural and those counties in which the bulk of the population from an early date were dependent on manufacturing or service employment, little change in *local* occupational patterns may mask important changes in the *national* picture.[14]

II

It was opportune to reconsider county population trends in the later eighteenth century because the Cambridge Group for the History of Population and Social Structure is undertaking an ESRC-funded research project into the changing occupational structure of England in the period 1750-1850, [15] and much of the available source material is drawn from sources which enable the relative importance of different occupations in a given period to be assessed but not the size of the occupied population. For the second half of the period the census provides information about population size and therefore growth trends in different parts of the country, and thus resolves the problem, but for the first half any estimates of population size and trends must remain largely dependent on Rickman unless new estimates are made.

The opportunity to generate improved county estimates arises from a fact with which Rickman himself was familiar and which is indeed reflected in his instructions to incumbents at the time of the first census. In 1801 he asked for totals of baptisms and burials for the years 1700, 1710, and every subsequent tenth year to 1770 and for all years from 1780 to 1800, but required marriage totals only for each year from 1754 onwards, and none for earlier years, knowing that from 1754 marriage registration was virtually complete whereas earlier it was seriously defective. Hardwicke's Act of 1753[16] made it impossible to contract a valid marriage in England unless celebrated in an Anglican parish church according to the Prayer Book and recorded in the parish register in a prescribed form. The only groups exempted from the provisions of the Act were Jews, Quakers, and members of the royal family. From 1754 onwards marriage registration therefore was in principle fully reliable, in stark contrast with baptism and burial registration. The number of births and deaths substantially

exceeded the number of baptisms and burials recorded in the Anglican registers and coverage deteriorated markedly in the later decades of the century.

In certain circumstances, therefore, the use of marriage data may offer a more reliable and exact guide to population trends than estimates based on all three types of events recorded in parish registers in the manner of Rickman. If, for example, the annual total of marriages were known with precision for each county, and if, further, it were safe to assume that the marriage rate had remained essentially unchanged in the half-century preceding the 1801 census, it would be a straightforward matter to calculate county population totals covering the whole period following the inception of Hardwicke's Act. The difficulty that there were substantial fluctuations in marriage totals from year to year could be overcome, or at least greatly reduced, by basing estimates of earlier population totals on the average frequency of marriages over a block of years centring on a convenient 'census' date.

This possibility was not overlooked in the past. In his observations on the results of the first census, Rickman wrote:

> A great variation in the annual amounts of marriages is caused by the circumstances of the times, and especially by the price of provisions; so that no safe inference concerning the increase or diminution of population can be drawn from the comparison of any single years with each other; but the average amount of the marriages for five years together, or for a longer period, is the best of evidence on the subject, because the register of marriages may be deemed perfectly correct.[17]

Rickman repeated this observation in the prefaces to each of the subsequent censuses which he directed. Again, Deane and Cole produced estimates of county totals for 1781 using two different methods, one of which was based on 11-year averages of marriage totals centring on 1801 and 1781. They noted that the estimate based on marriage data alone 'represents the closest approximation to the truth'.[18]

The use of marriage totals from the PRA as a basis for inferring population trends, however, is not as straightforward as might appear at first sight. Several of the problems stem from the nature of the 1801 census and its defects. The Act which made provision for the census specified that Justices of the Peace should require the

overseers of the poor within their jurisdictions to appear before them no sooner than 10 April nor later than 30 April 1801 in order to present returns made under the Act for the parishes for which they were responsible.[19] Yet the census (both the enumeration abstracts and the PRA) was ordered to be printed on 21 December of the same year. The whole work of assembling and collating the returns, therefore, was accomplished in no more than eight months, though there was no previous experience to call upon. It is little wonder that the census volumes are neither internally consistent nor complete. In the case of the PRA, county totals do not always equal the sum of the hundred totals and, similarly, the printed national totals sometimes differ substantially from the sum of the county figures.[20] This imposes a significant burden of comparison and revision before the best use can be made of marriage data. A more serious problem is posed by the fact that returns for several hundred parishes are missing. It is essential to attempt to identify the parishes which were missed and to compensate for them. In order both to make clear the necessity for such corrections, to describe how they were attempted, and to deal with other sources of potential error, it is convenient next to describe the strategy adopted in generating the new estimates to be presented.

III

In principle the method employed might appear simple. County population totals are to be estimated for the 'census' years 1761, 1771, 1781, and 1791. In order to produce these totals, thirteen-year averages of marriage totals are calculated centring on each of the 'census' years and for 1801 (for example, the marriages for 1755-67 providing an average for 1761, and so on). The ratio of the average centred on 1761 to the average for 1801 will then establish the relative size of the population of the county in question. Thus if, for example, the population total in 1801 were known to be 50,000 and the ratio were 0.7 the implied population in 1761 would be 35,000. But credible estimates cannot be produced so simply. They can only be produced if several initial problems are recognised and solved.

A first difficulty with the method lies in its implicit assumption that the crude marriage rate did not change over time which is not capable of demonstration in the absence of censuses before 1801. Suppose that the crude marriage rate were falling in

the later eighteenth century, then the population in 1761 would be overstated using this method since a given population would have contracted more marriages per head at the earlier date than at the later one. Assuming a constant rate would exaggerate the true population total and cause the population growth rate to be underestimated. If the crude marriage rate were rising, of course, the opposite would be the case. This difficulty, however, is not insuperable since the equivalent of census population totals exist as a result of the use of the technique of inverse projection in conjunction with the estimates of annual totals of births and deaths produced by an earlier research project of the Cambridge Group (marriage data were not used in the inverse projection exercise).[21] The sum of the county population totals for any date before 1801 can therefore be constrained to match those produced by inverse projection, thus counteracting any distortion produced by assuming constant crude marriage rates.

Although a general change in the level of the crude marriage rate can be controlled by using inverse projection totals, however, changes in the *relative* level of the rate between different counties might still present a problem. The issue of the stability of the relative levels of county crude marriage rates over time cannot be addressed directly in the later eighteenth century in the absence of county population totals not themselves derived from marriage data (which would involve circularity of argument). Their stability relative to each other, however, can be tested during the early decades of the nineteenth century since the successive censuses provide both county population totals and marriage totals from the PRA. The rates for 1801, 1811, and 1821 are set out in table 2. They are based on the average number of marriages over 13-year periods centred on the dates in question. The national population totals at each date were taken to be those obtained by inverse projection.[22] They are higher than the census totals. The early censuses undercounted children and omitted men serving in the army and navy. Rates based upon them are therefore too high. Moreover, the scale of the undercount varied between censuses.[23] County totals at each census date were increased in the same ratio as the national total to preserve internal consistency.

The national rates in 1811 and 1821 were almost identical (8.23 and 8.20 per 1,000 respectively) though the rate in 1801 was somewhat higher at 8.58. The simplest way in which to test the stability of relative level of the county marriage rates

is to produce a rank ordering of the counties for each of the three dates and then test the extent of change from one date to the next. For example, Westmorland was ranked ninth in 1801 (ordering from the lowest rate to the highest), sixth in 1811, and fourth in 1821. It therefore moved three places between 1801 and 1811 and two places during the next decade. The average change in rank number among the 41 counties in the decade 1801-11 was 3.54; in the next decade 5.17, but for reasons discussed in the next paragraph, the latter was distorted by the special circumstances of four counties, Devon, Hampshire, Kent, and the East Riding of Yorkshire. If these four are excluded from the calculation, the average falls to 4.51. A higher figure in the second decade is to be expected because rates changed less in this decade than in its predecessor so that small absolute changes could result in a relatively marked change in ranking. If the same comparison of ranking is made over 20 years from 1801 to 1821, and again excluding the four 'rogue' counties, the average change in ranking is 4.86, little different from the figure for the 1811-21 decade, suggesting that change was not usually cumulative but had a substantial random component. In a few cases the overall change between 1801 and 1821 was marked; the rankings of Essex, Worcestershire, Leicestershire, and Sussex changed by 15, 12, 11, and 10 over the two decades, but generally the changes were minor, in 10 cases the ranking in 1821 was the same as in 1801 or had changed by only 1 place. Changes in the relative positions of the counties, therefore, though not trivial, were for the most part limited on the evidence afforded by the rates in the early nineteenth century.

Consider next the four 'rogue' counties. In each case the crude marriage rate in 1801 was far higher than in 1821. In three cases this was clearly a 'wartime' effect. These were Devon, Hampshire, and Kent, where the rates for 1801 and 1821 were respectively; 9.2 and 7.9 per 1,000; 9.8 and 8.0; and 9.0 and 7.6. In each case it is demonstrable that the aberrantly high rate at the earlier date was linked to exceptional activity in those ports which were major naval bases, such as Deptford, Woolwich, Chatham and Sheerness in the case of Kent; Portsmouth in the case of Hampshire; and Plymouth in the case of Devon. In Plymouth, for example, the average annual number of marriages rose from 461 in the 13-year period centring on 1791 to 869 in the period centring on 1801. The comparable totals for Devon as a whole were 2,646 and 3,226. Thus of the rise for the county as a whole (580) over three-quarters (438) was accounted for by a wartime boom in Plymouth. Broadly similar considerations

apply in the other two cases. Almost one half of the rise in the total of marriages over the same period in Hampshire, for example, occurred in Portsmouth. The crude marriage rate for the period centring on 1801 was 16.4 per l,000 in Plymouth; 18.0 per 1,000 in Portsmouth. These are exceptionally high figures. The East Riding of Yorkshire displays a similar pattern to that found in the 'naval' counties, though the reason is less clear in this case. In all four cases comparison of their rates in 1801 with the rates in neighbouring counties underlines the improbability that the high rates were other than a temporary phenomenon.

It is plain that assuming that the marriage rate found in 1801 in these four counties also held good for the preceding 40 years would result in a severe overstatement of the rate of growth over the period since assuming a high marriage rate must depress the size of the population to which it refers. In order to avoid this it was assumed that the prevailing rate over the period prior to 1801 should be based on the rate relating to 1821 and therefore on marriage frequencies over the period 1815-27. The 1821 rate was increased in each case by 0.38 per 1,000, the amount by which the national rate in 1801 exceeded the rate in 1821 (8.58 compared with 8.20). For example, the Hampshire marriage rate in 1821 was 8.00 per 1,000, which becomes 8.38 after adjustment. Using this rate rather than the 1801 rate (9.76) means that the population of Hampshire at each census date from 1761 to 1791 is 16.5 per cent higher than if the original 1801 rate had been used (9.76/8.38 = 1.1647).

This procedure is not an ideal solution since there were earlier wars with comparable, if smaller, effects on naval bases and marriage totals, but it reduces the distortions which would otherwise arise.[24]

The four counties, however, cannot be treated in isolation. The excess of marriages occurring in these counties at the turn of the century would have taken place elsewhere in England but for the distortions produced by wartime conditions. Just as it is appropriate to base the calculation of the populations of the four counties at earlier 'censuses' on a lowered crude marriage rate, it is also appropriate to raise the marriage rates in the other 37 counties marginally when estimating their populations over the four preceding decades. The scale of the adjustment should be such as to produce the same national population totals as would have resulted if the

1801 rates had been used for every county. This implies that the rates in the other 37 counties should be increased sufficiently to *reduce* their populations at each 'census' from 1761 to 1791 by 1.89 per cent, thereby exactly offsetting the *increase* in the populations of the four counties at these dates brought about by the substantial reductions in their crude marriage rates just described.

Two further preliminary operations need to be described. First, it was essential to try to identify the scale of omissions from the 1801 PRA for each county. At first blush it is not clear that this is necessary. If the population of a county in 1801 is known and its size at earlier dates is to be estimated from marriage totals for the relevant periods, keyed to the 1801 population total, it might be thought that it is only necessary that the proportion of the population covered should not change, and not that coverage should be complete. As an example, the ratio of 500 to 250 is the same as that between 400 and 200. If 100 per cent of the population is covered (yielding totals of events of 500 and 250 respectively for, say, 1801 and 1761) the estimated population in 1761 will be exactly the same as if 20 per cent of the population was not covered at each date (yielding totals of 400 and 200). But it must not be forgotten that the process involves comparing marriage totals for two 13-year periods. In the example given the two periods would be 1755-67 and 1795-1807. The 1795-1807 period includes data taken from the 1811 PRA for the years 1801-7 inclusive. There were few if any parishes missed in the PRA returns of the second census. In a county where there had previously been a substantial number of missing parishes, adding uncorrected totals for the years 1795-1800 to the totals taken from the 1811 census would cause the increase in marriages between the 1785-97 period and the 1795-1807 period to be overestimated since the second group would include a period of fuller coverage. Hence the growth in population from 1791 to 1801 would be overstated. Account must therefore be taken of 'missing' parishes in the1801 PRA.

Assessing the necessary corrections is a laborious process. The 1801 PRA listed the parishes in each hundred from which a return had been obtained and which had been incorporated in the hundred totals at the time that the text was sent to the printer. This suggests a straightforward solution --- to compare the list of parishes from which a return had been obtained with a list of the parishes in the hundred in

question, calculate the size of the missing population as a fraction of the total for the hundred, and inflate the PRA marriage totals appropriately. Thus, if in a given hundred 5 parishes were missing from the returns, containing 8 per cent of the total population of the hundred in 1801, the total of marriages for the whole period 1754-1800 would need to be increased by 8.70 per cent (100/92 x 100 = 108.70).[25]

Unfortunately no such simple solution is feasible because of the shortcomings of the 1801 census. The listing of parishes from which a return had been secured proved frequently at fault and the situation was worsened rather than improved when Rickman made an initial attempt to correct matters by a follow-up exercise. The range and severity of the problems involved has been discussed in detail elsewhere and need not be rehearsed again here.[26] In the current exercise the number of parishes (or more accurately registering units) identified as missing but having marriage registers was 575. A similar exercise undertaken for the *Population history of England* resulted in a total of 632 parishes,[27] a higher figure, but much of the difference arises from the restriction of the present exercise to parishes in which a marriage register was maintained during the later eighteenth century (there were many chapelries which maintained registers of baptisms and burials but where no marriages were celebreated). Rickman, who was keenly interested in trying to establish how many places had been missed in the 1801 PRA returns and the follow-up exercise, made a further enquiries in 1811. It is reasonable to conclude that his final total of missed parishes in England was 713.[28] Precision is beyond reach in this matter. Yet it is essential to make the attempt if marriage totals are to be used as a basis for estimating population totals and trends. Accordingly, the populations of the parishes identified as missing were expressed as percentages of the populations of the hundreds to which they belonged, and the marriage totals were increased proportionately.

The second preliminary operation can be described very briefly. The substantial inconsistencies between the published national totals of marriages and the totals obtained by cumulating the county totals is mirrored by similar inconsistencies between the published county totals and the sum of the totals for their component hundreds.[29] In some instances the reasons for an inconsistency may be clear, in others there is room for doubt. The principle followed in this exercise was to start with the

published totals for individual hundreds, build county totals from them, and use the cumulation of these county totals to produce national totals. Totals built up in this way were privileged over published county and national totals unless there was a compelling reason to do otherwise.

One further complication should be mentioned. It stems from the fact that its constituent parishes do not always 'nest' neatly into a given hundred. Some parishes were divided between different hundreds (which occasionally also meant different counties). The PRA take no account of this fact, reporting all parishes as if they belonged in their entirety only to particular hundreds. Initially the same was true of the census proper. In 1801 there is no indication that a parish might figure in more than one hundred. In 1811 the fact of a division is indicated but the population totals are not divided between the hundreds in question. In 1821 and thereafter both the fact of a division and the totals involved are normally recorded. Given these deficiencies in early census practice, it is difficult if not impossible to correct for this source of distortion in any exact and straightforward way. However, the problem affects only a limited number of hundreds and it is demonstrable that the scale of any distortion in hundred totals is usually too slight to be of consequence, both because divided parishes were normally placed by the PRA in the hundred in which most of the population were living, and because in some cases there were offsetting inaccuracies, a parish wholly allocated in hundred *X* where it should be divided between *X* and *Y* being roughly matched by a comparable parish in *Y* which should be partially allocated to *X*. The existence of this complication, therefore, does not significantly affect the general accuracy of the estimates, and no corrections were attempted.[30]

Combining a crude marriage rate with a county marriage total yields an estimated population total for each 'census' date. For example, the total number of marriages in Bedfordshire in 1755-67 was 5,804, or an annual average total of 446, centring on 1761. Since the crude marriage rate in the county in 1801 (based on marriages 1795-1807) was 8.52 per 1,000 (table 2), the implied total in 1761, after adjustment to offset the special treatment of the four counties whose marriage rates were aberrantly high in 1801, is 51,361.[31] Similar calculations for each county enable a national total to be built up. The national totals for 1761 to 1791 produced in this fashion were as follows: 6,140,431; 6,652,561; 7,212,091; and 7,852,555. The

comparable totals from inverse projection were: 6,310,338; 6,623,358; 7,206,139; and 7,845,678. Expressing the former series as a percentage of the latter demonstrates very close agreement except in 1761 (the percentages are 97.31, 100.44, 100.08, and 100.09). A lower figure for 1761 is to be expected. It is very probably due to the fact that, as the footnotes published in the PRA in 1801 make clear, coverage was defective in a significant number of parishes in the early years of the new regime.[32] Final county population totals were obtained using the ratios between the two sets of national totals. The Bedfordshire total for 1761 of 51,361 derived from marriage data, for example, is increased in the ratio 6,310,338/6,140,431 to produce a final figure of 52,782.

The very close agreement between the two sets of national totals listed in the last paragraph implies, of course, that the crude marriage rate varied surprisingly little in England over the 40-year period in question. It is worth noting that this conclusion is strongly underwritten by earlier work carried out at the Cambridge Group, summarised in table 3. Marriage totals had been abstracted from a total of 404 English parishes. The totals were re-weighted to offset the fact that they were not a random sample before being inflated to produce 'national' totals. Since estimates were made for each year, it is a straightforward matter to produce estimated national rates based on events recorded over the same 13-year periods as were used when making PRA-based calculations. The rates are remarkably stable and, as will be clear from the ratios in the final column, they are uncannily close to the national PRA-based rate for 1801 (8.58 per 1,000: table 2). Since it is most improbable that such close agreement between the two series of totals and rates could have arisen by chance this comparison tends to confirm the accuracy both of the PRA-based totals and those derived from the 404 parish sample.[33]

IV

It may be helpful to give an illustration of the successive steps involved in generating county marriage data and estimating county, and hundredal population totals. Table 4 shows marriage totals for the successive 13-year periods centring on 'census' dates for each of the hundreds within Bedfordshire. The top panel gives the 'raw' totals. The second panel shows the totals after making adjustments to reflect the proportion

of the population of the hundred which lived in parishes for which no PRA return was included in the 1801 census. In most cases no change was necessary because all the parishes made returns, but the totals for Barford, Stodden, and Willey are increased in the second panel, in the case of Willey substantially. Willey's original totals were raised by just over 22 per cent, reflecting the proportion of the population of the hundred living in parishes from which no return was obtained. The county marriage totals in panel 2 were those which were used in estimating the population of the county at each 'census' date.[34]

In the third panel the process is taken a step further. The population of Bedfordshire in 1801 is recorded in the census as 63,393. This total is unsatisfactory because of the undercount of young children and the exclusion of men in the armed forces.[35] The national population total for 1801 published in the census was 8,285,852 whereas the inverse projection figure was 8,658,265. Therefore the census total for Bedfordshire was increased by the ratio between the latter total and the former, resulting in a revised total of 66,343 in 1801. The top line of panel 3 lists the population of each hundred in 1811 (given the deficiencies of the first census, it seemed prudent to take the hundredal totals from the 1811 census rather than the 1801 census to measure the *relative* size of each hundred). The size of each hundred at each earlier 'census' date is taken to be captured by the ratio of the marriage total at that date relative to the total in 1801. Thus the annual average marriage total for Barford in 1761 was 378, in 1801 452, while the population in 1801 was 4,165. Therefore, the population in 1761 is taken as 378/452 x 4,165 = 3,477. Hundredal totals are cumulated to produce the county totals shown in the penultimate column. This mirrors the assumption made when calculating county totals that the marriage rate in any given hundred is unlikely to have varied greatly over the period, even though in some instances there clearly were substantial difference in the marriage rate *between* hundreds in the same county.

The fourth and final panel completes the process. In the final column the county totals produced by inverse projection are shown. In the case of Bedfordshire they do not differ greatly from the totals in panel 3, but it is important that the final hundredal totals should sum to the final county total and therefore the panel 3 totals are constrained to produce this result. Thus, the panel 3 total for Barford in 1771 is

3,686, and the ratio between the panel county total and the final county total for that year is 54,541 to 56,227. Therefore the Barford total in panel 4 is 3,575.[36]

The sequence of steps which yields an estimate of the population of a county for each 'census' date from 1761 to 1801, therefore, depends on a process which moves up from hundredal marriage totals but which also reverses direction, moving down from national and county totals to provide estimates of hundredal populations for each county. It is important to produce hundredal totals in parallel with the county totals because within counties there were always smaller areas whose economic and demographic histories varied greatly. Many counties, for example, included towns or boroughs which are treated as separate units in the PRA and whose population history can be reconstructed in the same way. Growth was often vigorous in the towns within a county even though it was sluggish in its rural hundreds. By using hundreds as the building blocks, units with greater internal homogeneity can readily be produced. Such units may either represent a subdivision of a county, or combine elements from two or more counties. Hundred-based descriptions of both demographic and occupational change will be published in due course, but are outside the scope of this essay.

V

The focus of attention can now be switched from the logic by which county and hundredal totals were calculated to considering the results of the exercise. Table 5 shows the county populations for each 'census' date from 1761 to 1801. It also shows the ratio of the latter to the former, expressed as percentages, and these are also shown sorted in ascending order. Over this period the national population increased by 37.4 per cent.[37] Only 13 counties matched or exceeded this level of increase, while 21 counties grew by less than 25 per cent. At the other extreme there was a small group of counties in which growth exceeded 50 per cent, eight in all.

In order to bring out some of the implications of the new set of population estimates, it is convenient to analyse the contrasting experience of different counties by considering them in three primary groups, comprising 24 counties in all, plus a fourth residual group consisting of those which remained when the 'London',

'industrial', and 'agricultural' groups had been identified. Details are set out in table 6 which is paralleled by figure 1, presenting the data in map form.

The first group consists of three counties in which growth was rapid because of the dominant influence of the expansion of London. The second group includes the bulk of the areas in which manufacturing industry was growing fastest, the textile districts and other centres of industrial expansion in Lancashire, the West Riding, Cheshire, and Derbyshire; the Staffordshire potteries; the framework knitting and lace manufacturing areas in Nottinghamshire, and the complex of metal working, engineering, and smallwares manufacture in Birmingham and the Black Country which caused rapid growth in Warwickshire. The third group consists of a massive wedge of land stretching from Lincolnshire and Essex in the east to Wiltshire in the west, including much of the best agricultural land in the country and covering 29 per cent of its surface area. Each group presents a marked contrast with the national average. Whereas population in England as a whole grew by 37.4 per cent between 1761 and 1801, in the London group of counties the comparable figure was 51.7 per cent; in the industrial group 74.0 per cent; in the dominantly agricultural group 15.0 per cent. At the beginning of the period 15.3 per cent of the national population lived in the London group; 20.8 per cent in the industrial group; 26.9 per cent in the agricultural group. At the end of the period the comparable figures were 16.8, 26.3 and 22.5 per cent. There were therefore marked changes in the relative size of the three groups, a feature which is brought out more vividly by considering the shares of each group in the overall growth of population in England as a whole. The London group accounted for 21.1 per cent of the total national increase; for the industrial group the comparable figure was 41.0 per cent; for the agricultural group 10.8 per cent. Not far short of two-thirds of the whole increase over the period, therefore, took place in the first two groups (62.1 per cent), a dramatic exemplification of the extent to which growth was concentrated in a comparatively small group of counties in which agriculture did not figure prominently. Indeed it was also concentrated within these two groups; 39.4 per cent of the total national increase took place in just three counties: Lancashire (17.0 per cent); the West Riding of Yorkshire (9.8 per cent); and Middlesex (12.6 per cent).

It is equally striking that the belt of agricultural counties claimed such a modest portion of the total increase. Indeed, there is a sense in which their share is overstated. If the populations of the towns and boroughs for which the PRA provided separate returns in 1801 are subtracted from the populations of this group, their growth rate falls from 15.0 per cent to 13.0 per cent (in the towns and boroughs within these counties the increase was 31.6 per cent). A growth of 15.0 per cent over a 40-year period implies an annual growth rate of only 0.35 per cent per annum. It is worth noting that these rates were not only low by comparison with much of the rest of the country, but were also modest when compared with many agricultural areas on the continent at the same period. At a time when the population of England as a whole was rising faster than that of most other European countries; when some parts of the country were experiencing a strikingly rapid expansion based on secondary and tertiary employments; and when English agriculture was characterised both by high yields per acre and high output per man, the size of the population supported by agricultural employment changed little; an illustration, perhaps, of the difference between a market-orientated, capitalist agriculture and peasant economies where subsistence sometimes remained an important objective and sons might be retained on a family holding even though the marginal family member produced less than he consumed?[38]

The contrast in growth rates between the three groups is far too great for any but a small part of it to be attributable to differences in rates of natural increase. The available evidence suggests only modest differences in nuptiality and marital fertility in different kinds of parish. Mortality differentials were greater, but since, in general, mortality was greater where population densities were high, as in urban or industrial settings, rates of natural increase were frequently higher in rural than in urban or industrial parishes.[39] The bulk of the difference in growth rates between different areas must be largely attributable to net migration flows.

How great a contrast is there between the new estimates and earlier calculations? This issue may be approached by comparing the growth patterns arising from the work of Deane and Cole with those produced by the present exercise. There is an initial difficulty in that, since the marriage returns are available only from 1754, they cannot be used to generate estimated county populations for 1751, but Deane and

Cole provided no estimates for 1761, the opening date in the tables above. The problem can be overcome, however, in a rough-and-ready way by assuming that growth in each county in the decade 1751-61 took place at the same pace as in 1761-71 and then constraining the resulting county totals to sum to the 1751 national population total obtained by inverse projection. This ensures that the overall rise in numbers is plausible while preserving the differential growth rates of the counties. Ratios representing the population increases over the half-century preceding the first census are shown in table 7 together with those based on the table published by Deane and Cole. The latter is shown in two versions. In column 4 the ratios shown are taken directly from their table.[40] In the next column they have been slightly reduced. Deane and Cole's estimates imply a rise in national population of 50.2 per cent between 1751 and 1801.[41] The comparable rise in the inverse projection estimates is 46.4 per cent. To make the ratio increases taken from the two series directly comparable, therefore, it seemed sensible to reduce the percentage increases by 464/502. Thus the increase of 15.5 per cent for Devon shown in column 4 is reduced to 14.3 per cent in column 5.

The rank order of the two series in table 7 differs substantially, sometimes, it would appear, inexplicably. Deane and Cole have Rutland increasing by 40 per cent, for example, where the present exercise suggests 6 per cent. Or again, Hampshire achieves a growth close to two-thirds in Deane and Cole, a marked contrast with the 26 per cent in the new list (due, chiefly, of course, to the assumption made about the prevailing crude marriage rate before 1801 described above: the same point explains the contrast in the position of Kent on the two lists).[42] Northumberland comes second on the Deane and Cole list with very modest growth whereas the county occupies a position roughly half-way down the new list. This list of contrasts could be considerably extended.

There is a general difference between the two lists which helps to explain some of the individual contrasts. Perhaps because of the averaging effect produced by the method of estimation employed by Rickman (that is, basing estimates on baptism and burial as well as marriage totals), there are more counties experiencing very limited growth during the half-century in the new list, and at the other end of the distribution, Lancashire's growth, spectacular even in Deane and Cole's estimation,

rises still further, approaching a tripling in the half-century period. A clue to the nature of the inaccuracies or inconsistencies in the estimates of Deane and Cole may be found in a consideration of the percentages of the adult male population engaged in agriculture. This can be measured with confidence for the first time in the 1831 census. Although the *absolute* county percentages in agriculture declined between the later eighteenth century and 1831 it is likely that their *rank ordering* remained fairly stable. Counties which were heavily agricultural early on remained so well into the new century, and similarly those where agriculture was comparatively unimportant in 1831, as in the 'industrial' and 'London' groups of counties, were not heavily agricultural 70 years earlier.

Table 8 sets out data from the 1831 census which enables variations in the prominence of agricultural employment within the male labour force to be appreciated. The ten counties with the lowest growth rates between 1751 and 1801 in the new estimates (table 7) had an average of 50.6 per cent of adult males engaged in agriculture in 1831, the ten next lowest in growth rates had an average of 45.0 per cent, the next ten 39.3 per cent, and the final eleven 24.4 per cent; the comparable percentages in the Deane and Cole list were 43.5, 49.1, 37.8, and 28.5. The former set shows a regular decline; in the latter there is a substantial rise between the first and second figures. The first represents what might be expected on general grounds. The second does not. It is highly improbable that the countries comprising the second group in the Deane and Cole set were both substantially more heavily agricultural in occupational structure in 1831 and yet grew faster than the first group in their set where agriculture was less dominant.[43]

VI

This brief review of some of the salient characteristics of population change in the later eighteenth century clears the decks for a reconsideration of the interaction between differential population growth rates and change in occupational structure which was discussed in general terms above and illustrated in table 1. The new estimates of county growth rates enable the same issues to be examined in the context of late eighteenth-century England. Table 9 mirrors the grouping of county data in table 6. In the London group 12.6 per cent of adult males were engaged in

agriculture; in the industrial group 19.7 per cent. In marked contrast in the agricultural group 52.2 per cent of adult males were so employed, while in the rest of England the comparable percentage was 37.5. All the percentages would in all probability have been higher in the later eighteenth century. Suppose, as an illustration of possibilities, that throughout the period 1761 to 1801 the percentage in agriculture in the London group had been 17.0; in the industrial group 25.0; and in the agricultural group 65.0; or, alternatively, since it would produce the same result, that these were the average percentages during this period. To complete the picture, of course, account must be taken of the balance of the population. Assume that in this residual group of counties 45 per cent were in agriculture.

On the assumptions just described, as may be seen in table 10, the percentage of the adult male labour force engaged in agriculture would have fallen by 2.4 per cent between 1761 and 1801, from 42.0 to 39.6 per cent, while those engaged in non-agricultural occupations would have risen similarly from 58.0 to 60.4 per cent. Over a period as long as a century, therefore, occupational change produced by differential population growth rates in counties with contrasting occupational structures of the sort experienced in England in the later eighteenth century could well have reduced the percentage employed in agriculture by, say, 5 per cent with a matching rise in the percentage in secondary and tertiary occupations; and all this without any changes in the corresponding percentages in individual counties. It is of interest to note, incidentally, that the national agricultural percentage in 1801 in table 10 closely resembles that inferred from the data in the early censuses.[44] Information about differential population growth rates, when combined with information about changes in the occupational structure of individual counties, will make it possible to establish the relative importance of compositional change and local change in altering the national occupational structure.

No other industry approached the size of agriculture within the labour force which made agriculture an obvious subject for an illustrative exercise of the sort just undertaken, but *mutatis mutandis* comparable exercises related to other industries would show that substantial change might arise from differential population growth rates alone. The potential importance of compositional change varied greatly depending on whether occupational structure was or was not uniform between

regions. Within tertiary employments, for example, it is to be expected that in the retailing sector many occupations employed a broadly similar percentage of the workforce and expanded at similar rates in all parts of the country, so that differential local population growth rates would have had little influence on national trends. But the same was not true for all kinds of tertiary employment. To take a rather trivial illustration, it is conceivable that the proportion of men who made a living as barristers did not change significantly or rose only modestly in London, but because London was growing more rapidly than the national population as a whole (and barristers were heavily concentrated in the capital), the proportion of adult males practising as barristers nationally might still rise significantly. Or again, in the secondary sector, occupations such as carpenter or tailor were very widespread throughout the country and any differences in their occupational percentages by region were muted. Differential regional growth rates would make little difference to national patterns in these circumstances. In contrast, textile employment percentages varied greatly from county to county, so that contrasting population growth rates might have a powerful influence on national changes. For example, consider an illustrative exercise like that shown in table 1. Assume that at the beginning of a period lasting a century 80 per cent of the population lived in counties in which 5 per cent of the labour force worked in textiles, while 20 per cent lived in counties in which 50 per cent of the labour force was similarly employed. In the textile counties population doubled every 50 years whereas in the other counties growth was much slower, with a 5 per cent growth in each period of half a century. As in the earlier exercise, assume no change in the percentages employed in textile manufacture in either group of counties. On these assumptions the national percentage engaged in the textile industry would rise from 14 per cent at the beginning of the period to 19.6 per cent after 50 years and 26.5 per cent after a century, a near doubling from the initial level, though there was no change in textile occupational percentage in any county.

VII

There were both changes in occupational structure and differences in population growth rates in all localities so that the contributions which each sub-division within the country made to the national whole was affected by both factors. Analytically, however, they are distinct and establishing their relative importance, both generally

and in individual industries, will be an important element in the current research project designed to identify changes in the occupational structure of England in the period 1750-1850. Where contrasts in local population growth rates were as marked as was the case in England in the later eighteenth century, the possibility that in some industries they may have accounted for the bulk of any change in their relative importance in the national occupational structure clearly exists. To take the most extreme example, in 1761 Lancashire housed only 4.8 per cent of the population of England, yet over the next 40 years 17.0 per cent of the national growth in population took place in this single county (table 6). Almost as striking is the fact that the agricultural counties housed 26.9 per cent of the national population in 1761 yet accounted for only 10.8 per cent of population growth down to 1801. Lancashire, with 18 per cent of the population of the 14 agricultural counties in 1761 enjoyed a rise in numbers 60 per cent greater than that in the agricultural block.

Nor should it be overlooked that, because the county was seldom a uniform unit, still more striking contrasts can easily be produced by using hundreds as the units of analysis rather than counties. Lack of space prevents any extensive demonstration of this point, but it is readily illustrated. Middlesex, for example, was a small county in area which housed the bulk of the population of London yet it included four hundreds, Edmonton, Elthorne, Gore, and Spelthorpe whose populations were almost stationary in the later eighteenth century. Their combined population rose from 48,502 to 50,510 between 1761 and 1801, or by only 4.1 per cent. Or again, the population in all parts of Lancashire was growing quickly in this period, but not equally quickly. The star performer was the hundred of Salford (here taken to include the town of Manchester). Its population grew from 96,516 to 301,251 between 1761 and 1801, or by 212 per cent, equivalent to an annual growth rate approaching 3 per cent. The rest of the county also grew rapidly, by 95 per cent, but by comparison with Salford its progress was almost staid. At the other extreme, it is possible to assemble groups of contiguous agricultural hundreds covering substantial areas in which the population was falling rather than rising over the same 40-year period. The extent of the contrast between the swiftest and slowest growing parts of the country is much more vivid when using hundredal data than when using county data.

VIII

The new estimates of county population totals shown in table 5 will, I hope, come to be regarded as an improvement on their predecessors but each total should be regarded at best as lying towards the centre of the range of plausible possibilities rather than exact. Further work may identify good reason to modify some of the estimates. In one case it is immediately clear that the new estimates must be wrong. It concerns the hundred of Islandshire and its neighbours situated on or close to the Scottish border in north-east England. Anomalously, Islandshire was part of the county of Durham but far removed from the main county. At its nearest point it was 50 miles from the rest of Durham. It shared a common border with Scotland and included, for example, Holy Island. Using the same method of population estimation used for all other hundreds, Islandshire would appear to have experienced very severe population decline in the later eighteenth century to the point that its population in 1801 was only 42 per cent of the 1761 total. Neighbouring hundreds bordering Scotland also appeared to suffer from sharply declining populations. The Northumberland hundreds of Glendale and Bamborough, and the town of Berwick-on-Tweed resembled Islandshire though their population declines were less extreme (in 1801 their populations were 59, 69, and 65 per cent respectively of their 1761 levels). That the apparent falls are spurious becomes plain when the crude marriage rates for the hundreds are considered. The rates for Islandshire, Glendale, Bamborough, and Berwick-on-Tweed, calculated from the average number of marriages in 1795-1807 and related to the populations in 1801 were 1.3, 2.6, 3.7, and 2.8 per 1,000 respectively. It would appear that the proximity of Scotland encouraged an increasing number of couples to move north of the border to contract their marriages. The populations of these hundreds in 1761 are greatly exaggerated when using the algorithm for estimating late eighteenth-century populations which in general produces convincing results.[45] Because the populations involved were relatively small their impact on the related county totals is limited, but in considering the growth rates for the counties over this period (Durham 30.4 per cent; Northumberland 22.7 per cent), the near certainty that the true figures were somewhat higher should be borne in mind. Fortunately, such aberrations appear to have been very rare.

Since the purpose of this essay was to present the new estimates of county populations in the later eighteenth century and to illustrate one of their uses for economic history, I have not moved outside the time frame which they set. It is, however, an artificial restriction. The census provides population data both for the county and the hundred down to 1841. The published population totals at all levels from the country to the hundred stand in need of adjustment to offset the effects of under-registration and service in the army and navy but consistent series covering the whole period 1761 to 1841 can be generated without difficulty.[46] Long runs of data always offer possibilities which are more restricted when runs are short. For example, they will allow the question of the impact of differential county growth rates on occupational structure to be pursued more effectively, covering the whole period conventionally equated with the industrial revolution. There is scope for much further work in this vein.

Table 1. *An illustration of the possible effect of differential growth rates on overall occupational structure*

	Total population	*Occupational split: agricultural/other*	*Agricultural population*	*Other population*
At time x				
'Rural' counties	70	70/30	49	21
'Non-rural' counties	30	20/80	6	24
Total	100		55	45
At time x + 50				
'Rural' counties	75	70/30	52.5	22.5
'Non-rural' counties	60	20/80	12	48
Total	135		64.5	70.5
At time x + 100				
'Rural' counties	80	70/30	56	24
'Non-rural' counties	120	20/80	24	96
Total	200		80	120
Percentage distribution: agricultural/other				
Time x			55	45
Time x + 50			48	52
Time x + 100			40	60

Table 2. *County crude marriage rates in 1801, 1811, and 1821*

	CMR 1801	*CMR 1811*	*CMR 1821*
Bedfordshire	8.52	8.01	8.11
Berkshire	7.02	7.04	7.14
Buckinghamshire	7.84	7.54	7.32
Cambridgeshire	8.46	8.28	8.44
Cheshire	8.19	7.81	8.38
Cornwall	7.70	7.18	7.38
Cumberland	7.18	7.35	6.25
Derbyshire	7.59	7.08	7.45
Devon	9.18	8.98	7.87
Dorset	7.48	7.07	7.08
Durham	8.22	7.57	7.80
Essex	8.04	7.42	6.82
Gloucestershire	8.49	8.70	9.24
Hampshire	9.76	9.69	8.00
Herefordshire	6.02	6.46	6.21
Hertfordshire	6.54	5.96	5.83
Huntingdonshire	8.64	7.87	7.89
Kent	9.00	8.46	7.57
Lancashire	9.91	8.97	9.37
Leicestershire	8.07	7.82	8.43
Lincolnshire	8.36	8.00	7.64
Middlesex	10.98	10.48	10.28
Norfolk	7.86	7.71	7.86
Northamptonshire	7.58	7.71	7.80
Northumberland	7.11	6.99	6.95
Nottinghamshire	9.39	8.12	8.94
Oxfordshire	7.34	7.04	7.12
Rutland	6.85	6.85	7.29
Shropshire	7.29	6.53	7.11
Somerset	7.71	7.49	7.26
Staffordshire	8.70	8.28	8.71
Suffolk	8.12	7.67	7.49
Surrey	8.05	7.63	7.92
Sussex	8.17	7.66	7.29
Warwickshire	8.76	8.81	9.11
Westmorland	7.22	7.03	6.79
Wiltshire	7.22	7.22	7.29
Worcestershire	7.60	7.52	7.90
Yorkshire, ER	10.24	8.81	8.17
Yorkshire, NR	7.22	7.75	6.87
Yorkshire, WR	8.46	8.39	8.61
England	8.58	8.23	8.20

Source: Marriage totals were taken from Parish Register Abstracts of the censuses of 1801, 1811, and 1821. The national totals were taken to be the sum of the totals for the individual counties. For population totals see accompanying text.

Table 3. *Crude marriage rates based on totals taken from a sample of 404 English parishes.*

	(1)	(2)	(3)	(4)
	Average annual total of marriages	*Population*	*Crude marriage rate per 1,000*	*Ratio of rate in col. 3 to 8.58* [1]
1755-67	54,246	6,310,338	8.60	1.002
1765-77	57,669	6,623,358	8.71	1.015
1775-87	61,794	7,206,139	8.58	0.999
1785-97	67,246	7,845,678	8.57	0.999
1795-1807	73,697	8,671,439	8.50	0.991

Sources: Marriages. Wrigley and Schofield, *Population history of England*, tab. A2.3, pp. 496-502: Population totals. Wrigley *et al*., *English population history*, tab. A9.1, pp. 614-5.

Note: 1. The national rate in 1801 was 8.58 per 1,000 (see tab. 2). For comment see associated text.

Table 4. *An example of the derivation of a series of county population totals for the later eighteenth century*

	Barford	*Biggles-wade*	*Clifton*	*Flitt*	*Manshead*	*Redborne-stoke*	*Stodden*	*Willey*	*Wixam-tree*	*Bedford*	***Bedford-shire***	*Co. totals constrained by inverse projection*
Panel 1												
1755-67	349	572	261	791	1,115	825	345	536	440	408	5,642	
1765-77	370	560	317	852	1,138	932	367	576	454	451	6,017	
1775-87	393	616	307	819	1,229	982	410	582	445	503	6,286	
1785-97	454	590	305	907	1,338	1079	466	598	498	563	6,798	
1795-1807	436	617	317	1112	1,557	1035	421	713	486	562	7,256	
Panel 2												
1755-67	378	572	261	791	1,115	825	360	654	440	408	5,804	
1765-77	400	560	317	852	1,138	932	383	703	454	451	6,190	
1775-87	425	616	307	819	1,229	982	428	710	445	503	6,464	
1785-97	491	590	305	907	1,338	1,079	486	730	498	563	6,987	
1795-1807	452	617	317	1112	1,557	1,035	431	776	486	562	7,344	
Panel 3												
1811 population	***4,402***	***6,426***	***3,993***	***8,597***	***15,628***	***9,892***	***4,263***	***7,160***	***5,153***	***4,605***	***70,119***	
1801 totals	***4,165***	***6,080***	***3,778***	***8,134***	***14,786***	***9,359***	***4,033***	***6,774***	***4,876***	***4,357***	***66,343***	
1761	3,477	5,637	3,111	5,786	10,589	7,460	3,372	5,714	4,414	3,163	52,721	
1771	3,686	5,518	3,778	6,232	10,807	8,428	3,587	6,140	4,554	3,496	56,227	
1781	3,915	6,070	3,659	5,991	11,671	8,880	4,007	6,204	4,464	3,900	58,761	
1791	4,523	5,814	3,635	6,635	12,707	9,757	4,554	6,374	4,996	4,365	63,359	
1801	4,165	6,080	3,778	8,134	14,786	9,359	4,033	6,774	4,876	4,357	66,343	
Panel 4												
1761	3,481	5,643	3,114	5,793	10,601	7,469	3,376	5,720	4,419	3,167	52,782	**52,782**
1771	3,575	5,353	3,665	6,045	10,483	8,175	3,479	5,956	4,418	3,392	54,541	**54,541**
1781	3,808	5,905	3,559	5,827	11,353	8,638	3,898	6,035	4,342	3,793	57,159	**57,159**
1791	4,410	5,669	3,544	6,469	12,390	9,514	4,441	6,216	4,871	4,256	61,780	**61,780**
1801	4,165	6,080	3,778	8,134	14,786	9,359	4,033	6,774	4,876	4,357	66,343	**66,343**

Source: The Parish Register Abstracts of the censuses of 1801 an 1811.

Note: Because of the effects of rounding the county total may not always equal the sum of the hundred totals.

Table 5. *Population growth in the English counties 1761-1801*

County	*1761*	*1771*	*1781*	*1791*	*1801*	*Ratio 1801/1761*	*Counties in rank order*	*Ratio 1801/1761*
Bedfordshire	52782	54541	57159	61780	66343	125.7	Wiltshire	101.6
Berkshire	101046	101153	106379	109742	114297	113.1	Hertfordshire	106.2
Buckinghamshire	96658	95707	101143	104688	112444	116.3	Rutland	108.6
Cambridgeshire	78022	80284	83298	89950	93504	119.8	Northamptonshire	109.7
Cheshire	140794	158156	169632	182906	200674	142.5	Huntingdonshire	111.7
Cornwall	132554	140765	159311	176215	197030	148.6	Berkshire	113.1
Cumberland	88800	96346	104215	110225	122685	138.2	Herefordshire	113.6
Derbyshire	114039	122899	134063	148630	168641	147.9	Norfolk	113.8
Devon	306546	285833	333558	336521	358963	117.1	Buckinghamshire	116.3
Dorset	100103	97936	104424	108420	120685	120.6	Devon	117.1
Durham	128875	129926	139140	150083	167823	130.2	Westmorland	117.5
Essex	200719	201748	208791	214086	236974	118.1	Yorkshire, NR	117.7
Gloucestershire	215751	216616	231057	244726	262481	121.7	Essex	118.1
Hampshire	178366	168634	207957	213202	229878	128.9	Oxfordshire	119.7
Herefordshire	82145	84270	89452	91348	93342	113.6	Cambridgeshire	119.8
Hertfordshire	96124	97673	96140	96181	102118	106.2	Lincolnshire	120.2
Huntingdonshire	35186	34397	37464	38540	39316	111.7	Dorset	120.6
Kent	236314	234024	260881	295916	321939	136.2	Worcestershire	120.7
Lancashire	303312	355591	432027	536244	704037	232.1	Gloucestershire	121.7
Leicestershire	104315	104593	112710	123615	136134	130.5	Northumberland	122.6
Lincolnshire	181634	188176	194048	204456	218262	120.2	Suffolk	124.8
Middlesex	558988	637458	676861	764942	856201	153.2	Somerset	125.3
Norfolk	251435	259197	256951	266778	286092	113.8	Bedfordshire	125.7
Northamptonshire	125648	129153	134539	134650	137888	109.7	Hampshire	128.9
Northumberland	134119	138105	144623	145969	164412	122.6	Shropshire	129.3
Nottinghamshire	93652	100505	111868	132808	146881	156.8	Durham	130.2
Oxfordshire	95869	99197	102207	104768	114721	119.7	Leicestershire	130.5
Rutland	15767	15102	15750	16589	17117	108.6	Kent	136.2
Shropshire	135705	141136	149041	157014	175440	129.3	Cumberland	138.2
Somerset	228612	235103	252341	270407	286489	125.3	Yorkshire, ER	139.0
Staffordshire	157680	173096	192154	215998	250282	158.7	Cheshire	142.5
Suffolk	176499	183486	195121	199971	220224	124.8	Derbyshire	147.9
Surrey	167147	180272	201452	237489	281563	168.5	Cornwall	148.6
Sussex	103237	109464	125945	140503	166725	161.5	Middlesex	153.2
Warwickshire	142014	155874	180293	215190	217878	153.4	Warwickshire	153.4
Westmorland	37073	38574	38240	41518	43554	117.5	Nottinghamshire	156.8
Wiltshire	190751	189439	196885	200623	193721	101.6	Staffordshire	158.7
Worcestershire	120851	128612	129619	137368	145817	120.7	Sussex	161.5
Yorkshire, ER	104966	114270	123852	143164	145922	139.0	Yorkshire, WR	164.9
Yorkshire, NR	138284	148428	157980	156272	162743	117.7	Surrey	168.5
Yorkshire, WR	357957	397619	457564	526182	590197	164.9	Lancashire	232.1
England	6,310,338	6,623,358	7,206,139	7,845,678	8,671,439	137.4		

Note: For the derivation of the county totals see accompanying text.

Table 6. *Differential growth rates in three county groups*

					Percentage of English total		
	Population 1761	*Population 1801*	*Increase 1761-1801*	*Percentage increase*	*Population 1761*	*Population 1801*	*Population increase 1761-1801*
Kent	236314	321939	85625	36.2	3.7	3.7	3.6
Middlesex	558988	856201	297213	53.2	8.9	9.9	12.6
Surrey	167147	281563	114416	68.5	2.6	3.2	4.8
London group	**962449**	**1459704**	**497255**	**51.7**	**15.3**	**16.8**	**21.1**
Cheshire	140794	200674	59880	42.5	2.2	2.3	2.5
Derbyshire	114039	168641	54602	47.9	1.8	1.9	2.3
Lancashire	303312	704037	400725	132.1	4.8	8.1	17.0
Nottinghamshire	93652	146881	53229	56.8	1.5	1.7	2.3
Staffordshire	157680	250282	92602	58.7	2.5	2.9	3.9
Warwickshire	142014	217878	75864	53.4	2.3	2.5	3.2
Yorkshire, WR	357957	590197	232240	64.9	5.7	6.8	9.8
Industrial group	**1309448**	**2278591**	**969143**	**74.0**	**20.8**	**26.3**	**41.0**
Bedfordshire	52782	66343	13561	25.7	0.8	0.8	0.6
Berkshire	101046	114297	13252	13.1	1.6	1.3	0.6
Buckinghamshire	96658	112444	15786	16.3	1.5	1.3	0.7
Cambridgeshire	78022	93504	15481	19.8	1.2	1.1	0.7
Essex	200719	236974	36256	18.1	3.2	2.7	1.5
Hertfordshire	96124	102118	5994	6.2	1.5	1.2	0.3
Huntingdonshire	35186	39316	4130	11.7	0.6	0.5	0.2
Lincolnshire	181634	218262	36629	20.2	2.9	2.5	1.6
Norfolk	251435	286092	34658	13.8	4.0	3.3	1.5
Northamptonshire	125648	137888	12240	9.7	2.0	1.6	0.5
Oxfordshire	95869	114721	18852	19.7	1.5	1.3	0.8
Rutland	15767	17117	1350	8.6	0.2	0.2	0.1
Suffolk	176499	220224	43724	24.8	2.8	2.5	1.9
Wiltshire	190751	193721	2970	1.6	3.0	2.2	0.1
Agricultural group	**1698139**	**1953023**	**254884**	**15.0**	**26.9**	**22.5**	**10.8**
Rest of England	**2340303**	**2980122**	**639819**	**27.3**	**37.1**	**34.4**	**27.1**
England	**6310338**	**8671439**	**2361101**	**37.4**	**100.0**	**100.0**	**100.0**

Source: see tab. 4.

Table 7. *The new estimates of growth ratios 1751-1801 compared with those of Deane and Cole (growth ratios measured by expressing the population of each county in 1801 as a percentage of its population in 1751)*

New estimates		***Deane and Cole***		
(1) *County*	(2) *Growth ratio 1801/1751*	(3) *County*	(4) *Growth ratio 1801/1751(original)*	(5) *Growth ratio 1801/1751(adjusted)*
Wiltshire	**102.4**	Devon	115.5	**114.3**
Rutland	**105.6**	Northumberland	116.6	**115.3**
Hertfordshire	**109.7**	Bedfordshire	118.1	**116.7**
Huntingdonshire	**110.9**	Westmorland	119.5	**117.9**
Devon	**113.2**	Wiltshire	121.5	**119.8**
Northamptonshire	**114.6**	Northamptonshire	121.6	**119.9**
Berkshire	**115.0**	Oxfordshire	126.8	**124.7**
Buckinghamshire	**117.0**	Cambridgeshire	126.9	**124.8**
Herefordshire	**118.5**	Somerset	126.9	**124.9**
Norfolk	**119.1**	Durham	127.2	**125.1**
Dorset	**119.9**	Gloucestershire	127.5	**125.4**
Essex	**120.5**	Norfolk	127.5	**125.4**
Gloucestershire	**124.1**	Huntingdonshire	128.1	**125.9**
Westmorland	**124.3**	Essex	129.5	**127.2**
Cambridgeshire	**125.2**	Herefordshire	130.7	**128.3**
Oxfordshire	**125.7**	Berkshire	131.1	**128.7**
Hampshire	**126.3**	Hertfordshire	131.7	**129.2**
Lincolnshire	**126.5**	Dorset	134.7	**132.0**
Northumberland	**128.1**	Buckinghamshire	135.7	**132.9**
Yorkshire, NR	**128.2**	Suffolk	136.1	**133.3**
Worcestershire	**130.4**	Shropshire	137.2	**134.3**
Somerset	**130.9**	Lincolnshire	140.4	**137.3**
Suffolk	**131.8**	Middlesex	143.1	**139.7**
Bedfordshire	**131.9**	Rutland	143.7	**140.3**
Leicestershire	**132.9**	Leicestershire	146.5	**142.9**
Durham	**133.4**	Cornwall	147.3	**143.6**
Shropshire	**136.6**	Cumberland	149.2	**145.4**
Kent	**139.8**	Worcestershire	150.1	**146.3**
Cumberland	**152.3**	Yorkshire, NR	151.8	**147.8**
Yorkshire, ER	**156.8**	Derbyshire	165.1	**160.0**
Cornwall	**160.3**	Hampshire	169.0	**163.6**
Derbyshire	**162.0**	Nottinghamshire	170.4	**164.9**
Cheshire	**162.7**	Warwickshire	172.2	**166.6**
Nottinghamshire	**170.9**	Sussex	174.3	**168.5**
Warwickshire	**171.1**	Staffordshire	175.6	**169.7**
Sussex	**173.9**	Cheshire	183.8	**177.3**
Staffordshire	**176.9**	Kent	188.2	**181.4**
Middlesex	**177.5**	Yorkshire, ER	189.8	**182.8**
Surrey	**184.5**	Yorkshire, WR	192.5	**185.3**
Yorkshire, WR	**186.1**	Surrey	208.1	**199.7**
Lancashire	**276.4**	Lancashire	218.5	**209.3**

Table 8. *Males aged 20 and over engaged in agriculture in England in 1831*

	Males Twenty Years of Age	*Agriculture: Occupiers employing labour*	*Agriculture: Occupiers not employing labour*	*Labourers employed in agriculture*	*Total in agriculture*	*Percentage in agriculture*
Bedfordshire	22,568	1,330	474	11,588	13,392	59.3
Berkshire	37,084	1,711	458	14,802	16,971	45.8
Buckinghamshire	35,504	2,152	453	16,743	19,348	54.5
Cambridgeshire	35,715	2,421	1,266	15,698	19,385	54.3
Cheshire	78,930	4,374	4,059	15,094	23,527	29.8
Cornwall	69,737	4,608	3,613	16,243	24,464	35.1
Cumberland	40,614	3,617	2,839	9,010	15,466	38.1
Derbyshire	58,178	3,320	4,257	10,593	18,170	31.2
Devon	116,188	9,328	3,356	35,311	47,995	41.3
Dorset	37,861	2,243	967	14,056	17,266	45.6
Durham	59,045	2,229	1,544	7,556	11,329	19.2
Essex	79,023	4,561	888	38,234	43,683	55.3
Gloucestershire	94,234	3,675	1,846	20,927	26,448	28.1
Hampshire	74,711	2,774	1,234	24,675	28,683	38.4
Herefordshire	29,342	2,505	1,679	12,213	16,397	55.9
Hertfordshire	34,910	1,518	399	14,700	16,617	47.6
Huntingdonshire	13,001	857	397	5,967	7,221	55.5
Kent	115,655	4,361	2,152	36,113	42,626	36.9
Lancashire	313,099	6,658	9,714	20,949	37,321	11.9
Leicestershire	49,812	2,656	2,045	10,642	15,343	30.8
Lincolnshire	79,535	6,901	6,204	32,167	45,272	56.9
Middlesex	358,521	1,050	490	11,376	12,916	3.6
Norfolk	93,498	5,229	2,718	37,466	45,413	48.6
Northamptonshire	43,793	3,015	1,117	17,775	21,907	50.0
Northumberland	53,203	2,376	1,261	10,441	14,078	26.5
Nottinghamshire	56,582	2,643	2,414	11,799	16,856	29.8
Oxfordshire	39,018	2,054	458	15,998	18,510	47.4
Rutland	4,940	,429	424	1,910	2,763	55.9
Shropshire	56,474	3,832	2,139	17,296	23,267	41.2
Somerset	95,556	6,032	3,731	28,107	37,870	39.6
Staffordshire	101,632	3,781	3,649	16,812	24,242	23.9
Suffolk	71,376	4,526	1,121	33,040	38,687	54.2
Surrey	119,565	1,873	727	16,761	19,361	16.2
Sussex	67,076	3,160	1,330	26,124	30,614	45.6
Warwickshire	83,239	2,838	1,142	15,644	19,624	23.6
Westmorland	14,020	1,435	1,685	3,474	6,594	47.0
Wiltshire	58,039	3,387	1,239	24,708	29,334	50.5
Worcestershire	52,796	2,636	1,260	14,590	18,486	35.0
Yorkshire, E. Riding	49,914	3,671	1,914	13,911	19,496	39.1
Yorkshire, N. Riding	47,396	4,950	4,334	14,646	23,930	50.5
Yorkshire,W. Riding	231,666	7,096	10,636	24,502	42,234	18.2
England	3,173,050	139,812	93,633	739,661	973,106	30.7

Source: 1831 census, Enumeration Abstract.

Table 9. *The percentages of the adult male labour force in agriculture in England in 1831 (males aged 20 and over)*

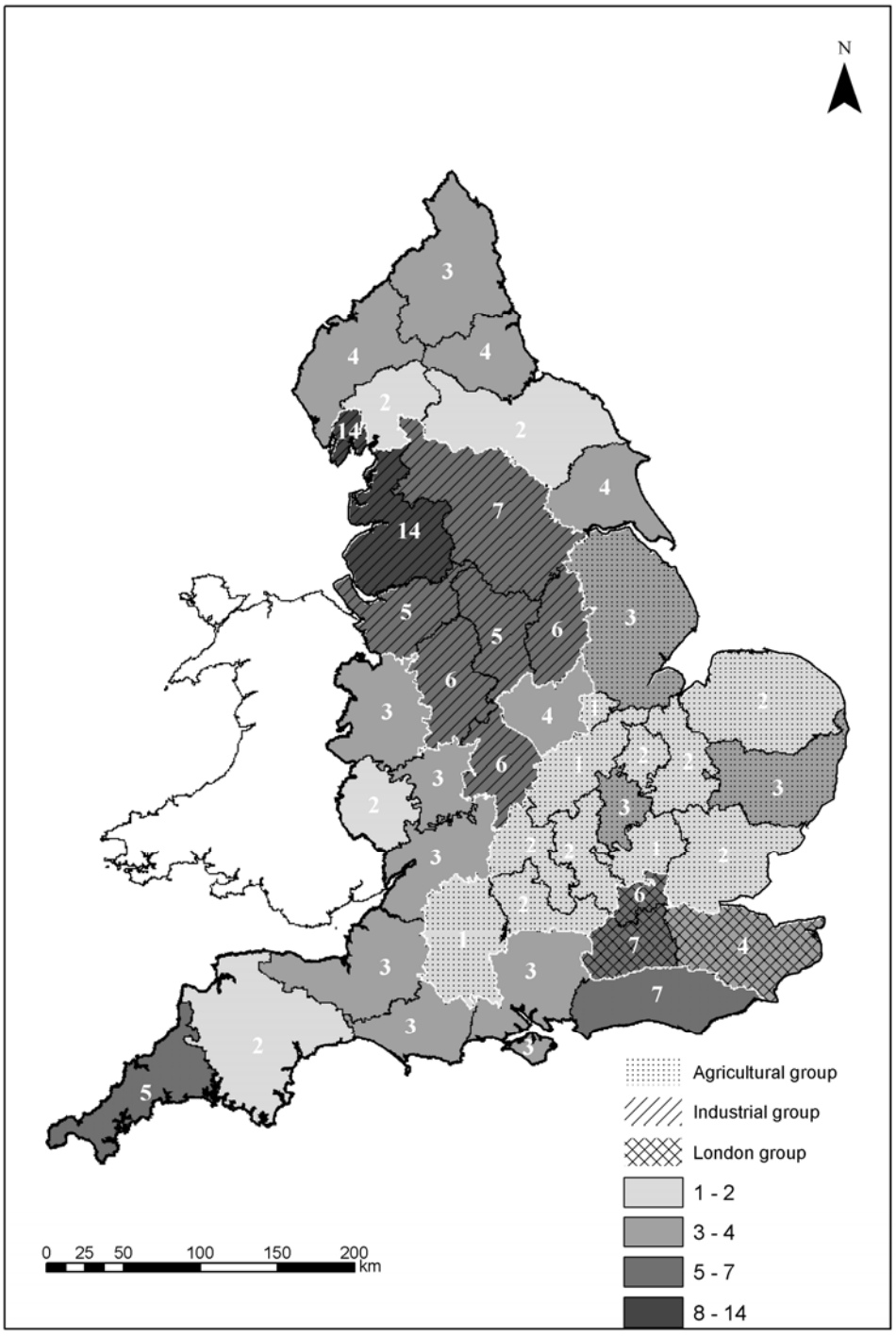
	Total	*Engaged in agriculture*	*Per cent in agriculture*
Kent	115,655	42,626	36.9
Middlesex	358,521	12,916	3.6
Surrey	119,565	19,361	16.2
London group	**593,741**	**74,903**	**12.6**
Cheshire	78,930	23,527	29.8
Derbyshire	58,178	18,170	31.2
Lancashire	313,099	37,321	11.9
Nottinghamshire	56,582	16,856	29.8
Staffordshire	101,632	24,242	23.9
Warwickshire	83,239	19,624	23.6
Yorkshire, WR	231,666	42,234	18.2
Industrial group	**923,326**	**181,974**	**19.7**
Bedfordshire	22,568	13,392	59.3
Berkshire	37,084	16,971	45.8
Buckinghamshire	35,504	19,348	54.5
Cambridgeshire	35,715	19,385	54.3
Essex	79,023	43,683	55.3
Hertfordshire	34,910	16,617	47.6
Huntingdonshire	13,001	7,221	55.5
Lincolnshire	79,535	45,272	56.9
Norfolk	93,498	45,413	48.6
Northamptonshire	43,793	21,907	50.0
Oxfordshire	39,018	18,510	47.4
Rutland	4,940	2,763	55.9
Suffolk	71,376	38,687	54.2
Wiltshire	58,039	29,334	50.5
Agricultural group	**648,004**	**338,503**	**52.2**
Rest of England	**1,007,979**	**377,716**	**37.5**
England	**3,173,050**	**973,106**	**30.7**

Source: see tab. 7.

Table 10. *Illustration of the possible effect of differential growth rates on the share of agriculture in the occupational structure of England in the later eighteenth century*

	Percentage in agriculture in 1831 (adult male labour force)	*Assumed percentage in later eighteenth century*	*Percentage of total population in 1761*	*Percentage of total population in 1801*	*Agricultural population in 1761 (percentage of adult male labour force: col. 2 x col. 3)*	*Agricultural population in 1801 (percentage of adult male labour force: col. 2 x col. 4)*
London group	12.6	17.0	15.3	16.8	2.6	2.9
Industrial group	19.7	25.0	20.8	26.3	5.2	6.6
Agricultural group	52.2	65.0	26.9	22.5	17.5	14.6
Rest of England	37.5	45.0	37.1	34.4	16.7	15.5
England					42.0	39.6

Figure 1. Differential growth rates in three county groups



[1] . The work underlying this essay was made possible by an ESRC grant (RES-000-23-0131), entitled 'Male occupational change and economic growth in England 1750-1851'.
An earlier draft was greatly improved by the comments made by Peter Kitson and Leigh Shaw-Taylor.
[2] . In the early censuses England was taken to include Monmouth, but in this essay all data referring to England exclude Monmouth. England therefore consists of 39 counties, or 41 if the three Ridings of Yorkshire are treated as equivalent to counties, as in this essay.

[3] . Deane and Cole, *British economic growth*, tab. 24, p. 103 and associated text.

[4] . Deane and Cole preferred Brownlee's estimates of national totals. A discussion of the methods employed and the assumptions made by scholars such as Finlaison, Farr, Griffith, and Brownlee, all of whom produced estimates of population growth in the eighteenth century, may be found in Wrigley and Schofield, *Population history of England*, app. 5. It should be noted that all these scholars depended on the returns secured by Rickman but corrected his data in different ways.

[5] . It might be expected that Deane and Cole's revision of Devon would also have changed the rank order of counties, but Devon was the slowest growing country in both county series and therefore left the rank ordering of counties unaffected.

[6] . The nature and the notable duration of the controversy are discussed in Glass, *Numbering the people*, and well illustrated in his two companion volumes, *The population controversy* and *The development of population statistics.*

[7] . Rickman, *Observations on the results of the Population Act, 41 Geo. III.*

[8] . There is a fuller account of Rickman's procedures in Wrigley and Schofield, *Population history of England*, pp. 572-4.

[9]. A summary of Rickman's methods and results, including the text of the letter which he sent to selected incumbents in 1836 may be found in *1841Census*, Preface, pp. 34-7. It maybe of interest to note that Rickman himself had died in 1840. His executors passed on the documents containing his calculations to the Home Office. Edmund Phipps and Thomad Vardon, acting on behalf of the first Registrar General, Thomas Henry Lister, who had also died very recently, published the table in the census and briefly described Rickman's method of calculation. Their text suggests some reserve about Rickman's results. They wrote: 'We may, at a future, period, enter into a consideration of the merits of the calculation, deeming it sufficient for the present to state that there is reason for supposing the estimate hereby arrived at to be an approximation to the truth': ibid., p. 35.

[10] . Ibid., tab. 4.6, p. 101.

[11] . Wrigley and Schofield, *Population history of England*, pp. 89-96.

[12] . Wrigley and Schofield, *Population history of England*, app. 4.

[13] . There is a discussion of trends in adult male agricultural employment in the early nineteenth century in Wrigley, 'Men on the land and men in the countryside'. See esp. tab. 11.12, p. 332.

[14] . An example of the importance of this consideration may be found in Woods's intriguing discussion of mortality trends in nineteenth-century England. For much of the century expectation of life at birth changed very little in England as a whole, but Woods showed that mortality might improve significantly in each type of settlement --- rural, small town, large city, metropolis, etc. --- but because there was much more rapid growth of population in the least healthy settlement types, local improvement would not be mirrored nationally. Woods, 'The effects of population redistribution on the level of mortality'.

[15] . See n. 1 above for details of the grant.

[16] . 26 George II, cap. 33.

[17] . Rickman, *Observations on the results of the Population Act, 41 Geo. III*, p. 4.

[18] . Deane and Cole, *British economic growth*, p. 102.

[19] . 41 George III, cap. 15. *An act for the taking an account of the population of Great Britain, and of the increase or diminution thereof.*

[20] . The accuracy of the printed county totals compared with the sum of the constituent hundreds varied greatly. In some counties there were only occasional inconsistencies. In Buckinghamshire, for example, there were discrepancies in six years between 1754 and 1800 (1754, 1759, 1767, 1768, 1770, and 1798). In Derbyshire in contrast the sum of the hundred totals failed to match the printed county total in every year except 1755-63 and 1771. Occasionally, the discrepancy was very large indeed, usually because of a misprint. The printed total for Devon in 1792, for example, is 1,619 while the sum of the hundred totals is 2,619. There are comparable problems when the national total is compared with the sum of the printed county totals. Disagreement between the two figures was uncommon before 1766 (other than in 1761). From 1767 to 1781 in each year the national total fell short of the sum of the county totals by a figure in the range between 1,000 and 1,500, except for 1780 (2,288). There was then a further period of generally good agreement, broken by a few major errors, probably attributable to poor proofing. In 1790 the printed total exceeded the sum of the county totals by 4,000; while in 1797 it fell short of the latter by 2,000. In the PRAs printed in subsequent censuses the agreement was always very close, indeed in most years there was exact agreement.

[21] . The population totals in question may be found in Wrigley, *et al.*, *English population history*, tab. A9.1, pp. 614-5.

[22] . See n. 21.

[23] . Wrigley and Schofield, *Population history of England*, tab. A6.7, p. 595.
[24] . The effects of earlier wars are clearly visible. In Portsmouth, for example, the number of marriages in the 8-year period 1756-63 was 3,772. In the 8 following years this total fell to 2,063. The earlier wars also caused distortions in the estimated populations in the Devon and Kent because other naval bases were affected in the same way as Portsmouth. It is significant that in tab. 5 in all three counties the population in 1771 is smaller than in 1761, a pattern rarely found in other counties. The 'true' totals should probably be lower in 1761 and higher in 1771.
[25] . Provided, of course, that all the parishes in question maintained marriage registers.
[26] . See Wrigley and Schofield, *Population history of England*, app. 7, 'Rickman's parish register returns of 1801 and 1841'.
[27] . Wrigley and Schofield, *Population history of England*, tab. A7.10, p. 621.
[28] . Ibid., p. 601.
[29] . See n. 20 above.
[30] . It should be borne in mind that this problem also affects the comparison of hundred totals over time. For example, where a hundred included one or more parishes which overlapped into another hundred, its population in 1821 will not be exactly comparable to its population in 1811.
[31] . 446 x (1,000 /8.52) x 0.9811 = 51,361. See p. above for explanation of the final adjustment figure.
[32] . The footnotes refer to a total of more than 230 parishes in which returns were defective. In the great majority of cases the dates of the period of defective registration show that the problem was confined to the early years of registration.
[33] . The comparison also provides new and important evidence that the re-weighting of the parishes in the 404 sample on which the reconstruction of national population trends in the *Population history of England* was based captures the national pattern accurately.
[34] . As, for example, the total for 1755-67, 5,804, quoted above p.
[35] . It is of interest to note that when the work which gave rise to the *Population history of England* was in train, an estimate of the impact of these factors was made. It suggested that the published national total in the 1801 census should be increased by 4.49 per cent, or from 8,285,852 to 8,658,265 (Wrigley and Schofield, *Population history of England*, tab. A6.7, p. 595). The subsequent inverse projection exercise produced a gratifying similar total for 1801, 8,671,439 (Wrigley, *et al.*, *English population history*, tab. A9.1, pp. 614-5). The two exercises were, of course, independent of each other.
[36] . 3,686 x 54,541/56,227 = 3,575.
[37] . From 6,310,338 to 8,671,439; see tab. 5.
[38] . This issue is far too complex to be pursued here, but would repay further examination. Population growth accelerated generally in Europe in the second half of the eighteenth century. There were nevertheless substantial tracts in which growth was slight or absent. This was probably true of much of western France, for example. But there were many agricultural areas in which growth was more rapid than in the group of 14 agricultural counties in central southern England, both in the heartland of Europe and towards its periphery. The Belgian provinces afford several examples of this, for example, and at a time when the urban proportion was falling rather than rising. In Norway, a country with only a tiny urban population, all four dioceses were growing briskly in the second half of the eighteenth century. Such examples could be multiplied. Comparisons across space raise as many questions as similar comparisons over time. Population estimates are usually subject to wide error margins; the dates for which estimates are available seldom coincide; and rural populations did not make their livings exclusively from agriculture. In some cases rapid growth came from a low base because of previous devastation by war. Yet a systematic investigation of the topic might reveal much of interest about the relative strength of the influences leading to the release of labour from the land or its retention, and about the extent of the contrast between England and other countries. Dupâquier, 'La peuplade', fig. 15, p. 80; Klep, 'Population estimates of Belgium by province', tab. 15, p. 505; Drake, *Population and society in Norway*, Statistical appendix, tab. 1, pp. 164-5. See also Bairoch, 'Une nouvelle distribution des populations' which shows how widespread was the fall in the urban percentage throughout continental Europe in the second half of the eighteenth century, even though total populations were rising rapidly.
[39] . Evidence bearing on this issue may be found in Wrigley *et al.*, *English population history*, pp. 182-94 (nuptiality); pp. 268-79 (mortality); and pp. 501-7 (fertility).
[40] . Deane and Cole, *British economic growth*, tab. 24, p. 103.
[41] . In making this calculation to preserve comparability between the two sets of estimates Wales and Monmouth were deleted from the original list of Deane and Cole.

[42] . See p. above.
[43] . Much more could be said about the reasons why Rickman's method of estimating county totals was likely to produce inaccurate results, and therefore also to affect totals derived from his work, but it would be out of place to engage in a lengthy discussion in this essay.
[44] . Wrigley, 'Men on the land and men in the countryside', tab. 11.12, p. 332.
[45] . Other hundreds in Northumberland and Cumberland also bordered on Scotland. In Northumberland Coquetdale and Tindale both had rather low crude marriage rates (5.9 and 6.2 per 1,000 in the period centred on 1801), lower than in hundreds such as Morpeth and Castle which had no common border with Scotland, If, however, there was marriage 'leakage' across the border in these hundreds it appears to have been present throughout the period 1761 to 1801 since there was population growth in both hundreds, substantial in Tindale, modest in Coquetdale. In Cumberland Eskdale hundred had a land border with Scotland while Cumberland hundred faced Scotland across the Solway Firth. In both hundreds the crude marriage rate was lower than elsewhere in the county (the rates were 6.1 and 5.7 per 1,000 respectively in the period centred on 1801, when in the rest of the county the rate was 7.6), but in both hundreds, as in Coquetdale and Tindale, escape across the border appears to have been a constant rather than an increasing phenomenon since in both hundreds population growth was brisk between 1761 and 1801 in the new estimates.
[46] . It would, of course, be equally, or perhaps even more valuable to extend the county series further backward in time, but, if feasible at all, it would involve vastly more effort than the present exercise. Coverage was less good in all three series (baptisms, burials, and marriages). Correction for under-registration would be problematic, and it would be necessary to collect new data for substantial periods of time from large numbers of parishes in order to estimate county totals.