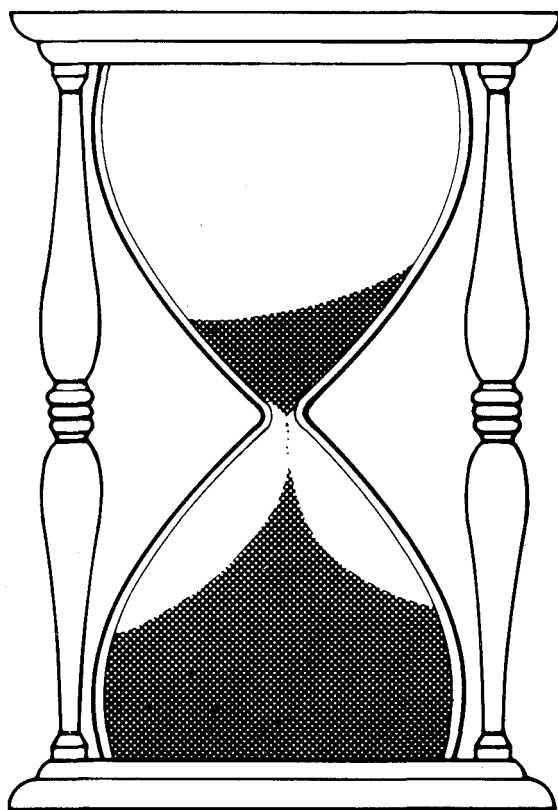


Historical Geography Research Series

LATE SEVENTEENTH CENTURY TAXATION
AND POPULATION: THE NOTTINGHAMSHIRE
HEARTH TAXES AND COMPTON CENSUS

TIM UNWIN



NUMBER 16 AUGUST 1985

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HISTORICAL GEOGRAPHY RESEARCH SERIES

No. 16

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NOTTINGHAMSHIRE HEARTH TAXES AND COMPTON CENSUS

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INTRODUCTION

No major attempt has yet been made to reconstruct the spatial and social distribution of wealth in England between the sixteenth and nineteenth centuries. This was a period of important change in English society, as the final vestiges of the feudal mode of production were swept away by the ever increasing power of capital. In the 1960s and 1970s a number of scholarly geographical studies were published relating to taxation in the eleventh, fourteenth and sixteenth centuries, but this sequence of cross-sections has not yet been continued into the seventeenth and eighteenth centuries. Darby and his colleagues have provided us with an extensive insight into the distribution of population and wealth as illustrated in Domesday Book; Glasscock has depicted the spatial distribution of movable wealth derived from the 1334 Lay Subsidy; and Sheail has assessed the information given in the 1524/25 Lay Subsidies.¹ It is the purpose of the present work to illustrate the potential use of the information to be found in the Hearth Taxes, dating from between 1662 and 1689, in establishing a further cross-section of wealth from the end of the seventeenth century. It is both methodological and substantive in its content: details of the Hearth Taxes and problems in their interpretation and use are discussed, and they are then illustrated with a case study from the county of Nottinghamshire.

In essence the Hearth Taxes provide a nominative list of taxpayers listed by township together with the number of hearths owned by each household. A typical extract for the 1674 assessment of Nottinghamshire is illustrated in Fig. 1. The information contained within them has so far been used in four main ways:

1. In constructing lists of people inhabiting certain townships.
2. As an indication of the size of 'settlements' and individual houses within those settlements. When combined with a study of vernacular architecture this can tell us something about the structure of settlement in the second half of the seventeenth century.
3. As a guide to the absolute population and wealth of a county, and the relative distributions of these variables within it.
4. As a general indicator of the social and economic status of the population within an area.

Much of this work has been undertaken by historians and there has been a decided lack of attention to the spatial distribution of the information obtained within the Hearth Taxes. The majority of studies of the Hearth Tax have been concerned with the reasons for, and problems of, its assessment. Little attention has been paid to an evaluation of what can be learnt from the documentation about such things as the variations in social structure between different parts of England, or even

Staunton	Farndon
W. Staunton 1	W. Staunton 1
William Holt 4	William North 2
Math Martin 2	James Gorton 2
John Hall 2	John Gorton 2
Ben. Wignall 1	William Wright 1
John Gorton 2	John Gorton 2
Robt. Gorton 2	Robt. Gorton 1
John Gorton 1	Robt. Martin 1
Robt. Chaffin 1	Widow Gorton 2
Thos. Gorton 2	John Gorton 3
Robt. Green 2	Robt. Gorton 2
Thos. Wignall 2	Robt. Gorton 2
Wm. Wignall 2	John Gorton 2
Robt. Gorton 2	Math. Gorton 2
Thos. Gorton 2	Thos. Gorton 2
Wm. Gorton 1	Wm. Gorton 2
John Gorton 2	Thos. Gorton 2
William Gorton 1	Robt. Gorton 2
41	Wm. Gorton 2
Thorpe	Wm. Gorton 2
Thos. Gorton 3	Wm. Gorton 2
Wm. Gorton 3	Wm. Gorton 2
John Gorton 3	Wm. Gorton 2
William Hall 1	Wm. Gorton 2
Robt. Gorton 1	Wm. Gorton 2
Thos. Gorton 1	Wm. Gorton 2
15	Wm. Gorton 2
Discharged by Certificate	Wm. Gorton 2
Wm. Gorton 1	Wm. Gorton 2
John Hall 1	Wm. Gorton 2
Mary Gorton 1	Wm. Gorton 2
Wm. Gorton 1	Wm. Gorton 2
2	Wm. Gorton 2
	Wm. Gorton 2

Figure 1. Extract from the Nottinghamshire Hearth Tax assessment of 1674: Staunton, Thorpe and part of Farndon (E179/254/30)

the spatial distribution of fire places within a single county. One of the main purposes of the present paper is therefore to illustrate the potential rewards to be reaped from an investigation of the differences in wealth and social structure through space as revealed by the Hearth Taxes. Geographers have, in general, ignored them for far too long.

The historical works on seventeenth century taxation by Chandaman and Kennedy provide broad details on how the tax was levied, why it was introduced, and its overall significance at the national scale.² The most detailed accounts of the nature of the Hearth Taxes, and the problems associated with their use, though, are to be found in Meekings's accounts of the levying of

the tax in Dorset and Surrey.³ Marshall has also provided an account of the struggle over the imposition of the taxes between the king and the executive on the one hand, and the House of Commons and the people on the other.⁴ Shorter surveys of the Hearth Tax are to be found in West and Howell.⁵ In the geographical context Foster, Morgan and Patten have also provided brief guides to the documents.⁶ In a substantive geographical attempt to use the Hearth Taxes to understand the settlement history of an area Meirion-Jones has assessed the information contained within them in association with a study of the vernacular architecture in the Odiham and Selbourne area of Hampshire.⁷ Published transcripts have been completed for the following English counties: Bedfordshire, Cambridgeshire, Derbyshire, Dorset, Herefordshire, Oxfordshire, Shropshire, Somerset, Suffolk, Surrey, and Warwickshire.⁸ County summaries of the material are sometimes to be found in the volumes of the Victoria County History, as for Leicestershire, and other specific areas of the country, notably the Isle of Wight, have also had their Hearth Tax records transcribed.⁹ West has provided a list of most of the other local studies undertaken based on the Hearth Taxes.¹⁰

The present study begins with a short account of the historical background to the taxes and the nature of the surviving documents. It proceeds with an analysis of the information contained in the Nottinghamshire Hearth Taxes, and in particular the assessment of 1674. Material from the ecclesiastical 'census' of 1676, known as the Compton Census, is then investigated to assess the comparative reliability of the two sources as indicators of the spatial distribution of population. Nottinghamshire has been chosen as the specific area of study because of the good survival of the relevant documentary material, and also because the Hearth Taxes for this county have not yet received widespread attention.

HISTORICAL BACKGROUND TO THE HEARTH TAXES

Legislation

By the second half of the seventeenth century the amount of income available to the Crown from traditional sources had dwindled considerably. This resulted partly from the abolition of feudal tenure, but it was also due to the sale of royal demesne lands throughout the previous century. Parliament therefore voted an annual income of £1,200,000 to the Crown, and to provide this it granted a perpetual excise on ale and beer, in addition to the traditional revenue available from the Customs.¹¹ Nevertheless there was still a shortfall of an estimated £300,000 per annum, and in consequence the Commons had to agree on a way of obtaining further revenue. This was achieved in an Act of 1662, entitled "An Act for establishing an additional Revenue upon his Majestie his heires and successors for the better support of his and their Crown and Dignity", which provided for a new tax on hearths.¹²

This Act specified that:

From and after the five and twentieth day of March in the year of our Lord God one thousand six hundred sixty and two every dwelling and other house and edifice, and all lodgings and chambers in the Inns of Court, Inns of Chancery, colleges and other societies that are or hereafter shall be erected within the kingdom of England, dominion of Wales and town of Berewick-upon-Tweed (other than such as in this Act are hereafter excepted and declared), shall be chargeable, and by this present Act be and are charged, with the annual payment to the king's Majesty, his heirs and successors, for every fire-hearth and stove within every such house, edifice, chambers and lodgings as aforesaid, the sum of two shillings by the year, to be paid yearly and every year at the Feast of St. Michael the Archangel and the Feast of the Annunciation of the blessed Virgin St. Mary.¹³

The tax itself was to be administered through the instruments of local government, and the Petty Constables were to obtain a statement of the number of hearths in each building from the occupants, with false statements being punishable by a £2 fine. The original Bill made no provision for exemptions, and these were only added at the report stage and in the final reading. By the time the Act became law, though, there were in practice five categories of exemption:

1. Royal property in the King's hands.
2. Privileged bodies, such as the Dean and Chapter of St. George's Windsor.
3. Those who paid neither Church nor Poor Rate.
4. Persons who inhabited a house worth under £1 a year and did not have any property exceeding that value, nor an annual income greater than £10. Such people had to obtain a certificate from the Minister, Churchwardens and Overseers of the Poor, which was then to be signed by the Justices.
5. Charitable institutions, such as Hospitals and Almshouses, with an annual endowed income of less than £100. In practice Free Schools were also included as exempt in this category.

Industrial hearths, including kilns, stamps, furnaces and blowing houses. Bakers' ovens and smiths' forges, though, seem not to have been exempt.

The first Act also specifically stated that it was the occupier and not the landlord who was to pay the tax. As Meekings notes "this had the effect of exempting the hearths in the occupation of poor persons from all payment, even when they were rented from a wealthy landlord".¹⁴ The actual spatial units used in the assessment and collection of the tax seem to have varied between counties, within counties, and also through time,

but the normal taxation unit throughout most of England was the township.

The collection of the tax was in the first instance to be undertaken, within six days of the feast day when the tax was due, by the Petty Constables, who could distrain and sell the goods of defaulters to make good the payment. The moneys gathered, together with the returns, were then to be sent within twenty days to the High Constables, and thence, within a further ten days, to the Sheriffs. Within the next twenty days all the moneys and returns were to be sent to the Exchequer. At each stage of this process the officials were to be allowed a poundage: the Petty Constables 2d., the High Constables 1d, and the Sheriffs 3d.

In 1663 a revising Act was passed on the grounds that many occupiers had made false statements, and that the Petty Constables had frequently failed in their duty to ascertain the true numbers of hearths.¹⁵ Its main aim was to improve the machinery of assessment, and this it indeed seems to have done. The Petty Constables were now to have their assessments checked by two "substantial inhabitants", and all of the hearths were to be recorded. This gave rise to two sets of figures for each taxation unit, one for the chargeable hearths and the other for non-chargeable hearths. If the Petty Constables failed to send on their assessments on time they were to be fined £5, and at the next stage both Petty and High Constables were to be examined on oath by Justices as to the truth of their statements. The Justices were then to hand on the assessments to the Clerks of the Peace, who would prepare a County Roll and also Exchequer Duplicates.

While this revising Act therefore tightened up on the assessment of the tax it did little to improve the actual mechanisms of obtaining the money due from it. A second revising Act was therefore introduced in 1664.¹⁶ This led to a complete reorganisation of the administration of the tax, and from June 24th of that year the king was to be allowed to appoint Receivers who would in turn appoint their own sub-collectors. These sub-collectors were to be given full powers to enter any property and inspect the number of hearths therein. Four other measures were introduced to improve the yield from the revenue: landlords who sublet houses to poor people became responsible for the payment of the tax on those houses; all houses with more than two chimneys became liable to tax; refusal to pay within one hour could lead to immediate distraint; and if sealed up hearths or chimneys were found they became liable to twice the normal rate of tax. Although the sub-collectors became responsible for both the assessment and collection of the tax, they were still to be assisted by the Petty Constables.

Problems involved in the administration of the Hearth Taxes

All commentators have emphasised the unpopularity of the tax and the difficulties involved in its administration.¹⁷ As Marshall

has noted "the ostensible reasons for the pronounced dislike of the tax are those set forth in the repealing act: that it was 'a great oppression to the poorer sort' and 'a badge of slavery upon the whole people', since it exposed the private citizen to the indignity of having his house entered and searched by strangers".¹⁸ She goes on to discuss five main causes for this hatred of the tax:

1. The oppression by those responsible for its levying, especially after 1666.
2. The general temper of the moment.
3. The general poverty.
4. The gradual stopping up of loopholes through the introduction of improved legislation.
5. The state of national affairs in view of the impending Dutch war, which meant that revenue collection had to be as tight as possible.

An entry from the diary of Samuel Pepys for June 30th 1662 provides a contemporary account of the unpopularity of the Hearth Tax on its introduction, and the context in which it was enacted:

This I take to be as bad a juncture as ever I observed. The King and his new Queene minding their pleasures at Hampton Court. All people discontented; some that the King doth not gratify them enough; and the others, Fanatiques of all sorts, that the King doth take away their liberty of conscience; and the heighth of the Bishops, who I fear will ruin all again. They do much cry up the manner of Sir H. Vanes death, and he deserves it. They clamour against the Chimny-money and say they will not pay it without force. And in the meantime, like to have wars abroad - and Portugall to assist, when we¹⁹ have not money to pay for any ordinary layings-out at home.

This quotation is important in that it emphasises that the unpopularity of the Hearth Tax should not be seen in isolation from other causes of social and political disquiet. The force referred to by Pepys broke to the fore in 1666-67 when Marshall notes that riots of varying intensity broke out at Hereford, Marlborough, St. Neots, Hexham, the North Riding, Weymouth, Winchcombe, Pewsey, Banbury, Taunton and Bridport.²⁰ Earlier in 1663 there had been other planned riots at Bristol and London, and Meekings comments that "it is clear also that the keepers of unlicensed ale houses and the houses of inmates had an interest in keeping any official from inspecting their houses; whilst an age in which smugglers and owlers existed in great number would naturally be an age which would produce evasion of such a tax".²¹

It is difficult to estimate the degree of evasion that was caused by the unpopularity of the tax. It certainly seems to have been quite high in 1662, and in this context Marshall cites

an example of the walling up of at least 850 hearths in Blackburn Hundred in Lancashire.²² This abuse of the system was, though, *theoretically* prevented by the passing of the first revising Act, and it does seem that with the specification of chargeable and not-chargeable hearths there was a greater degree of overall accuracy in the *assessments*. The additional problems encountered in the actual collection of the tax, and the large numbers of statements of arrears, suggest, however, that the actual returns from the tax remained a far poorer estimate of the numbers of hearths than did the assessments.

A further source of considerable difficulty in interpreting the documents in the period before 1664 is that most of the Sheriffs and Constables left office in October of each year. This meant that there was great confusion between the incoming and outgoing officials as to who was responsible for the actual collection of the tax once it had been assessed. When the King's Receivers took over the administration of the tax this problem was largely overcome, but at the same time it also gave rise to greater friction between the tax collectors and the populace.

Additional problems are encountered in that in some areas it is clear that certificates of exemption were granted to people who did not fall into any of the specified categories of exemption. Marshall cites several examples of this practice of exempting people who should actually have paid the tax, and in one notes that "certificates representing in value the sum of £360, were disallowed in the account of the receiver for Cornwall because they were illegal".²³ Again, though, while this problem makes the interpretation of the actual financial returns highly difficult, it should not necessarily invalidate the accuracy of the *assessments* providing that the hearths which had been discharged by certificate were actually recorded therein.

The unpopularity of the tax led to further cries for its repeal, and in 1666 the Commons attempted to abolish it. Instead of its abolition, though, the tax collection was handed over to specific contracted agents, known as 'farmers', who also became responsible for the collection of the instalments due on Lady Day 1666 which had not already been received. The tax was administered by these farmers until Lady Day 1669, when due to growing conflicts between the farmers, the populace, and the local officials its administration passed back into the hands of Receivers for each county. These Receivers were responsible to two Agents for the Hearthmoney who acted under the general supervision of the Treasury. This direct administration of the tax appears to have achieved some positive increase in its yield. Thus Chandaman has noted that during the period 1662-1664 the Hearth Tax yield was only in the region of £112,500 per annum, whereas during the period Michaelmas 1669 to Lady Day 1674 the net receipts of the Hearth Tax increased to an average of £145,000 per annum.²⁴ From Michaelmas 1674 the tax was again put out to farm, this time on two successive five-year contracts. The reason for this change in administration was apparently due

largely to the Lord Treasurer, Danby's, preference for such a basis of government finance. By the early 1680s it became apparent that the farmers of the tax were making excessive profits, and so from Michaelmas 1674 the administration of the tax was placed in the hands of a new government Hearthmoney office. This return to direct administration led to a further increase in the yield, which averaged approximately £216,000 per annum during the eight collections between Michaelmas 1684 and Lady Day 1688.²⁵ With the accession of William and Mary to the throne of England the tax was abolished in 1689.²⁶

The Nature of the Surviving Documents

In summarising the legislation noted in the previous section it is possible to divide the history of the Hearth Taxes into seven periods:

1. Michaelmas 1662 - Lady Day 1663, when it was administered by the machinery of local government under the first Act;
2. Michaelmas 1663 - Lady Day 1664, again administered by local officials, but specifying both chargeable and not-chargeable Hearths as a result of the second Act;
3. Michaelmas 1664 - Lady Day 1666, when administered by the King's Receivers;
4. Michaelmas 1666 - Lady Day 1669, when it was administered for the first time by farmers;
5. Michaelmas 1669 - Lady Day 1674, when there was a return to the Receivers;
6. Michaelmas 1674 - Lady Day 1684, being the second period under farmers; and
7. Michaelmas 1684 - 1689 when it was finally in the hands of Special Commissioners.

When the tax was being handled by the farmers and the Salaried Commissioners there was no need for detailed documents relating to the assessment to be submitted to the Exchequer. Consequently, for the periods Michaelmas 1666 to Lady Day 1669 and Michaelmas 1674 to 1689 no detailed documentation survives relating to the Hearth Tax assessments at the Public Record Office. It is only therefore for the periods Michaelmas 1662 to Lady Day 1666 and Michaelmas 1669 to Lady Day 1674 that substantial documentation remains.

Meekings has classified this material into six main categories:

1. The Hearth Tax Accounts, recording payments from the collection areas;

2. The Exchequer Duplicates of the Assessments;
3. The Schedules of Arrears;
4. The Particulars of Account, which were placed in a bag and included the returns, the exemption certificates, letters, receipts and certificates of payment;
5. The Exchequer Tallies of Receipt, which all now appear to be lost; and
6. The Auditors' Miscellanea.²⁷

Of these the Exchequer Duplicates of Assessment survive most fully, and are of greatest use in reconstructing patterns of wealth distribution, since they normally record by township the names of the taxpayers and the numbers of hearths at which they were assessed. The precise nature of these Exchequer Duplicates of Assessment varies depending on the type of administration under which they were compiled, and also the part of the country to which they refer. In general the 1662 documents only give lists of chargeable people. Following the revising Act of 1663 until Lady Day 1664 figures for both chargeable and not-chargeable hearths are given, and during the period of the first Receivers the 1662 assessment is recorded in the middle of the manuscript, the revisions in the right hand margin and then the final revised total is stated in the left hand margin. The reasons for the changes are also frequently noted in the margins. The Exchequer Duplicate Assessments for the Michaelmas 1669 to Lady Day 1674 period are again all similar, normally noting both chargeable and not-chargeable hearths, and if they have been used more than once alterations are noted in the margins. The Exchequer Duplicates for most English counties are to be found in section E179 in the Public Record Office, but survival of the documents is variable in quality and quantity. Details of the Accounts and Particulars of Account, where they survive, are sometimes to be found in the Public Record Office, but together with other documents pertaining to the collection of the tax they may also be located in County Record Offices.

Interpretations of the Hearth Tax material

It is the purpose of this section briefly to summarise the main problems relating to evasion, exemption and interpretation resulting from the changes in the legislation and administration of the Hearth Taxes noted in the previous sections. More detailed and specific problems in their use are discussed in the context of Nottinghamshire below.

Evasion

The unpopularity of the tax, and the rigorous attempts by the Crown to increase its yield, suggest that evasion in terms both of assessment and actual returns was probably quite common. Given the higher yields of the period 1669-1674, as against those

of 1662-1666, it is likely that the later assessments and returns were more accurate, but again they cannot be seen as complete evaluations of the numbers of hearths or households in a township. Two points, though, should be made in connection with tax avoidance. The first is that there is little reason to believe that *within any one county* evasion and corruption should have been more widespread in some areas than in others. This implies that, while absolute figures should be treated with caution, the effect of evasion on the *relative* distribution of hearths will be of far less importance. The second point is that it was easier to hide a hearth than a house. Consequently it seems plausible to argue that the number of householders in a township provides a better basis for a comparative index than does the number of actual hearths.

The general objection to the tax by the populace was partly because it was a tax on all people, rich and poor, levied at a single rate. This, though, endows it with distinct advantages as a source for the study of seventeenth century England, because it implies that after the revising Acts of 1663 and 1664, *theoretically* all of the properties in an area should have been mentioned. Unlike, for example, the Tudor Subsidies or the Subsidies during the reigns of the first two Stuarts, which only recorded a small number of the wealthier householders as taxpayers in each township, the Hearth Tax provides a more thorough coverage of householders at most levels of society. It is one of the few taxes of this era that records the poorer elements of society, through their being noted specifically as exempt, and we therefore have a source that should provide some numerical information on the poor.

Russell has argued that the assessments of the Sheriffs' time were likely to have been the most accurate since the local officials who undertook them knew the people and the houses.²⁸ In terms of evasion, this does not accord with the available data. The revising Act of 1663, by requiring the statement of chargeable and not-chargeable hearths, is likely to have led to greater accuracy than previously, and the second revising Act of 1664, when the King's Receivers were given control of the tax saw a further tightening up of the administration. It is also possible to argue that because the local officials knew the people they would in some cases have been much more likely to treat their friends in the community leniently, or even to accept bribes, especially when the official financial rewards for their task were relatively low.

While it therefore seems that evasion probably became less common after Lady Day 1664 we have few ways of actually identifying its precise extent in the tax assessments. Evasion of the actual payments of the tax can though be measured by the painstaking comparison of accounts, arrears and assessment where all three types of evidence survive.

Exemptions

While following the revising Act of 1663 both chargeable and exempt hearths should have been recorded, a cursory glance at many Hearth Tax assessments indicates that in a large number of townships no not-chargeable hearths or households were recorded. This presents a considerable problem, since in cases where no exempt hearths and households are noted it is uncertain as to whether there were indeed no such hearths and households, or whether they were simply ignored, or even deliberately omitted. Indeed, even where some not-chargeable hearths are mentioned in a township it is never certain that all such hearths were actually recorded. In some cases separate categories of exemptions are also specified, with the Essex Hearth Tax of 1671 for example naming *householders* who were explicitly exempt but only *enumerating paupers* in receipt of Poor Law money.²⁹ Nevertheless, if only the chargeable hearths and households are used as a basis for relative comparisons, some idea of regional distributions of wealth can be obtained. There are still, though, fundamental problems of interpretation, since such an argument is only valid if the ratio of chargeable to exempt hearths remained constant over the area of study. Clearly in some townships the significance of exempt households will in practice have been far higher than in others. Thus, for Derbyshire, Edwards has noted that in the lead mining villages, such as Eyam, Great Hucklow, Little Hucklow and Stoney Middleton, the not-chargeable entries far outnumbered the chargeable entries, in contrast to the situation that then prevailed in most of the rest of the county.³⁰ While at the county scale it is difficult to identify areas where the exempt population has been omitted from the Hearth Tax, there would appear to be four main ways of assessing whether the not-chargeable sector of the population was assessed at the local scale. These are through a comparison with Hearth Tax records for the area from other dates; by a comparison with the numbers of people recorded within the Compton Census; from the detailed reconstruction of the population using parish registers; and through the collection of miscellaneous data, such as land transactions, concerning the heads of household within the township.

Interpretation

In the long run, while it must be admitted that the Hearth Taxes are subject to inaccuracies in terms of direct evasion, uncertainty over individuals and hearths that were exempt, corruption and incompleteness, they do provide some indication of patterns of wealth in the late seventeenth century, at a time when little other evidence is available, and they therefore deserve investigation, with full cognizance of their problems being explicitly acknowledged.

Fundamentally, the Hearth Taxes record the number of taxpayers in a township together with the number of hearths. In the past attempts have been made to use the Hearth Taxes to provide estimates of population numbers in England at the end of the seventeenth century.³¹ The problems with the source that

have been summarised so far suggest that such attempts to derive a global, absolute, population figure are likely to be highly inaccurate. In addition to the question of the average population per household at this time, debate over the use of the Hearth Taxes for the derivation of population figures revolves around whether the number of hearths or the number of households is the better base figure to use. Russell in his study of the Isle of Wight, has thus recently argued that "the distribution of hearths rather than households has been taken as the surer guide to total population figures, on the general assumption that the greater the number of hearths in a householder's possession the larger his household".³² While this argument may be valid for very large households with numerous chimneys and many servants, there is no good evidence to suggest that a house with three hearths necessarily had a higher population than did a house with one or two hearths.

The precise relationship between the number of hearths and the wealth of a household, or at a larger scale of a township, is also a vexed problem. While it is probable that wealthier people lived in houses with more hearths than did poor people, and thus that the number of hearths can probably be used as a general indicator of wealth, it is by no means easy to equate this measure with other measures of taxable wealth, such as the movable wealth assessed in 1334. In this context Stanley has been sceptical of attempts to compare distributions of wealth in England in 1086, 1334 and 1524-25, based on different measures of wealth.³³ This is not the place to enter this specific debate, but while it is obvious that a ranking of townships based on one measure of wealth will be unlikely to be identical to one based on another measure, it is indeed worthwhile to make the comparison to see what new questions are provoked by the similarities or contrasts revealed.³⁴

Having provided a general account of the background of the Hearth Taxes, and some of the problems of interpretation to which they give rise, three examples of the ways in which they have been used to illustrate differences in population and wealth over space will now be cited. The utility of the taxes will then be evaluated in more precise terms with reference to one specific county. Of the four uses for the Hearth Taxes outlined in the Introduction, attention will focus primarily on the information that they provide on the distribution of wealth and social structure. No attention will be paid to their use by genealogists concerning the information found in the Hearth Taxes relating to personal names at the end of the seventeenth century.

Spatial interpretations of the Hearth Taxes

Few studies of the Hearth Taxes have tried to come to grips with the difficulties involved in the spatial representation of the data. Two of the more recent county transcripts, those of Derbyshire by Edwards and of the Isle of Wight by Russell, have though been concerned with cartographic representations of their

findings.³⁵ In an earlier study of a smaller area Meiron-Jones has also analysed the Hearth Tax in a spatial context.³⁶ These three studies therefore warrant some consideration.

The Derbyshire Hearth Taxes

In his comprehensive analysis of the Derbyshire assessments over the years 1662-1670 Edwards emphasises that "it is risky to estimate population from records such as the hearth-tax assessments, and if we do so, we should beware of quoting a figure with too much appearance of exactness".³⁷ He, nevertheless, then proceeds to suggest that a multiplier of 4.25 is most appropriate for seventeenth century households. In representing the information spatially he argues that "without needing to convert such figures into population estimates, we can calculate for each place a population density - or rather its reciprocal in acres per household. The results can then be plotted on a map such as that showing the parishes and chapelries of the county around 1800".³⁸ This statement that the index 'acres per household' is equivalent to population density involves the implicit assumption that households were of a uniform size throughout the county; this, as will be shown for Nottinghamshire, is not necessarily valid. In illustrating the data he uses a map of parish boundaries *circa* 1800, making allowances for cases where outlying parts of one parish may have been situated in a different parish. This then forms the basis for a choropleth map of acres per household. The main problem with this approach is that it is extremely difficult to obtain an accurate impression of constabewick boundaries at the end of the seventeenth century, and that there will, therefore, be a certain amount of error within the density figures. He suggests, however, that "though these assumptions may not all be correct they are justifiable as long as we are interested merely in a general picture of the county".³⁹

He then continues by analysing the social status of different elements of the population at this period using Fieldhouse's classification noted below:⁴⁰

<u>"No of hearths</u>	<u>Social status of occupier</u>
1	Husbandmen and the poorer sort
2-3	Most craftsmen, tradesmen yeomen
4-7	Wealthier ditto and merchants
8+	Gentry and nobility"

As Edwards admits "this can only be a very rough guide, since (for instance) many lesser gentry are to be found in houses with fewer than eight hearths".⁴¹ It is, though, clearly an extremely arbitrary classification, and it is doubtful whether it should even be treated as a rough guide. In different regions of the country people of a similar social status may well have lived in houses of different size and stature.

Despite its problems Edwards' study is useful in that it emphasises two other important caveats. Firstly, he notes that "close examination of the hearth-tax lists shows that there are cases in which individual houses expected to be entered for a particular place appear in the lists under a neighbouring place",⁴² and secondly, that "there are a number of people who almost certainly appear in the assessments under more than one place".⁴³ These two observations clearly further complicate the spatial representation of the data.

The Isle of Wight

In a slightly earlier study of the Isle of Wight Russell has resolved problems similar to those of Edwards in a different fashion. His main concern was again to provide a transcription of the names of people mentioned in the Hearth Tax. He emphasises that "the Hearth Tax records form an invaluable guide to the names of people within a given locality, forming directories whose coverage was never again reached until the census returns of 1841".⁴⁴ In this context he seems, therefore, to ignore the probably greater significance of parish registers for providing a record of the population of an area at this date. The Hearth Taxes only provide a list of heads of households; they do not cover the whole population.

In illustrating the spatial distribution of hearths, which he uses as a surrogate for population on the basis that hearths are likely to form a more accurate index than households for total population, he does observe that the exact boundaries of tithings at this time are unknown. Consequently he uses proportional symbols located in the centres of each tithing to represent hearths per square mile. While the use of proportional symbols to represent *absolute* numbers of hearths might be an acceptable way of resolving this problem, their use for measures of *density* is misleading and misguided.

North-east Hampshire

Having examined briefly two methods of illustrating the information contained within the Hearth Taxes over a wide area, it is now pertinent to summarise the one substantive example of their use by a geographer at a more detailed scale. In his study of thirteen parishes in the north-east of Hampshire, Meirion-Jones uses the evidence of the Hearth Taxes in association with a study of vernacular architecture to reconstruct and interpret the settlements therein.⁴⁵ He argues that the Hearth Tax Returns are "reasonably accurate and may consequently be used to assess the amount and distribution of settlement".⁴⁶ Within each tithing he has evaluated the number of dwellings with one hearth, two hearths, three hearths, four hearths, and more than four hearths, and then with a different symbol for each of these five categories, subdivided by those that were chargeable and those that were not chargeable, he has plotted the symbols approximately in the centre of each tithing. While this is a useful way of illustrating the structure of each settlement *in general terms*,

it can only be undertaken at this scale of about a dozen parishes, because otherwise the symbols would become too small to be easily differentiated. In addition the schematic use of symbols gives no indication of the real distribution of dwellings within the townships; this is a subject for which Hearth Taxes provide no information.

Meirion-Jones' study does, though, reinforce arguments suggesting that the Hearth Taxes when used in association with other evidence, such as old maps and the architectural record, can provide a broad reconstruction of the settlement structure of late-seventeenth century England. Having surveyed previous attempts to illustrate spatially the evidence of the Hearth Tax it is now possible to look in more detail at the evidence of the single county of Nottinghamshire.

THE NOTTINGHAMSHIRE HEARTH TAXES

The surviving records of the Hearth Tax for Nottinghamshire are most complete for the assessments for Lady Day 1664 and for Lady Day 1674.⁴⁷ While the Lady Day 1674 records provide an almost entire coverage of the county, those of 1664 are damaged and survive legibly for only two-thirds of the townships.⁴⁸ Both assessments provide figures for chargeable taxpayers and hearths, and not-chargeable householders and hearths, and in addition those of 1674 include notes relating to 'unpaid' and 'empty' entries. These additional notes in the 1674 assessment provide considerable complications, because the 'total' number of hearths specifically stated for a township in the documents is sometimes different from the summation of individual numbers of hearths within that township. In several instances the document 'total' would appear to be the total entries for a township without the empty or unpaid hearths being included. This, though, is by no means always the case, since equally frequently the document 'total' clearly includes the empty hearths, and sometimes the totals differ even when there are no empty or unpaid entries. In practice a pragmatic choice has to be made in deciding which total to use for further analysis, and the method used in the present study has been to sum all of the stated numbers of households and hearths in a given township and then to use that total, rather than the document 'total', in subsequent analyses.

Evidence at the scale of the township

This paper is mainly concerned with the information shown by the Hearth Taxes at the scale of the county, and to what extent it can be used at a national scale, but three important points should be made at this stage about the nature of the evidence of the Hearth Taxes within individual townships. The first is that in some cases the same personal name is recorded as being the

taxpayer for hearths in several neighbouring townships. It is possible that these instances refer to separate people with the same name, but it is also possible that this situation reflects instances where the property owner, rather than the tenant, is recorded as being responsible for the payment of the tax. This would concur with the change in legislation resulting from the second revising Act of 1664 when landlords became responsible for payment of the tax on properties leased to those too poor to pay. Consequently it should not automatically be assumed that the names recorded in the Hearth Tax necessarily refer to the inhabitants of the properties as stated.

Secondly, there is a problem over the nature of the properties recorded as being 'empty'. It seems likely that these properties did indeed have no people living in them. However, if this is so, then global totals of entries taking no cognizance of those noted, perhaps haphazardly, as 'empty', will inflate any population estimates based on the Hearth Tax; 83 townships in Nottinghamshire had at least one entry recorded as 'empty' in the 1674 Hearth Tax. The difficulty here is that we have no method of evaluating the conscientiousness of those people recording properties as 'empty'. It is indeed possible that many empty houses were not recorded as such, and it is also uncertain as to whether the term 'empty' itself meant that the properties were temporarily devoid of inhabitants, or were permanently so.

The third point to note is that, over the ten year period 1664-1674, there was not unexpectedly some degree of change in the lists of taxpayers and the numbers of hearths recorded for each township. In addition the territorial units used for the purpose of taxation also sometimes changed. To assess the changes in names and hearths recorded between 1664 and 1674 the taxation units for which complete records survive for the same units in both years in the hundred of Newark were studied. This sample represents 21.6% of the 74 taxation units for which records survive mentioning chargeable and not-chargeable hearths and households in both 1664 and 1674. Table 1 summarises the findings of this investigation. Five main problems of interpretation, though, are encountered in such a comparison between the Hearth Tax records of two years. Firstly, the same person's name may be spelt differently in the two records. Secondly, in one document there may be a Christian name and in the other a title, such as Mr. or Widow, when the same person is mentioned. Thirdly, there is a problem when the same name occurs more than once in one year's assessment, especially when the numbers of hearths are different and the name only occurs once in the documentation for the other year. Fourthly, there are occasionally mentions of buildings, such as 'The Parsonage', rather than the names of taxed individuals, and fifthly there are sometimes mentions of categories of people, such as 'two poore widowes', which omit any mention of individual names. Despite these difficulties, Table 1 does illustrate several points of importance. The most significant finding of the analysis is that, although the numbers of actual chargeable households recorded changed very little over

Table 1. Changes in names of householders in Hearth Tax between 1664 and 1674 in Newark Hundred

	BESTHORPE	CLIFTON, NORTH	CLIFTON, SOUTH	COLLINGHAM, NORTH	COLLINGHAM, SOUTH	COTHAM	FARDON	GIRTON	HARBY	HAWTON	SCARLE, SOUTH	SIBTHORPE	SPALDFORTH	STOKE, EAST	THORPE	WINTHORPE	Totals	Means	Standard devs.
No. of chargeable and not-chargeable households in 1664	28	38	36	112	95	19	81	36	32	23	46	20	23	74	10	61	734		
Names and numbers of hearths the same in 1664 and 1674	7	4	9	23	27	6	13	11	10	7	11	8	9	15	1	9	170		
Names the same but hearths increased 1664 to 1674	2	5	0	9	2	2	15	3	0	0	4	3	1	8	2	7	63		
Names the same but hearths decreased 1664 to 1674	0	0	0	0	1	0	1	0	1	0	0	0	0	2	0	1	6		
1664 names present in 1674 as % of total no. of 1664 names	32.1	23.7	25.0	31.2	31.6	42.1	35.8	38.9	34.4	30.4	32.6	55.0	43.5	33.8	33.3	25.8		34.3	7.5
New names in 1674 as % of total 1674 names	66.7	66.7	70.0	50.7	57.7	52.9	52.5	57.6	68.6	53.3	53.1	38.9	54.5	53.7	72.7	58.5		58.0	8.6
Identical entries in 1664 and 1674 as % of 1664 entries	25.0	10.5	25.0	18.7	27.4	21.0	13.6	25.0	28.1	17.4	21.7	35.0	30.4	17.6	10.0	11.5		21.1	7.2
Identical entries in 1664 and 1674 as % of 1674 entries	25.9	14.8	30.0	29.6	36.6	23.5	18.0	27.3	25.7	26.7	31.2	38.9	31.8	24.1	9.1	17.1		25.6	7.6

Sources: P.R.O. E179/160/320 and E179/254/30

the ten year period, there was indeed much variation in the names of taxpayers and not-chargeable heads of household, and the numbers of hearths at which they were assessed. Thus overall the percentage of entries that was identical in both years was 21.1% of the 1664 entries and 25.7% of the 1674 entries. These low figures reflect both changes in heads of household and also changes in the numbers of hearths at which individuals were assessed. If only the names of individuals are studied, it is clear that a much higher percentage of names remained the same. Thus, 34.3% of the personal names present in 1664 were also present in 1674. This figure may, though, be a slight overestimate since it is not possible to differentiate between different people with the same name. It nevertheless does reflect a high turnover in population over a ten year period, and accords well with Peyton's arguments for considerable population mobility in Nottinghamshire during the seventeenth century.⁴⁹ There is also, though, much variation between the turnover rates of different taxation units, with the lowest percentage of names present in both 1664 and 1674 being 23.7% of 1664 names in North Clifton and the highest 55.0% at Sibthorpe. When the changes in numbers of hearths are investigated, it is very clear that it was rare for the number of assessed hearths to decrease and quite common for them to increase over the period 1664-1674. Thus columns three and four of Table 1 indicate that over six times as many people had their assessment for hearths increased over the period than had their assessment decreased. This evidence adds further support to the arguments suggesting that the assessment of chargeable hearths was probably more accurate at the later date, although it should equally be noted that the 1674 not-chargeable assessments may well have been less complete than those of 1664. This is reflected in the last two columns of Table 1, where identical entries for both years form a higher percentage of 1674 entries than they do for 1664 ones, largely because more not-chargeable households were recorded in 1664 than in 1674.

The County Record

In looking at the evidence of the Hearth Taxes for the whole of Nottinghamshire, it is clear than, although there was some considerable change in the names of heads of households *within* most townships over the period 1664-1674, the overall number of chargeable taxpayers changed remarkably little. In order to compare the 1664 information with that for 1674 at the scale of the county it is necessary in a number of cases to combine townships so that the final taxation units are compatible.⁵⁰ When this is done, and taking only the specific taxation units where chargeable taxpayers were recorded in both 1664 and 1674, the mean number of chargeable taxpayers per taxation unit rose only slightly from 36.80 (standard deviation 32.81) in 1664 to 37.97 (standard deviation 34.79) in 1674.⁵¹ The mean number of chargeable hearths per taxation unit, on the other hand, rose more appreciably from 60.67 (standard deviation 74.37) in 1664 to 81.92 (standard deviation 99.74) in 1674.⁵² This suggests either that over the ten year period there was an increase in wealth and hearth building of somewhere in the region of 33%, or that, while the number

of taxpayers remained approximately similar, the tax assessment was more thorough and fewer hearths escaped detection at the later date. The latter of these two alternatives seems to be a more likely explanation of the observed change. While these figures only relate to a sample of the total taxed townships at each date, because they are concerned only with the townships where figures survive for both dates, the means are nevertheless very similar to those for all of the taxed townships for which information survives at each date. Thus the mean number of chargeable taxpayers per township, considering all the cases where figures survive, for 1664 is 36.06 (standard deviation 32.52) and the mean number of chargeable hearths is 59.01 (standard deviation 73.27).⁵³ For 1674 the overall mean number of chargeable taxpayers was 39.26 (standard deviation 65.89), and the mean number of chargeable hearths was 89.02 (standard deviation 209.27).⁵⁴

While there is therefore some evidence to suggest that the efficiency of assessment improved between 1664 and 1674, it is also evident that the relative distribution of hearths between townships remained remarkably constant between the two dates. Rank correlation coefficients can be used to investigate more precisely how this relative distribution changed through time. One difficulty, though, in using Spearman's rank correlation (r_s) is that with this data set there are a number of tied ranks.⁵⁵ This problem can be circumvented to some extent by calculating the maximum and minimum possible values of r_s in the following manner. A maximum value of r_s will be found when, where there are tied ranks in 1664 and the overall ranking is in descending order of magnitude, the tied ranks are then internally ranked in descending order based on their values in 1674. This can then be compared with the 1674 data sorted, where tied, in descending order based on the 1664 data. Conversely, a minimum value for r_s can be found by internally ranking 1664 tied ranks on the basis of ascending order of magnitude in 1674, and the 1674 tied ranks on the basis of ascending 1664 data. If this procedure is undertaken then the correlation coefficient, r_s , for chargeable taxpayers in 1664 and 1674 lies between 0.972 and 0.958, and for chargeable hearths r_s lies between 0.937 and 0.926, implying that the rankings are broadly similar. In general, therefore, this evidence indicates that, though the numbers of chargeable taxpayers increased marginally and the numbers of chargeable hearths increased appreciably between 1664 and 1674, the overall relative distribution of these two variables remained relatively stable between the two dates; taxation units which had most taxpayers and hearths in 1664 continued so to do in 1674.

Since the 1674 data set is spatially more complete, and from the above analysis is also likely to be more accurate in terms of chargeable hearths assessed, it has been used in preference to the 1664 data as the basis for the remainder of this study. Nevertheless, the findings of the above two paragraphs are crucial for an understanding of the use of the Hearth Taxes in the analysis of the spatial distribution of wealth throughout England in the seventeenth century. If it is true that elsewhere

in England, as in Nottinghamshire, the number of chargeable taxpayers changed only slightly between the 1660s and the 1670s, then it would be possible to argue that, where the Hearth Tax survives for different dates in different counties, these distributions can in fact be compared on the basis of chargeable taxpayers. To justify this conclusion, though, more research must be undertaken on how the number of taxpayers did actually vary through the 1660s and 1670s in other parts of England. What seems clear at this stage is that at a national scale chargeable taxpayers will provide a more reliable index upon which to base any regional comparisons than will the much more variable chargeable hearths.

In turning more specifically now to the distribution of taxable 'wealth' as recorded in the 1674 Hearth Tax, it is necessary to evaluate which variables are likely to provide the firmest basis for a comparison between townships within Nottinghamshire. The Hearth Tax essentially provides four variables for investigation: chargeable taxpayers, chargeable hearths, not-chargeable householders and not-chargeable hearths. The main difficulty with this data is that not-chargeable information is recorded for only 65% of the taxation units within Nottinghamshire for which chargeable information is given. In some hundreds, notably Rushcliffe, Bingham and the North Clay division of Bassetlaw, not-chargeable hearths are recorded for most townships, but in others, particularly Broxtow, Thurgarton and Leigh, and to some extent Newark, these are frequently absent. If the absence of not-chargeable hearths reflected a situation where there were indeed no people exempt from taxation due to poverty, it might be expected that this was a reflection of regional prosperity and that therefore townships with no not-chargeable hearths should be situated in the same general area as those with very few recorded not-chargeable hearths. This is not the case, and the observation that the presence or absence of not-chargeable hearths seems partly to depend on the hundred, and thus the unit of local administration in which the township lay, would suggest that the failure to mention not-chargeable hearths reflects a failure to record such hearths rather than their real absence in 1674. On this basis it seems more logical to use chargeable hearths and the number of chargeable taxpayers to compare different townships, rather than a combination of chargeable and not-chargeable figures. Providing not-chargeable hearths and households were distributed relatively uniformly over the county, and varied little as a percentage of the total hearths or taxpayers in different townships, then the use of only the chargeable figures should not greatly disturb the overall relative spatial pattern. As mentioned on page 13 there are, however, fundamental problems involved in refuting or supporting this assumption.

One way of assessing the significance of the problem is to investigate how the not-chargeable figures vary in relation to the total figures for townships where both chargeable and not-chargeable figures are recorded. If this is done for 1674, it is found that the mean percentage of taxpayers who were chargeable in townships throughout the county was 77.65%. The not-chargeable

householders therefore accounted for 22.35% of all those named in these townships. On average, though, 86.73% of hearths in these townships were chargeable. The observation that a lower percentage of hearths than households was not-chargeable is because the mean number of hearths per chargeable household was higher than that for the not-chargeable household. Following the 1664 Act it should be noted that no house with more than two chimneys was to be exempt from payment.⁵⁶ In addition the standard deviations for the percentages of households and hearths that were chargeable, at 11.2% and 7.8% respectively, are very low, implying that there was not a great amount of variation between townships in the relative proportion of chargeable to not-chargeable hearths and households.

Few generalisations can be made concerning the spatial variation of the percentage of households or hearths that were chargeable. Both distributions, for households and hearths, are very similar, and for this reason Figure 2 illustrates only the percentage of householders who were chargeable in taxation units which recorded both chargeable and not-chargeable households. For most hundreds there appears to be a relatively scattered distribution of proportions of taxpayers above and below the mean, but in Broxtow hundred, in the west of the county, in all of the taxation units which recorded both chargeable and not-chargeable householders the percentage who were chargeable was above the mean value (77.65%) for the county as a whole. This evidence is difficult to interpret, because it could suggest that in the west of the county there were indeed fewer exempt householders in 1674 than there were elsewhere in the county. The observation that Broxtow hundred also had many taxation units which did not record not-chargeable householders might then suggest that the absence of exempt householders in the assessments did in fact reflect their absence in reality. On the other hand, these figures for the percentage of householders who were chargeable may themselves be spurious, reflecting the possibility that in Broxtow hundred, even where some exempt householders and hearths were recorded, the assessors did not bother to record them all. In this context it is perhaps significant that several taxation units in neighbouring hundreds adjoining those in Broxtow hundred record figures well below the mean, suggesting that the hundred boundary, and thus the practice of the assessors, was indeed significant in determining the number of not-chargeable households and hearths recorded. For the moment this problem must be left unresolved, but the significant point to be noted is that at least throughout Nottinghamshire the proportion of chargeable to not-chargeable householders was relatively constant, as reflected by the low standard deviations noted above.

The relative distribution of hearths, and by analogy wealth, represented in the 1674 Hearth Tax can be illustrated in two ways, both aspatially and spatially. Looking first at the aspatial relationships Figure 3 displays the rank-size distributions of the four variables, total households, chargeable taxpayers, total hearths, and chargeable hearths.

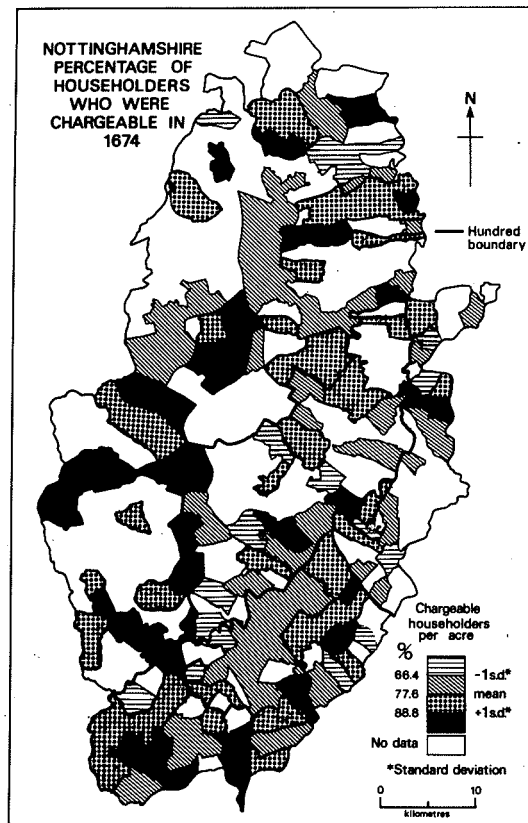


Figure 2

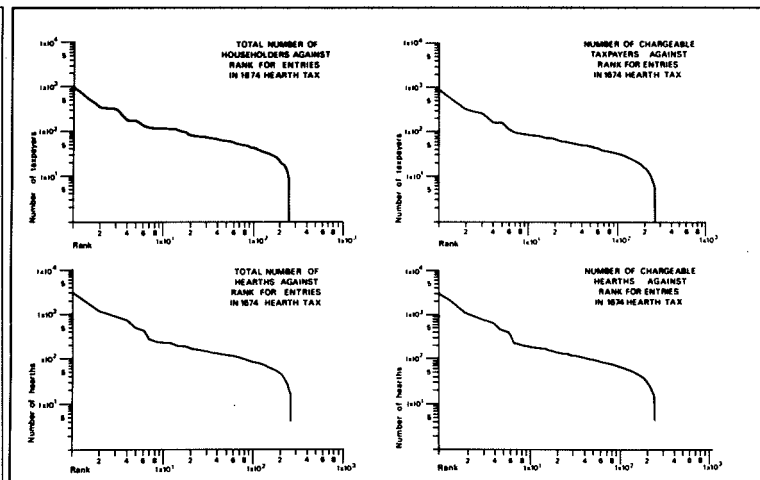


Figure 3

Each graph plots a measure of the 'size' of a taxation unit, in terms either of householders/taxpayers or hearths, against the rank order of that taxation unit on double-logarithmic paper. The first observation to be made concerning these distributions is that they are all very similar. This again supports the argument that even if only the chargeable figures are studied they do probably represent a similar pattern to that which would be obtained if it were possible to have figures for all of the not-chargeable hearths and households. Rank correlation coefficients comparing the rank order of taxation units in 1674 sorted by chargeable hearths and chargeable taxpayers again confirm the close similarity between these two distributions. Thus the maximum r_s is 0.946 and the minimum is 0.930, suggesting that there is little difference between the rank orders of taxation units based on chargeable hearths and chargeable taxpayers.

Secondly, all of the graphs indicate a break after the first six taxation units. The remainder of the smaller taxation units follow a generally uniform curve, which has been noted elsewhere as being characteristic of all taxation assessments of Nottinghamshire between the eleventh and eighteenth centuries, and possibly of all rural settlement patterns.⁵⁷ This curve indicates that the modal class of hearths and taxpayers is not the class with the lowest values therein. The important feature of these distributions, though, is that they suggest that the six taxation units with the highest values, namely Nottingham, Newark, Mansfield, Worksop, Southwell and East Retford, formed a distinct part of the settlement structure. Nottingham, Newark and East Retford were the three boroughs in the county, and Mansfield, Worksop and Southwell were the three other emerging towns in this period. This break in the graph can therefore be interpreted as distinguishing between the urban and rural settlement patterns. In the 1334 Lay Subsidy only Nottingham and Newark stood out as being clearly distinct from the remaining rural settlements,⁵⁸ and the change by the seventeenth century almost certainly indicates a real increase in the number of settlements in the county which could be called urban.

In attempting to illustrate the information spatially a number of difficulties are immediately encountered. Firstly, in seventeenth century Nottinghamshire, houses in the taxation units were not distributed uniformly throughout the area, but were generally, although not always, located in nucleated settlements⁵⁹. Secondly, it is often difficult to identify exactly where the seventeenth century taxation unit boundaries lay. These two factors would suggest that maps using proportional symbols would best illustrate the required information. However, other problems complicate the issue. Thus a number of taxation units did indeed consist of more than one township and more than one distinct settlement. This means that if proportional symbols were used in these instances they would not in fact each represent a specific settlement, and that perhaps the use of choropleth maps could therefore be a better method of representing the data. In looking at the use of choropleth maps it is possible to use tithe, enclosure and estate maps to provide a set of boundaries

for most of the county towards the end of the seventeenth century.⁶⁰ In cases where boundaries are uncertain it is then possible to combine taxation units so that they lie within a set of known boundaries. Nevertheless, the use of choropleth maps will tend to reduce the apparent significance of a populous nucleated settlement located in a large taxation unit. In an attempt to evaluate these two methods of illustrating the data, both proportional circle and choropleth maps have been constructed. In cases where more than one settlement is located within a taxation unit, and proportional circles are used, then the circle is located at the centroid of the polygon formed by treating each named settlement as a corner of that polygon.⁶¹

For the purposes of comparison, choropleth and proportional circle maps were constructed for the following four variables: chargeable hearths, total hearths, chargeable taxpayers, and total households. This illustrated that all of the choropleth maps were highly similar, as were the proportional circle maps. The choropleth maps of chargeable taxpayers and chargeable hearths (Figures 4 and 5) thus both illustrate that, in general, the north-west of the county has low densities of taxpayers and hearths in contrast to higher densities in the north-east and a more mixed, or scattered, distribution in the south. Superimposed on this it is also possible to identify localised areas where taxation units surrounding an urban centre also have high densities of taxpayers and hearths. Thus Nottingham in the south-west, Southwell in the centre of the county, East Retford in the north, and to some extent Newark in the east, all act as nodes around which greater densities are found. These maps, though, only indicate chargeable taxpayers and hearths, and they can only be considered to represent the overall relative distributions of these variables if it is assumed that the not-chargeable hearths and householders were uniformly distributed throughout the county. A comparison between Figure 2, indicating the percentage of householders that were chargeable in 1674, and Figure 4, the density of chargeable taxpayers, does suggest that there was a slight tendency for areas with higher densities of chargeable taxpayers to have had a higher percentage of their householders recorded as chargeable, but this is not always the case and the lack of firm evidence concerning not-chargeable households and hearths prevents any firm conclusions being drawn on this particular matter.

The similarity between all of the proportional circle maps means that it is possible to represent them all here by the single example of that of chargeable taxpayers (Figure 6). This closely supports the findings of the previous paragraph, illustrating a relatively uniform pattern of rural taxpayers, associated with a few large urban settlements. While it is tempting to see proportional circle maps as maps of the settlement pattern this should be avoided, since some taxation units included more than one settlement.⁶² Nevertheless, Figure 6 does indicate an important feature that is absent from the density choropleth maps. This is that, despite some difficulties over the aggregation of units, settlements such as Mansfield, Warsop and Worksop,

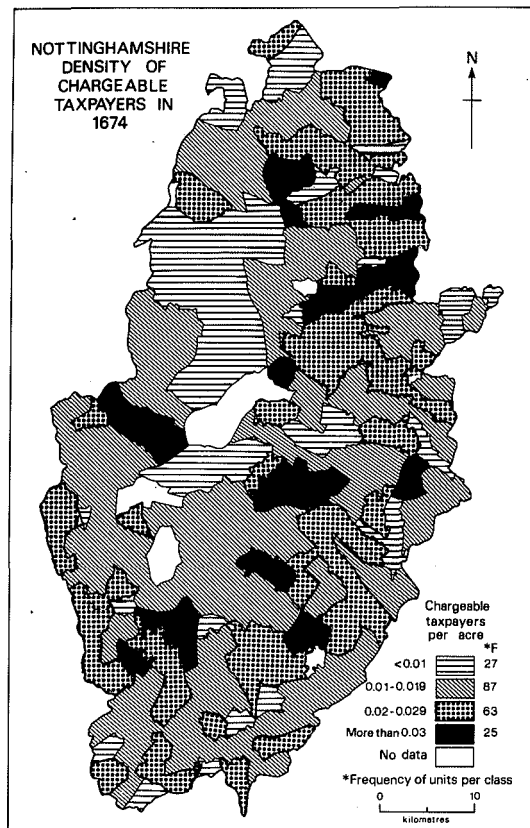


Figure 4

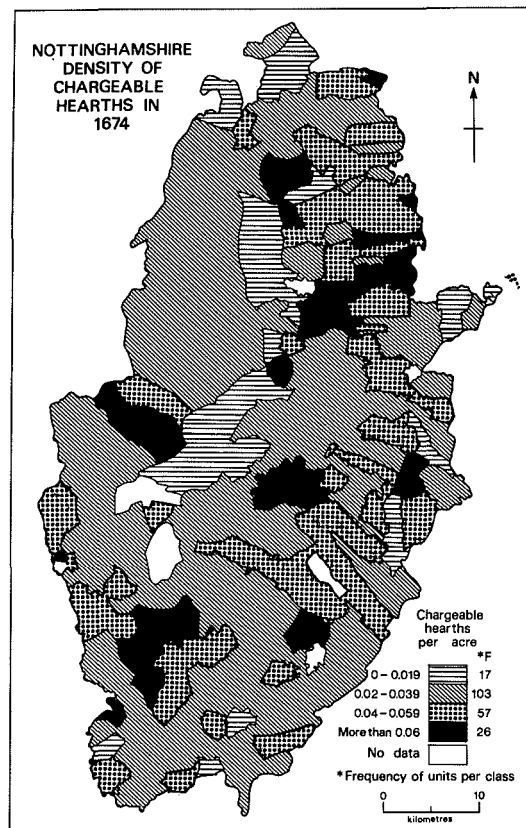


Figure 5

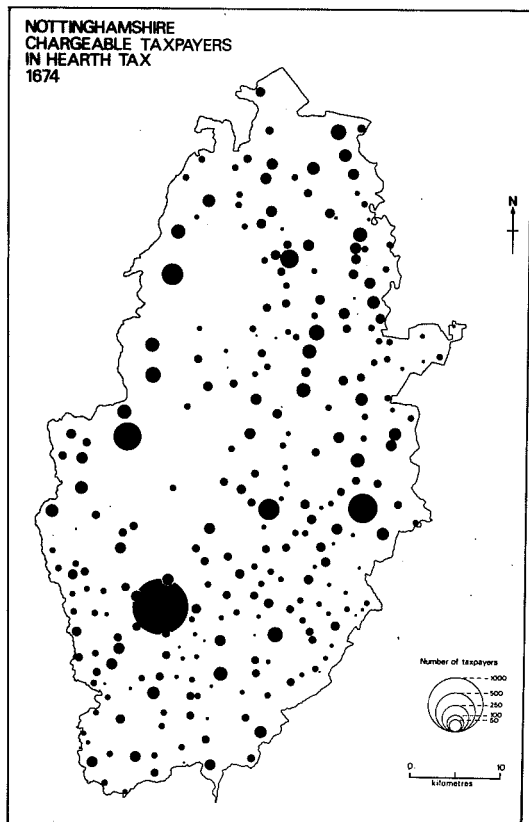


Figure 6

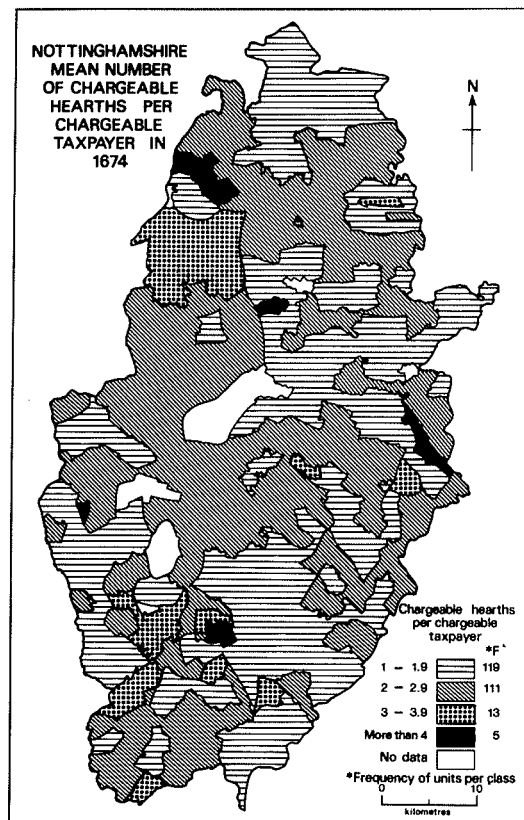


Figure 7

in the north-west of the county did indeed have many hearths and taxpayers. Other contemporary cartographic evidence supports this, indicating that, although there were several scattered farmsteads in these townships during the late seventeenth century the actual settlements of Worksop, Mansfield and Warsop were indeed substantial.⁶³ The presence of a large number of taxpayers in a few locations in the north-west of the county is not noted in the choropleth maps, because the taxation units in this region were large and densities were correspondingly low.

Having identified the general pattern of the distribution of taxpayers and hearths in the county it is now possible to use the Hearth Tax to investigate it in more detail. If hearths are used as a surrogate of wealth, the mean number of hearths per taxpayer in each taxation unit can provide one means by which the average wealth per family can be compared in different parts of the county. The lack of information relating to not-chargeable hearths means that only the chargeable figures can be analysed, but a comparison between the density of chargeable hearths per unit area (Figure 5) and the mean number of chargeable hearths per chargeable taxpayer (Figure 7) indicates that parts of the county with high densities of hearths, such as the north-east, did not necessarily have more wealthy taxpayers, that is to say chargeable taxpayers with large numbers of hearths. In the county as a whole the mean number of chargeable hearths per chargeable taxpayer was 2.32 hearths, but there was much spatial variation, with four main areas of low mean values of chargeable hearths per chargeable taxpayer. These were found in the north, the centre east, the south-east and the west of the county (Figure 7), suggesting that in contrast to other parts of the county these were areas where taxpayers probably lived in less elaborate houses and were therefore likely to be poorer. Figure 7 also illustrates that the three boroughs of Nottingham, Newark and East Retford were among a relatively small number of taxation units with numbers of hearths per taxpayer well above the mean.

The map of the standard deviation of chargeable hearths per chargeable taxpayer (Figure 8) adds a further dimension to our understanding of some of the spatial aspects of social structure in seventeenth century Nottinghamshire. A low standard deviation in a taxation unit represents a situation where all of the taxpayers had a similar number, either large or low, of hearths; a high standard deviation illustrates areas of high contrast within taxation units in terms of the number of hearths per taxpayer. Thus areas of uniform social structure will have low standard deviations, and areas of diverse structure will have high standard deviations. It should be emphasised that this analysis is only concerned with chargeable entries and that it therefore ignores the poorest, exempt, stratum of society. Nevertheless, the earlier analyses, which indicated that, in general, there was little variation in the proportion of householders and hearths that were chargeable (Figure 2), suggests that any conclusions based on chargeable figures will be representative of a past reality. In any case divergence, or lack of

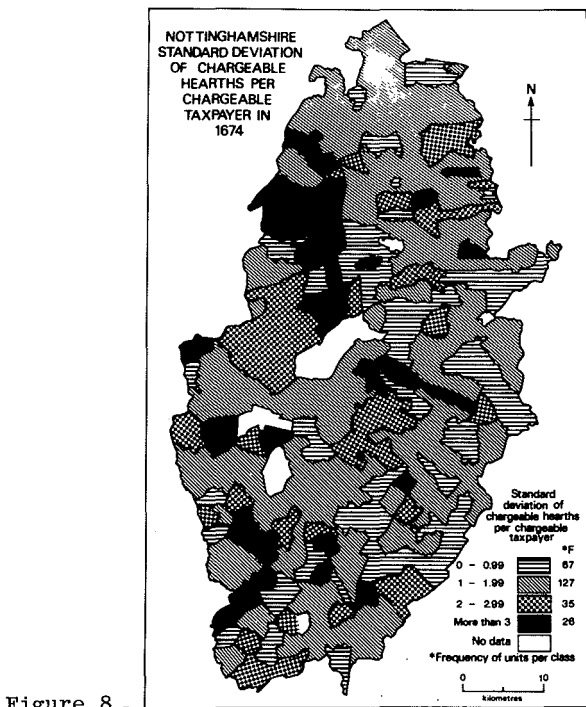


Figure 8 -

it, in the figures for chargeable hearths per taxpayer will still provide an indication of social differentiation, regardless of further possible differentiation at the lowest social levels. Figure 8 is difficult to interpret, but in overall terms it suggests that the east of the county was more uniform in social composition than was the west. In particular the north-west of the county seems to have been an area of high social diversity. This was precisely the area where, as at Thoresby, Worksop, Clumber and Papplewick, large mansions had been built and where, consequently, there was a small number of very wealthy families and a large number of poor. Interestingly, both Nottingham and Newark also stand out as taxation units with greater than average social diversity. The majority of the other, rural, townships with high social diversity represent scattered situations where one large house dominated the physical and social landscape, as at Wollaton, Holme Pierrepont and Grove.

This section has illustrated that much information can be gleaned from the Hearth Taxes concerning both the overall distribution of wealth in the county, and also, to some extent, the social distribution of that wealth. The following section will compare this information with that found in the Compton Census.

THE COMPTON CENSUS AND ESTIMATES OF POPULATION

So far no attempt has been made in this paper to equate taxpayers and householders with population, yet there was clearly some connection between the number of taxpayers in a township and its population.⁶⁴ There are two critical problems, though, with such an equation. Firstly, the previous section has illustrated that there was great social diversity in some parts of the county, and since it seems likely that different levels of society were able to maintain different sized families, no single multiplier would necessarily be appropriate to convert 'households' to 'population'. Secondly, the lack of information on exempt taxpayers means that where they formed an important element in the population, and for any reason failed to be recorded, serious distortions will emerge in any broad calculation of population levels.

In this context the Compton Census of 1676 provides an independent indication of population levels in the county. It too is open to criticisms as a source, primarily due to the observation that many entries within it are evidently rounded approximations, but if the overall patterns of density of occupancy of the countryside that it reveals are similar to those of the Hearth Taxes then this provides added confirmation that they each indeed approximated some past reality.

The ecclesiastical census of England made in 1676 by Henry Compton, the Lord Bishop of London, asked the incumbent of each parish to provide responses to three questions: the number of persons within his parish, the number of such persons that were "popish recusants" or suspected so to be, and the number of other dissenters therein.⁶⁵ The first category of information is normally considered to refer implicitly to those of age to receive Communion, and although at the beginning of the seventeenth century it is uncertain whether this age was 14 or 16, ⁶⁶ by 1676 it referred specifically to those above the age of 16. While this source can therefore be used to give an indication of the relative distribution of population in the county in 1676, any absolute figures can only be derived by making assumptions concerning the proportion of the population that was under 16 at this time. There have been various estimates of the percentage of the population in this category, with Smith suggesting that the under 16s represented between 33% and 40% of the population, the latter figure following King's work on Lichfield in 1695.⁶⁷ This difference therefore presents problems in attempting to evaluate total population figures, but, if it is assumed that the spatial variation of the fraction of the population under 16 varied little through the county as a whole, then the raw figures of the Compton Census can provide a useful indicator of the relative distribution of Nottinghamshire's population towards the end of the seventeenth century.

The 1676 census for Nottinghamshire provides evidence for most of the parishes in the county, although information does not survive for Stokeham, Bevercotes, East Drayton, Carlton on Trent, Langford, Rufford, Bole, Misterton, West Stockwith,

Askham and Laneham.⁶⁸ It records a total of 35,166 people over the age of 16 for the county, of which 169 were recorded as popish recusants, and 1,569 (4.5%) were other dissenters. In addition to the problems concerning the age structure of the population it is uncertain how accurate were the reports of the incumbents. If only the total number of people in the parish, assumed to be those of age to take Communion, is studied then the problems over the wishes of the incumbent to cover up dissension or to expose it are likely to be avoided. Nevertheless, there still remain difficulties over incumbents approximating the figures, especially when large numbers were involved. One way of investigating the significance of this problem is to study the frequency distribution of the last digits of the stated numbers of people in parishes. Such a study indicates that 21.6% of all final digits were '0', suggesting that there was indeed some rounding off. A χ^2 test to compare the observed frequency distribution with a uniform distribution of final digits gives a value of $\chi^2 = 41.391$, which is above the critical value of 16.919 for χ^2 with (n-1), that is 9, degrees of freedom at the 0.05 level of significance. This confirms that some approximation does indeed appear to have taken place, and the original figures indicate that this was notably so when large numbers were involved. Thus of the 44 parishes with the last digit '0', 36 had recorded 'populations' of over 100, and this rounding-off seems to have been particularly prevalent in Retford deanery in the north of the county.

While the Compton Census figures should therefore be treated with some caution, the spatial distribution of population of age to receive Communion in 1676, including dissenters and recusants, is nevertheless closely similar to that of chargeable taxpayers and hearths in the 1674 Hearth Tax. The proportional circle map of population above 16 (Figure 9) again illustrates the apparent dominance of a few large settlements, or towns, over a relatively even scatter of rural population. Two methods of illustrating the overall density by choropleth maps have been used to investigate whether the choice of categories positively influences the perceived pattern. Thus Figure 10 divides the densities below the three most densely populated units, those of Nottingham,⁶⁹ Newark and East Retford, into three groups, each covering an equal density range. This procedure gives 3 units in the densest class, 14 in the second densest, 97 in the third densest, and 77 in the least dense.⁷⁰ Figure 11 illustrates the same information by dividing it up into quartiles, with 47 units in the densest category and 48 in the remaining three categories. In both maps areas of no shading illustrate areas for which no information survives. The overall impression given by both choropleth maps is very similar, suggesting that the categories chosen to portray the information are less crucial than might be imagined. In general, the east and the south of the county are shown as being more densely occupied than the north-west and west. Figure 10 depicts the overall dominance of the three boroughs, and both maps well illustrate that there is then a very scattered distribution of other areas of relatively high density. This is particularly well shown in Figure 11,

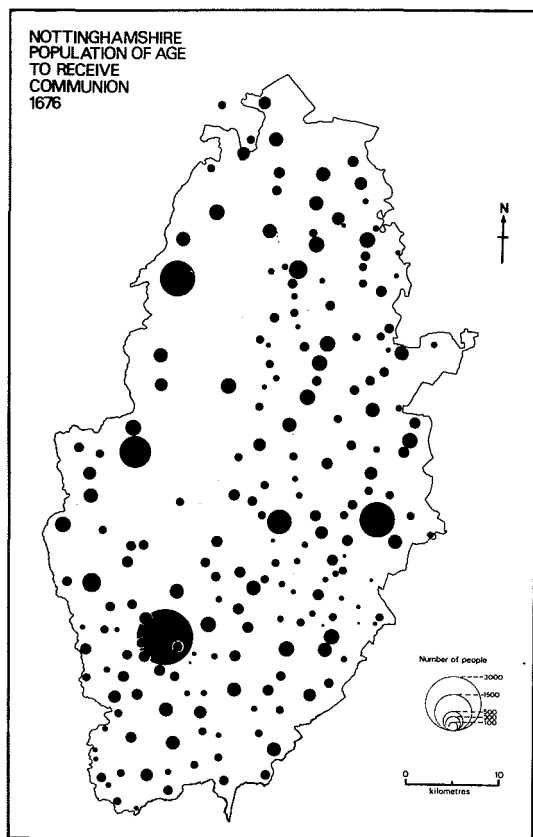


Figure 9

which indicates that throughout the county there were clusters of dense population separated by other areas of less dense population levels. As with the Hearth Tax data the main differences between the proportional circle and choropleth maps are to be found in the north-west of the county, which had a few large settlements set in taxation units or parishes with large areas, thus giving rise to low overall densities. It should be emphasised again, though, that the proportional circle map does not, by itself, tell us anything about settlement pattern. This can only be determined by detailed investigations of the cartographic record and other field evidence. Figure 12, which illustrates the aspatial rank-size distribution of parish population of age to receive Communion, confirms the overall distinction between a set of six 'urban' settlements in the upper section of the curve and the remaining 'rural' units that was visible in the Hearth Tax data (Figure 3).

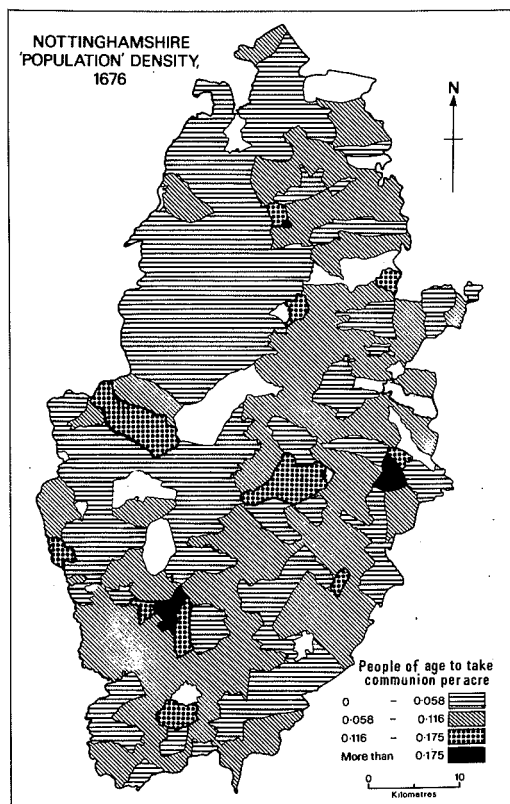


Figure 10

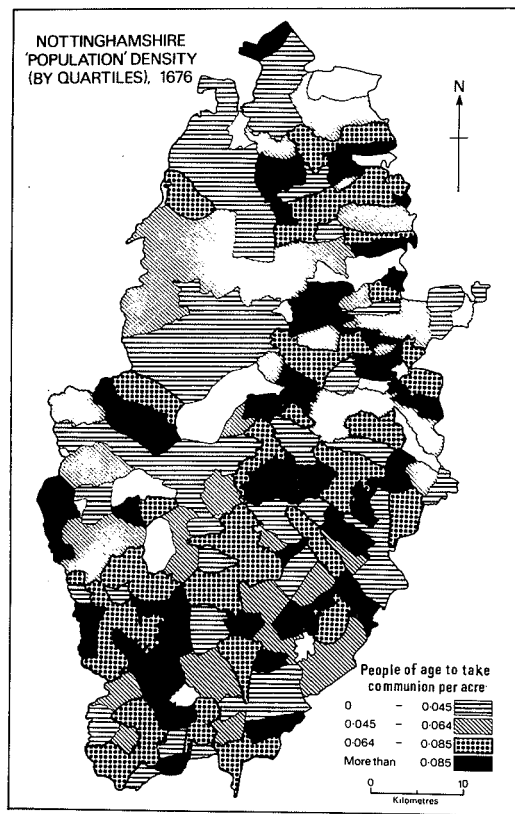


Figure 11

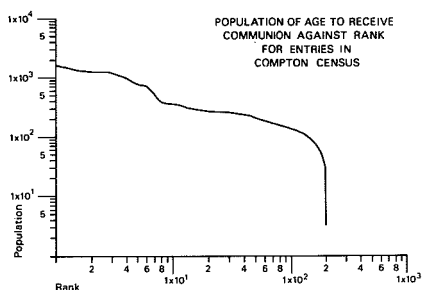


Figure 12. Nottinghamshire: population of age to receive Communion against rank for entries in the Compton Census.

THE HEARTH TAXES AND THE COMPTON CENSUS: A COMPARATIVE ASSESSMENT

In overall terms the evidence of the 1676 Compton Census, based on a totally different set of criteria, presents a closely similar pattern of land use intensity to that of the 1674 Hearth Tax. While both sets of data suffer from their own problems of interpretation, the observation that they both illustrate a similar pattern suggests that this did indeed reflect the situation in the late seventeenth century.

It is not possible, though, directly to compare the evidence of the 1676 Compton Census and the 1674 Hearth Tax, because they were based on different territorial units. The Compton Census was generally drawn up on a parish basis, whereas the Hearth Tax was assessed at the smaller township level. It is therefore necessary to combine a number of these units for purposes of comparison. Because of the lack of contiguity between many of the parishes and townships, and the lack of information in several of these units for one of these cross-sections, the 204 Compton Census units and the 269 Hearth Tax units were combined into 189 units for which information was available at both dates. This having been done it is then possible to compare the overall similarity of the two data sets using Spearman's rank correlation coefficient (r_s), again for tied ranks of one variable sorting the other in the same order and then in the inverse order to obtain maximum and minimum values for r_s . When this is done for the correlation between the 1674 chargeable taxpayers and the 1676 population of age to receive Communion, r_s ranges from 0.883 to 0.875. These values are all highly significant and confirm that the Hearth Tax and Compton Census present an essentially similar pattern of intensity of land use.⁷¹ It is interesting to note, though, that population of age to receive Communion, that is to say population over 16, appears to have been more significantly related to the number of taxpayers than it was to the number of hearths. This reflects Patten's concern over the use of multipliers for population figures based on the number of hearths in a township and confirms that the number of taxpayers is, as would be expected, a better indicator of population levels than the number of hearths.⁷²

Given the difficulties with the data noted above, any attempts to calculate population multipliers must be fraught with complications. Patten has observed that most estimates of the figure by which the number of households should be multiplied to give population figures range from between 4.2 to 4.5.⁷³ Likewise, although emphasising that the search for universal multipliers is unwise, Laslett has suggested that the mean household size for this period was around 4.75.⁷⁴ It has already been noted in this paper that household size will probably have varied with class, and that multipliers will to some extent have varied from township to township. Nevertheless, it is of interest *cautiously* to investigate what relationship there was between population and taxpayers at this date. In 1674, for taxation units with both chargeable and not-chargeable householders recorded, the mean percentage of taxpayers that were chargeable was 77.6%. Not-chargeable householders here therefore accounted for 22.4% of the total. In the county as a whole, for the various combined parish/taxation units, the mean population over the age of 16 per chargeable taxpayer was 3.67 (standard deviation 1.30 people per chargeable entry). To account for the not-chargeable householders this figure of 3.67 should therefore be reduced by 22.4%, which gives a figure of 2.85 people over the age of 16 per household. If 33% of the population was under 16, as argued by Smith,⁷⁵ the figure for total population must therefore be inflated by this amount. This procedure gives the total of 4.25 people per household in Nottinghamshire *circa* 1674-1676. If 40% of the population is assumed to be under 16, the population per household would be slightly higher at 4.75 people per household.

If the same procedure is undertaken for the total number of chargeable and not-chargeable householders in the county, adding zero to the chargeable taxpayers in townships where no not-chargeable householders were recorded, the mean population over the age of 16 per household is 3.11. With 33% of the population assumed to be under 16 this would give a total of 4.64 people per household. All of these figures coincide closely with the previous estimates of household size at this period. The difference of 0.39 people per household between the estimate of 4.25 people per household based on chargeable entries, assuming that they were a given 77.6% of total entries, and the estimate of 4.64 people per household, using all of the recorded chargeable and not-chargeable entries, does little to solve the problem as to whether all of the not-chargeable hearths were recorded or not, but the overall similarity in the order of magnitude of these figures and previous estimates of household size suggests that the majority of chargeable hearths were probably recorded, and that an assumption that they generally accounted for about 78% of all hearths is indeed valid.

There are clearly difficulties involved in attempting to analyse *absolute* figures from the Hearth Tax. Nevertheless there is, as yet, little evidence of regional variation within the county of Nottinghamshire in the accuracy of the recording of *chargeable* taxpayers. This suggests that the *relative* differences

observed between different parts of the county are probably still significant. In this context it is of interest to investigate how the pattern of 1676 population of age to receive Communion per chargeable taxpayer in 1674 varied throughout the county. Figure 13, based on categories of one standard deviation above and below the mean, indicates that there is no clear pattern in this distribution.

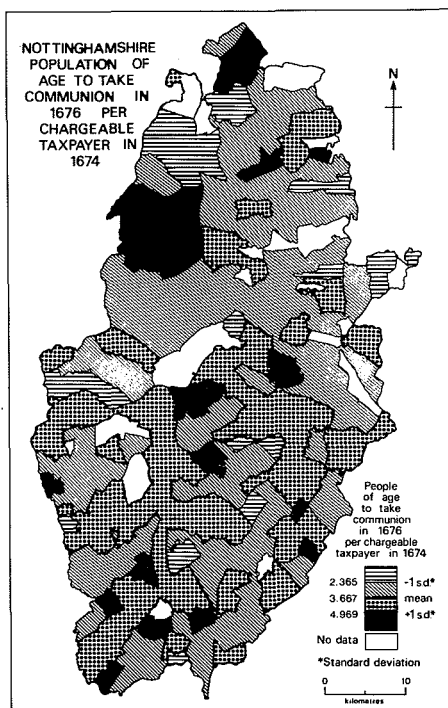


Figure 13

Three conclusions, though, seem to be particularly pertinent. Firstly the pattern suggests that there was unlikely to have been any administrative bias in the recording of either population in 1676 or taxpayers in 1674, because, if for example there had been a tendency to underestimate the number of chargeable taxpayers in one hundred or deanery, then this whole area would tend to show up as one with relatively high populations per taxpayer. This is not the case, and there is great variation in population per taxpayer within all of the hundreds and deaneries in the county. Secondly, the arguments of the previous paragraph suggest that the distribution of 1676 'population' per 1674 chargeable taxpayer may well represent real differences in

household size within the county. In general, Figure 13 suggests that the north of the county had lower household sizes than did the south. Comparison with Figure 2 indicates that this observation is not due to the possibility that the north of the county had significantly higher percentages of chargeable taxpayers than did the south. Thirdly, there is likewise little similarity between Figure 13 and Figure 7 implying that there appears to be little spatial relationship between population per chargeable taxpayer and hearths per chargeable taxpayer. In essence, Figure 13 indicates that there was great diversity in the structure of parishes in different parts of the county; one parish may have had a low mean household size, whereas a neighbouring parish may have had a large average household size.

While this is not the place to go into a detailed explanation of these observed patterns in the context of Nottinghamshire, it is nevertheless pertinent to highlight a number of important issues that they reveal.

The seventeenth century landscape of Nottinghamshire was one which was predominantly rural, and yet the six urban settlements were beginning to play an increasingly important social and economic role. This situation is best illustrated by the aspatial rank-size distributions, where an upper limb to the distribution is clearly visible. Within the rural landscape, though, densities of population, taxpayers, and hearths, which can serve as an indicator of wealth, tended to be relatively high in the north-east, low in the north-west, and varied in the south. Townships adjacent to the emerging towns of Nottingham, Newark, Southwell, Mansfield, Worksop and East Retford often tended to be more affluent, as indicated in the sizes of houses and numbers of chargeable hearths, but throughout the county local variations in rural 'wealth' were also to be found. At the county scale this probably reflects the activities of local landlords more than widespread economic or environmental factors which could have been pertinent at the national scale. The extent of this local differentiation is crucial in understanding the socio-economic structure of the county at this date.

Four main processes seem to have been at work in creating the observed patterns of wealth and population. Firstly, over most of the county, excluding the north-west, there had been expansion of population following the economic and demographic crisis of the mid-fourteenth century. By the seventeenth century this led to a relatively even distribution of population and wealth over much of the rural south and east of the county.⁷⁶ Much of the north-west of the county, on the other hand, remained relatively unexploited, since it had been within the bounds of Sherwood Forest, which had remained closed to widespread exploitation until the sixteenth century.⁷⁷ In addition this north-western part of the county once had much land within it held by monasteries, such as those at Beauvale, Felley, Newstead, Rufford, Welbeck, Worksop, Wallingwells and Blyth. The Dissolution led to the acquisition of many of the monastic sites and some of their estates by wealthy lords who frequently proceeded on a

policy of emparking large areas of the erstwhile forest. A second process at work can therefore be identified as the creation of large estates in the north-west of the county, giving rise to low overall population densities and greater social inequality than was to be found elsewhere in the county. Thirdly, there had been a major change in the structure of marketing and trade following the fourteenth century economic crisis. The many rural, periodic, markets of the thirteenth century had gone by the sixteenth century, to be replaced by nine major markets located mostly in the towns.⁷⁸ This concentration of economic activity in a few locations can be seen in the increased dominance of the urban settlements in the seventeenth century rank-size distributions and the maps of population density and 'wealth'. Local towns had become the foci of social and economic activity.⁷⁹ The fourth factor that must be considered in explaining the pattern of 'wealth' illustrated for Nottinghamshire in the Hearth Taxes is the individual activity of landlords. Thus, although throughout most of the county rural wealth and population were relatively evenly distributed, within this overall pattern there were many local differences between townships, and these were largely the result of differential landlord policies. The distinction between those villages with one and those with many landlords,⁸⁰ the influence of the sixteenth century enclosure of arable for pasture, and the building of large rural mansions by urban merchants, were all important factors in explaining the local differences in wealth and social structure.

These four factors only represent a partial description of the changes that gave rise to the patterns of wealth prevalent in the county *circa* 1675. They do, though, reflect the growing domain of capital, both in the restructuring of the marketing network and in its increasing investment in the rural economy.

CONCLUSIONS

Cross-sectional studies at one point in time, such as this, are bound, by their very nature, to be descriptive; an investigation of process requires the dimension of time. To be able, though, to evaluate how phenomena changed through time it is necessary to have certain standpoints from which to evaluate change, and these standpoints must be portrayed accurately. This paper has therefore concentrated on the problems associated with the accurate presentation of the information recorded in one source, the Hearth Tax, in the hope that it will provide the basis from which other studies will then use the Hearth Tax to interpret socio-economic change in the seventeenth and eighteenth centuries.

Six main conclusions can be drawn from this analysis of Nottinghamshire. Firstly, despite the problems and difficulties of its use, the Hearth Tax provides an important source from which regional differences in wealth and social structure can be described. However, it must be emphasised that used by themselves the pages of the Hearth Tax tell us very little about population distribution or indeed settlement pattern.

Secondly, although the general reliability of both the Hearth Taxes and the Compton Census have been questioned in the past, the broadly similar patterns which these two very different sources reveal suggest that they both may indeed represent well some past reality.

The third major conclusion relates to the specific content of the Hearth Taxes. Of the four variables included within the assessments, namely chargeable taxpayers and hearths and not-chargeable householders and hearths, it is the chargeable taxpayers, particularly in the period after 1664, which are likely to be the most reliable, and which can thus form the basis for a wider comparison between regions. It seems highly likely that many not-chargeable hearths were omitted from the assessments even after the revising Act of 1663 which specified that they should have been recorded. Likewise, given that it was easier to hide a hearth than a house, the number of chargeable hearths is likely to be a less accurate record of a past reality than is the number of taxpayers. For a wider comparison of the information available over the whole country more work must be done elsewhere to ascertain the variations through time of the people recorded as owing tax. If though, as the Nottinghamshire evidence suggests, the number of chargeable taxpayers in a township changed relatively little between 1664 and 1674, a fourth tentative conclusion can be posited suggesting that comparisons between regions can indeed be undertaken on the basis of chargeable taxpayers, even where assessments do not all survive for the same date.

A fifth important conclusion concerns the very real problems of the representation of the data. It is not always possible accurately to reconstruct the boundaries of the taxation units used for the Hearth Tax, but some approximation to the areas can be arrived at through the use of first edition Ordnance Survey maps, the enclosure and tithe award maps, and seventeenth and eighteenth century estate maps. All of these sources must always be used in an accurate attempt to identify boundaries. However, even when these sources are used, a not entirely accurate impression of the distribution of wealth is always obtained by choropleth density maps. This is particularly problematic when, for example, a populous village or small town lay within a large township, much of which may have been forest or waste. For this reason it is to be recommended that proportional symbol maps are used alongside the choropleth maps to represent the spatial distribution of hearths and taxpayers.

Sixthly, and finally, the use of the mean number of hearths per taxpayer and the standard deviation of this distribution for each township provides a good index of social differentiation. When this index is mapped for areas larger than a single county it will then be possible to detect regional patterns of social inequality at a wider scale.

Overall it is clear that while the Hearth Taxes may not be accurate in their absolute detail, they are very useful as

indicators of *relative* distributions; it is the differences between townships rather than the precise figures in any one township that are important. One significant issue which this paper has not really considered in any detail, though, is the compatibility between hearths and other measures of wealth, such as movables and land. This is crucially important if the Hearth Taxes are to be compared with other earlier taxation documents, such as the 1334 Lay Subsidy and the 1524-25 Subsidies. While a detailed analysis of this problem lies outside the immediate scope of this present publication, several suggestions must nevertheless be put forward on this matter. The first, and most immediate, difference between the evidence of the Hearth Taxes and the cross-sections based on earlier sources is that, following the sixteenth century dissolution of the monasteries, there was no longer the taxation division between secular and ecclesiastical wealth in the taxes of the late seventeenth century. More significant, though, it is not clear precisely how movable wealth may have been related to numbers of hearths at this time. The number of hearths is evidently a much coarser measure of wealth than is the value of an individual's land or movable goods. Nevertheless, it does seem logical to argue that a wealthy person would generally have had more movable goods, more land and more hearths than would a poorer man. Quantifying this relationship is not possible, since for no single date do we have all three measures of wealth. The high correlations obtained, though, in this paper when the three different measures of population in 1676, chargeable hearths in 1674 and taxpayers in 1674 were compared suggests that it may indeed be possible to draw general cautious conclusions, certainly as far as *relative* distributions are concerned. A further indication of the similarity between the evidence portrayed by different sources can be obtained by comparing, for example, the spatial distribution of wealth derived from the 1621 Subsidy on goods and lands with that illustrated by the Hearth Taxes. Although these two sources are separated by half a century, they nevertheless, in the case of Nottinghamshire, both represent highly similar spatial distributions of wealth.⁸¹ This then further supports the contention that, given the constraints within which any such comparison must be made, it would be legitimate to compare the national distributions of wealth represented by the Hearth Taxes in the late seventeenth centuries with those illustrated by earlier taxes on movables.

Regardless of the problems associated with comparisons between the Hearth Taxes and other earlier indices of wealth, what this paper has illustrated is that, with care, and concentrating mainly on chargeable taxpayers, the Hearth Taxes can indeed be used to provide a valuable indicator of the distribution of wealth and social structure in the seventeenth century. The task that must now be undertaken is to analyse the information available for other counties, and eventually, it is hoped, for the whole country.

ACKNOWLEDGEMENTS

Grateful thanks are due to Robin Glasscock for comments on an earlier draft of this paper, and to Suzannah Hall for drawing the majority of the figures. Figure 1, a facsimile of part of E179/254/30, appears by kind permission of the Controller H.M. Stationery Office.

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- 12 14 Car. II, c. 10. Printed in A. Browning (ed.), *English historical documents Volume VIII 1660-1714* (London 1966) 307-8.
- 13 Browning (ed.), *op.cit.* 307. See also Meekings (ed.), "Surrey" *op.cit.* xiii.
- 14 Meekings (ed.), "Surrey" *op.cit.* xiii.
- 15 15 Car. II, c.13.
- 16 16 Car. II, c.3.
- 17 In particular see Chandaman, *op.cit.*; Meekings (ed.), "Surrey" *op.cit.*; Marshall, "The levying". *op.cit.*
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- 47 Assessment for Lady Day 1664, dated 1663 P.R.O.E179/160/320, E179/160/322, E179/254/28. Assessment for Lady Day 1674, P.R.O. E179/254/30-31.
- 48 For 1664 there is some mention of 194 taxation units, whereas records for 1674 survive for 269 townships.
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- 50 This was necessary in 21 cases, and these also included those instances where the not-chargeable entries for adjacent townships were recorded together in the Hearth Tax assessment even though their chargeable entries were recorded separately.
- 51 155 taxation units had chargeable taxpayers in both periods.
- 52 156 taxation units had chargeable hearths in both periods.
- 53 163 taxation units mentioned both chargeable taxpayers and hearths in 1664.
- 54 259 taxation units mentioned chargeable taxpayers, and 260 mentioned chargeable hearths in 1674.
- 55
$$r_s = 1 - \frac{6\sum d^2}{n^3 - n}$$
- where d is the difference in rank between a taxation unit at the two dates, and n is the number of taxation units.
- 56 16 Car. II. c.3.
- 57 Unwin, "rank-size" *op.cit.*
- 58 *ibid.*
- 59 P.T.H. Unwin, *Patterns and hierarchies of rural settlement in Nottinghamshire before 1700* (unpubl. Ph.D thesis, Univ. of Durham, 1979).
- 60 145 tithe maps covering the period 1839-1850, 101 enclosure maps from between 1766 and 1832, and 135 estate maps prior to 1800 were used to compile a set of boundaries for this purpose.

- 61 In the construction of proportional circles the following formula was used:

$$r_n = \frac{(\max r)(\text{value } n)^{0.57}}{(\max \text{ value})^{0.57}}$$

where r_n is radius of value n , $\max r$ is maximum radius, $\max \text{ value}$ is maximum value, and $\text{value } n$ is value of variable n . For use of the exponent 0.57 see J.J. Flannery, The relative effectiveness of some common graduated point symbols in the presentation of quantitative data *Canadian Cartographer* 8 (1971) 96-109.

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- 63 See the following maps in the Nottinghamshire County Record Office: Mansfield tithe map of 1844; map of Earl of New-castle's land in Norton circa 1630, CU 2S; Warsop estate map of 1605, WP 52; and Worksop's enclosure map of 1775, WS 2L/1-6
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- 66 R.M. Smith, Population and its geography in England 1500-1730, pp. 199-238 of R.A. Dodgshon and R.A. Butlin (eds.) *An historical geography of England and Wales* (London 1978) A.S. Langley, A religious census of 1676 A.D., *Lincolnshire Notes and Queries*, 16, (1920), 33-51
- 67 Smith, *op.cit.* 201; Glass, *op.cit.*
- 68 Bodleian, Tanner Ms. 150 fo. 129; also transcribed in E.L. Guilford, Nottinghamshire in 1676, *Transactions of the Thoroton Society of Nottinghamshire*, 28, (1924), 106-13. This is not the Salt copy mentioned in Patten, "Population" *op.cit.*
- 69 For this purpose the three parishes of Nottingham St. Mary St. Nicholas and St. Peter were treated as one unit.
- 70 Due to uncertainties over the precise boundaries of some units the original 204 parishes were combined into 191 units for density calculations. Nottingham (1.506 people per acre), Newark (0.64 people per acre) and East Retford (3.390 people per acre) all had appreciably higher densities than the fourth ranked unit of Winthorpe (0.175 people per acre), hence the justification for treating these three units as a separate category.

- 71 This analysis has been based only on the use of chargeable figures due to the incompleteness of the figures for not-chargeable householders and hearths. Similar findings are reported by Patten, "Population" *op.cit.*
- 72 Patten, "The Hearth Taxes" *op.cit.* 22; compare with opposite arguments of Russell, *op.cit.*
- 73 Patten, "The Hearth Taxes" *op.cit.* 23.
- 74 P. Laslett, Mean household size in England since the sixteenth century, p. 139 of P. Laslett and R. Wall (eds.), *Household and family in past time* (Cambridge 1972)
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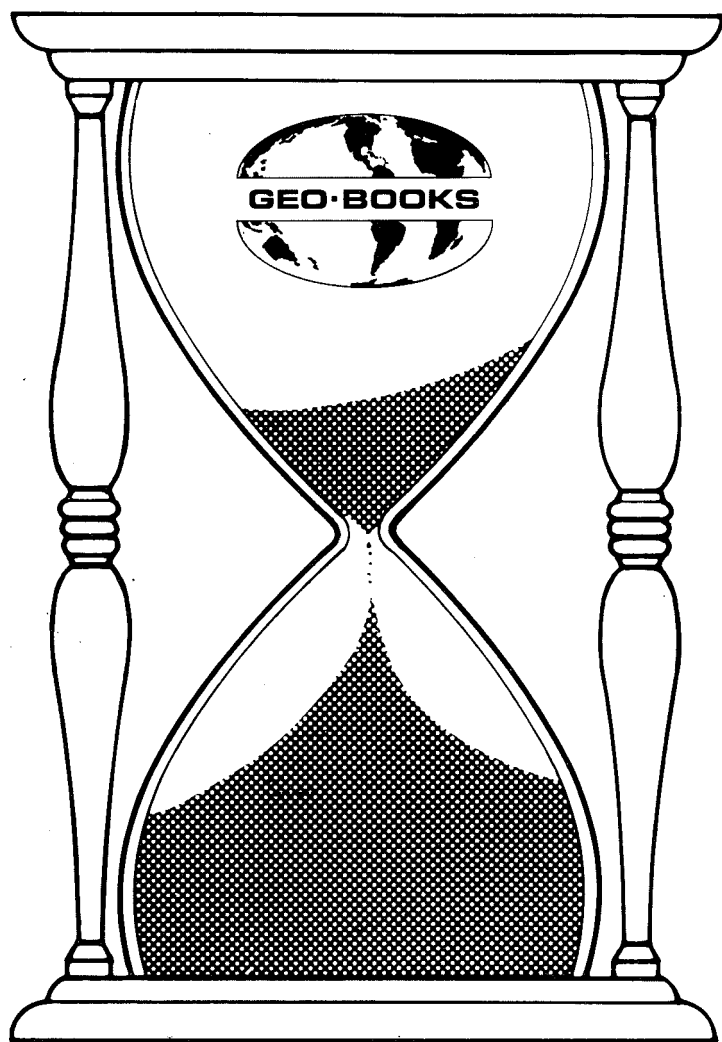
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Published by Geo Books, Norwich for the Historical Geography Research Group of the Institute of British Geographers.

Printed by W.H. Hutchins & Sons, Norwich, England.



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ISBN 0 86094 193 0