ASPECTS OF THE ALIGNMENT AND LOCATION OF MEDIEVAL RURAL CHURCHES

by

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St Mary’s and St Lawrence’s, South Walsham, Norfolk -
two churches in the same churchyard, but aligned 10° differently

ABSTRACT

This thesis explores the alignment of medieval rural churches and discusses whether their differing alignments have any specific meaning. It also examines the location of rural church sites and the chronology of church creation in relation to the process of settlement nucleation, the topography of church sites and their possible reuse. A survey of almost 2000 rural medieval churches provides the basis for this study.

Part I provides a broad context for the detailed consideration of the results of the survey and their significance. It summarises earlier church alignment studies and the issues that they raise; the practice of alignment more generally; studies of the rural church and its place in the landscape; and earlier studies of medieval rural settlement.

Part II describes the survey methodology and its basic results, applies the results to the theories advanced in earlier studies and evaluates them in the light of this new evidence.

Part III discusses and analyses two significant variations which have been uncovered: the clear pattern of spatial variation in church alignment between the east and the west of the country, and the fact that between two and three times as many churches were built on east-facing slopes as on west-facing slopes. Possible reasons for these variations are evaluated and discussed. It suggests that harvest dates may have been a factor in the decision to build a church and that churches appear to be aligned with sunrise at early harvest completions. It also examines the chronology of the adoption of church sites and the development of local burial in rural areas. The possible relationship between earlier pagan sites and church sites, as part of the process of "Christian substitution", is discussed, particularly in relation to the use of east-facing slopes. It proposes that local burial sites were adopted in villages early in the settlement nucleation process and that these graveyards provided the sites for the later building of churches, resulting in a bias of churches on east-facing slopes as the middle-Saxon burial sites seem to have sought them out previously.

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(all photographs were taken by the author, unless otherwise acknowledged)

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GLOSSARY & TERMINOLOGY

Throughout this thesis when there are key numerical or statistical references in the text to important data which are contained in the relevant tables, these are highlighted in the same colour in both text and table to improve readability. There is no significance in the particular colours used in any instance.

Alignment The term 'alignment', when used in relation to churches in this thesis, refers to the line parallel with the walls of the nave or chancel to the point on the horizon, measured in degrees from North, rather than using the more traditional term - the **orientation** of a church, which in its strictest sense refers to alignment towards east.

Arc of sunrise The portion of the horizon where the sun appears to rise, between the **Midsummer** and **Midwinter Solstices.**

Azimuth The actual position of sunrise, measured in degrees from North when horizon elevation and the position of the observer are taken into account. Azimuth values for the latitudes surveyed, over a level horizon, are shown in Appendix 2. The effect that horizon elevation has on the azimuth of sunrise is explained in Chapter One.

Calendar (Julian) The Julian calendar, instigated by Julius Caesar, measured the year at 365.25 days (approximately eleven minutes too long). This resulted in a gradual drift between solar time and calendar time, such that by the late sixteenth century there was a ten day difference between the two (Cheney 2000, 17-19).

Calendar (Gregorian)

The Gregorian calendar, proposed by Pope Gregory, was designed to put the sun and calendar back into synchronization so that the date of Easter could be calculated correctly. In Europe it was adopted in 1582, but in Britain, with a doubt of all things Catholic, it was not adopted until 1752, when eleven days were removed from October that year (Cheney 2000, 17-19).

Declination (magnetic)

The amount by which North, as indicated on a magnetic compass, varies in an east-west direction from the position of True North. It was first measured in 1576 in London. Since this date, its value at Meriden (the geographic centre of England) has varied between 12° east in 1576 and 24° west in 1820 (Clark *et al.* 1988, 659). It currently (June 2010) stands at 2° 21′ west [1]. The values for each area for the years surveyed are shown in Appendix 4. Declination, taken together with Inclination (variation in a north-south direction), makes up **Secular Magnetic variation**.

[1] http://geomag.nrcan.gc.ca/apps/mdcal-eng.php (last accessed 18th June 2010)

Declination (star) Measures the position of a star in the sky in relation to the North Star and the celestial equator.

Ecliptic Represents the plane of the Earth's orbit around the sun. It is only when the moon crosses this plane that it can be eclipsed.

Equinox (Autumn and Spring)

The two days in the year when day and night are of equal length, each is halfway between the summer and winter solstices. Spring equinox is towards the end of March (around the 21st) and the autumn equinox towards the end of September (around the 23rd). On these two days the sun rises due east and sets due west wherever the observer is on the Earth (see Kaler 1996, 61-62; Heilbron 1999, 56).

Moonrise standstill (major and minor)

In a similar pattern to the movement of sunrise between the summer and winter solstices, the moon rises and sets between certain positions. Over a period of 18.6 years, these limits vary between the widest range (major standstill at each end) and the narrowest range – the minor standstill. This pattern is shown in diagram 2.2 in Chapter Two (Ruggles 1999, 36-37).

Orientation The state of being orientated, in other words, facing the east (Chambers Twentieth Century Dictionary, revised edition 1970, London: Chambers). In modern times its use has been broadened to include leanings or affinity in many situations.

Orbital Precession The result of the same phenomenon as **Polar Motion**. It causes the equinoxes to appear to move relative to the stars in the sky, but has no effect on the relationship between poles, equator and ecliptic for an observer on earth, which "will maintain their same configurations relative to the horizon year after year" (Kaler 1996, 151), so has no effect on sunrise for the purposes of this thesis.

Polar Motion The rotation of the polar axis over a period of 26,000 years, so that North is indicated by different points in the sky (Kaler 1996, 149-151), but has no effect on the relationship on compass directions and sunrises for the purpose of this thesis.

"Remote" and "Isolated" churches

Throughout this survey when discussing churches that are some distance from their settlement, **Remote** has been used where only one or two other buildings are close to the church, and **Isolated** has been used where the church is completely by itself.

Saxon period The terminology and dates used during this thesis, are those adopted by both the Norfolk **HER** and the Suffolk **SMR** for Early Saxon (*c*.411–650 CE), Middle Saxon (*c*.651–850 CE) and Late Saxon (*c*.851–1100 CE).

Secular Magnetic variation

The amount by which the position of True North and Magnetic North differ; it is made up of figures for **Declination**, which measures the difference in an east-west direction, and Inclination, which represents the difference in a north-south direction.

Solstice (Summer) The point at which the **azimuth** of sunrise changes from moving northwards to moving southwards, signifying the longest day, usually June 21st.

Solstice (Winter) The opposite of the summer solstice, signifying the shortest day, usually around December 21st.

Statistical tests

Standard Deviation - Provides a measure of the amount by which a group of figures is spread about its mean (average) value; the larger the standard deviation, the wider the spread of figures.

Confidence - An arithmetic mean is a point estimate of the average value of a sample group of figures, and degrees of confidence indicate how much reliance can be placed on the mean value for additional cases. Confidence coefficients or 'degrees of confidence' provide a range within which the mean value of the whole group is likely to fall – the greater the confidence required, the wider the range (Hayslett 1973, 150). For example, an arithmetic mean of a sample group of figures might be 55, but the actual value for the whole group will be in a range of 53 to 57 at 95% confidence and a range of 52-58 at 99% confidence – in other words, there is a 95% chance that the actual mean for the whole group lies within the first range and a 99% chance that it lies within the wider range. Generally, as the number of figures in the sample group grows, the more confident is the calculation of the mean value for the whole group and the narrower its range becomes (see Hayslett 1973, 150-162 for a more detailed explanation of the methods of calculation). Throughout this thesis the automated methods of calculation of confidence levels within Microsoft Excel have been used (STDEV and CONFIDENCE).

Where the whole group has been surveyed (such as the churches in western Cornwall or in Norfolk) the use of confidence figures is not applicable as the 'sample' and the 'whole group' are the same, as there are no other churches in the county to survey, so the calculated mean value is accurate and correct.

True bearings The direction, measured in degrees from North after the value for the current Magnetic **Declination** has been subtracted, usually noted as " °True".

ABBREVIATIONS USED IN THE TEXT

(-)SMR	(County or National) Sites and Monuments Record
AOD	Above Ordnance Datum (Mean Sea Level)
BCE (CE)	Before the Common Era (The Common Era)
CBA	Council for British Archaeology
CCS	Cambridge Camden Society
DMV	Deserted Medieval Village
HER	Historic Environment Record (the renamed Sites and Monuments Record in Norfolk)
OE, ON	Old English & Old Norse
OS	Ordnance Survey
OSPSGA	Oxford Society for the Promotion and Study of Gothic Architecture
TASC	Trevor Jones' research - Saints Cults: Towards an Electronic Atlas. Found at http://le.ac.uk/elh/grj1/database/data.html (last accessed August 2008)

ASPECTS OF THE ALIGNMENT AND LOCATION OF MEDIEVAL RURAL CHURCHES

GENERAL INTRODUCTION

> One end of every Church doth point to such a place where the sun did rise at the time the foundation thereof was laid … … and by the standing of these churches, it is known at what time of year the foundations of them were laid.
>
> (Sir Henry Chauncy 1700, 43)

For at least three hundred years, the alignment of churches has been variously considered by antiquarians, ecclesiologists, folklorists, historians, archaeologists and has recently been investigated by geologists. Many studies of the alignment of churches have been published since the late nineteenth century investigating various ideas that churches were aligned towards specific points on the horizon; each of which will be examined in detail. Chauncy's conclusion, quoted above, is a good example of the apparently definitive results that many of these studies have produced. Like Chauncy, the majority of these earlier researchers investigated alignments with sunrise, but many concentrated on sunrises that occurred on the feastday of the patron saint to which the individual churches were dedicated. Almost two thousand medieval rural churches have been surveyed for this thesis and their alignments vary by up to ninety degrees, which is exactly one quarter of the entire horizon. It is therefore easy to see why, over the years, reasons for this variation might have been sought when it was generally accepted that churches were aligned eastwards.

The location of rural churches has also been studied for many years. Landscape historians have investigated the links between church location and possible previous ritual use of the site in question, whether through Christian substitution, readoption of a site or as an expression of *Romanitas* (for example: Bell 1998, 4; Eaton 2000, 14-17; Blair 1992; 2005, 377; Morris 1989; Rattue 1995; Stocker & Everson 2007), although recent work at Shapwick in Somerset (Gerrard and Aston 2007) has shown that care has to be taken when drawing conclusions based only on the current siting of the

church and settlement (because both are now known to have moved). Writers have also commented on the relationship between the site of the village church and that of the manor house (including Dymond 1968, 29; Morris 1989, 131; Blair 2005, 385; Williamson 1993; Scarfe 1987) and the location in relation to the village which the church currently serves (Morris 1989, 235-252; Ellison 1983; Wade-Martins 1980b; Williamson 1993). Medieval settlement patterns and settlement movement, particularly between mid-Saxon times and the twelfth century, have also been studied in detail and are intimately involved with the location of the churches which serve them. Other examples illustrate the complexity of the situation where the siting of churches can be explained by more than one possible reason, such as a combination of Christian substitution and the use of a locally prominent site.

This thesis explores whether the differing alignments of medieval rural churches have any specific meaning. In the past it has been variously considered that churches faced east for liturgical reasons or reasons of Christian religious belief; that they faced Jerusalem; that they faced sunrise on the day that building started; or that they faced sunrise on their patronal-saint's feast day, and, in the cases where nave and chancel were aligned differently, that this represented religious symbolism. In addition it has been suggested that churches were set out with a compass and therefore towards magnetic east when they were built, rather than true east.

This thesis also explores the location of rural churches, especially the topography of their sites and the sites' possible reuse. It also explores the timing of the adoption of the sites that now contain village churches, particularly in relation to the processes of settlements fixing their position and settlement nucleation, which, together with topographical elements, suggest that there are indications that some church sites may have determined the location of the settlement that they now serve rather than *vice versa*.

THESIS STRUCTURE

Part I (Context) provides a broad context for the detailed consideration of the results of the survey and their significance. **Chapter One** briefly considers references to church alignment in church texts, and examines specific studies of church alignment in more detail. The methodology of these earlier studies is described along with their results and conclusions. The issues that are raised by the results of these studies, and in some cases the issues that their methodologies raise, are also discussed. Chapter One also considers the factors concerning the position of sunrise, such as the changing seasons, elevated horizons and calendar change, as well as considering the issues surrounding church dedication, all of which are elements that are central to the basis of most of the earlier church alignment research and its conclusions. **Chapter Two** discusses the background to the subject of alignment generally, including Palaeolithic and Bronze Age examples; and it covers aspects of alignment between two or more objects, and the alignment of objects towards distant features, both on the ground and in the sky. **Chapter Three** outlines the historiography of the origin of rural churches, especially the 'minster model'; it also considers the location of churches, particularly in relation to the possible reuse of earlier ritual sites and the proximity of both the village and the lordly residence. It also outlines the historiography of rural settlement studies between the eighth and twelfth centuries, a time of much church building.

Part II describes the author's survey of almost two thousand rural medieval churches. **Chapter Four** outlines the sample selection as well as the procedures adopted for the survey itself, and provides an overall analysis of the basic survey results. In **Chapter Five** the results of the survey are applied to the various theories of alignment outlined in the earlier studies described in Chapter One. In particular, it uses the survey results to consider whether churches were aligned towards sunrise on their patronal-saints' feast day; whether churches that have naves and chancels with different alignments represent religious symbolism; whether churches were aligned with sunrise on the day they were set out; whether churches were aligned towards sunrise at Easter and whether churches were aligned towards Jerusalem. It concludes that none of these earlier theories can be supported by the results of this survey, and that there is a more rational explanation for the observed alignment variations.

Part III (Analysis & Synthesis) enumerates and discusses two significant variations in alignment which were uncovered during the analysis of the results. In **Chapter Six**, the first of these variations – a clear pattern of spatial differences in church alignment between the east and the west of the country – is considered. This disparity has been revealed for the first time due to the size of the survey; three possible reasons for it are evaluated and discussed. Firstly, the possible influence that the variation in the position of magnetic north may have had in the setting out of church buildings is considered. Secondly, the possibility that there is a chronological element to the variation in alignment is examined, by investigating a possible chronology of church building and then comparing the alignments of the churches built in the different periods. Finally, the likelihood that climate played a part in the spatial pattern of the alignment of churches is investigated by examining whether harvest dates may have been affected by climatic differences across the country. The possibility that churches may have been first set out after a particularly early and successful harvest is then investigated, which might have been seen as an auspicious time to build a church.

Chapter Seven expands on the second significant variation uncovered by the survey – that of churches sited on sloping land. The survey revealed that between two and three times as many churches were built on east-facing slopes as were built on west-facing slopes; possible explanations for this are put forward and discussed. The differences between this pattern, and the different distribution of churches built on artificially levelled platforms on sloping sites, is also considered. To test whether the bias of church sites towards east-facing slopes is a real one, or whether there is actually more land that slopes eastwards which may account for the inequality, a computer based analysis of the topography of the entire county of Norfolk is undertaken. In addition, the significant numbers of lost and ruined churches in Norfolk which were located in the same parish as an extant church are used to investigate whether the slope of their sites played any part in the selection of one church for retention over the one which fell into disuse.

Chapter Eight develops the ideas raised in the previous chapters concerning the relationship between the siting of the church, the timing of the adoption of church sites, settlement nucleation, and east-facing slopes. The timing of the selection of the church site, and the development of local burial in rural areas, is discussed, particularly in relation to the apparent adoption of religious sites very early in the settlement

nucleation process. The proximity of the church and manor house and the sequence in which they were built is also examined, as it is usually considered that many of the country's small rural churches were sited by the manorial lord on his own land, usually close to the manor house, which has been referred to as the church/hall focus. The issue of possible pre-Christian use of church sites is also discussed and is related to the reported attempts of the church to incorporate earlier ritual sites as part of Christian substitution. It also explores whether there is any indication that the origins, and hierarchy, of medieval rural churches influence specific church locations, by attempting to establish whether there were different factors affecting the location of different types of church, for example, were the influences on the decisions that were taken when siting a minster church, the same as those when deciding the site of a field church?

Finally, in **Part IV (Conclusions)**, **Chapter Nine** draws together the considerations of the previous chapters. In addition to indicating that the conclusions of many of the previous studies of church alignment can be shown to be in error, it proposes that in many situations there is a more practical, and simpler, set of influences on alignment than previously supposed. The overall aim appears to have been alignment eastwards, including aligning closer to east when the opportunity arose through rebuilding or extension, but it is suggested that the spatial variation in church alignment identified in the results of this survey can be explained by climatic variations reflected in harvest dates. An alternative process to the minster model in relation to the creation of some local church sites is also proposed. Instead of churches being built, and presumably their sites selected, later and later in the Saxon period as lower and lower levels of the lordly hierarchy are considered, it suggests that many religious sites were selected by local villagers in their settlements as a graveyard which later became the site for the building of what is now the village church.

PART ONE

CONTEXT

CHAPTER ONE

HISTORIOGRAPHY OF CHURCH ALIGNMENT STUDIES

'There is no one but knows that every old church is built east and west.'
(John Mason Neale 1841b, 7)

INTRODUCTION

This chapter outlines the historiography of church alignment by examining earlier studies and surveys of church alignment and by summarizing references to alignment in broader church-related texts. It also considers other associated aspects which impact upon church alignment and its research; the position of sunrise and the factors which affect it, such as horizon elevation and calendar change, both of which alter the actual position on the horizon where the sun appears; and church dedication, which is at the centre of many of the previous theories of the reason for specific church alignments and the variation between them.

Despite the apparent certainty of the quotation from Sir Henry Chauncy in 1700, noted in the General Introduction to this thesis, in which he concluded that churches were aligned with sunrise on the day that they were set out, Chauncy himself did not publish any corroborative details or explanations; his statement appears to have been made to try and explain the obvious differences that he had noticed between the alignments of individual churches. After this reference, the subject of church alignment appears to have been largely ignored for almost 200 years, apart from a poem by William Wordsworth about Rydal chapel written in 1823. Even the Ecclesiologists during the middle decades of the nineteenth century ignored it in the main, although Richard Morris has commented that "alignment intrigued" them (Morris 1989, 208). The Cambridge Camden Society (CCS) did produce *The Orientator*[2] to measure church alignment as part of a church recording exercise suggested in an early publication by

[2] The Orientator – a piece of equipment produced by the CCS, which was designed to assess the alignment of a church and compare it with the point of sunrise

John Neale (Neale 1841a, 10), but the survey seemed to fail completely (White 1962, 60), probably due to difficulties in data collection. However, apart from this exercise and *very* brief mentions of alignment in the pamphlets they aimed at church builders, the CCS not only had little to say about the subject of orientation but did not try and influence Victorian church builders either; in other words, they were only descriptive not prescriptive[3]. They were abrupt and forthright in their comments on many aspects of architecture and building form, particularly which aspect of pointed architecture was used, the size of the chancel, the chancel window style, the altar's position and its height above the nave floor, but they did not appear to comment about the alignment of the church, or mention any requirement for new buildings to face east (or indeed any other direction, such as a saint's-day sunrise).

It has also been suggested that the Oxford Movement was interested in the orientation of churches. As Johnson wrote in 1912, quoting Victorian authors, "the practice of orientation had grown lax in the years preceding the founding of the Oxford Movement in 1833" (Johnson 1912, 206), although the Oxford Movement seems to have concentrated on liturgy and belief rather than on church buildings, apart from their decoration. In his book on the Oxford Movement, the Dean of St Paul's, R. W. Church, wrote a 24-page chapter entitled *The ideal of the Christian Church* in which church buildings are not mentioned at all (Church 1892, 360-384) and it has been suggested that the Oxford Movement was on an altogether more spiritual and less material plane than the CCS (Brine 1990, 15). The fact that neither the Oxford nor Cambridge movements were really interested in alignment is illustrated by the results of the survey of Victorian churches described in Appendix 1, where it is shown that alignment towards east in Victorian times was rather *less* rigorously observed than by medieval church builders; indeed the only examples of churches in this survey that are aligned towards north or south are from the Victorian period. The lack of influence over alignment, particularly by the CCS, is also illustrated by the fact that there is no difference in alignment between the churches designed by architects who were members of the CCS and those who were not (see table A1.2 in Appendix 1 on page 309). Taken together, these clearly confirm the absence of any instruction from the

[3] see Appendix 1 for a more detailed examination and analysis of the writings of the Victorian Ecclesiologists, including their few references to alignment and the details of the survey form they developed

Society in this matter and probably reflects the true Victorian interest in the issue, rather than that commented on by Morris (1989, 208) and Johnson (1912, 206).

Interest in church alignment appears to have re-emerged during the late nineteenth century after which time a few local detailed surveys were published (Shore in 1886, Eeles in 1914, and comments on alignment in passing by Anderson (1898, 154) and Griffith (1908, 37)). There was a revival in interest shown by increasing numbers of published studies after the middle of the twentieth century which has continued until the present day (published studies by Cave 1950; Benson 1956; Searle 1974; Davies 1984; Abrahamsen 1992; Dymond 1999; Hoare & Sweet 2000; Ali & Cunich 2001, 2005; Hinton 2003[4]; Muirden 2005; Wall 2006 and comments by Trubshaw in 1989). Some of these studies suggest alternative reasons why churches are aligned in different directions, frequently arriving at answers as definite as, but different from, Chauncy's conclusion. The majority of these earlier surveys also investigate alignments towards sunrise, particularly sunrise that occurred on the feastday of the patron saint to which the individual churches were dedicated; others investigate sunrise on the day that building started; some have studied sunrise at Easter and others have suggested that churches faced Jerusalem. In addition, several have investigated the often-noticed difference in alignment between the nave and chancel in a single church and the proposal that this has religious symbolism (Cave 1950; Benson 1956; Hoare and Sweet 2000; Muirden 2005), with varying conclusions.

This chapter will examine each of the studies of alignment, outlining the main issues that they raise and their main conclusions. Where it is felt that there are errors in the data, or that erroneous conclusions have been drawn from the data, these are identified and discussed briefly. Additional comments on the quality of the results of these studies will be raised in the following chapters when the results of this much larger survey are applied to the earlier theories. The summarised alignment results of all of these studies are shown in Table 1.3 on page 47, but prior to their detailed examination, mentions of church alignment in more general texts are outlined.

Several general works concerning churches mention church alignment, sometimes only in passing; for example, John Blair in *The Church in Anglo-Saxon Society* only refers to alignment once, in a footnote, as "this difficult topic" (Blair 2005, 416). Earlier writers such as Baldwin Brown and Walter Johnson referred to orientation

[4] An unpublished Masters Dissertation (Hinton 2003)

at greater length. Brown thought that "orientation was made much of in the later days of universal Christendom, although the church in the earliest times, and the Roman Church throughout, were indifferent to it" (Brown 1903, 22). Johnson, writing in 1912, devoted a whole chapter to the subject (1912, 204-242), in which he listed the findings of earlier surveys and the discussions of earlier theorists, especially the possibility of saint's day sunrise alignments and the phenomenon of differently aligned naves and chancels, but ultimately sat on the fence by concluding that "it would be a bold man … who should affirm [a single] explanation [for alignment variation], and harder still … to dismiss every case as the result of chance or ignorance" (Johnson 1912, 242). John Harvey in 1974 referred to "the much disputed question of varying orientation" and that it had now been "settled in favour of patronal-saint sunrise" (Harvey 1974, 60), accepting the results produced by Rev. Benson in his 1956 study of Oxfordshire churches which is examined later in this chapter. Harvey went on to refer to two Cathedrals (York and Winchester) which were realigned to face east when rebuilt by the Normans, where the earlier Saxon cathedrals had followed the general alignment of the Roman street pattern (Harvey 1974, 74-75, 90-92). Richard Morris notes the same change in the adoption of alignment eastwards, particularly at York (Morris 1979, 116-119) and he suggests that this was part of "a new concern with alignment during the eleventh and twelfth centuries … evident in cathedrals which were rebuilt and re-orientated" (Morris 1989, 208). Nevertheless, this new concern with alignment, if it existed, was not universal even amongst larger churches, as not all cathedrals rebuilt at this time were realigned; for example at Canterbury, where "the walls of the final phase of the Anglo-Saxon cathedral lay parallel to the Norman cathedral … but five metres to the south" (Blockley 1993, 126; also in more general terms in Pounds 1994, 29), so the realignment appears to have been limited to cathedrals in towns with Roman street grids which were significantly different from east-west. Morris goes on to say that "there are signs that similar changes [in alignment] were made at village level" (1989, 208), this aspect is discussed further in Chapter Three. Stephen Friar lists most of the possible explanations for alignment that were discussed by earlier writers, but concludes that the reason for orientation has "remained a mystery" (Friar 1996, 326).

According to Cruden's *Concordance*, there are six references to East in the New Testament Gospels (Cruden 1769, 127-128) and a further three in Revelation. Most refer to the Second Coming on Judgement Day, for example:

> Acts I, v.11, "[the second coming] shall so come in like manner as you beheld him going into heaven [to the east]"
>
> Matthew XXIV, v.27, "For as the lightning cometh out of the East …, so shall also the coming of the Son of Man be".

References to East in the Bible cannot have been references to buildings or their orientation, as purpose-built churches did not exist at the time the New Testament Gospels were written. The quotation below is taken from the *Dictionary of Liturgy & Worship* and is followed by an acknowledgement that Constantine buildings had their sanctuary at the west end, but that from the middle of the fourth century, the practice of locating the sanctuary at the east end was adopted and [alignment] became almost universal "but without complete accuracy in every case" (Davies 1972, 303).

> The siting of a building so that its sanctuary points to the east derives from the Christian practice of facing east for prayer. … the Christian eastern tradition could well have developed in contrast to the Jewish custom [praying towards the temple at Jerusalem], but would also have been influenced by the general pagan understanding of the time that the east is the direction in which the good divine powers are to be found, a view connected with sun worship (Davies 1972, 303).

However, even though the Jewish religion required those praying to face the temple at Jerusalem, east was also obviously very important to the Hebrews; Cruden noted that they referenced all compass directions with relation to east; using words to signify 'before' for east, 'left' and 'right' for north and south and 'behind' for west (Cruden 1769, 127), and the Old Testament Books of The Bible contain 38 references to east (Cruden (1769, 127-128), reflecting its apparent importance; beginning with Genesis III, v.24, "God was placed at the east end of the Garden of Eden" (Cruden 1769, 127).

Almost all of the church alignment studies discussed in this chapter focus on sunrise on specific days, so, prior to the summary and discussion of their conclusions, two specific issues which impact on the position of sunrise on the horizon need to be considered – horizon elevation and calendar change – as well as a general explanation of how the azimuth of sunrise moves throughout the annual seasons. In addition, as the authors of many of the studies of church alignment consider that churches faced sunrise on the feastday of their patronal saint, the issues of when churches were originally dedicated, and whether they were subsequently rededicated, become important. This section briefly discusses these issues, avoiding the complexities of the variations in the orbital motion of the Earth and of spherical trigonometry, and summarises the relevant aspects of church dedication.

THE POSITION OF SUNRISE

Seasonal changes

Sunrise at the Spring and Autumn Equinoxes over a level horizon occurs due east and sunset occurs due west everywhere on the planet, as the axis of the planet during the equinoxes is at right-angles to both the plane of the Earth's orbit and to the sun itself (Heilbron 1999, 56). From the Spring Equinox, the position of sunrise moves north along the horizon, at a rate which is dependant on the latitude of the observer, until the Summer Solstice. At this point it reverses, moving south along the horizon, through east at the Autumn Equinox, until it reaches its most southerly point at the Winter Solstice, whereupon it turns north again. All over the Earth the sun is always due east at 6 a.m. (solar time), due south at midday, due west at 6 p.m. and due north at midnight, although at England's latitude it is below the horizon, and therefore not visible, for some of this time. The actual length of day and night is again dependent on the latitude of the observer, as well as the season of the year (for a more detailed explanation see Kaler 1996, 61-80). The further north the observer's position, the more quickly the position of sunrise moves northwards from east as the year progresses after the Spring Equinox, and the wider is the arc of sunrise between the two solstice dates. In *extremis*, at the Arctic Circle, the sun just sets on mid-summer's eve at midnight and immediately rises again, therefore rising due North; and only just rises above the southern horizon at midday on mid-winter's day, an arc between sunrises of 180º (90º either side of East). In England, the extreme positions of sunrise for the counties examined in this survey are at the most southerly point in Cornwall (50ºN latitude), where the sun rises between 54º at midsummer and 126º at midwinter (an arc of 72º, 36º either side of east), and at its most northerly point in Cumbria (55ºN latitude) where the range varies between 49º and 131º, an arc of 82º, 41º either side of east[5] (full weekly sunrise details are shown in Appendix 2 on page 324).

[5] Sunrise Positions based on local sunrise time taken from the US Navy website http://aa.usno.navy/mil/cgi-bin/aa.rstablew.pl last accessed Aug 2008, and converted using calculations from Davis 2004 (Appendices) – the formulae are shown in Appendix 6 of this thesis.

Horizon elevation

In addition to the changes due to the seasons, the position of sunrise on the horizon is also affected by the height of the eastern horizon relative to the observer. An elevated horizon delays sunrise and makes the sun appear slightly later, therefore further south on the horizon, with a delay at England's latitude of approximately 1.5º along the horizon for every degree of horizon elevation[6]. This effect is illustrated in Figure 1.1, showing a 17° delay in sunrise over a horizon elevated by 12° for a church that would have faced sunrise due east (90°) had the horizon been level with the church. The delay is caused by the fact that the Earth rotates completely every 24 hours – a rate of 15° every hour (360°/24) – so that at this latitude the sun moves in an arc, therefore during the delay of the sun's appearance caused by the elevated horizon, the Earth has continued to rotate. This delay would apply to the many churches located in valley bottoms or on slopes that rise in an easterly direction. Therefore a church with an elevated eastern horizon aligned with sunrise on its patronal-saint's day would be facing in a different direction from a church aligned with sunrise on the same day but with a level (0°) horizon.

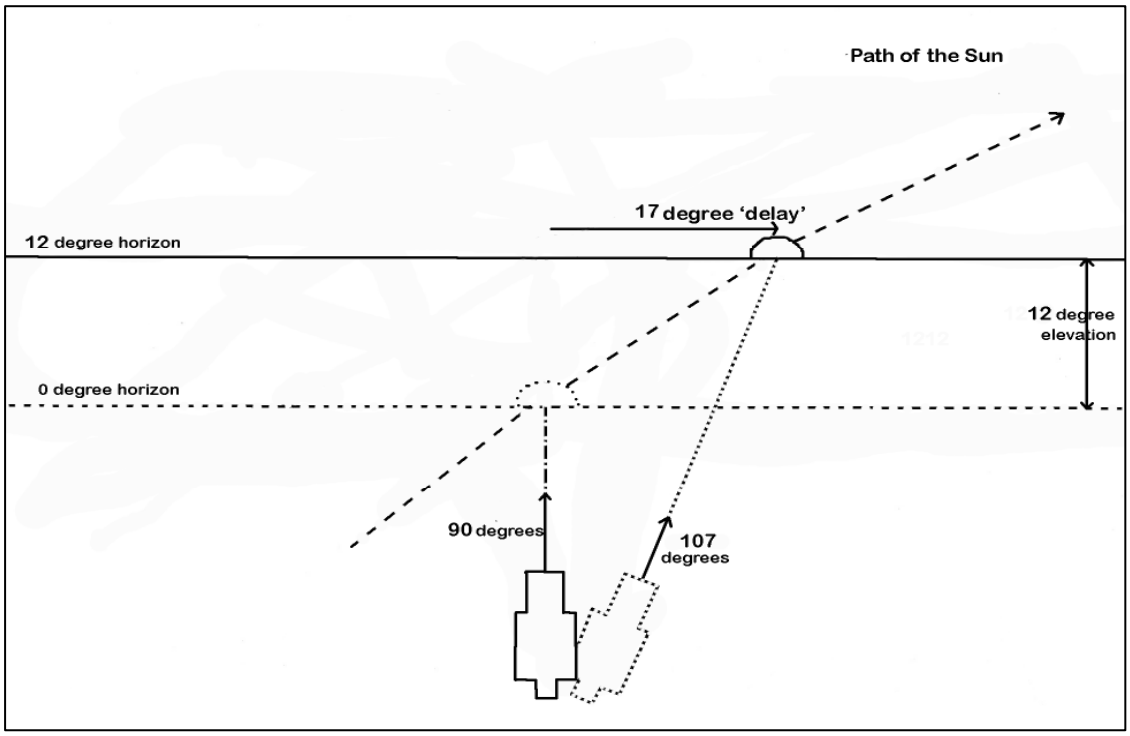


Figure 1.1 – The delaying effect on sunrise of an elevated horizon

[6] The detailed calculations were based on formulae supplied by Dr John Davis (British Sundial Society) in a pers. comm., October 2002, and (Davis 2004, Appendices). The general spherical trigonometry is discussed in Kaler 1996, 198-201 and 467-472 (Kaler: Appendix 3)

The opposite situation, where the church is higher than its eastern horizon, would have the reverse effect, advancing sunrise relative to that over a level horizon and making it appear slightly more to the north. This has been observed in very few cases as part of the horizon measurements made in this survey, as a church on top of a hill is much more likely to be facing a similar hill the other side of the valley (effectively making its horizon level, or even elevated) than to be located on top of a hill facing out over a flat plain, or on the edge of a high cliff overlooking the sea.

Calendar Drift

The second issue concerning the position of sunrise is calendar drift, which progressively affected the relationship between the calendar date and the solar date before it was corrected in England in 1752 (Cheney 2000, 18). The drift impacts upon the exact position of sunrise on a specific date, such as a saint's feastday, particularly when attempting to relate it to modern sunrise on the same date. The calendar date in medieval times was several days ahead of the same date today, after the calendar correction. In the medieval period there was concern about the calculation of the liturgically correct day for Easter which required a precise reckoning of the Spring Equinox (Heilbron 1999, 24-28; Cheney 2000, 4-6), the details of which are discussed in a later chapter. The error grew steadily after the introduction of the Julian calendar in 45 BCE and the adjustment to the calendar in most of the Roman world was made in 1582 CE by deducting ten days, but in the Protestant parts of Europe it was rejected at that time, not because it was inaccurate, but because it was popish (Heilbron 1999, 45). The change was made in 1752 CE in Britain, when the error was corrected by deducting eleven days from the calendar (Cheney 2000, 18).

As part of their investigations to correct the calendar, Renaissance astronomers used churches as observatories to establish the exact day of the Equinox by constructing *meridiana* (Heilbron 1999, 62-68). These consisted of a line on the church floor which had to run due north-south, along which was traced the position of the sun at midday each day, by projecting the sun through a small hole in a south-facing wall. This enabled the solstices, the shortest and longest days, to be identified and by

inference the equinoxes. Incidentally, these constructions highlight the range of very different alignments of Italian churches, reflecting Baldwin Brown's comment, noted earlier, about the Roman Church being indifferent to alignment. The requirement for a north-south direction for the meridian line meant that it would normally be expected to be roughly at right-angles to the axis of the church nave, which would be expected to be constructed close to east-west. However, the meridian line at Santa Maria Novella in Florence "stretched 58 metres up the nave, which was aligned near north-south, just reaching the choir" (Heilbron 1999, 69). At Palermo Cathedral, the meridian line runs diagonally across the nave and into the north trancept, showing the church to be aligned approximately southwest-northeast.

Figure 1.2 – *Meridiana* at Santa Maris Novella, almost directly up the nave (left) and almost diagonally across Palermo Cathedral (right). Santa Maria Novella image sourced from http://math.nus.edu.sg/aslaksen/pictures/10143-s.jpg (accessed 24th July 2009)

The calendar change has a particular impact when sunrise on a specific date, such as a saint's feastday, is considered, as the sun appears at a different place on the horizon today from where it did on the same calendar date in the year that the church was set out. During the period between the middle of the tenth century and the middle of the fourteenth century, when most churches were being built, the error grew from six

days to nine days (Duncan 1999, 41-52). The difference between a specific date in the twelfth century, a period of much church building, and the same date today, is approximately seven days – sunrise, according to the calendar date, occurring effectively seven days earlier then. Seven days earlier translates to a difference in sunrise position of approximately 5° further north on the horizon around the autumn equinox, when the sunrise position is moving south, but 5° further south at the spring equinox, when sunrise is moving north, and virtually no difference (a tiny fraction of one degree) at the summer and winter solstices, when there is little day-to-day change in sunrise position (see Figure 5.1 on page 130 for an illustration of the movement of sunrise on the horizon and Appendix 2 for the actual figures). So, if churches were aligned with their patronal-saint's feastday sunrise in medieval times, the calculations and adjustments required to establish where modern sunrise occurs on the day are fairly simple, depending only upon the year that the church was built. However, it is far more difficult to assess the adjustments required if churches were aligned with sunrise on the day that the building was set out, as the sun rises at the same point on the horizon twice in every year. Therefore, the changes in sunrise position brought about by calendar change relevant to each individual church depend not only on the year in which the church was built, but also on which season, as the adjustment would need to be made in the opposite directions for churches set out in Spring and those set out in Autumn, as sunrise is moving north in spring, day by day, and south in autumn. This means that any adjustment of sunrise position to correct for calendar change when attempting to prove building-start sunrise alignment is as accurate as tossing a coin.

THE HISTORIOGRAPHY OF CHURCH DEDICATION

The final subject considered here as part of the background to church alignment studies is that of the dedication of churches. When, and to whom, churches were dedicated forms an important part of the topic of church alignment since much of the earlier work has made one of two assumptions; either that churches have always been dedicated to the same saint, or that churches that are aligned similarly must once have been dedicated to the same saint if they have different dedications now.

The Reformation of the Church of England, the Puritan era and the Commonwealth period caused the knowledge of many church dedications to be lost or altered. John Ecton and Browne Willis worked in the eighteenth century to establish lists of dedications which had been lost. They had difficulties in some areas where dedications had been lost completely from folk memory and "made many assumptions" (Orme 1996, 47-50). Frances Arnold-Forster published a list of dedications in the late nineteenth century, but Francis Bond commented in the early twentieth century that Arnold-Forster's volumes also contained a large percentage of dedications of doubtful authenticity, as well as many still unknown (Bond 1914, 14). More recently, dedications in specific counties have been investigated more thoroughly, for example by Alan Everitt in Kent (1986), Nicholas Hoggett in Hertfordshire (1988), Peter Northeast in Suffolk (1995) and Reverend Linnel in Norfolk, who also acknowledged that Arnold-Forster was less accurate than Bond (Linnel 1962, 4). In addition, the dedications of Saxon and Norman Monastic Houses have been studied by Alison Binns (1989) and Tim Pestell (2004). Much of this recent work has delved deeper into early documentary records, particularly the work of Richard Clark (1992) in Derbyshire, identifying high levels of rededication; Wilhelm Levison (1956) on ninth-century churches; Lawrence Butler (1985) on the Anglo-Saxon churches surveyed by Harold Taylor; and of particular saints, such as Oswald, by Alison Binns (1995). The West Country has been particularly well studied, with recent publication of work by Nicholas Orme (1996), Susan Pearce (1985, 2003), Catherine John (2001) and Sam Turner (2006). Most recently, Trevor Jones' work, (Saints Cults: Towards an Electronic Atlas [TASC online database] and Jones 2007), has altered the thinking about rededications, and has, in particular, pointed out the possible error of applying results based on the proportions of rededications identified in the work of Clark and Orme to the rest of the country. This is discussed in more detail in later sections.

Definition of Dedication

The reference to a church being dedicated to any saint is merely convenient shorthand, as early writers held that no early church was originally dedicated to a saint, but only to God. Both Bond and Muncey quoted Hooker (the Protestant writer) writing in the late sixteenth century, as saying that "Churches were consecrated to none but the Lord only" (Bond 1914, 1; Muncey 1930, 2). Bond quoted Saint Augustine of Hippo as saying "To the saints we appoint no churches, because they are not unto us as gods, but as memorials as unto dead men, whose spirits with God are still living." (Bond 1914, 3), whereas Muncey expressed it slightly more generally: "It is not properly correct to speak of a church being dedicated to a particular saint or event – it is a convenient way of expressing that we mean that it is dedicated to God in memory of a particular saint or event" (Muncey 1930, 3). The practice of dedication to a saint may have originally been confined to the altar of the church, particularly if it contained relics. Certainly in later years, as altars and cults proliferated, the frequent side altars in a church were dedicated to a range of saints, different from the dedicatee of the high altar (Duffy 1992). This aspect is confirmed by Graham Jones' definition of dedication as "the commemoration of a saint, angel or aspect of the Divine, by naming a place or object of devotion in their honour, part of a larger phenomenon of religious cult" (Jones 2007, 16). Richard Hooker devoted two chapters, albeit short ones (Keble 1888, 44-51), of his eight volume *Ecclesiastical Polity* to the issue of the dedication of churches, which included an explanation that it was now the church that was so named and not the altar, which would have been too idolatrous for the Protestants to accept, although he did say that as far as dedication was concerned "sometimes they [idolaters] may judge as rightly what is decent about such external affairs of God" (Keble 1888, 49). His writing certainly implied that originally it was only the altar that was the subject of the dedication.

The incumbents, churchwardens and parishioners encountered during the survey for this thesis have universally referred to their church by the name of its dedicatee only, for example St Mary's or St Peter's, and they almost universally assume that the dedication of their church has remained the same since time immemorial.

Why dedicate a church?

A church was supposed to be consecrated before Mass could be celebrated in it. This task had to be undertaken by a bishop and originally had three associated ceremonies: Dedication of the church to God; frequently [but not always, as is shown below] naming the church in honour of a saint; and consecration of the altar and enclosure of any relics within (Orme 1996, 4-5). The chosen saint would then act as an intercessor, or intermediary, between the prayers of the individual and God, with the aim of magnifying their power. In addition it was believed that the presence of the saint magnified the effectiveness of oaths and contracts, which was one of the reasons for the proximity of churches and market places and churchyard fairs (Jones 2007, 17), still seen today by the use of The Bible on which to swear oaths. The choice of saint in early days was most likely to be made by the patron of the church, whether thegn or bishop, but by the High Middle Ages, the views of the bishop "are likely to have been decisive in many cases, though paying careful attention to the wishes of influential individuals, particularly those providing funds" (Jones 2007, 20).

The selection of a particular saint to act as the patron for a church was made for a variety of reasons. Dedicatees could be selected to promote Christianization, by using the apostles such as Peter, Andrew or Bartholomew; for reasons of practicality, by using saints whose feast days coincide with specific points in the farming year which reflect the local needs, such as Brigid and Anthony, whose feastdays occur during the birthing of different animals, or for supporting local trades, such as Peter for fishing. Graham Jones expresses this as "it is permissible to imagine that the feast saint was more likely to be chosen for their appropriateness for the secular seasonal cycle, especially the agrarian calendar" (Jones 2007, 51). In addition to the reasons noted above, the choice of saint might reflect the contemporary popularity of a particular saint or cult. Saints such as George and Mary waxed and waned in popularity both over time and geographically (Jones 2007, 13), and Giles and Leonard were popular in the twelfth century with monastic founders, and may also have been chosen as parish church patrons during the same period (Orme 1996, 31). Alison Binns recorded 514 dedications of monastic houses between 1086 and 1216, 235 of which were to Mary, 49 to Peter and Paul and fifteen to Andrew (Binns 1989, 18-19), but popularity changed during this period, Peter and Andrew were popular at the beginning (1066-1100) but almost no dedications are recorded to them towards the latter end, between

1150 and 1216 (Orme 1996, 27), emphasising changing popularities. Finally there might be political reasons for a choice of dedicatee, either nationally or locally. At a national level, there were dedications to Thomas Becket, whose death "evoked one of the most popular movements in Christian history" (John 2001, 109), whilst at a local level, a favourite saint of a major patron might be used, such as at the churches in manors controlled by the Beaufoy family of Norfolk, all of which were dedicated to St Andrew (Linnel 1962, 9). Another example would be the choice of the same patron saint for daughter churches as the one venerated at the mother church, such as at the cluster of ten adjacent dedications to St Mary in south Suffolk and north Essex, attached to the minster church of St Mary's, Stoke by Nayland (Cooper 2000, 161-168, Webb 2006, 27-28). The popular explanation for the predominance of dedications to St Mary on the roads to the shrine at Walsingham in Norfolk is that they reflect the pilgrimage routes to the shrine, which is dedicated to The Assumption, but Reverend Linnel thought this was purely conjectural as only two of the churches dedicated to Mary can be definitely linked with the Assumption rather than one of her other festivals (Linnel 1962, 8).

When were churches dedicated?

Any one of the reasons noted above could have been the basis for the final selection of the dedicatee for a church, but when was this choice made? If the saint was not selected, and known by the builder, before the foundations of the church were set out, then the building could not have been laid out on the correct alignment for the patronal-saint's sunrise, and any sunrise alignment could only have been correct by chance.

Churches have apparently been dedicated to saintly figures since very early Christian times. By the end of the fourth century it was becoming usual to place the church under an additional saintly patron (Orme 1996, 4). Bede recalled a few churches dedicated to particular saints – Alban and Martin in St Albans and Canterbury; whilst in Cornwall, the first dedication recorded was to Docco, in the early sixth century (Orme 1996, 12). Certainly by the ninth century, a saintly dedication appears to have been the norm, as the Synod of Chelsea in 816 CE decreed that "when a church is built, it shall be consecrated by a proper diocesan, who shall take care that the saint to whom it is dedicated be pictured on the wall, or on a tablet, or on the altar" (Muncie 1930, 89).

Nevertheless, despite Anglo-Saxon law and Synods, many churches remained undedicated as late as the twelfth and thirteenth centuries, "probably because the ceremony of consecration became so long and elaborate" (Linnel 1962, 8). Butley Priory in Suffolk was still undedicated seventeen years after its foundation and Cirencester Abbey in Gloucestershire remained undedicated for an even longer period (Orme 1996, 5). It seems unlikely therefore, if large monastic and abbey churches could remain undedicated for decades, that parish churches would have been treated very differently. If anything, parish churches would be more likely to escape 'under the radar', perhaps with greater numbers not dedicated to a saint when originally built, although this is difficult to substantiate since few parish church records survive from before the thirteenth century. One example of a parish church which remained undedicated is at Leuchars in Fife; it was still unconsecrated 60 years after its completion in 1184 (Linnel 1962, 9). In 1237 the Papal legate, Cardinal Otho, required that all such churches should be dedicated within two years, as without it no masses would be allowed (Orme 1996, 5). This implies that the problem of undedicated churches was considered both important enough, and still widespread enough, to have required intervention at the highest level. Once dedicated, the annual patronal festival was obviously important to the church hierarchy, as indulgences were offered by the Bishop of Exeter to people for keeping them – 24 days in Exeter in 1231 and 30 days in St Buryan in Cornwall in 1238 (Orme 1996, 8).

Were dedications changed?

There are many ways in which the rededication of a church might occur. Many of these are true rededications, either at a change of owner or as part of the rise of a specific cult, but in other cases, where the modern and medieval dedications are different, the change may well have been caused by the methods used by eighteenth-century antiquarians in 'discovering' lost dedications. These methods are discussed below.

All of the factors affecting the possible choice of saint for the original dedication, noted earlier, could also apply if a church was rededicated; changes in farming patterns in the area, changes in the popularity of particular saints and cults, changes in politics and even at a change of owner, particularly in early times. The Reformation of the Church in England saw an increase in the number of changes to

dedications to apostolic saints, and to All Saints or All Hallows, that had started in the fourteenth and fifteenth centuries (Bond 1914, 191), which was seen as part of the reduction of idolatry and image worship, particularly under Edward VI, when "dedication was further marginalized" (Orme 1996, 42). These changes throughout the Reformation, and after, meant that the original dedications were gradually lost from folk memory. The reduction in the number of mentions of the name of the church in testator's wills in Derbyshire illustrates this, with indications "that perhaps by the end of the sixteenth century, church dedications were no longer part of popular knowledge" (Clark 1992, 54). A similar pattern was noted in wills around Beccles in Suffolk during the later sixteenth century all of which refer to burials only in unnamed churchyards (Pers. Comm. David Lindley, Oct 2007). The loss from folk memory of dedications is also illustrated elsewhere in Suffolk, when the new vicar at Exning in 1823 found that "not one parishioner knew the saint-name of the church" (Northeast 1995, 201).

In some churches, the political importance attached to relics, and the veneration of saints, meant that devotion to a particular figure could cause the dedicatee of the church to be altered. This "proactive use of dedications is witnessed at Hoxne in Suffolk", where dedications changed from Ethelbert to Edmund to Peter and Paul over a period of about 300 years between 800 CE and 1100 CE, "and provides a potent example of the dynamics behind the choice of the patron saint of a church" (Pestell 2004, 94). Politics also influenced cases where the dedication of a wealthy and popular chantry overshadowed the dedication of the church in which it was founded, the chantry saint's name ultimately taking the place of the original dedication for the whole church (Muncie 1930, 99). Muncie quoted examples where this was the case in the City of Cambridge, at Hitchin in Hertfordshire and at Walton and Griston in Norfolk[7] (Muncie 1930, 99-100).

Once consecrated, a church may not be consecrated again, with a few exceptions; if it was "polluted by blood", had fallen into ruins or had been almost entirely destroyed by fire (Muncie 1930, 94-95). Whether the extension of a church through the addition of an aisle required re-consecration, or just consecration of the new, previously unconsecrated, floorspace, is unclear, but in any of these situations where a re-consecration was performed, it could have included a rededication. Alison Binns, writing about churches dedicated to Oswald, notes that precise evidence for the

[7] The last two examples were cited by Muncie from Blomefield's *History of Norfolk*, Vol II, 290 & 316

year of dedication for churches dedicated to St Oswald survives only in very few cases – in 1241, 1349, 1447 and a rededication in 1287. She feels that there was "good reason" to suppose that each of these was a rededication or a new building on an old site (Binns 1995, 243) and assumed that this indicated a continuation of popularity of Oswald, but does not offer any evidence that supports an Oswald dedication before these dates.

Feastdays were also moved, without changing the dedication, in parishes where the patronal feast happened at an inconvenient time in the farming year, such as at seed-planting or at harvest time. It became normal to transfer the feast to a more suitable time of year, often around Michaelmas at the end of September, when harvest gathering in was completed (Muncey 1930, 32-33). This period is also when the later annual labouring contracts were coming to an end and is considered to be the end of the farming year, before the winter activities started for the new farming year (Kussmaul 1981). Orme quotes an example at St Dominic in Cornwall, where the feastday was allowed to be altered in 1445, from 30th August, during harvest time, to the 9th May, a slacker time in the agricultural calendar (Orme 1996, 9). In a similar vein, at Hatfield in Hertfordshire in 1226, a fair was granted for four days on the feast of St John the Baptist (24th June). In 1318 this was altered to the vigil of St Etheldreda (October 16th) and the two days following (Doggett 1989, 10). Doggett went on to speculate that the dedication of the church was changed at the same time "to give impetus to the cult of St Etheldreda" (Doggett 1989, 10), but the change also shifts a long holiday from the time of the hay harvest to an agriculturally quieter time of the year. To complicate matters further, by the time of the Reformation, fairs were only held in Hatfield on the feasts of St George (23rd April) and St Luke, an apostolic saint, whose feast was conveniently on the 18th of October (Doggett 1989, 10), and presumably more acceptable as a celebration than for a female saint. The fact that each of these revised feastdays and fairs would have indicated to the antiquarians John Ecton and Browne Willis, when collating their lists of dedications, that the church dedication itself had been altered will be discussed below, however, the church at Hatfield is still dedicated to St Etheldreda today, thus avoiding misinterpretations by Ecton or Willis.

Richard Morris quotes examples from all over the country where settlement names, with continuity since Domesday, are based on the presence of a church and its owner's/founder's name such as Baschurch, Shropshire (now dedicated to All Saints),

Colkirk, Norfolk (now dedicated to St Mary), and Offchurch, Warwickshire (now dedicated to St Gregory) (Morris 1989, 157 and the relevant *Pevsner*). The fact that these settlements were known by these names could mean that the churches themselves were not dedicated to a saint at the time. Morris also quotes two similar examples – Alvechurch in Warwickshire and Pucklechurch in Gloucestershire – but as names from pre-Conquest sources. He goes on to suggest that "it would be interesting to know who the dedicatee of the church at Pucklechurch was at this date" since it was rededicated to Thomas Becket in the twelfth century (Morris 1989, 157). This has now been truncated to just St Thomas (Verey 1970a).

Whilst in some areas of the country up to two-fifths of the parish churches appear to have been rededicated at some point in their history, it is becoming apparent that this level of change was not necessarily universal. Richard Clark has identified that forty per cent of the churches in Derbyshire have changed dedication between the sixteenth century and the present day (Clark 1992, 49-61); Nicholas Orme has showed that almost thirty per cent of the modern dedications of Devon's churches are different from pre-Reformation ones – 140 out of 482 – and even in Cornwall, where many patron saint names are preserved in the name of the village, 30 out of 218 churches (14%) are dedicated to different saints now from when the villages gained their name (Orme 1996, xii). In Kent, however, according to Alan Everitt, "very few [dedications] seem to have been altered at the time of the Reformation, in most cases they are recorded in early wills or other early documents; and in a significant number in the *Domesday Monachorum* or in other pre-Conquest sources" (Everitt 1986, 227). Other researchers do not quantify levels of rededication, for example Sam Turner in the West Country "does not rely heavily" on church dedications in his investigation of the medieval church in the west because there is "normally no way of discovering when they [dedications] were first used at any specific church" and so many of them have changed over the years (Turner 2006, 9). Despite some lower figures in other counties, it might still be assumed that the level of rededication discovered in Derbyshire and Devon was common in all areas, but Graham Jones states that "Assuming that this level of change was universal, is inaccurate" (Jones 2007, 48). He goes on to list several counties where rededication rates are far lower than in Devon and Derbyshire; particularly in Worcestershire, with "attrition rates" of less than ten per cent, rededications of just under a quarter of the churches in Leicestershire, and post-

Reformation changes in dedication in the West Midlands seem to have affected between ten and fifteen per cent of parochial churches (Jones 2007, 49 – based on TASC figures). Whether these lower rates will apply to other areas of the country remains to be seen.

Even today, 26 of the 1,926 churches in the survey for this thesis have no current dedication recorded either in Pevsner's *Buildings of England* or on the notice board, or in the porch, of the church itself. Two of these were described by Pevsner as "old church", where the original church had been replaced by a later church in the parish, leaving 24 churches, most still consecrated and used, without a dedicatee. This either reinforces the suggestion that some dedications became lost from folk memory after the Reformation and in these cases were never recovered or reinstated, or that some churches were never dedicated to a saint in the first place and these escaped the pressure of the medieval church hierarchy to rectify the situation.

Establishing lost dedications

Reference was made earlier to the work of John Ecton and Browne Willis in attempting to identify dedications that had been lost. There was a revival of interest in the eighteenth century in church dedications and Ecton, and later Willis, began to compile gazetteers of church dedications and festivals. In doing so they used the eighteenth-century parish feast dates to conjecture the date of the medieval patronal-saint's feastday (Orme 1996, 48; Jones 2007). For many reasons, not least that in many cases the feast day had been altered, and that there was confusion as to exactly what the parish feast was celebrating, these lists were inaccurate. In Devon only 54 (31%) of the known medieval dedication feasts coincide with the eighteenth-century parish feast date (Orme 1996, 48/9). Willis assumed "without exception" that the parish wake (feast) occurred on the nearest Sunday to the patronal feast (Clark 1992, 52). Clark then quoted examples in Derbyshire where the wakes took place on dates which did not reflect the medieval dedications, known by evidence from wills. The fact that Ecton had had to use wakes as an indicator of the saints day, implies that the clergy and parishioners at this time did not know the true date. Recorded by post-Reformation wills, almost all of the wakes fell between June and November, with September the peak month, an influence of seasonal activities (Clark 1992, 53). This matches well

with the attempt by Henry VIII to move the annual feast of the dedication for all churches to the 1st October from "that called commonly the church holy day" (Orme 1996, 10). This refers to the celebration on the anniversary of the original date of dedication, rather the celebration of the feastday of the patronal saint. Since a church should not have been used for Mass before it was consecrated, it is unlikely that consecration would have been delayed until the saint's feastday, so there are likely to have been two separate feast dates in most parishes. As Graham Jones put it "Patronal festivals need to be distinguished from feasts on the anniversary of [the churches'] consecration – known as the dedication festival". This may have caused confusion in later times when the date of the parish wake was taken to represent the feast of the patron saint (Jones 2007, 18).

These factors contribute to the considerable inaccuracies in the eighteenth-century lists, carried through into Frances Arnold-Forster's gazetteer in the late nineteenth century. Many writers since then have commented on the detailed local work required to establish documentary evidence of medieval dates in order to have any likelihood of establishing the original date and saint, Clark concluding "never assume continuity, unless it can be palpably proved" (Clark 1992, 54).

CHURCH DEDICATION: CONCLUSIONS

It appears that some, possibly many, churches may not have been dedicated to a saint when they were first built. Some churches have been rebuilt, and some of those may have been rededicated. Although not unusual, rededication is not apparently as common as had been thought, and Graham Jones' work argues against the previous thinking – that between a third and a half of all medieval churches were once dedicated to a different saint from their current dedication – but it still appears that at least some rededication took place in all parts of the country. Perhaps it is not unreasonable to estimate that around 20% of all churches have been rededicated since they were first built, whether their original dedication was altered intentionally by the owner or the authorities, or altered unintentionally by antiquarians anxious to provide a complete list.

Despite the possible problems that rededication might cause when assessing patronal-saint sunrise alignments, it is still important to use the large dataset provided

by the survey for this thesis to examine whether churches face specific sunrises. If the proposal that churches do face their patronal-saint's sunrise is true, then whilst the churches may not face sunrise of their current dedicatee, the range of overall alignment should reflect a pattern of saints that were popular prior to any rededication. It will also allow the results of all the earlier alignment studies to be placed in context.

EARLIER CHURCH-ALIGNMENT STUDIES

Each of the published studies of church alignment that was mentioned in the introduction to this chapter is summarised below and the main arguments and conclusions are considered and commented upon. Prior to this, a poem by William Wordsworth which mentions church alignment is analysed. Although not strictly speaking a study of church alignment, Wordsworth's poem, written in 1823, has been quoted as a source in several of the later studies on the subject, and so is discussed here as the first in chronological order.

William Wordsworth 'On the same occasion', ***The Literary Associations of Rydal Church*****, E. Jay, editor, Rydall: Armitt Trust, 1993, unpag**

This extract is from the second of two poems written to Lady Fleming of Rydal Hall entitled "On seeing the foundation preparing for the erection of Rydal Chapel, Westmorland" in 1823. This second poem was subtitled, "On the same occasion" (the second, third and fourth stanzas are quoted below).

Then, to her Patron Saint a previous rite
resounded with deep swell and solemn close,
through unremitting vigils of the night,
till from his couch the wished-for sun uprose.

He rose, and straight – as by divine command,
they, who had waited for that sign to trace
their work's foundation, gave with careful hand
to the high altar its determined place;

Mindful of Him who in the Orient born
there lived, and on the cross his life resigned,
and who, from out the regions of the morn,
issuing in pomp, shall come to judge mankind.

This poem has been quoted in earlier work on church alignment (Cave 1950, 47; Benson 1956, 206; Ali & Cunich 2001, 155; 2005, 56), but was it poetic licence? Did Wordsworth actually see this process – a vigil watching for sunrise on the feastday of the patron saint and the subsequent fixing of the position of the altar and alignment of the church – or was he converting Simon Domville's seventeenth-century idea, which uses many of the same words, into poetry? Domville's manuscript, which was sold at his death in 1678, is cited in Johnson (1912, 225), as follows:

> In the days of yore, when a church was to be built, they watched and prayed on the vigil of the dedication, and took that point of the horizon where the sun arose from the East … . I have experimented (*sic*) some churches and found the line to point to that part of the horizon where the sun arises on the day of the saint to whom the church is dedicated.

At Rydal, the theory of patronal-saint sunrise alignment actually appears to work. The church is dedicated to St Mary, and is aligned at 66º True, but with an eastern horizon elevated by 12º, thus delaying sunrise by approximately 17º, as shown in Figure 1.1 earlier, which means that to appear at the elevated horizon at 66º True, sunrise at a level (0º) horizon would have to have been at 49º True (66° minus 17°). At this latitude, this is close to the summer solstice at around the end of June. There are two feast days for St Mary at this time of year; Salutation on June 25th and Visitation on July 2nd. Unfortunately, this fairly well publicised nineteenth-century event has been seen as the proof of what had gone before and has given credence to the theory, despite the fact that the measurements here, which appear to confirm patronal-saint sunrise at this site, are the first time that such statistical 'proof' has been published for this key site. Previously it had only been taken on trust, probably based on the authority of the reporter (Wordsworth), which has been enough for some writers to be convinced that it must have been an ancient ceremony and applied at most, if not all, churches and in all periods.

However, whilst Rydal chapel apparently faces close to sunrise on one of two midsummer Marian festivals, they are not the most important ones. After the Reformation, Mary's Assumption (August 15th) was omitted from the list of festivals and her Nativity (September 8th) was then considered the most important (Friar 1996, 277), rather than her Salutation or Visitation, so why was the church not aligned with sunrise on her Nativity? The fact that it is built at rightangles to the axis of a 1 in 15 slope (6.6%), as shown in Figures 1.3 and 1.4, probably had a far greater influence in the final alignment and position of the church than any particular sunrise date. If the church had been aligned with sunrise on Mary's Nativity, when sunrise would have appeared at 100º True (Sept 8th sunrise at 83º [8], +17º horizon "delay"), it would have been aligned much closer to east, but it rotates the church 34° to the south of its existing alignment; almost diagonally down the slope, rather than along it. Building at such an angle to the axis of the slope would make the building process more difficult in terms of buttressing for twisting loads, and, equally importantly, it makes the internal

[8] See Appendix 2 for sunrise details at 55° North

liturgical layout difficult, with the chancel floor several feet lower down the slope than the floor of the nave. So even here at Rydal, where the church *is* actually aligned with one of the feastday sunrises of its patron saint, the saint's day sunrise alignment is probably coincidental and the result of other much more practical factors.

Figure 1.3 – St Mary's, Rydal – built along the 1 in 15 slope

Figure 1.4 – St Mary's, Rydal – looking up the slope

There are also doubts about whether Wordsworth actually saw the process of the setting out of the foundations at this church in the way he describes. A seven-volume anthology of the letters of the Wordsworth family enables another view to be taken. William Wordsworth, his wife Mary and his sister Dorothy lived in a house named Rydal Mount adjacent to the church site for 37 years, between 1813 and 1850. They were tenants of Lady Fleming of neighbouring Rydal Hall, with whom they fell out in May 1822 as a result of their complaints about the condition of the house (de Selincourt 1939, 71). The poem about the setting out of the church must have been written towards the end of 1822, certainly after August 6th, when Dorothy wrote to Edward Quillinan "my brother has not composed a single verse since you left us [in May 1822]" (de Selincourt 1939, 88); and before February 1823, when Mary wrote to Lady Beaumont, enclosing copies of the two poems, saying that she "hoped that they had the power of a peace offering [to Lady Fleming]" (de Selincourt 1939, 104). On November 19th 1822, in the middle of a long letter to Edward Quillinan, Dorothy wrote an apparently disconnected sentence "The church **is** to be built, in the orchard next to our field" (her underlining) (de Selincourt 1939, 98), implying that there had been some doubt about whether the church was to be built or not, and also where it was to be built. In February 1823, building work on the church had apparently still not been started as Mary, in a letter, asked Lady Beaumont "if you or Sir George could send us any hints, or sketch for a chapel that would look well in this situation, it is possible that it could be made useful through her [Lady Fleming is identified in a footnote] agents" (de Selincourt 1939, 104). In November 1823, Dorothy wrote to Catherine Clarkson "our church is near finished on the outside and is very pretty and you can have no idea how beautiful in connexion with the village, especially when seen from the other side of the Lake" (de Selincourt 1939, 126). These are the only references to the church in the published letters of this period of eighteen months.

This raises several questions about the whole building process at this site. The church was built during 1823, and the setting out referred to in the poem, if it took place at all, must have happened in late June 1822 to coincide with one of the midsummer Marian feasts.

> Firstly, if the church was to be built in the orchard, were the trees grubbed out before the vigil was undertaken so that sunrise could be seen over the horizon, effectively marking the site, or afterwards, just before building started?

Secondly, if Wordsworth had actually witnessed the vigil at the location where the church was to be built (to set its alignment), why was Dorothy later expressing surprise that it was to be built in the orchard next to the house?

Thirdly, why didn't this unusual action (Wordsworth being out in an orchard around 3:30 a.m.) feature in the letters of one of these three prolific letter writers, when many other minor events, including several mentioning the church, were included?

Although there is no reason why Wordsworth should have written the poem soon after he had witnessed the overnight vigil, it is odd that such an unusual action went unrecorded until the poem was written the following year. It seems eminently possible that this poem was just that – poetic licence – and that Wordsworth was putting in to words an idea that had certainly been around for at least a century and a half. The possibility that it is just a story is strengthened by the fact that Wordsworth himself admits to using such license in some of his poems by writing to Isabella Fenwick in 1843 that "I do not ask for pardon for what there is of untruth in such verses, considered strictly as matters of fact. It is enough if, being true and consistent in spirit, they move and teach in a manner not unworthy of a Poet's calling" (de Selincourt & Darbishire 1947, 415; Nuttall 1974, 114). However, whether it was real or not, many subsequent church researchers have treated it as an actual observation, and more importantly, as proof of a centuries-old tradition.

Shore T., 1886, 'Orientation of Churches in Hampshire', ***Walford's Antiquarian Magazine and Bibliographer 10,*** **105-108**

Shore measured the alignment of over ninety churches in Hampshire and Wiltshire. Fifty-seven named churches, plus "others", were measured as being aligned between 20° and 22.5° north of east and were described as "Saxon". Sixteen named churches, again plus "others", were aligned between 10° and 15° north of east. Both these groups, according to Shore, were aligned "east-northeast". Shore felt that this pointed either to a Celtic survival, in that this was the position of sunrise on May 1st [9] and these churches "were aligned with the sunrise on a continuation of the Celtic spring festival" [of Beltane]; or that they are part of "the Anglo-Saxon worship of the Virgin, the beginning of May being particularly dedicated to her" (1886, 108). He differentiated between these seventy-three churches, and those he described as "Norman", thirteen of which he measured "to have an east-west alignment, which is their usual direction, or

[9] In fact, the position of sunrise on May 1st at this latitude is 66° (24° north of east) see Appendix 2 p.324

are built on a line south of east" and that "I have met with no church built entirely in Norman time, or begun in that age, which has an east-northeast orientation" (1886, 97). He felt that this therefore confirmed his assertion that the churches aligned east-northeast were Saxon – and that east-northeast was the "usual line of orientation of a West Saxon church" (1886, 107).

However, eighteen churches in Shore's survey have also been surveyed as part of the survey of churches carried out for this thesis. Of these eighteen, only six alignment readings in the two surveys are within 3° of each other, six are between 4º and 10º apart, and the largest difference is 17º. The methodology for the measurements for this survey, outlined in Chapter Four, ensures consistency between readings at different churches, casting doubt on these particular measurements of Shore's, and therefore perhaps, all of Shore's readings. One of the 'Saxon' churches he described in the east-northeast group (20°-22.5º north of east) is in reality very close to due east – All Saints' Minstead (85º) − while another at Corhampton (no dedication), which he measured at "10°-15º north of east" (1886, 106), is actually aligned slightly south of east, at 92º. If the reason for the differences was that Shore did not allow for magnetic declination in his measurements, then all the readings would vary by the same amount and in the same direction, rather than by up to 9º to the south and up to 17º to the north, so it is most likely that his readings were affected either by iron in, or near, the walls, or were due to faulty equipment.

Without publishing any details, he also concluded that "the usual explanation that the line of old churches is in the line of sunrise on the day of the saint to whom the church is dedicated, does not hold good in Hampshire" (1886, 107). Shore's use of the term "usual explanation" here seems to point to a much wider knowledge of, and perhaps an on-going general discussion of, this issue. Since this study was the first published presentation of survey results in England, it strongly indicates that Wordsworth's poem was not the only earlier reference to this topic, and that it was a subject that had been considered by a wider audience, but, without any earlier measurements with which to assess it and without any apparent published discussion, patronal-saint sunrise alignment appears to have been generally accepted as the norm.

Eeles F., 1913-14, 'The orientation of Scottish Churches', ***Proceedings of the Society of Antiquaries of Scotland 48,*** **169-183**

Eeles published a survey of 62 churches in north-eastern Scotland (Aberdeenshire, Banffshire, and Morayshire), only 30 of which were medieval, or built on medieval foundations, as "so many of the ancient churches have been destroyed or rebuilt" (1913, 169). He referred to the orientation (here meaning east-facing) of churches as an "almost universally adopted practice", and noted that there were exceptions "chiefly in Italy" (1913, 169) and "in the Scottish Episcopal Church in the eighteenth century [when] orientation was impossible under the Penal Laws" (1913, 174). He stated that his intention was "not to advance any theory … but merely to give exact orientation of a group of churches" (1913, 176), but he did mention the "theorising in England" about church alignment with the sunrise on the festival of the patron saint, and went on to say "This has been vehemently denied, and with good reason" (1913, 176).

The sample of 62 churches varied in alignment between 55º and 110º, with a mean direction of approximately 83º. Almost two-thirds of them (61%) were aligned to the north of east, and while he measured eight churches as due east, he noted that three of these had "older stones" aligned to the north of east (1913, 182-183). The 30 medieval churches within the sample also ranged from 55-110º, with the same mean alignment (83º) while 63% of them were aligned north of east. He extracted twelve churches dedicated to three particular saints – Andrew, Moluoc and Drostan – and showed that churches dedicated to Andrew and Drostan varied by 45º (St. Andrew 65-110º, St. Drostan 55-100º) and those dedicated to St. Moluoc ranged from 70º to 95º. In general terms he showed that there are many churches dedicated to saints with winter festivals that had alignments to the north of east – when the sunrise is far to the south of east – and "whilst it is not possible to prove a negative in all cases … we may safely say that we find nothing here to warrant the holding of the saint's day sunrise theory" (1913, 180).

Eeles briefly mentioned the variation in the position of magnetic north over time, but erroneously assumed that the variation was regular both in period and within a specific range; and he discussed the possibility of the use of a compass in the original building of the churches, noting that "this theory is not supported by the facts, even if we could believe that the compass was known and used here so long ago" (1913, 180).

Cave C., 1950, 'The Orientation of Churches', ***Antiquaries Journal 30,*** **47-51**

The first of the modern surveys of church alignment was a compass survey of 642 churches conducted before and after the Second World War, which gave results for 633 churches. It appears to have covered much of the country to judge from the specific churches that were mentioned in the text. The alignments vary between 39° and 130°, with a mean of 86°. (The data presented in the article were amalgamated into five degree groups and the calculation of this mean is based on assumption that the original data were distributed evenly within each group). The survey included many urban churches, where Cave noted local influences on alignment, mentioning churches in Winchester and Chichester aligning with the Roman street pattern at 100-109° and 94-100° respectively, although he said that this did not appear to apply in York where his measurements varied between 39 and 125° (similar to the author's measurements noted in Chapter Five). He also noted that site restrictions had appeared to affect alignment, quoting effects on several larger churches, including Rievaulx Abbey which is orientated close to north-south because of its narrow site. This is confirmed by Anthony New, who states that "because of the steep slope, the church [Rievaulx] actually lies almost north-south". (New 1985, 312) (Measured by the author at 163° True in June 2000)

Cave also addressed the issue of alignment with sunrise on the patron-saint's feastday. He used a subset of 151 churches dedicated to St Peter, St Andrew and All Saints taken from his survey and found that "not one church aligned with sunrise on its patronal-saint's day" (1950, 48-49). For each of these saints, their patronal sunrise was outside the most extreme range of alignments. He also referred to suggestions that churches were aligned with sunset, rather than sunrise, on the feast day of their patronal saint. Again he found no evidence for this, "all the alignments for churches dedicated to St Peter fell south of sunset, whilst all the churches dedicated to St Andrew were aligned to the north of their feastday sunset" (1950, 50). He concluded that the "deviation from orientation due east" was "due to the direction of sunrise when the line of the foundations were first laid out" (1950, 50) – thus agreeing with Sir Henry Chauncy, writing two and a half centuries earlier.

Cave identified 99 churches in his survey where the nave and chancel had different alignments, which he called "skewed". The chancel was aligned to the north

of the nave in 56 cases, and 43 were aligned to the south. This aspect is considered in more detail in Chapter Five when the possibility that the different alignments represent religious symbolism is discussed. Cave felt that the "small percentage of churches with skew chancels and the way that the numbers fall off with increasing deviation shows … that the deviations were accidental, due to faulty laying-out" He went on to say that "there is nothing to show any symbolic meaning was in question" (1950, 55).

Cave also stated that he "could not make his measurements agree with [those of Shore]" but it is not clear whether he meant measurements at specific churches or that his overall results were different. Cave assumed that this lack of agreement was "because he [Shore] was not aware of the magnetic field which is found in so many churches and which may cause the deviation of the compass by many degrees". However, as already noted, Shore's results are a little suspect, but more importantly, the results of this survey will show that there is considerable variation in mean church alignment across the country, so the fact that Cave's measurements did not agree with those of Shore could easily have been because they were surveying in different areas.

Benson H., 1956, 'Church orientations and patronal festivals', ***Antiquaries Journal 36,*** **205-213**

Benson's survey of 237 churches in Oxfordshire was undertaken on the premise that there was a definite link between church alignment and sunrise on the patronal-saint's day. Specifically, he quoted Cave's earlier (and three times larger) survey, as failing to find any churches that aligned with their patronal-saint's sunrise, but suggested that this was because there are other feast days for the saints in question that Cave did not consider. In particular, Benson quoted two additional feast days for St Peter, 22nd February and 1st August; in addition to the near midsummer date of June 29th with "its extremely northerly sunrise" (1956, 206). He then found seven, out of 25, churches dedicated to St Peter that aligned with sunrise on these dates; so, even after including these additional feast days, eighteen of the 25 churches dedicated to St Peter in Oxfordshire still did not face a St Peter's sunrise.

He explained away the negative result by saying that an earlier church on the site would have "provided years of opportunities to sight the sun on the correct day" (1956, 206). This appears to ignore the fact that if there was an earlier church on the same site that was dedicated to the same saint, it would already be pointing in the right

direction, but it shifts the problem one step further back – how was the alignment of that earlier church established? If the new church was to be a rebuild and was to be dedicated to a different saint, perhaps at an early change of owner, how would the builders have 'spent years' looking in a different direction before knowing in which saint's direction to look?

The details of Benson's results were used in such a way as to assume that churches aligned in the same direction, irrespective of their current dedication, were once dedicated to the same saint, which he termed "a cluster"; for example a St. Michael cluster for churches aligned at 96° (correct for sunrise at the end of September – St Michael's day), with the assumption of, but no evidence for, a later change in dedication.

To locate the exact sunrise point at each of the churches, Benson used details of horizon elevation and the shift in dates involved in the adoption of the Gregorian calendar in 1752 (outlined earlier) and came to the conclusion that 212 of his 237 churches faced sunrise on only eleven different dates, "nine of which happen to be festivals of the Holy Church – a very significant fact" (1956, 210). Many of the details of his argument do not stand up to close scrutiny. Apart from the 25 churches that do not face sunrise on a specific date, mentioned above (237 minus 212), which were "isolated cases, or difficult to measure" (1956, 210), and the 34 churches aligned with sunrise on the two dates that are not "festivals of the Holy Church", the remaining dates of the festivals he identified are not necessarily principal ones; he uses February 22nd as a festival of St Peter (his chains), not mentioned at all in the calendar in *The Oxford Dictionary of Saints*, and as "*Petrus in cathedra in Antochia*" in Cheney (2000, 81); and he uses August 22nd as the "octave day of the Assumption" (one week later). Octave days were introduced after the seventh century for some saints' days; "among the oldest being SS Peter and Paul, St Lawrence and St Agnes, … from the twelfth century the custom was extended to observing the days in between the first and eighth days. The number of feasts with Octaves was greatly increased in the Middle Ages; they were reduced, however, by the Breviary reforms of Pope Pius V [after 1566]" (Cross 1957, 974-975). At best then, February 22nd was only a minor festival and less likely to be celebrated in place of the main feastday of St Peter on June 29th. If the intention was to align the church with the saint's feastday, why not align it with sunrise on the main feast in June? Similarly, the Octave of the Assumption, on August 22nd,

was not only unlikely to have been a celebrated event when the churches in question were first being built and their alignments fixed, but why was the church not aligned 4º more northerly, in other words one week earlier, to align with sunrise on the day of the Assumption itself? This example particularly, appears to be a case of stretching the argument to breaking point, when the real focus, if there actually was one, was so close by.

Benson's limited 'eleven festival sunrise dates' are between seven and fourteen days apart, therefore he was effectively adding together churches into 5º or 10° groups, as the sunrise point is moving along the horizon at almost 5º per week around the time of the equinoxes. This amalgamation of results runs counter to the whole tenet of his paper which extols the need for accuracy by taking detailed note of calendar changes and horizon elevations. Further examination of some of the other details in Benson's study highlights other areas of concern; in particular, the data he quoted for churches dedicated to St Peter where Cave "failed to identify alignments" (noted above). Of the four churches that Benson stated faced sunrise on the minor festival of St Peter on 22nd February (1956, 206-207), three were measured as part of this thesis. Drayton St Peter, South Newington St James and Wilcote St Peter are all aligned at 103º True, which is close to the expected level-horizon position of sunrise on 22nd February (details of sunrises shown in Appendix 2). However, the church at Wilcote faces an eastern horizon elevated by 1º, South Newington faces a horizon elevated by 4º and Drayton's is elevated by 8º. This has the effect of delaying the sunrise at each of these sites, as shown in table 1.1 and Figure 1.5 below. This means that the church at Wilcote actually faces sunrise on 27th February (rather than 22nd February), South Newington faces sunrise on March 8th and on March 16th at Drayton (three weeks after the St Peter's feastday), effectively removing all three from Benson's "St Peter cluster". In order for these three churches to be aligned with the rising sun on February 22nd over their elevated horizons, they would need to be aligned at approximately 105º, 109º and 115º respectively (Drayton's sunrise details are shown in Figure 1.5). Notice also that the church at South Newington (dedicated to St James) is only in Benson's group because of its similar alignment to the others – Benson offered no evidence for any rededication from St Peter, other than its alignment – perhaps St Felix (March 8th) would have been a more applicable dedication here.

Table 1.1 Benson's survey - sunrise and St Peter						
	Church Align-ment	Sunrise date – level horizon	Actual Horizon elevation	Delay of sunrise (to nearest degree)	Actual sunrise date (at 103°)	Alignment required for 22nd Feb sunrise (to nearest degree)
Drayton St Peter	**103°**	**22nd Feb**	**8°**	**12°**	**16th Mar**	**115°**
S. Newington St James	103°	22nd Feb	4°	6°	8th Mar	109°
Wilcote St Peter	103°	22nd Feb	1°	2°	27th Feb	105°

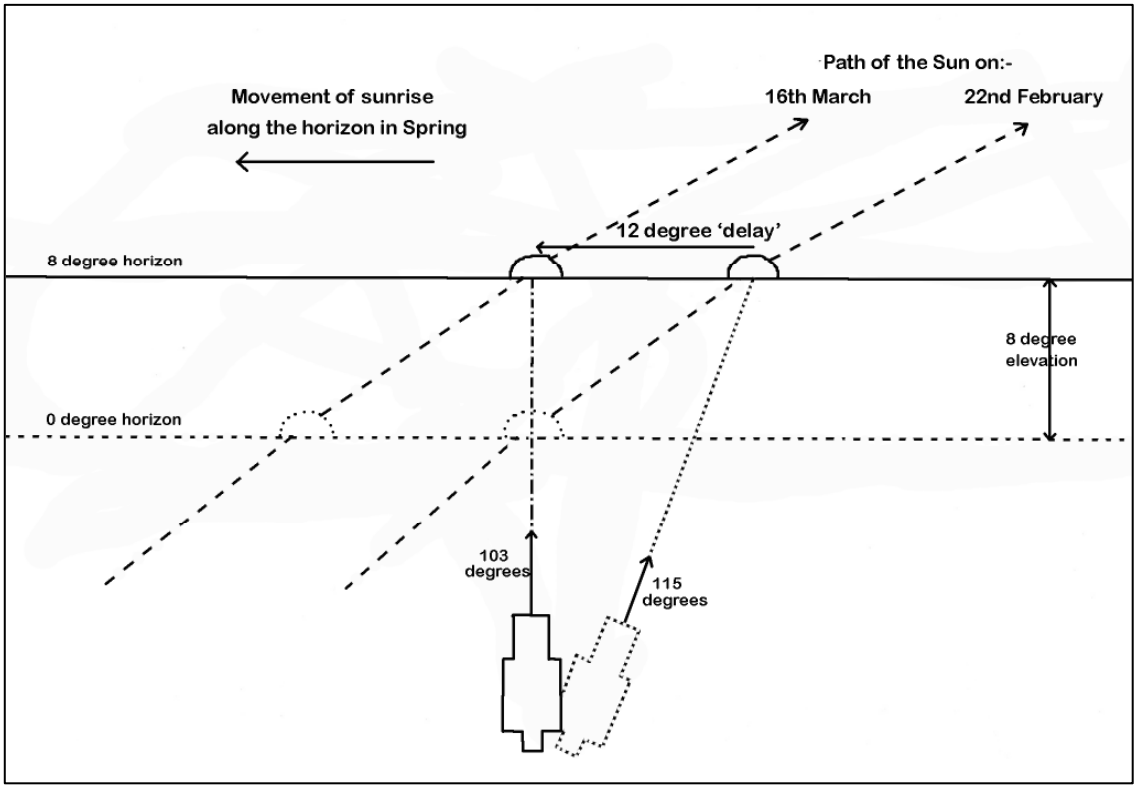


Figure 1.5 – Sunrise movement and elevated horizon at St Peter's, Drayton, Oxfordshire – aligned with sunrise three weeks later due to the elevated horizon

Benson dealt in depth with churches that had naves and chancels with different alignments – which he called "crooked churches" – and he treated them as an extension to his patronal-saint alignment argument. He explained the difference in alignment between nave and chancel by the movement of sunrise due to calendar change and that a later rebuild, particularly when chancels were lengthened or rebuilt after the Fourth Lateran Council of 1215, was still aligned with the patronal-saint sunrise, which had moved slightly along the horizon. He suggested that feast days in the first half of the

year, when sunrise is moving northwards from the extreme south of midwinter sunrise, require a sunrise correction to the north and *vice versa*. Where this idea did not fit, as with the three churches where the nave and chancel are misaligned "by 4° or 5º ", Benson acknowledged that for these churches this was "far too much for the requirements of the Julian calendar [shift]", and concluded that "this must indicate a change of dedication" (1956, 212) – another example of fitting the data to the assumption.

Searle S., 'The Church points the way', *New Scientist,* 3rd Jan 1974, 10-13

Searle was the first to consider seriously the possibility that churches had been set out by magnetic compass, and that the known movement of magnetic north over time explained the variation in church alignment. His sample was very small and included only nineteen churches, but he concluded that there was a direct correlation between date of building and the alignment of the church reflecting the changes in the position of magnetic north. Unfortunately, Searle dated four of these churches because they fitted in a particular place on his alignment curve – "author's dating, within the century the church was said to have been built, as indicated by its orientation" (1974, 11, table 1 footnote) – thus using a circular argument to position them. The small sample of churches only had a range of alignments of 23° (with magnetic north between 5° west and 18° east of true north) rather than the range of 90° difference in alignments observed in the larger surveys. Magnetic variation is discussed in greater detail in later chapters, but the lack of scientific rigour in Searle's study means that his conclusions can be safely set aside.

Davies R., 1984, 'Church Orientation in Rutland', *Rutland Record Vol. 4*, 142-143

In 1984, Davies, with sixth form students at Oakham School, undertook a compass survey of the 46 churches in Rutland. Converting his magnetic survey results to true bearings, by deducting the local declination at the time (6°)[10], the churches ranged between 57° and 108°, with a mean of 85°. His starting hypothesis was that the alignment of the chancel coincided with sunrise on the saint's day to which the church is dedicated, but he found "no correlation" in the results.

[10] http://geolab.nrcan.gc.ca/geomag/e_cgrf.html (accessed 15th April 2002)

Abrahamsen N., 1992, 'Evidence for Church Orientation by Magnetic Compass in Twelfth Century Denmark', ***Archaeometry 34 (2)*****, 293-303**

Abrahamsen's survey included 572 twelfth-century churches in Denmark. His particular interest was magnetic changes, and initially the survey was conducted from early maps. A sample of 204 of these churches in two districts was measured on the ground using a compass. The results for the different areas are shown in table 1.2 below. Abrahamsen discounted the accuracy of the measurements from maps due to the magnetic bias of many of the eighteenth-century maps, which confused magnetic and true North and appeared to rotate the churches clockwise, in other words, align them even further to the south of east.

He mentioned three studies in Germany and Denmark carried out in the nineteenth and early twentieth centuries which proposed that churches were aligned with patronal-saint sunrise, but found that "typical results are a normal distribution, symmetrical around 0º " this would be "hard to explain, as saints days are scattered all over the year and no biased orientation would result" (1992, 300)

Much of the article is concerned with trying to extricate statistical patterns from the alignment data. In the two areas he measured on the ground, Thisted and Aarhus, there appeared to be two different underlying patterns – in Thisted particularly – which he suggested could have been caused by different methods of setting out. The histogram for the alignment of churches in Aarhus appears to be far more regular – almost a bell-curve. He found that the simplest explanation for the clockwise rotation of the alignments "appears when comparison is made with the general magnetic declination in the Danish area, being systematically east of north between 1000 CE and 1600 CE" (1992, 301). He noted "that the mean direction of [English] churches of all periods was approximately 85º", and wondered whether "[the] UK magnetic declination of a few degrees west during the fourteenth century provided a possible magnetic explanation for the difference in orientation from the Danish churches" (1992, 294). Magnetic changes and the effect that this might have had on church alignment are discussed later in Chapter Six. What Abrahamsen did not take into account, however, was that during the eleventh, twelfth and thirteenth centuries magnetic declination in England was to the east of north (Clark *et al*. 1988, 659; Merril *et al*. 1996, 3), the same as in Denmark, though slightly less extreme, so is unlikely to explain the difference.

He concluded that "some churches were probably laid out by sun or stars … … the remaining strongly rotated group may have been laid out using a magnetic compass" (1992, 302). He felt that his results "indicated a fairly common use of the magnetic compass soon after its appearance in Europe" (1992, 303).

Table 1.2 – Summary of Abrahamsen's Danish survey results				
Measured on the ground				
Area name	Number	Range	Mean	% N of East
Thisted	88	78-120°	97.3°	25.0
Aarhus	116	68-116°	91.8°	40.5
Mean	**204**		**94.2°**	**33.8**
Measured from Maps				
Mean	368	58-140°	98.8°	26.1
OVERALL	572		97.2°	28.8

Dymond D., 1997, 'Churches and Churchyards', ***Historical Atlas of Suffolk*****, D. Dymond (ed.), Suffolk County Council, 54 &197**

Dymond undertook a survey of 23 churches in the Thedwastre Deanery in central West Suffolk, measured from 1/2500 scale maps, using a "best-fit" line to represent the alignment. The alignments ranged between 69° and 103°, with a mean of 86°. Sixteen were north of east and seven south of east. Little variation was noted in alignment between churches of different sizes, or in those that had different floorplans. Similarly, there was little difference between the alignments of churches that were mentioned in Domesday (85% of the total) and those not mentioned: 85.9° and 86.5° respectively.

Hoare P. & Sweet C., 2000, 'The Orientation of Early Medieval Churches in England', ***Journal of Historical Geography 26 (2)*****, 162-173**

Hoare and Sweet's survey, consisting of 183 churches with substantial elements of visible Saxon or Saxo-Norman fabric identified in The Taylors' *Anglo-Saxon Architecture*, produces a mean alignment of 88°, with individual churches ranging between 42º and 128º. The results were analysed by Saxon sub-periods and indicated similar results irrespective of period, from the earliest 'A' period (600-800 A.D.) at 88°, to 87° for the latest, Saxo-Norman, period (1066-1116). This result firmly shows that any variation in the alignment of churches is not related to the period in which they

were built. Their mean result was approximately 2° above the mean of 86° from Cave's larger survey, but their sample excluded large areas of the west of the country which have no extant Saxon buildings (2000, 165), areas which, as the analysis of this survey will show, contain churches which exhibit a numerically lower mean alignment. They discuss the possible use of the compass in the setting out of the churches, but discount it on the basis that magnetic east was well to the south of true east during the Saxon period, and this would have resulted in churches aligned considerably further south than they are (2000, 167). They also conclude that the "time-honoured support for the various sunrise models is misplaced (although an occasional building may have been so aligned)" (2000, 168).

There were few churches with different nave and chancel alignments measured in this survey – which they called "crooked" – as the survey was only concerned with elements of surviving Saxon fabric, and few churches had both a Saxon chancel and nave. The few that did have both were dealt with by taking an average reading for both parts if they fell into the "crooked" category.

Ali J., & Cunich P., 2001, 'The Orientation of Churches: Some New Evidence', *Antiquaries Journal 81*, 155-193

Ali and Cunich's survey investigates the alignment of 143 large parish and Monastic churches with known dedications that were built between the mid eleventh and late twelfth centuries. They conclude that 33 (almost a quarter) of these churches were aligned with sunrise on the day of their patronal saint. However, they also conclude that 28 others were aligned with their patronal-saint's day sunset; 37 were aligned with Easter sunrise; 25 were orientated east-west; twelve were aligned with magnetic east; five were aligned for topographical reasons; 31 were aligned with Julian calendar sunrises or sunsets and only 20 of the sample of 143 were unclassifiable. This would seem almost to be a return to the 1960s, when alignments were 'discovered' in every direction (such as at Stonehenge – see Chapter Three), and importance was given to the fact that an alignment match existed, without investigating whether it had any significance, or had occurred through chance. No explanation was offered as to why different church builders might have employed so many different alignment formulae.

Muirden J., 2003-5, 'Crooked Churches and Saintly Sunrises', *Church Archaeology 7-9*, 33-43 (published 2005)

No church alignments were included in the article for the 194 churches surveyed, the data had been converted to sunrise dates; but an unpublished interim version of the survey shows data from the first 49 churches surveyed in the range 46° – 123º, although there are no rural churches with alignments to the north of 52º, the two churches aligned at 46º being located in Exeter[11], apparently aligned with the Roman street pattern.

Muirden adopts Benson's earlier methods [of deducing the dedication of the church by the sunrise direction it faces] "because his results were so impressive" (2005, 33). Since "fewer than one-fifth of Devon churches have a dedication record pre-dating 1300, the number that can be traced back to Norman times is tiny", he states the subject has to be tackled from the "opposite direction" (2005, 35). This involved "determining their alignment sunrise data, to see if [this] suggests any favoured festivals" (2005, 35). According to the table of results, (2005, 35) none of the 194 churches surveyed faces sunrise between May 10th and August 4th, or between November 25th and January 18th, a total of 20 weeks, amounting to almost 40% of the year. During these 20 weeks, there are only six days when no principal saint's feast is celebrated – July 12th, Nov 26th, December 2nd, 19th and 20th and January 11th (as recorded in the feastday calendar in Farmer 1987, 474-478). This period is when the sunrise is closest to north-east or south-east, rather than due east, and includes the major feastdays of several of the most popular current dedications – John the Baptist, Peter, Peter and Paul, Margaret, Andrew, Nicholas and John the Evangelist. If the theory of patronal festival sunrise alignment was true, then these major festivals should have at least some churches aligned with their sunrise. All of this also assumes that churches were originally dedicated to a specific saint when they were first built, as was discussed earlier in this chapter.

Muirden deals with churches with different nave and chancel alignments – which he calls "crooked" – in detail. There are 53 such churches in Devon and he extends the proposal that churches face their patronal-saint's sunrise in order to explain such churches by suggesting that differences in alignment between nave and chancel reflect calendar drift during the period between the building dates of the two parts of

[11] Pers Comm. James Muirden - Interim version of the survey received July 2003

the church; usually a later chancel built on a new alignment to maintain its alignment with the shifted sunrise of the original patronal festival. In nine cases this proposal was stretched to the extreme to include churches where the nave and chancel walls *were* built parallel to each other, but the east wall of the chancel was not built at rightangles to the north and south walls (2005, 36-37). It was assumed in these cases that a line at rightangles to the east wall of the chancel was aimed at the shifted sunrise.

He identifies a concentration of churches "that share a popular sunrise window" (2005, 41), and he notes that Benson found a similar group "for which he presented a persuasive argument … that they faced sunrise on the Octave day of the Assumption, though there seems to be no discernible reason why this festival should attract more reverence than the Assumption itself" (2005, 41). His final conclusion is that "If churches were carefully aligned on their patronal sunrise, then analysis … could throw light on matters beyond the scope of present orthodox research, since their original patron saint and approximate date of foundation could be deduced" (2005, 41).

Ali, J. & Cunich, P., 2005, 'The Church East and West: Orienting the Queen Anne Churches 1711-34', ***Journal of the Society of Architectural Historians 64,*** **56-73**

This article starts by reiterating the statistical significance of the patronal-saint sunrise alignments, as well as the Easter Sunday and patronal-saint sunset alignments, discussed in their earlier article on large churches (Ali & Cunich 2001, 155-193).

The basis for this study was eighteen eighteenth-century churches which "the Church Commissioners and [major architects] thought ought to be aligned east-west", but whose actual alignments range between 57º and 115º. Their investigation of individual sites and church dedications shows that "sun control can be largely discarded as the principal control … for [the alignment of] Queen Anne Act churches" (2005, 66). Sir Edmond Halley was appointed to the Church Commissioners in 1712, and the authors thought it "inconceivable that he would not have offered the practical solution of declination-corrected compass bearings to determine the geographic axes of the church sites" (2005, 67). Their conclusion, for these eighteen churches, which vary in alignment by up to 58º, is that "in all cases an easterly alignment was achieved". Further, that "there is a considerable gap in our knowledge of the underlying architectural precepts in common usage during the [medieval] period. That such knowledge had already been lost when Wren commenced his rebuilding … seems

almost certain" (2005, 70). As can be seen from the results of the survey of Victorian churches shown in Appendix 1 of this thesis, the overall alignments of medieval churches and those of the Victorian era are, apart from a small number of churches, very similar, so it is difficult to see what knowledge had been lost.

One of their final conclusions is that "It has always been assumed that an east-west alignment was important in church building, we now have quantitative information with which to amplify that assumption" (2005, 71). This does seem a little presumptuous from a sample of eighteen churches whose alignments vary by such a large amount.

Wall J., 2006, 'Church Orientation', ***Bulletin of the British Sundial Association 18(i)*****, 16-17**

As might be expected from the name of the journal in which it was published, this was not a survey of churches, but the article refers to seventeenth- and eighteenth-century sundials, particularly those that are set at an angle to the church wall (canted-out), or had offset (or declining) gnomons, in order to compensate for the poor east-west alignment of the churches involved. Whether or not this was likely to be due to an improved ability to measure east accurately at the time of the creation of the sundial was not explored.

Figure 1.6 – Sundials compensating for the poor east-west alignment of the church - "canted-out" at St Mary's, Gilcrux, Cumbria (church @ 64°) (left), "offset gnomon" at St John's, Ickham, Kent (church @ 108°) (right)

Table 1.3 – Summary results for each of the surveys discussed in this chapter					
SURVEYS in U.K.	**Location**	**Number of churches**	**Range**	**Mean**	**% aligned North of East**
Shore	Hampshire	90+	See text		
Eeles	Scotland	62	55-110º	**83º**	62
Cave	England	633	39-130°	**(86°)**	63
Benson	Oxfordshire	229	45-117°	**83°**	72
Searle	Various	19	See text		
Davies	Rutland	46	57-108°	**85°**	65
Dymond	Suffolk	22	69-103°	**86°**	69
Hoare & Sweet (Saxon)	England	183	42-128°	**88°**	60
Ali & Cunich (Monastic)	England	143	49-163°	**90°**	51
Ali & Cunich (18th C)	London	18	57-115º	**87º**	63
Muirden	Devon	49(see text)	46-123º	**86º**	58
TOTAL		**1,386**	**39-130°**	**86.0°**	63
This survey		1,926	38-128º	86.1º	63
Surveys elsewhere					
Abrahamsen (Denmark)	Thisted	88	78-120°	97°	25
	Aarhus	116	68-116°	92°	40
Mean		204		94°	34

CHURCH ALIGNMENT STUDIES: CONCLUSIONS

In terms of the data they employ, some of the earlier alignment studies outlined here are better than others. Some leave accuracy to be desired and others seem to have allowed the stated aims of the work to influence their conclusions. As an overall body of work however, the results seem to indicate that the raw data have real value as the sample size grows, in that the bottom-line results of all the surveys added together exactly match those of the survey for this thesis, with an identical range of alignments, the same mean value and the same proportion of churches aligned to the north of east. What all these surveys do seem to confirm is that there was a general focus for church alignment which was close to east, as each of the studies exhibits a mean value a few degrees to the north of east (bar one, which was exactly east). The details will be more closely examined in later chapters.

Wordsworth's poem about sunrise on the saint's day at Rydal church has been used as the proof that the method must have been used before, and has given credence to the theory, which seems to have convinced some writers that it must have applied at most, if not all, churches in all periods, despite the obvious evidence to the contrary and Wordsworth's own admission about his use of poetic licence. The fact that some churches do face sunrise on the patronal-saint's feastday does not mean that they were actually meant to. Some churches are bound to face sunrise on their patronal-saint's day, purely by chance, since only eight (0.4%) of the 1,926 churches in this survey are aligned outside the sunrise arc during the year for their location. With a maximum of only 80º between midwinter and midsummer sunrises in much of England, and almost 2000 churches surveyed for this thesis, it would statistically remarkable if none at all faced the relevant sunrise.

Benson's work appears to be founded on minute accuracies involving Julian date alterations; discussions of whether the upper limb, the half orb or full orb of the sun should be used for assessing the exact moment of sunrise; and the elevation of the horizon. However, he then proceeded to generalize the results by amalgamating the data into 5º or 10º groups and concluded that almost all of the 229 churches that he surveyed face sunrise on only eleven specific days, most of which conveniently correspond to particular saints' feastdays. As has been shown, some of these dates are at best doubtful as celebrated festivals, and others seem to ignore the impact of the

elevation of the horizon which had been so carefully considered earlier in the article. Muirden supports the majority of Benson's methods and conclusions and criticises others for "wholesale methods of analysis [which] may have served to conceal, rather than reveal, the case for patronal saint sunrise" (2005, 41), but analysis to substantiate an argument of this sort, which both Benson and Muirden claim applies to most churches, requires the broader picture, rather than just the investigation of a small sample of individual churches that happen to fit the criteria.

Identifying a group of churches that face the same direction, but are dedicated to different saints, and concluding that they must have originally been dedicated to the same saint because of their alignment, seems little better than the circular argument used by Searle, noted earlier, to date churches by their alignment, and is one way of ensuring that the proposal that churches faced their patronal-saint sunrise is true. In fact, based on the results of all the other surveys, it is the only way that it can be true; patronal-saint sunrise alignment will always be very difficult to prove when the results of the other surveys noted here have shown, and the results of this survey will show, that the great majority of churches are aligned close to east.

It is just possible, as Muirden argues (2005, 39-41), that "crooked" churches represent realignments in order to continue to align with a specific sunrise as the calendar shifted in relation to the sun, and those misaligned to the right are dedicated to summer saints, and those to the left to winter saints. But since this idea is based on dedications that can often no longer be traced and that the whole idea of saint's day sunrise alignment does not appear to be supportable, then the simpler idea that this pattern represents a desire to face closer to east seems far more attractive and will be shown by the results in this survey in Chapter Five to be far more likely. It also ignores the obvious fact that some of the churches that have chancels that are misaligned to the right (which according to Muirden must have been dedications to summer saints) are aligned well south of east and therefore aligned towards sunrise during the winter months, so the realignment is in the wrong direction taking it even further away from the sunrise of a summer saint. Similar cases exist of churches with chancels misaligned to the left, therefore dedicated to winter saints according to Muirden, but are aligned towards summer sunrises, so are also realigned the wrong way.

Abrahamsen's reference to the differences in magnetic declination between England and Denmark cannot explain the difference in the alignment of English and

Danish churches. He referred to the westward declination in England during the fourteenth century, but this was only for a very short period, and for at least 500 years before this magnetic declination in England was to the east of north, the same as in Denmark, though slightly less extreme.

The fact that the results of the surveys noted here are very similar in the patterns of alignment that they exhibit has led the majority of the authors to similar conclusions – that the general focus for church alignment was just north of east and that some of the theories suggesting specific targets for church alignment could not be supported. The similarity of their results also lends weight to each of them in that none is glaringly different, although there are minor differences between them in different areas of the country which will be explained by the analysis of this much larger survey in later chapters. Two of the authors, Benson and Muirden, have used their data to arrive at a very different conclusion – that patronal-saint sunrise alignment is not only supportable, but probable – this will be examined more closely in the analysis of this survey's results in later chapters.

CHAPTER TWO

THE HISTORICAL USE OF ALIGNMENT

Each generation has the Stonehenge it deserves – or desires
(Jacquetta Hawkes 1967, 174)

INTRODUCTION

This chapter outlines the issues that will be considered in more detail later when applying the results of this survey to the alignment, and particularly the location, of churches. It considers the background to the use of alignment generally in history and prehistory by identifying the objects and features that have been assumed in the past to have had intentional alignments and explores the significance that has been placed on them.

Alignment appears to have been part of most aspects of prehistoric life; from the houses that people lived in, the monuments associated with the ceremonial and ritual aspects of their lives, and even after death – from the tombs or memorials in which they were buried to the specific ways that their bodies were laid out in the ground. Not all of these aspects necessarily applied at the same time, but examples can be found from the Palaeolithic period, through the Neolithic, Bronze and Iron Ages, the Roman and post-Roman periods, and right up to modern times, especially in relation to death, burial and worship. Alignment has also been recently considered as part of some fringe mystical aspects of modern life, such as ley lines and orthotonies (lines along which UFOs were believed to appear).

Jacquetta Hawkes' comment, quoted above, could probably apply to many other monuments as well, but at Stonehenge, interpretations have ranged from a Pagan Temple – Aubrey (1693), a Druidic temple – Toland (1726), a solar observatory – Lockyer (1909) and Somerville (1927), a hub for ley-lines – Watkins (1925) to a lunar eclipse predictor or computer (amongst other things) – Hawkins (1966) and Thom (1967), or even the possibility that it was just built as an offering to the Gods and had no practical function – Johnson (2008, 254).

Research work is always open to reinterpretation, especially when new evidence is discovered; when research methods change and improve; when new methods of analysis are invented or developed; or the focus of investigations changes. It is also open to reinterpretation if faulty research methods or assumptions are made, or if relevant data are ignored because they do not fit the original presumption. Some of the Stonehenge interpretations noted above have been disproved or altered by later researchers by tightening research criteria and exploring all aspects, even those that do not apparently fit the required pattern. These last aspects were used particularly by Williamson and Bellamy (1983), Ruggles (1999) and Burl (2000), when examining aspects of previous work in their area of study which will be covered in more detail below.

ALIGNMENTS

In the following sections, each type of subject noted above – houses, monuments, tombs and burials – will be considered in turn, roughly chronologically within each. In some instances the alignments are towards objects in the sky, such as the sun, moon and stars; in others the alignments are towards other objects on the ground; and in other cases it is a combination of both, for example in the situation when the moment of sunset combines with a topographical feature on the horizon. Since in each of these cases it is the alignment itself which appears to have been important to the builder, they are all discussed together.

1) Houses

In the Bronze Age and later, most houses were circular, the majority having their entrances facing eastward, mainly due east, perhaps evoking a cosmological metaphor for the house and the universe (Bewley 2003, 88; Parker Pearson 1993b), where east was associated with light, warmth, life, and good, while west was associated with the opposite in each case (Parker Pearson & Richards 1994, 50). From a practical point of view, however, a southeast-facing doorway, rather than an east-facing one, would allow in far more midwinter light at a time of year when light was short-lived. It has also been suggested that an east-facing door was used to face away from prevailing southwesterly winds (Bewley 2003, 88), also proposed by Pope, with a sample of 690 prehistoric houses from 253 sites in north and central Britain (Pope 2008, 19-20) where

the large majority have entrances facing eastwards, which was attributed to a combination of the maximization of light and winter shelter from the wind. Pope felt that houses that did not face this way in the survey were revealing the importance of local topography in those cases (Pope 2008, 20).

2) Monuments

Prior to the appearance of cursuses there is little to suggest that Neolithic builders were concerned with precise layout at all – "houses, barrows and causewayed enclosures were all less than regular and displayed little sense of alignment" (Loveday 2006, 114). Good indications of this are the Neolithic 'Long mortuary enclosures', of which Loveday shows 42 examples in a diagram, distributed across much of the Midlands and East Anglia, which are aligned towards every point of the compass (Loveday 2006, 55-58). However, recent work at the Ness of Brodgar on Mainland, Orkney has discovered elements of alignment involving a large stone building located between the Stones of Stenness and the Ring of Brodgar which "is aligned on the Maes Howe cairn" (Catling 2009, 6) although, as Maes Howe is almost due east of the building, it cannot be certain which was the target – Maes Howe or east – but there does appear to have been a purposeful alignment.

Cursuses, by virtue of the nature of their linearity, possess an obvious capacity for alignment with distant features. Unlike long barrows, however, the 'business end' is more difficult to establish, so there are "no indications as to which of the two opposing alignments was considered important" (Loveday 2006, 132). In addition, they were overwhelmingly constructed in flat gravel landscapes "where skyline features were few and decidedly unimpressive … but where it is certain some stars will fall into line" (Loveday 2006, 132). Several cursuses are associated with rivers, particularly river confluences (Loveday 2006, 133). Excavating at Maxey in Cambridge, Francis Pryor found the cursus alignment there was manifestly illogical, aligned diagonally across an island which was later more practically divided by field boundaries at right angles to the waters edge; perhaps it was originally aimed at the River Welland, but the end was obliterated by the movement of the river (Pryor *et al.* 1985, 17-21). There has also been discussion about the length of time that cursuses were in use and it is difficult to tell when they were superseded. When henges were built, they were "usually" located some distance from cursuses (Harding 2003, 89-90), but at Dorchester a henge was built

alongside the cursus (Harding 2003, 89), while at Maxey the henge there was built over the cursus (Prior *et al*. 1985, fig 40), which presumably prevented its subsequent use completely.

Loveday refers to the heavens as "a bran tub from which orientation can always be plucked, if the rising points of the sun and moon are too constrained, there are myriad stars to choose from" (Loveday 2006, 137). He goes on to say that claims for the Dorset cursus as an astronomical observatory (by Penny & Wood in 1973) are difficult to accept, as some elements of their observatory were not fixed. In addition, their claims for meaningful alignments for one part of the cursus were not reflected in the other arms of the same complex, which had no significant alignments at all (Loveday 2006, 137). There are other cursuses which are close to significant solar alignments, but "wilfully miss them" (Loveday 2006, 138), for example "the western section of the Dorchester cursus aligns broadly with midsummer sunset/midwinter sunrise, but it is awkwardly realigned halfway along its length, which is in itself odd, as the builders seem to have an impressive ability to build lengthy straight lines" (Loveday 2006, 138), although Barclay and Harding note that on occasion cursuses have only one ditch that is straight, the other meandering slightly (1999, 2-3). Other cursuses, at Maxey, Fornham, Buscot and Scorton are all aligned in a similar direction, roughly northwest/southeast, but also "miss the significant midsummer sunset/midwinter sunrise solar alignment, and the adjacent moonset alignments, by a few degrees" (Loveday 2006, 138). There are also a significant number of cursuses aligned north/south, for example at Rudston in East Yorkshire (Harding 1999, Fig 3.1 page 31), both of which are points where neither sun nor moon ever rise or set so make unlikely alignment focuses. There is a possibility that all these sites which are not aligned with the sun or moon are aligned towards a star, or group of stars, but since it is very difficult to see even the brightest star rise (Loveday 2006, 139), a point that is also emphasised by Ruggles (1999, 52) and Burl (2000, 205), a stellar alignment has to reflect a star's transit rather than its rising or setting, which basically means that such an alignment could point to a wide arc of the sky whilst the star or group is above the horizon, making conclusions about the target impossible. Another difficulty is that due to polar motion, the position of the stars in the sky changes, varying by up to 22º in 1500 years (Ruggles 1999, 52; Burl 2000, 24), thus altering the night sky completely.

Loveday finally downplays the whole idea of intentional alignment of cursuses and avenues by concluding that "The fact that cursuses really were the first monuments to override regional patterns of construction and adhere to a type recognizable from Devon to Dumfries is of hugely greater significance than ultimately irresolvable questions about how precisely they were used" (Loveday 2006, 143).

3) Megalithic Monuments

Megalithic monuments are the features about which most has been written on the subject of alignments. The comments by Jacquetta Hawkes concerning Stonehenge, quoted at the beginning of this chapter, are mirrored by an assessment by Aubrey Burl of the descriptions of the monument at *Calanais* on the island of Lewis in the Hebrides, with similar uses and properties ascribed to the monument by various writers over the last 300 years to those at Stonehenge (Burl 2000, 202).

Many, if not most, of the alignments described as significant by writers such as Gerald Hawkins in *Stonehenge Decoded* (first published in 1965) and Alexander Thom on 'Megalithic Astronomy' during the 1960s (Thom 1967 and 1971) have been reassessed, and largely dismissed, by Clive Ruggles in 1999 in *Prehistoric Astronomy in Britain and Ireland*, and Aubrey Burl in the 2000 revised edition of *The Stone Circles of Britain, Ireland and Brittany*. Burl points out that astronomy is one of the most contentious aspects of the study of stone circles, and in the absence of evidence, modern man is denied "the likelihood of rediscovering the cosmology of the early people" (Burl 2000, 117-118), something which Ruggles refers to as a "search for lost knowledge" (Ruggles 1999, 3). Ruggles suggests that the difference of opinion between Archaeologists and Astronomers about the meaning of monuments arose because of "parallel but very different views of the same monument" and as simply seeing their own reflection in the past (Ruggles 1999, 8). During a prolonged discussion since the 1970s, each side has "largely argued past the other, starting from different tenets, addressing different aspects of evidence, using different methods, and has come to very different conclusions" (Ruggles 1999, 9).

Gerald Hawkins arrived at two major conclusions in *Stonehenge Decoded*. Having identified several sun-based alignments, he wondered what other alignments might exist. To do this he decided that "we need the machine" (Hawkins 1970, 127-

128). Using an early IBM mainframe computer, a total of 120 pairs of points were assessed for azimuths and declination (1970, 136-137). This resulted in multiple alignments towards sun rise/set and towards the rising and setting moon in its extreme positions (1970, 140), but even with the computer, only fifteen of the eighteen possible alignment positions were identified (1970, 171).

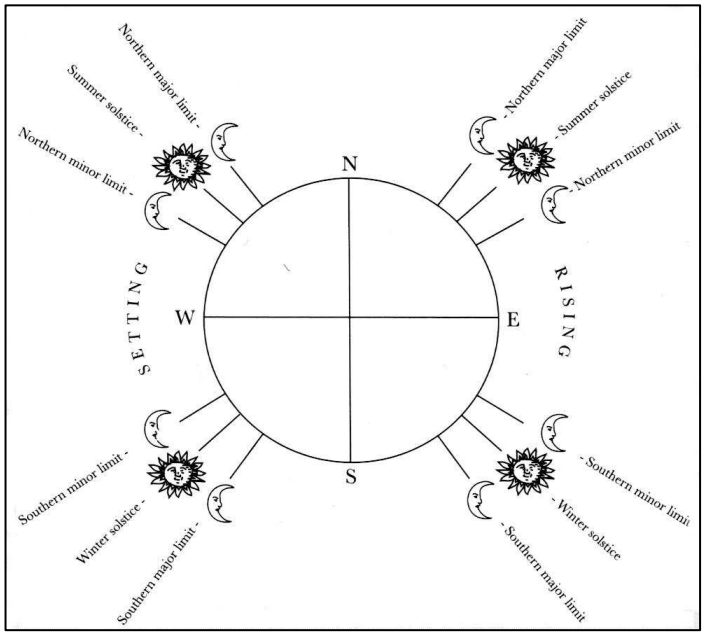


Figure 2.1 – Twelve of the eighteen major sun and moon positions (Ruggles 1999, 37)

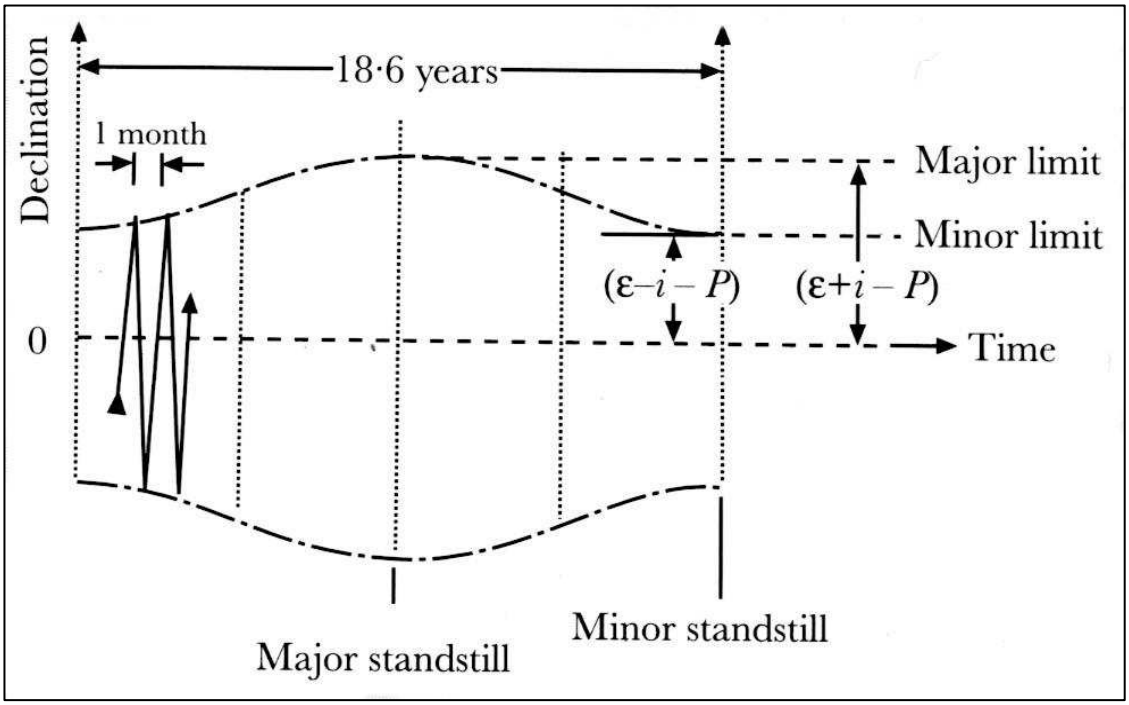


Figure 2.2 – The 18.6 year lunar cycle (Ruggles 1999, 36)

The second conclusion was that Stonehenge was used as an eclipse predictor. Hawkins wrote "There can be no doubt that Stonehenge was an observatory; the impartial mathematics of probability and the celestial sphere are on my side" (Hawkins 1970, preface), but as Ruggles demonstrates, errors in Hawkins' mathematics reduced the chances of Stonehenge being an eclipse predictor to worse than evens (Ruggles 1999, 42-43). Due to the way the moon moves around the Earth, it can only be eclipsed when it is opposite the sun, in other words at full moon, and only then in the years when it is at the extreme ends of the range of rising and setting (when it is on the same plane as the Earth's orbit around the sun, known as the ecliptic) (1970, 176). According to Hawkins, the 18.61 year cycle of movement of the rising and setting positions of the moon is most accurately made up of three figures – 19, 19 and 18 years – totalling 56, the number of Aubrey holes at Stonehenge, and that by the movement of six stones around the Aubrey holes in a certain way, Stonehenge "could have predicted – quite accurately – every important moon event for hundreds of years" (1970, 178).

Alexander Thom proposed a consistent unit of length – the megalithic yard (2.72 feet) – which he said was in use in the Neolithic and Bronze Ages for the erection of stone monuments over a wide area (Thom 1967, 34-55). He also coined the term 'Megalithic Astronomy' which involved the use of stone circles as indicators of sun, moon or star rising and setting points. Apart from detailed claims that they were used for identifying the solstices and the major and minor limits in the rising and setting of the moon, he claimed to identify other functions at specific sites. For example, the Nine Maidens stone circle at Stanton Drew in Oxfordshire apparently marks a complete sequence of star risings and settings in the early morning hours at midwinter, "when any community wants to have a method of telling the time" (Thom 1967, 105), perhaps a rather overwhelming solution to such a small problem.

The two principal problems identified by Burl and Ruggles about both of these works are those of spurious accuracy and the selective use of data, each of which is expanded below. In addition, they have noted other problems with interpretations of megalithic sites, such as *post hoc* justification, circular argument, and the tendency to emphasize those data which confirm a pre-conceived set of ideas while ignoring those that do not (Ruggles 1999, 41; Burl 2000, 63).

Spurious Accuracy

The frequently identified connection between chambered tombs and the sun's penetration on specific days is often counted as accurate to a few fractions of a degree by Thom, but in reality, is rarely accurate to better than 5º (Burl 2000, 60). Thom also favoured alignments using stones which indicated "slivers of the sun tracing hill slopes, or momentarily appearing in notches" at the solstices in 2000 BCE, but Burl is convinced that this level of accuracy is not possible using rough stones as markers, and felt that it is difficult to measure alignments from weathered stones to better than 2º (Burl 2000, 60) and much of Thom's survey data is accurate to within one minute of arc, which is "so exact that it would take 180 years to collect the data to position the marker in the first place" (Ruggles 1999, 52). Some of this accuracy is further compromised by the fact that recent evidence about atmospheric scattering of light, particularly near the horizon, shows it to be more severe than Thom realised – which "make his stellar alignments particularly problematic" (Ruggles 1999, 50-51).

The moon has particularly complex changes in its rising and setting positions over an 18.61 year cycle. Added to this complexity is the fact that many of these events occur in daytime, when the rising and setting could not be not seen, so it would take at least double the length of this cycle, in other words 37.2 years, to confirm the full details, with 13,577 risings and settings to record, with absolutely no evidence that records were ever kept (Burl 2000, 60). Even Hawkins acknowledged the difficulty that the Babylonians had with eclipse predictions, showing little success until a thousand years after Stonehenge (Hawkins 1970, 175).

Selective use of data

The selective use of data has been highlighted many times in relation to the work of Hawkins and Thom. Ruggles and Burl have both identified inconsistent treatment of similar monuments and the apparent working backwards from conclusions to determine where to survey in other cases.

If specific aspects, such as stone outliers, were used to mark alignments, and there was communication between the various builders, which Thom insisted was present by the use of consistent measurement units (his megalithic yard (Thom 1967, 34-55)), it seems reasonable to assume that there would also have been a consistent approach to the use of the monuments. However, Thom proposed that of eighteen stone

circles in Cumbria, only nine had an astronomical use – four for the sun and the remainder had targets including the moon and several stars. So, not only did nine of the monuments produce no alignments at all, those that did were completely inconsistent in their application. The specific alignments at these nine sites were formed by outliers (three times), stone to stone across the circle (four times), circle to circle (ten times) and centre to entrance (twice) (Burl 2000, 117-118). In addition to the selective use of different markers at each of the sites, many of these make unsatisfactory foresights. Burl cites problems with outliers particularly and points out that parallel entrances are better; an entrance stone with a portal outside it creates an unequivocal sightline with no need to establish the centre of the ring, which in itself is often difficult (Burl 2000, 119).

Care also has to be taken with interpretation of data. Clive Ruggles identifies groups of Scottish tombs which appear to show a regional pattern; the alignment of Clyde-Solway tombs is clustered around northeast, the Camster tombs in Caithness are clustered on due east and cairns in Shetland are clustered towards southeast. However, he goes on to show that there are other groups of tombs in the same areas within which the alignments are not clustered (those on the Isle of Arran and many of the Clava cairns of Inverness) (Ruggles 1999, 130), thus reducing the impact of those that are clustered together. Similarly, ignoring data that did not fit was also seen as a problem at *Calanais* in the Hebrides, where the southern orientation of the avenue was emphasised by Hawkins and Thom as a lunar standstill orientation with alignments to local mountains; this attempts to integrate the monument with its landscape and the broader sky, but its contextual reasoning ignores data that do not fit, such as other stones and other similar mountains, and is therefore guilty of data selection (Ruggles 1999, 136).

Megalithic Monument Alignment: Conclusions

A few alignments, particularly solsticial sunrise ones, can be shown to exist, but there needs to be a consistency of approach and method in order to prove that that was the intention of the builders, rather than just happenstance. Dispersion is a problem; similar attributes have been ascribed to most stone circles, some of which are recumbent, some with cairns; some have sightlines from circle to circle, others from circle to outlier, or from stone to stone or even from stone to hilltop, cleft in the skyline or a slope with a specific angle. All this "provides very weak evidence for a coherent calendrical

function" (Burl 2000, 61). However Burl does not dismiss the idea that circles had some function, by saying "If there was an astronomical function to any of the circles it can only have been a minor part" (Burl 2000, 61). If astronomy was one of the major functions of a stone circle, it would be reasonable to expect that most, if not all, of the stones would be involved in forming alignments, rather than the minority, or in some cases just single pairs of stones.

Burl also asks the question: "If astronomical sightlines did exist, what are they for? Was it for scientific study of the heavens, or were the lines symbolical – if so, for the dead or for the spirits of an Other-World?" (Burl 2000, 59). Ruggles takes a similar view, by asking "If astronomy really was involved [at Newgrange] the possible reasons why it was important that sunlight around midwinter should light up the interior of a tomb need to be established. What is certain is that Newgrange was not an observatory … its chief function was as a tomb for the dead. Yet few people … have doubted that a powerful astronomical symbolism was deliberately incorporated into the monument" Ruggles 1999, 19).

Apart from the site-specific problems of accuracy outlined by Burl and Ruggles, it has also been suggested by others that the accuracy required for some of the events has put them out of the reach of prehistoric peoples. For example, the 18.6 year period between some of the moon-based events that have been identified as the focus for certain alignments causes problems for Anthony Johnson (2008, 254), when he suggests that "the idea that Neolithic people had to wait up to half their lifetime to witness a particular lunar event, which may not even have been visible on the day, casts doubt on the whole idea". John Oswin felt that the exact timing details of solar events were secondary, that it was more important to mark the main dates for the year, especially the farming year, and "it was enough to know that the sun had reached and passed its solstice" rather than to know exactly when it was (Oswin 2009, 37).

4) Burials

Prior to the building of permanent religious buildings, alignment of burials and burial chambers seems to have been important since very early times. From the Palaeolithic to modern times some burials appear to have been associated with eastward alignments with purpose.

Tombs in the Western Mediterranean

The alignments of over 2,000 Neolithic and early Bronze-Age communal burial tombs and other megalithic features on the Iberian Peninsula and in the western Mediterranean have been measured by Hoskin (2001). With a few noted exceptions, particularly in Provence, where all 214 entrances faced sunset or west, 93% of the remainder (2,130 of 2,290) [author's calculation from various graphs in Hoskin's study], are aligned very close to the arc of sunrise between midwinter and midsummer, centred on east (Hoskin 2001, 21). Hoskin also comments that "this range was identical with the range of sunrise at the time when churches were constructed" (2001, 7-8). (This is actually not quite true, as the results of this survey will show; there are a small number of churches in this survey that are outside the local arc of sunrise, the furthest by 12º.) The placement of the vast majority of tombs within this arc cannot have happened by chance, and Hoskin infers a significance similar to that found in the alignment of the churches in Britain towards east, by imagining a future archaeologist finding the ruins of thousands of Christian churches and concluding that "sunrise must have played a fundamental role in church orientation, at least in the symbolism of the religion served by these churches" (Hoskin 2001, 7-8). It is disconcerting that, time and time again, turning the pages of Hoskin's book reveals another graph of tomb orientations, each of which could easily be a graph of English church alignment, with similar ranges and distributions of alignments.

In many cultures around the western Mediterranean there is a consistency of orientation over a wide geographical region and it seems that only in the sky can the explanation of such uniformity be found (Hoskin 2001, 16); for example, there are 177 seven-stone *antas* over a wide area of Portugal and Spain, every one of which is orientated east or southeast over a range of 60º, so Hoskin feels "confident, indeed certain, that we are engaged in archaeo-astronomy" (Hoskin 2001, 16), and that the same purpose was communicated over a broad area.

It seems reasonable that the Winter solstice could have been of great concern to early people because of its decisive importance in indicating the change of seasons. The Summer solstice and lunar standstills may also have been of interest (Hoskin 2001, 19); but just why prehistoric people should have found [equinoctial] alignments of interest is not obvious; the precise position is difficult to establish and "does not signify the sort of change that the solsticial changes of the direction of sunrise do" (Hoskin 2001, 18). This whole subject also raises the question of why should any change of season be important to the dead? Facing eastwards could be part of the light/rebirth idea that appears to have been important to the Egyptians, where Pharaohs were buried with their feet pointing east so that they would face the rising sun on revival (Parker Pearson 2003, 59). Mike Parker Pearson also points out that whilst the doorways of the Mediterranean *tholoi*, a subset of the tombs measured by Hoskin at Los Millares in southern Spain, face east or southeast, the tombs are never built to the west of the settlement, which would have allowed the dead to overlook the living [through the entrance of the tomb] (Parker Pearson 2003, 130), indicating that close consideration had been given to the precise situation of these tombs relative to the settlements, as well as to the orientation of their entrances.

Chambered cairns of the central Scottish highlands

Although not recorded in similar numbers to those in the western Mediterranean, the majority of the Highland chambered cairns, or passage graves, are aligned in a similar way to them, that is, within the quadrant centred on due east. Henshall and Ritchie consider that the fact that there are equal numbers to the north and south of east "reflects no more than a broad preference rather than one designed with a specific celestial movement in mind [although they are all within the arc of sunrise] (Henshall & Ritchie 2001, 119).

Boyle Somerville claimed that the azimuths of two [Clava-type] cairns at Balnuaran near Inverness were aligned precisely with midwinter sunset and that this could "scarcely be a more convincing proof of orientation" (Somerville 1923, 207), although sunset later proved to be viewable in 1997 for "several days" before and after the actual solstice (Henshall & Ritchie 2001, 120); what remains of one of the two tombs is shown in Figure 2.3.

Figure 2.3 – Remains of one of the 'Clava' cairn pair at Balnuaran, from inside and outside, showing the width of the entrance passage allowing the sunset to be viewed for several days

These results are similar to those at Maes Howe, on Mainland, Orkney, where the solsticial alignment is only a generalised one, the sun's rays in fact strike the rear wall of the chamber for "three weeks either side of the actual solstice" (Foster 2006, 18), although others have noted this event as many as thirty-five days either side of the solstice (Henshall & Ritchie 2001, 121). Despite these results, the solstice was obviously still the focus, especially since the sunset appearances are equally spaced either side of the event itself, and given the time of year, an insurance that improves the

chances of the sun actually appearing. Far more of the Clava-type cairns face slightly further south than the two that convinced Somerville of midwinter-sunset orientation. The remaining seventeen appear to be targeted on major setting positions in the lunar cycle, according to Ruggles (1999, 130) and confirmed by Burl (2000, 238).

Notwithstanding the possible sun-based or moon-based alignments for these tombs, there are others which appear to have been influenced in other ways. Some of them, particularly a group of long cairns, are thought to have been influenced by the topography of their site rather than any sky-based focus (Henshall & Ritchie 2001, 119), and Ruggles noted that, in most regions, there is a complete avoidance of aligning tombs close to north (Ruggles 1999, 130).

Inhumations

As far back as 60,000 years ago, the funerary practices amongst the Neanderthals seem to indicate a strong preference for west-east orientated burials. Mike Parker Pearson describes this as an "unlikely chance occurrence", although the whole issue is still controversial and "there are still many unanswered questions" (Parker Pearson 2003, 149). In the early Bronze Age, inhumations in cemeteries in southeastern Europe were crouched and facing east. Men were placed on their right side with their head to the south, and women were placed on their left side with their head to the north, but "it is difficult to draw universal conclusions as there was an immense variation in practices within the same societies" (Parker Pearson 2003, 54).

It has been argued that up to one quarter of all known Anglo-Saxon burials in Britain have relationships with older monuments, mostly Bronze-Age barrows (Williams 1998, 92). This relationship does not just consist of proximity, but in many cases involves alignment as well. At Mill Hill, Deal (Kent), all the Anglo-Saxon burials within the barrow ditch were aligned towards the centre and a significant proportion of the burials outside the ditch were laid with head pointing towards the barrow (Lucy 2000, 130). There are many recorded examples of alignment apparently being used to differentiate between burials of different types. In some instances, alignment appears to have been used to differentiate between adult and child burials. At Wittenham in Berkshire, most of the adult burials were aligned west-east or southwest-northeast, whilst the children were usually buried north-south. Similar patterns were found at West Heslerton in Yorkshire, where "orientation seemed to be quite heavily structured

by age, as well as assemblage" (Lucy 2000, 131-132). Elsewhere, orientation seems to have been used to differentiate by gender, as at Sewerby in Yorkshire, where "burials with jewellery were more likely to be orientated to the south or southwest, whilst burials with weapons seemed actively to avoid this direction" (Lucy 2000, 132).

In a study of seventh- and eighth-century burials at Finglesham in Kent by Sonia Hawkes (1976, 33-51), it was argued that although generally west-east, 90% of burials were aligned between midsummer and midwinter sunrise azimuths (the arc of sunrise), and were therefore deliberately aligned with sunrise on the day of the burial, the variations in grave alignment reflecting the time of year of the burial (Hawkes 1976, 50-51). It was subsequently argued by Martin Welch (1992, 74-75) that, because of the lack of graves aligned at the southern end of the sunrise range, this model significantly under-represented the number of deaths that were likely between November and February, and that the variation in alignment was due to inaccuracies on the part of the burial party in assessing the direction of east, or to using a local referent [the barrows located close to the cemetery]. Welch also pointed out that west-east burials cannot all be assigned to Christianity, as this orientation seems to have been widely used before Augustine's mission to England in 597 CE, and it is not known when Christian communities in Europe adopted west-east burial as their exclusive method, "but there is a suspicion that it was at a relatively late date" (Welch 1992, 74).

With such variation in alignment of early Anglo-Saxon burials, it seems obvious that there were a number of different influences involved. Any number of reasons for specific alignments might have been considered, which could have been regional, local or personal, for example, towards the origin of his/her ancestors; towards former burial places; facing the deceased's house or favourite place; towards a natural feature; following local existing practice; at a significant time of day (sunset etc); using the lie of the land; facing down hill; facing away from the prevailing wind; or facing away from the settlement (as with the *tholoi* mentioned earlier). As Ruggles puts it (1999, 89), "some of the possible methods are only significant to the deceased and their close family, others have a slightly wider significance – how can we know which of these situations applies for any given burial?"

Excavations of Anglo-Saxon inhumations in Norfolk seem to have produced slightly less variable results. At Spong Hill, the 58 late fifth- to mid sixth-century graves excavated in 1974 were arranged approximately west-east, the majority within

20° of east, and almost all within the arc of sunrise with a mean direction slightly south of east (Hills *et al.* 1984, 21). At Sedgeford, the middle-Saxon burials were aligned either side of east, the later burials aligned south of east, although the earlier burials appear to follow the local contours. It was also considered that some burials may have been aligned towards a local referent on the summit of Dove Hill (Davies & Hoggett 2001, 18; Wilcox 2002, 38).

Richard Morris suggests that the cemetery in early Christian times fulfilled some of the ritual functions that were eventually served by the church (Morris 1983, 33). Certainly by this time alignment eastwards had become important. This practice of eastward burial alignment continues today, although for the churchyards which are part of this survey, visible burial monuments (mainly post 1700) appear to be aligned with local ecclesiastical east, in other words, parallel with the church and other burials, irrespective of the actual alignment of the church. This is a pragmatic approach, avoiding the requirement for the gravediggers having to find true east, and one which was mentioned by Rahtz (1978, 1-14) as a consideration in relation to Saxon grave alignments. In one or two extreme cases in this survey on very steep slopes, the graves have been aligned parallel with the contours, rather than west-east.

Despite the west-east pre-requisite for Christian burials, burials have still been used to indicate hierarchy; the lord of the manor was frequently buried in the church, the well-to-do buried on the south side of the church, close to the door, and the poor were often buried on the darker north side, which has always been associated in folklore with the devil and evil (Parker Pearson 1999, 14).

5) Mystical

Alfred Watkins interpreted the straight lines he identified between objects and features in the landscape, such as horizon notches, as tracks used in prehistory linking ancient sites and he named them ley lines, but even he recognized that when these lines were close together and close to parallel, such as the convergences he noted at Stonehenge, that they could not have been tracks (Watkins 1925). The straight lines were reinterpreted by John Michel (Michel 1969) as lines of energy in the landscape utilised by prehistoric people (fitting Ruggles' concept of lost-knowledge (Ruggles 1999, 3)). Subsequent careful statistical analysis has disproved the whole concept of the existence of these straight lines between ancient features as meaningful. Comparing the 'actual' ley markers identified on a particular 1:50,000 Ordnance Survey sheet, with a similar number selected for different reasons (named buildings beginning with certain letters), Forrest managed to produce more 'ley lines' with the second set (cited in Williamson & Bellamy 1983, 97). Similarly, Williamson and Bellamy conducted their own experiment with ley marker data, identifying all the supposed ley lines on a specific 1:50,000 Ordnance Survey sheet, then randomised each marker position within its 1km grid square, and found an equal number of six, seven, eight and nine-point lines. This led them to conclude that "there is thus not the slightest evidence for the deliberate alignment of ancient sites on the map" (1983, 101-102). In addition to the statistical dismissal of the idea, much of the original survey work by Michel was apparently subject to similar data selection problems to those identified earlier by Ruggles (1999, 41) in relation to stone circle alignments. Michel's assertion that he only used prehistoric markers as primary evidence, and other features as confirmation, has been shown to be false. Later checking by Williamson and Bellamy showed that he not only used some later features as primary markers, but also ignored "innumerable large stones" as possible primary markers, but which did not fit into any of his lines (Williamson & Bellamy 1983, 104-115).

The concept of Orthotonies, straight lines along which UFOs were supposed to have travelled, briefly became of interest in the 1960s; "but it was rejected [even within the fringe] because of its poor statistical basis" (Williamson & Bellamy 1983, 15).

ALIGNMENT: CONCLUSIONS

There is clearly a general concentration of eastward alignments for each of the subjects examined in this section; some are practical whilst others are symbolic. In the case of house doorways, the selection appears to be practical, as it is easy to see why they should face east, to let in the maximum amount of light in the winter and face away from the prevailing wind, but the majority of eastward alignments are symbolic and seem to have been important for thousands of years. For many of the burial practices, facing east can be seen as part of a light/rebirth/resurrection focus, aimed at the rising sun, emphasising the positive, and easing the deceased's passage into the next life. The interpretation of, and even the existence of, alignments at some monuments, however, such as at Stonehenge and *Calanais*, is more problematic. Some of the examples discussed here, such as many of the claims for megalithic astronomy and the multiple alignments in stone circles, have been shown to be either fanciful or grossly over-exaggerated, but there are still many situations in each of the aspects of prehistoric life, such as burial tombs, where similar and specific alignments over a wide geographic area cannot have been arrived at by chance. If they were deliberate they must also have held meaning for the people who set them out, but it is that meaning which appears to elude modern man. Hoskin's example of a future archaeologist encountering ruined Christian churches and arriving at a sun-based conclusion for their alignment highlights the problem. Of course, in a non-prehistoric context, the future archaeologist could use the written history to establish why churches were aligned eastwards, except, as will be demonstrated later, there is none.

CHAPTER THREE

HISTORIOGRAPHY of CHURCH ORIGIN, CHURCH LOCATION and RURAL SETTLEMENT

Bor, ha' yew noticed yew hin't far t'saarch
in Norfick, if yew wanter see a chaarch?
Jus yew go up ena little hill
an yew'll see savrel chaarches, that yew will.

(Norfolk Churches – John Kett)

INTRODUCTION

This chapter examines the origin of churches and especially the pattern of hierarchical development, broadly described as the 'minster model', according to which, church building was spread down the social scale as time progressed. This chapter also explores earlier work on the location of churches and the reasons for the choice of site, ranging from the very broad plans of the early church hierarchy to incorporate earlier pagan religious sites, to the site-specific choices made by each local church builder. In addition, it also briefly outlines earlier explanations of the patterns of settlement development from the seventh century to the twelfth century, a time of much church building. Each of these subjects will be developed in the later chapters of this thesis by using the results of this survey to test whether the conclusions drawn by earlier writers can be expanded or refined, particularly concerning the location of churches and the timing of their building.

CHURCH ORIGIN

This section outlines the historiography of the hierarchy and origin of a range of rural church buildings, from minster church to field church. Defining either of these types of church is not simple, as the "lack of generally accepted terminology for religious institutions has caused terrible confusion" (Foot 1992, 216), and the term seems to have been used in several different ways over the years. In the early days of the Conversion,

minsters – to which large parochial territories were attached – facilitated the conversion of the population and their integration into the church by teams of clergy based at important early churches (Radford 1973; Blair 1988a, 2005; Morris 1989; Blair and Sharpe 1992; Foot 1992). Initially, their parochiae often seem to have extended to the whole Hundred, based on a seventh- or eighth-century Royal *tun* (Barlow 1979, 169-170; Morris 1983, 64; 1989, 128). In recent times, "Minster has been used as a specialized sense by some scholars to refer to Anglo-Saxon institutions that lay behind the mother churches in Domesday Book" (Foot 1992, 215-216), but Franklin suggested that, in the most general terms, "a minster is a church that originally, or vestigially, had pastoral responsibilities for an area larger than a single village" (Franklin 1984, 69). Summed up neatly by John Blair, "the generally accepted view of how England acquired its rural churches was that Kings, and bishops under their patronage, founded churches in important administrative centres. By the mid eighth century all, or most, English Kingdoms had established a network of minster parochiae, typically covering between five and fifteen modern parishes, served by priests from the central church" (Blair 1991, 91).

At the other end of the scale, field churches are defined by their lack of burial rights and therefore their lack of churchyard. King Edgar's Law codes of 960 CE show 'churches without graveyards' as the last of the list of church categories (Barlow 1979, 187; Gem 1996, 22; Morris 1989, Blair 2005). This categorization implies that thegns' bookland churches without graveyards would be included with field churches, along with chapels, such as monastery gate chapels and chapels of ease.

There has been a wide range of influences on the origin of churches as well as on their location. The origin of churches and their position in the hierarchy, which in turn is determined by the position in the hierarchy of the sponsor/owner, are so closely linked and inter-related as to be difficult to separate. In other words, the origin of a church on a particular site is likely to be affected by its position in the hierarchy; whether it was an early minster church built on a mid-Saxon royal estate, or one of the thousands of lesser churches built later on smaller estates. Below minster-church level it is difficult to explain the background to a church, because there is little direct or specific evidence for the origin of most English parish churches (Owen 1971, 11-13; Morris 1985, 47; Blair 2005, 373). Exactly what constitutes the origin of a church on any site can also be difficult to assess, as the current church may have been preceded

by an earlier church, which may itself have been preceded by an earlier religious use of the site, such as a graveyard which could have been used as a preaching location, and which itself might have been associated with an earlier pagan ritual or burial site.

Church Hierarchy

There were two broad phases of church building in England, closely connected to the ecclesiastic hierarchical structure. The first phase, begun soon after the Conversion, established the ecclesiastic framework by setting up minster churches (Morris 1989, 93-139; Blair 2005, 79-290) and the second phase in the late-Saxon period saw the minster system begin to fragment, and the parochial system develop, as churches were built by those further down the lordly hierarchy (Morris 1989, 140-167; Blair 2005, 368-504).

Late-Saxon Law codes mention church hierarchy several times. King Edgar's Law codes of 960 CE list three categories of church – old minsters, thegns' bookland churches with graveyards and churches without graveyards (Barlow 1979, 187; Gem 1996, 22). Archbishop Dunstan at the end of the tenth century classified churches as head, middling or lesser-minsters, with a fourth class of field churches with no burial grounds (Braun 1970, 38; Barlow 1979, 187). Some six decades after Edgar, the codes of Cnut (1014) and Ethelred (1020) list four church categories – head minsters, lesser minsters, still smaller minsters and field churches (Blair 2005, 368; Morris 1989, 129; Gem 1996, 22; Braun 1970, 38). John Blair (2005, 368) argues that the third of the four levels of church mentioned in the law code of 1014 must be the thegn's estate church, redefining the other levels as cathedral, clerical minster and finally the field church, whereas Barlow referred to them as Episcopal minsters, other old minsters, manorial churches with burial rights and "the rest" (Barlow 1979, 187).

By the tenth century there were many large rural parochiae, and tithe, churchscot and soulscot from local churches were still paid to the old minster (Morris 1989, 228), unless the church had a graveyard, in which case one-third of the Lord's tithe went to his own church (Barlow 1979, 195; Morris 1989, 228; Jones A. 2002, 49). Subsequent devolution of power and the fragmentation of estates, referred to by Blair as "manorial fission" (2005, 372), along with the requirements of a rapidly expanding population, gradually increased the number of churches built on successively smaller and smaller estates. At the lowest end of the manorial spectrum, this expansion of

church building sometimes meant multiple churches in one settlement – a process seen in the extreme in East Anglia (Warner 1986, 45-46; Williamson 1993, 158-161; Groves 1995, 108-115) – in some cases with three or four churches built close together. There are seventy-nine villages in Norfolk alone that had more than one church (Batcock 1991, 10-11), and three neighbouring parishes in west Norfolk, Oxborough, Barton Bendish and Beechamwell, had at least three churches each (Rogerson 1987, 1).

The position of a church (or patron) in the hierarchy is particularly important where church sites are concerned, and can be demonstrated to have had an effect in many cases – although these are frequently concentrated in urban areas. In York, for example, the only church that is not constrained by its site is York Minster, which is aligned at close to 90° (commented on by Harvey and Morris, noted in Chapter One), compared with all the remaining churches in the city, some of the which follow the Roman street grid (Holy Trinity, Goodramgate (36°), St Olave, Marygate, at (41°), St Mary, Bishophill (42°), and at right-angles to them is St Michael le Belfrey (127°), author's measurements June 2001), and others which "took their cue from the nearby streets and properties of the Anglo-Scandinavian city, and are angled this way and that, like so many weathercocks" (Morris 1989, 209), the alignments of which range between St Cuthbert, Peasonholme, at 56° and St Helen, Stonegate at 83° (author's measurements June 2001). In reality this seems to reflect the fact that the builders of the minster had the power to clear a large site, rather than be forced to build within the confines of the city's existing topography. St Michael le Belfrey, adjacent to the minster but aligned at 127°, was rebuilt as late as the early sixteenth century, between 1525 and 1537[12] Pevsner & Neave 1999), but remains parallel with the Roman street alignment within the confines of its earlier site, shown below in Figure 3.1.

[12] http://stmichaelsyork.org/cps/history.htm, (accessed 12th June 2008)

Figure 3.1 – Alignments of York Minster and St Michael le Belfrey (right foreground) compared[13].

At the foot of all the hierarchical lists, the field church seems to have been a classification that groups together the many types of small church that did not have a graveyard, including small estate churches, monastic gate chapels and chapels of ease. In medieval times they existed in considerable numbers, "especially in areas where the parochial system developed later, and provided places of worship for the convenience of growing and scattered populations" (Dymond 1995, 58), particularly in the winter months when travel might be difficult. In East Anglia, many were originally built as local churches by groups of freemen (Warner 1996, 197-198), and these have been suggested as one possible reason for the growth in shared churchyards (Williamson 1993, 159).

[13] Source: http://york-tourism/images/36549 (accessed 12th July 2004)

What preceded the current church building?

Although this thesis is principally concerned with existing church buildings, how the church site developed and what preceded the current building, whether it was an earlier church building or a cemetery, is important, as the fact that there *was* an earlier use probably determined the choice of the site for the current church. This aspect will be explored in the final chapters of this thesis.

Early-Saxon cemeteries were usually separate from settlements (Hills 1979, 310; Rogerson 2005), but many of the 'final-phase' cemeteries which were founded on new sites in the seventh century and often integrated into the settlement of the period, have been obscured by later settlement, including churches and churchyards (Morris 1983, 53-55; Hoggett 2007, 314). It is not certain that the presence of a graveyard of the period 850 CE-1100 CE can necessarily be equated with presence of church, but if burial grounds that did not develop into churches were common, then more would be expected to have been found away from current churches, "therefore some, if not most graveyards developed into church sites" (Morris 1989, 153).

There are few examples of churches where excavation has shown the extant church to have been rebuilt on the same site as an earlier one; Rivenhall and Asheldham in Essex (Rodwell 1973 & 1985), Raunds (Northants) (Boddington 1996), Barton on Humber (Lincs) (Rodwell 1981), Tong (West Yorks) (Ryder 1993, 119-132), Wharram Percy (East Yorks) (Bell & Beresford 1987), St Helen in the Walls (York) (Rodwell 1981), St Marks, Wigford (Lincs) (Gilmour & Stocker 1986), Potterne in Wiltshire (Davey 1964), Llanelen on the Gower peninsular (Schlesinger & Walls 1996, 101-104), Iken (West *et al.* 1984) and Brandon (Carr *et al.* 1988) in Suffolk and four in Norfolk – All Saints, Barton Bendish (Rogerson *et al.* 1984), St Benedict, Norwich (Roberts & Atkin 1982), Thetford (Dallas 1993) and St Martin at Palace, Norwich (Beazley 2001). However, the development situation is bewilderingly complicated even when just these few sites are considered. At some, postholes or slots for an earlier wooden structure were discovered, in some cases within the area enclosed by the later stone foundations (St Martin Norwich, Thetford, Wharram Percy) and at others as separate buildings (Rivenhall, Wigford, Llanelen, and possibly at Shapwick in Somerset (Gerrard & Aston 2007)). At other sites earlier stone work or foundation trenches were found, again in some cases within the confines of the later building (Iken, St Helen York, Tong, Barton on Humber) and at others as a separate structure

(Raunds). At three of the sites – Barton Bendish, St Benedict's Norwich and Potterne – the excavators felt that an earlier church was located close by in the churchyard, but was not discovered within the excavated area. The whole subject of earlier timber churches preceding the current building is further complicated by the possibility that postholes and beam slots within church buildings are, in some cases, for internal fittings or for construction scaffolding, such as those at Hadstock in Essex (Rodwell 1981, 114-115).

At none of the churches noted above was a significant realignment noticed by the excavators. The discovered post holes and earlier stonework or foundation trenches were on the same, or similar, alignment as the current church, thus arguing against the comment by Richard Morris that there were changes in alignment in churches at village level between the Saxon and Norman periods as part of the "signs of a new concern with alignment during the eleventh and twelfth centuries" (1989, 208) that had been identified at Exeter, Wells and York when the cathedrals were rebuilt by the Normans in the eleventh century.

Excavation shows few English parish churches with structures before 900 CE (Morris 1989, 163), although by the 940s, private churches were tipping the balance of pastoral organization in the countryside (Blair 1985, 119; Morris 1989, 196). Parish churches prior to 950 CE were normally fabricated in wood (Morris 1989, 165), and the widely held view is that the "great rebuilding" of churches in stone between 1050 CE and 1150 CE (Gem 1988; Morris 1989; Blair 2005) was a stamping of the new Norman manorial authority in England after the Conquest, rather than a material- or technique-led exercise. However, Alibert (1997, 180) argues that "Even in eleventh-century Normandy, churches built in wood existed alongside those in stone, which [wooden churches] were traditional amongst the countries from which the 'new Christians' [Normans] came." This seems to imply that the Normans had continued to build wooden churches long after their conquest of Normandy, even with access to excellent stone close to hand, at Caen. In Denmark, the rebuilding of wooden churches in stone peaked in the early twelfth century (Abrahamsen 1992, 293) and was therefore carried out in parallel with the same exercise in England, reinforcing the idea that rebuilding churches in stone in England was part of a contemporary process in many countries, rather than a specific exercise of the power of lordship.

CHURCH LOCATION

There appears to have been a range of influences on the location of churches, operating either from the top down within a broadly over-arching spiritual plan of the church hierarchy, such as the possible incorporation of earlier ritual sites; or from the bottom up, with the simple practical local desire of each patron for his church to be located for his convenience and on a suitable secure site. The first two of these factors has been examined by earlier writers, particularly the reuse of earlier pagan sites, variously called "Christian substitution", "Christianization" and "de-paganization", with differing degrees of support. This section outlines and comments on the possible reuse of earlier types of religious site, but first addresses site suitability and siting for the convenience of the patron.

Site Suitability

Perhaps the most important reason for the choice of the location for a church, or almost any other building, has to be the suitability of the site for building on. The ground should have suitable load bearing qualities, and it should be both stable and accessible when needed. The successive floods of 2007 and 2008 have highlighted this issue, with frequent pictures in the media of Tewkesbury Abbey standing alone above the floodwaters, with the rest of the town submerged. Here, the choice of site must have been made after long familiarity with the characteristics of the flood patterns of the Rivers Severn and Avon, and is also a reflection of the patron's position in the hierarchy and his ability to command the best site. Although the current abbey building was not started until 1087[14] (Verey 1970a, 256), the site for the town has Roman and Saxon origins, with an earlier Saxon monastery located on the same site[15] (Aston 2000, 59); establishing a monastery is likely to have been sponsored and located by a person of high status who was able to donate the site. The suitability of the site is particularly marked when comparing the situation at Tewkesbury with pictures of the sites of neighbouring village parish churches, suffering in several feet of water in the same floods, where the owner did not have the same ability to choose the best site. They are pictured below as Figures 3.2 and 3.3.

[14] http://www.tewkesburyabbey.org.uk/his.htm (accessed 17th Nov 2009)
[15] http://www.tewkesbury.net/history.asp (accessed 17th Nov 2009) and http://www.theheritagetrail.co.uk/abbeys/tewkesbury%20abbey.htm (accessed 17th Nov 2009)

Figure 3.2 – Tewkesbury Abbey (Gloucestershire), during the floods of 2007, occupies the highest land in the town[16]**.**

Figure 3.3 – St Michael's, Tirley (Gloucestershire), three miles south of Tewkesbury, during the same floods – the porch gives a true indication of the depth of the water[17].

[16] Source: http://guardian.co.uk/artblog/2007/jul/23/week/ Tewkesbury.html (accessed 1st April 2008)
[17] Source: http://churchtimes.co.uk/uploads/images/Tirley-P/42537.html (accessed 1st April 2008)

The suitability of the site for building on is logically the most important criterion used in site selection for a church, but other influences must also have been considered. Some might be thought of as practical reasons, such as a convenient location close to the patron's residence; and others as spiritual reasons, such as the incorporation or suppression of earlier pagan religious sites. These two are considered below.

Convenience of the Patron

Apart from site suitability, the main practical reason that is likely to have applied in all areas, urban or rural, is the siting of the church close to the patron's seat for their convenience, referred to as "foundation by estate proprietors" (Blair 2005, 385), as "seigneurial considerations" (Morris 1989, 268), and as the Church/Hall focus (Dymond 1968, 29). This may be seen as being a development of the pagan custom of having an idol-room in the house (Morris 1989, 75), but there are few examples of churches which were absorbed into the house, such as at Cheddar, Somerset, and Deerhurst, Gloucestershire, "they are limited in number and a very elite practice" (Blair 2005, 386; Taylor & Taylor 1965). However, the close association of church and house seems to be applicable at all levels of the church hierarchy, from the early eighth-century minster-church sites located close to Royal estates, such as at Bamburgh in Northumberland (Morris 1989, 131) or Rendlesham in Suffolk (Warner 1996, 115; Carver 2005, 494; Newman 2005, 478); the large parochiae representing Crown demesne manors, such as at Pickering, Pocklington and Driffield in East Yorkshire (Morris 1989, 133-135); countless lordly churches built on smaller estates during the tenth and eleventh centuries; to smaller field churches built by groups of freemen often located midway between hamlets or farmsteads (Warner 1996, 197-198; Williamson 1993, 159)[18].

The juxtaposition of the church and the manor house is commonly seen throughout most of the country. Richard Morris notes that although some houses next

[18] One Norfolk example of a field church may have been misinterpreted in the past as an example of a church from the 'lordly estates' category - St Withburga's at Holkham is an isolated church located on a large knoll now in the flat parkland of Holkham Hall, the seat of the Earl of Leicester, but in the thirteenth century was "located equidistant between three settlements in the parish" (Hassall & Beauroy 1993, 537).

to churches are of medieval date, most of the current buildings are post-medieval, and that some are either in castle baileys or next to mottes (Morris 1989, 248). In Herefordshire, 50 of the 102 mottes shown on Morris' map (1989, 251) (author's calculation from the map data) are "in close association" with the church – although this is taken as "within 200 yards", rather than directly adjacent. He sees this as an indication of an early seat of power "often replaced by a hall later" (1989, 250), and if the Norman ownership, which *begat* the motte, was imposed on an earlier estate, then the juxtaposition is likely to be repeating an association between hall and church that was already in existence. In Suffolk, David Dymond has shown that 36 of 52 isolated church sites are next to manor houses and he feels that there is a possibility that many of these are successors to pre-Conquest halls (Dymond 1986, 29). Even in Norfolk, where Tom Williamson has suggested that this association is less strong (Williamson 1993, 167-168), the results from this survey show that of the 174 churches currently remote from their settlement, 31 are next to a Hall or moated site, and in addition there are 38 adjacent to just a single farm. Richard Morris has commented on the juxtaposition of farm and church as a possible indication of earlier manorial sites "dwindling in importance to the status of farms" (Morris 1989, 274).

The building of the church prior to the motte has also emerged as a common model (Morris 1989, 252), particularly where Saxon burghs preceded Norman castles, for example at Cuckney in Northants, Corfe (Dorset) and Eye in Suffolk, where the churches are just outside the Saxon stronghold (Morris 1989, 262-4). The church was also built outside the ditched enclosure around the manor house at Raunds in Northants, *circa* 920 CE, and at Goltho in Lincolnshire, *circa* 1000 CE, which may imply a parochial use of the church, so that villagers could enter the church without having to enter the manorial enclosure (Blair 2005, 389).

Figure 3.4 – St Mary's and Hall at North Aston, Oxfordshire – the 'closest association' between house and church found in this survey (although this version of the hall is of the seventeenth century (Sherwood & Pevsner 1974, 718))

John Blair, however, puts forward an alternative model to that of the church as an adjunct to the manor house. He postulates that there appears to be "an equally widespread pattern of church development as a part of structured peasant settlements, possibly explaining the location of thousands of churches" (Blair 2005, 395), which he attributes to absentee, particularly monastic, landlords (Blair 1991, 140-142). So in these cases, the church was located for the convenience of the congregation, rather than that of the patron. This is also hinted at in Lincolnshire, identified by Stocker and Everson, in that there is a recurrent pattern of locations of church and rectory within a row of settlement plots, rather than adjacent to a manorial site. The authors there thought it spoke either of public involvement in church planning or as lordly replanning of the settlement (Stocker & Everson 2007, Fig 3.28, 61 & 66).

Settlement shift from possible Anglo-Saxon cores, still marked by the presence of the church, has been noted in several villages in southeast Somerset (Ellison 1983),

for example, at Aller (1983, 14), Beercrocombe (22), Seavington St Mary (84), Seavington St Michael (89), Stocklinch (98) and Broadway (104). Similarly, at Wharram Percy in Yorkshire, excavation has revealed that the site of the manor complex had been shifted twice, in the twelfth century and in the thirteenth century, each time moving north from the original Saxon settlement site, still marked by the church ruins (Beresford & Hurst 1989, 122-132 & Fig 25). In each of the cases noted here, it seems to point to the selection of the church site being made for the convenience of someone in the Saxon period, usually the patron. In Norfolk and Suffolk, a number of fieldwork investigations have been undertaken around church sites, each of which seems to point to Saxon-period church sites (Wade-Martins 1980a & 1980b; Rogerson 1997; Davison 1990 & 1995; Newman 2005; Martin 2005; Laverton 2001); these will be considered in more detail in Chapter Eight.

Chapels of ease were also sited for convenience, but for the convenience of the congregation. Often located in positions which were closer to the settlements than the parish church, and easier to reach particularly during winter, many chapels of ease later became parish churches, although "this was often long delayed as it threatened the status and income of the mother church" (Dymond 1995, 59).

Reuse of earlier sites

The main spiritual reason for the choice of a particular location was arguably to incorporate the power or influence of an earlier site and to ease the transition into Christianity for the users of the site by its reuse. There are various possible situations involving such reuse and it has been considered important to differentiate between them (see Morris 1989, 57-58; Blair 2005, 183; Bradley 1993, Eaton 2000, Bell 2000, Hawkes 2003), although it is difficult to see much of a difference between the three categories. The site may have been reused for reasons of Christian substitution, by converting the site to Christianity and incorporating and suppressing the extant ritual uses; it may have been used as a Christian site after a break in use, noted as superimposition; or as an expression of *Romanitas*, which is seen as the emulation of the culture of the Roman Empire and early Christianity. This division seems to be somewhat artificial. Converting a pagan site to a Christian one is straightforward; incorporating the earlier use could ease the transition from one religion to another in

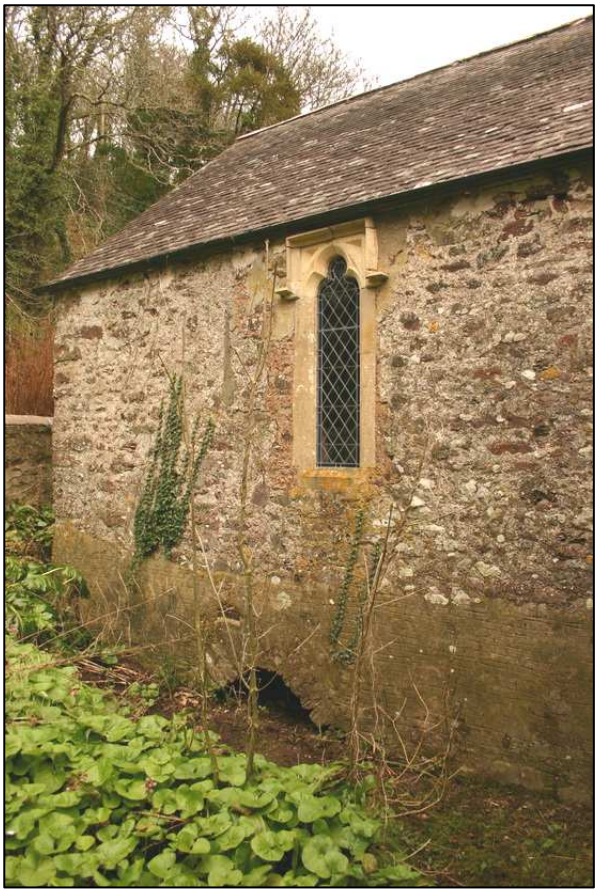
the minds of the participants. Re-adoption of a site after a break in use can either be made by chance (in which case it is not really a readoption but coincidence), or it can be made because the earlier use, although discontinued, was remembered or identifiable, in which case there is no real difference between converting a site and readopting it. Expressions of *Romanitas* appear to be similar to Christianization, in that it was hoped that the power of the stone, or the site's earlier use and its connection to Rome and Christianity, could be incorporated (Eaton 2000, 96; Morris 1989, 28-29).

Christian substitution was seen as important by the church in the earliest days of the Conversion. It was mentioned in the Pope's letter to Abbot Mellitus in 601 CE (Grinsell 1986, 33; Morris 1989; Blair 2005), in order to assist in the conversion of the population to Christianity by using their existing religious sites. It was raised again much later as one part of the Canons of Edgar[19] in 1005x8, which instructed priests to extinguish heathen practices, such as the worship of wells, trees and stones (Morris 1989, 60; Rattue 1995, 79; Harte 2008, 22), which, although it was not suggesting reusing the site, does confirm that these practices must still have been continuing in a widespread manner at this time. There are many examples of churches that have been built next to, or on, features that may represent earlier ritual sites, such as in the henge at Knowlton (Dorset) (illustrated as Figure 3.12 on page 93); in the centre of the Iron-Age hillforts at Whittlebury in Northamptonshire (Jones & Page 2006, 187), at Hanbury (Worcestershire), Tetbury (Gloucestershire), Aylesbury (Buckinghamshire) (Blair 1992, 234), and Breedon in Leicestershire (Morris 1989) (illustrated below); adjacent to the Iron-Age broch at Harray (Mainland, Orkney) (Petrie 1890, 93; Fraser 1923, 32), (illustrated below); alongside the megalithic remains at Stanton Drew (Avon) and Midmar (Aberdeenshire) (Morris 1983, 59) and possibly at Avebury (Wiltshire) in the Saxon burgh adjacent to the henge (Pollard & Reynolds 2002, plate 17 and 235-237) or next to the monolith at Rudston in East Yorkshire (shown as Figure 3.13 on page 93). There are also many examples of churches built on, or near, Bronze-Age barrows, for example at High Wycombe, Buckinghamshire, which adjoins elite seventh-century barrow burials (Morris 1989, 256); Earsham (Norfolk) (Morris 1983, 60); Scartho (Lincolnshire) (Stocker & Everson 2007, 61); Ogbourne St Andrew (Wiltshire), and Fimber (East Yorkshire) (Morris 1983, 59; Grinsell 1986, 33).

[19] Mis-named, according to John Blair, they should be attributed to Archbishop Wulfstan (Blair 2005, 444)

Figure 3.5 – St Nicholas', Harray, Mainland, Orkney – the churchyard built around the remains of an Iron-Age broch, with a war memorial at its centre

Figure 3.6 – St Mary & St Hardulf's, Breedon on the Hill, Leicestershire – the church located in an Iron-Age hill-fort, also the site of a Mercian minster *circa* 680 CE (Morris 1983, 58)



Similarly there are churches built near, or over, springs (wells), of which there are many extant examples in this survey: Westwell and Binsey (Oxfordshire), Gilcrux, Kirkoswald and Castle Sowerby (Cumbria), Dereham (Norfolk), numerous churches in Cornwall and several in Pembrokeshire, for example at Burton, Dale, Lawrenny, St Ishmaels and Gumfreston (the last two are illustrated as Figures 3.7, 3.8, 3.9 & 3.10).

Figure 3.7 – A spring emerging beneath the chancel at St Ishmael's, Pembrokeshire

Figure 3.8 – A spring enclosure in the nave north wall at St Lawrence's, Gumfreston, Pembrokeshire

Figure 3.9 – Gumfreston Spring enclosure (detail)

Figure 3.10 – view of the altar from the spring enclosure

Springs, or wells (the O.E. form of spring (Gelling 1984, 30)), are the most obvious example of natural objects in the landscape which might have been the subject of veneration in earlier times – because of the magic of water issuing from the ground – and perhaps the most obvious candidate for Christianization. Jeremy Harte records 919 Holy wells, 201 of which are associated with a church and 67 are located in churchyards (Harte 2008, my calculations from his appendix "Analysis of sites"). James Rattue's assessment of Holy wells though, seems to downplay the whole idea of Christianization, saying that "too much has been made of the various aspects of it", particularly springs, because water is naturally at the heart of the Christian ritual, involving the use of holy water generally and particularly in the central act of baptism (Rattue 1995, 34). Few holy wells were recorded before Domesday; Rattue lists nine, and Jeremy Harte lists eight from Anglo-Saxon sources (charters, the Burghal Hideage and a will) (Rattue 1995, 63; Harte 2008, 17-18), although this may be an under recording, as charters usually concentrated on boundary features, so might not have included wells that were sited away from the boundaries. A few holywell-type placenames are mentioned in Domesday for the first time; a dozen according to Rattue (1995, 63) and three according to Harte (2008, 18). Both writers list many wells

Christianized at a later date, but Rattue goes on to say that "the simplistic model of Christianization is totally inadequate" (1995, 66), because it can be shown that the Church was fully prepared to create its own holy wells rather then convert pagan ones. He sees this as part of a larger pattern, where the Church was afraid of hydrolatry and other nature worship throughout the eleventh century, evidenced for example, by Edgar's Canons of 1005x8, calling for extinguishment and destruction of pagan sites, mentioned earlier (Rattue 1995, 79-81), in addition to other mentions in the Northumbrian Priests' Law of 1010 (Harte 2008, 22). These rules were reversed in 1102 by the Council of Westminster when cults of wells were brought under the Church's wing, and were made subject to the authority of the local bishop (Rattue 1995, 79; Harte 2008, 23), which "attributed sanctity to the fountain" (Jones 1998, 76), when they "became part of the wider religious landscape" (Harte 2008, 23). Rattue goes on to suggest that this softening of attitude might have been because of the general spread of new churches, and that the authorities may have realised that "they were no longer living in a sea of sub-paganism" (1995, 79).

If the Church had seen the Christianization of wells as a priority in earlier times, then the use of well sites close to churches would surely have been evident in a far greater number of cases. There are only a few examples of major churches associated with wells, notably at the eponymous Wells in Somerset, where the Holy well of St Andrew is close to the east end of the minster, with continuity of use on the site with a Roman mausoleum and a Saxon burial chapel (Rodwell 1981, 142-143; 2001). Overall, the idea of Christianization may be somewhat overstated, because as Rattue puts it "A very substantial number of wells, if not the absolute majority, were left alone by the church" (1995, 42). Harte supports this by suggesting that around two-thirds of all healing wells in several counties he surveyed – Devon, Herefordshire, Warwickshire, Worcestershire, Somerset and Gloucestershire – were never adopted by the church (Harte 2008, 93). Richard Morris also points out that the possible relationship between a parish church and a pre-Christian sacred place "becomes bewilderingly complicated because of the jumble of cults and the revival of rural heathenism in the ninth and tenth centuries, after the Scandinavian colonization" (1989, 56-57), particularly in the east of the country. The idea that there was a period after the eleventh century when the reuse of sites was considered more important than previously, is obliquely reinforced by John Blair's observation that the examples of churches built close to Bronze-age barrows

which reflect a local continuation of ritual sites, is a pattern in which "the builders of the earlier [pre-eleventh century] minster churches had shown little interest" (Blair 2005, 376).

On the other hand, John Blair has suggested that the model of 'churches on sacred sites' has not really been applied to England, where parish churches are normally seen as off-shoots of manor houses (Blair 2005, 374). He notes that several single-celled chapels of the tenth to twelfth centuries, mainly in Cornwall, have been shown, by excavation or by their association with above-ground remains, to have developed from pagan cemeteries or wells. "This suggests that there may be others that perpetuate different sorts of ritual features such as trees or standing stones which have left no trace" (Blair 2005, 376), an idea which will be developed by the application of the results of this survey in later chapters. The lack of permanence of some of these features presents a problem because possible sites such as sacred trees or groves are unlikely to be evident in the later landscape, as few trees in Britain live long enough. There are, however, some examples, such as at Ketton (Rutland, now Lincolnshire), where excavation has revealed burials around a tree which is close to a small church associated with further burials, although it is unclear which was there first (Blair 2005, 381).

The yew is a tree of particular interest in this context, despite the fact that worship through nature was seen as the Kingdom of the Devil by the Church (Cornish 1946, 16; Ross 1967 33-35), as its evergreen foliage was seen as a symbol of everlasting life. It must also be remembered, that "in early times, the yew held a different position in peoples' minds as it was almost the only evergreen tree in England and Wales" (Cornish 1946, 17). Although the yew can be particularly long-lived, Cornish felt that "it is unlikely that any yew tree growing in churchyards today was planted before the time of the great rebuilding, making them a Christian symbol rather than an earlier pagan one" (1946, 17). However, modern dating techniques have shifted the probable planting date of the largest yew trees back several hundred years. There are thirty-one examples in Bevan-Jones' survey of trees which have trunks greater than ten metres in circumference, such as at Clun in Shropshire, which may be more than 1300 years old (Bevan-Jones 2002, 29 & gazetteer 189-193), firmly placing their planting in the middle-Saxon period. Bevan-Jones points out that only a few of the known Anglo-Saxon churches have ancient yew trees in their yards, but the trees'

longer lifespan could make the yew a marker of seventh- or eighth-century Anglo-Saxon church sites which currently only contain a more modern church (2002, 29). A further 60 trees in his survey were measured at more than 26 feet in circumference, which Bevan-Jones classed as "more than 1000 years old" (Bevan-Jones 2002, 29 & gazetteer 189-193), including the tree, which is 28 feet in circumference, in the yard at All Saints', Alton Priors in Wiltshire, illustrated below.

Figure 3.11 – Yew tree in the churchyard at All Saints', Alton Priors (Wiltshire) – 28 feet in circumference (A4-sized clipboard for scale)

There remains the question of whether it was bishops, monks, or indeed anyone at all, who directed the incorporation of the earlier pagan sites, such as wells and barrows. John Blair has suggested that many small churches were built on older ritual monuments, where the sites were apparently selected for non-practical reasons and where they may represent sites of long-standing sacredness (Blair 2005, 376). But his observation, noted earlier, that the builders of the early minster churches, "frequently bishops" (Blair 1991, 91), had apparently shown little interest in commandeering earlier ritual sites (Blair 2005, 376), appears to indicate that they had other priorities, possibly the patron's convenience. It may also be wrong to assume that, in the tenth and eleventh centuries, the church came *after* the manor; as Blair comments that

"placing his church on a perceived sacred site away from the manor, may be an example of the lord trying to gain control of a traditional source of power such as a well or tree" (Blair 2005, 382). This could represent an additional way that undeveloped cult sites were brought into the Christian fold, not specifically authorized or directed by senior members of the church hierarchy, but as a method of imposing local secular power or even as a way of gaining local acceptance.

The in-depth studies at Shapwick in Somerset highlight the fact that detailed knowledge of any individual site can reveal so much extra information about its history, that previous assessments of the current church and its location do not necessarily reflect the true situation. In fact, the detailed knowledge provided by excavation, landscape analysis and interpretation at Shapwick (see Gerrard & Aston 2007, particularly 963-981) has raised additional questions which would not have been evident otherwise. In the absence of this research, the location of Shapwick church in the centre of the village would have been totally unremarkable; it is not located adjacent to a manorial centre nor is it close to a feature which could be interpreted as of earlier ritual importance. However, the extensive research there has shown that the final position of the church, and its relationship to the settlement and topographical features, is the result of a complex series of events. An earlier stone-built church, possibly a minster, thought to be of the ninth century and of at least two phases, was built close to a seventh- or eighth-century timber building, which was possibly an earlier church, or possibly a *caput* hall. Both the 'hall' and stone church were built close to a spring (although there were nine springs in the parish in total) and close both to Bronze-Age barrows and to the remains of a Roman building. In addition, there was another adjacent timber-framed building overlain by a stone building which was probably the site of the vicarage. Late-Saxon settlement shift saw the church and manorial *curia* left isolated and, approximately 250 years later, the manorial administrative functions were moved some 600 metres to a new moated site at the northern end of the current village at the end of the thirteenth century. The church site was moved into the village during the early fourteenth century, where a new larger church was built, albeit with an old-fashioned floorplan featuring a central tower. All this raises the following questions: if the timber building was a *caput* hall, and it preceded the church, was it sited close to the spring for practical reasons? Was the church built close by for the convenience of the hall residents, or because of the spring? If the earlier timber building was a church

and not a hall, was it located where it was because of the spring, the prehistoric barrows or the Roman building remains? Finally, was it only a desire for a larger building that caused the church site to be moved or was it to improve access for the patron and villagers, rather than leaving the church where it was - isolated, as so many others are?

Investigating churches with Romanesque towers in Lincolnshire, Stocker and Everson (2007) have concluded that eighteen churches (27%) appear to have been located in relation to some natural or ancient feature in the landscape (thirteen of which were springs and twelve of these were in the Lindsey district), 31% were located in open spaces within settlements and 42% were located close to the manorial centre or due to some other episode of lordly planning or replanning (2007, 61-64). The high proportion of churches in Lindsey built close to a spring suggested to the writers that either the church was an early foundation that preceded the settlement, or that it was thought a more appropriate location within the settlement, rather than next to the manor (2007, 64), but there is no evidence as yet for any of these churches dating from a period when pagan wells were being 'converted' to Christianity (2007, 63). Subsequent phases of settlement development have clouded the association of the churches with natural features, so that at present, fourteen of the eighteen churches appear to be associated with lordly planning or open space within the settlement, but can be stratigraphically separated to show their original association (2007, 61 & 65). This work provides another indication that only very detailed analysis allows a true reading of the situation, in that without it, the importance of the springs to the original location of these churches would have been substantially diluted.

Expressions of *Romanitas*

An expression of *Romanitas* was the third type of possible spiritual reuse of earlier sites, where their incorporation was seen as a way to emulate the Christian culture of the later Roman Empire. There are almost 200 parish churches in Britain which are known to overlie or adjoin Roman sites, such as at Caister St Edmund (Norfolk), Castor (Cambridgeshire) and Bewcastle (Cumbria) and "it is plausible that some of these are developments of perceived ancestral burials or reuses of the earlier burial site" (Blair 2005, 377), although it is equally likely that they are examples of

Romanitas. Tyler Bell puts the number of churches associated with Roman structures at 160, but suggested that they "may represent only a fraction of the total" (Bell 1998, 2). Tim Eaton has identified the 25 churches located in Roman forts as the earliest acknowledged class of Roman structure consistently reused for Christian purposes, many as missionary churches early in the Conversion (Eaton 2000, 14-17). Bell calls the use of Roman sites a "distinct and purposeful reuse", in many cases several centuries after the structures' desertion and ruination (1998, 4). From the seventh century, Saxons saw Roman masonry buildings as synonymous with Christianity, and further, that there was an association between stone buildings and the church, indicated by the number of churches over Roman buildings throughout the country in settlements with placenames derived from stone (Bell 1998, 6; Rigold 1972, 38), for example Lullingstone (Kent), Stansted Abbots (Herts), Whitestaunton (Somerset) and Stanwix (Cumbria). This link is unlikely to be just an attraction to stone as a building material, as most churches were built in wood at this time (Thomas 1986, 121; Rodwell 1985).

The reuse of Roman altars, however, seems to confuse the issue somewhat. More than 50 altars are known to have been reused in ecclesiastic contexts (Eaton 2000, 65), but, since some of them have been used in subservient positions, classified as "casual use" by David Stocker (Stocker 1990, 83-88), such as at the base of the chancel arch at Godmanstone (Dorset) (Eaton 2000, 106) and the three altars buried in the footings at St Mary's, Bisley (Gloucestershire) (Eaton 2000, 101), it seems equally possible that these are examples of either the Christianization of pagan altars at Godmanstone, or merely the eminently practical use of the largest pieces of stone in the lowest courses of the wall at Bisley.

Conspicuous sites

The use of particularly conspicuous sites for churches can demonstrate elements of both practicality and spirituality. In many cases they are another example of the reuse of sites of earlier importance; many are in elevated positions, providing conspicuous locations such as knolls and hilltops, and have been noted by all writers for churches across the whole country, such as those at Edlesborough in Buckinghamshire, at Holme on Spalding Moor in East Yorkshire and at Godshill on the Isle of Wight. It has been observed that churches dedicated to St Michael frequently occupy hilltop sites and are an indication of spirituality (Morris 1989, 52-56; Stocker & Everson 2006, 82),

although the results of this survey show that St Michael's churches are much more likely to be built on flat lowland sites. Richard Morris also refers to other "locally conspicuous sites" (1989, 69) and quotes many examples of pre-Conquest churches in the flat areas of East Yorkshire built on locally elevated sites, although he suggests that in these cases it was "most likely that the patrons also lived in such positions and in due course provided their eyries with churches" (Morris 1989, 267), and therefore amount to being sited for the convenience of the patron. Other sites which are conspicuous for reasons other than solely their elevation, which Richard Morris describes as having "indications of more than local status" (1989, 69), are an additional example of the sort of site that had earlier significant uses. The main example he quotes was the church at Knowlton in Dorset, which as well as being in the centre of a henge, was also in the later Hundredal meeting place, with a possible parallel at Thwing in East Yorkshire (Morris 1989, 74). In these cases, the sites would have had a prominent place in the minds of everyone over a wide area and their adoption as the site for a church possibly gained *kudos* for the patron, reflecting John Blair's comment, noted earlier, that adoption of cult sites may have been an exercise by the patron of gaining the power of the site (Blair 2005, 382). Morris acknowledges that the Knowlton site is often used by others as an example of 'de-paganization' (Morris 1989, 72), but offers the possibility that the church-builders may just have adopted a convenient enclosure for burials adjacent to a now abandoned settlement (Morris 1989, 73). It is not possible to determine which of these reasons was behind the original choice of the site for the church, but it highlights the fact that care must be taken when making any assumptions.

Figure 3.12 – Knowlton church sited in the centre of the henge, which was also the Hundred meeting place, or was it sited there to be within a convenient enclosure for burials?

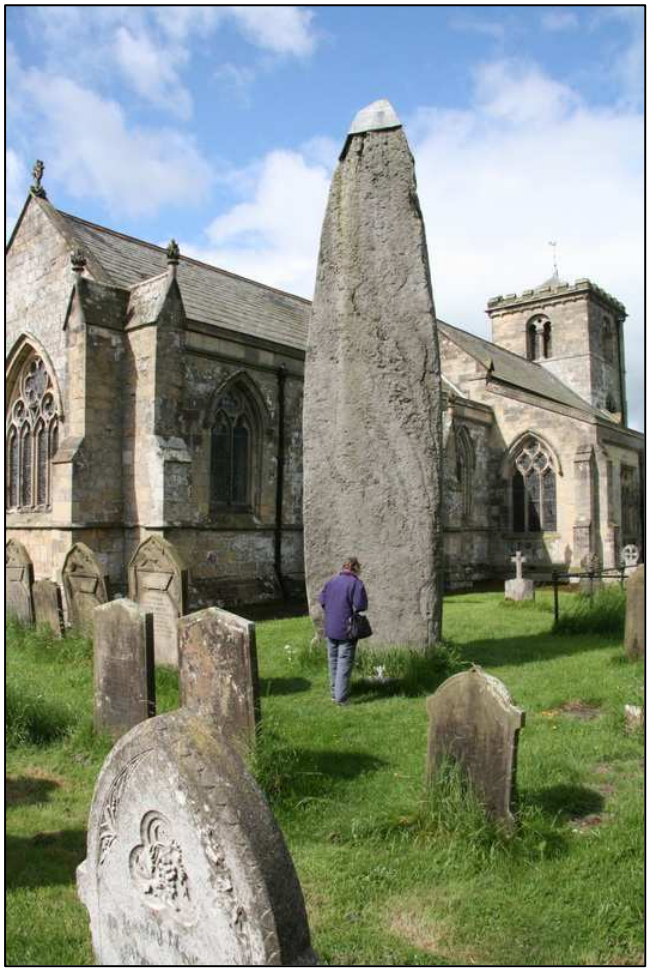


Figure 3.13 –

All Saints', Rudston with monolith (chief measuring assistant for scale)

The site of All Saints' at Rudston in East Yorkshire is a similar case. Richard Morris makes the point that the church at Rudston was built next to the monolith, and asks "why are there not more churches built close to standing stones" (1989, 82)? One

possible explanation is that the Rudston site is also on top of a hill, so this 'conspicuous site' may have taken precedence over the fact that the monolith was there, or perhaps it reinforced the choice of the prominent site. The fact that there are few churches close to standing stones does suggest that they were not considered important enough to require Christianization and reaffirms the argument that Christianization may have been generally overstated as a concept. At Alton Priors in Wiltshire, however, two felled megaliths are set beneath the church floor, accessible by trapdoors (Surman 2008, 5-6), although whether the church was sited over them for the purpose of Christianization or not, and whether the stones have always been accessible, rather than buried, is unclear. These examples, particularly at Knowlton and Rudston, reiterate how complex the whole issue of church location is, particularly when coupled with the position in the hierarchy that the church patron occupied. This subject is developed in later chapters by using the results of this survey.

CHURCH LOCATION: CONCLUSIONS

The location of churches has been shown to be influenced by many, often inter-related, factors. In many cases the earliest churches were established on the 'best' sites in terms of topography, but whether that was for practical reasons, such as for the convenience of the patron who had already chosen to live there, for avoiding flood-prone land or for conspicuousness, is not clear. Writers have discussed a wide range of influences on the location of churches of every age, size and type, ranging from the incorporation of earlier ritual sites to the simple desire for the church to be close at hand. The incorporation of earlier ritual sites appears to have continued to operate over several centuries, although whether its operation, or focus, was as organized or as comprehensive as the church hierarchy appears to have originally intended, is unclear.

John Blair feels that a fundamental distinction could be drawn between local churches which stand where they do because their sites had sacred significance, and those which grew from the contemporary locational needs of manorial settlement and had no roots in any ritual past (Blair 2005, 373). What is clear from the research at Shapwick and from some of the cases in Lincolnshire, noted earlier, is that detailed local work on a site-by-site basis can change the apparent relationship between church, manor and topography to such an extent that summary conclusions drawn without such

detailed analysis, especially at single sites or from very small datasets, should be treated with care. Statistical reliability of the results grows as the sample size grows, especially as it appears from hundreds of other sites in Somerset, Norfolk, Yorkshire and Lincolnshire that the moving of the church at Shapwick was an unusual exercise, and that the vast majority of churches stayed in their original location even when the settlement shifted away. Applying the results of this large survey in later chapters to the location of churches, and separating sites chosen principally for manorial reasons or for topographical reasons will be made more difficult when taking into account the many east-facing sloping sites that have churches built on them.

SETTLEMENT STUDIES

This section outlines the historiography of rural settlement change, from the mid-Saxon period to about a century after Domesday, which was an important period for rural church building. It outlines the earlier views of settlement and discusses the more recent major writings about rural settlement, particularly the patterns that developed in the different regions based on the major landscape/agricultural classifications of 'planned' and 'ancient' countryside. It also touches briefly on the parallel development of open-field agriculture. Although the specific types, and patterns, of settlement that developed across the country are not the primary interest of this thesis, the timing of the appearance of the church in the settlement and its specific location within the settlement *are* matters of central importance, and will form a major part of the analysis in the final chapters.

Formalizing terms "used by writers for several centuries", Oliver Rackham's definitions of 'planned' and 'ancient' countryside and the 'highland' area use different levels of settlement dispersion (in other words hamlets, villages & isolated farms) as one of the eight distinct differences between the regions (Rackham 1986, 4-5). Planned countryside has been described by others as 'Champion' or 'Midland', and ancient countryside has been described as 'Woodland' or 'South-east'. Rackham notes an often sharp division between the types of countryside which do not reflect the local administrative boundaries and frequently cut parishes in half (Rackham 1986, 5). The three types of countryside are shown in Figure 5.1 below, along with the boundaries of the areas surveyed for this thesis. and it has been recognized that whilst "each area is broadly homogeneous, with many broad similarities in the types of rural settlement", both in their formation and changes in them, there are also some variations within the areas, especially at the margins (Taylor 1983, 77-85; Williamson, 2003 5-6), and there are different opinions on the timing of settlement nucleation (Lewis *et al*. 2001, 201 & 214; Taylor 2002, 54; Williamson 2003). Different writers have offered slightly different versions of the boundaries of the two types of countryside, including those arrived at when measuring nineteenth-century dispersion of settlement in *An Atlas of Rural Settlement* (Roberts & Wrathmell 2002, 8-9), "but all agree that the Midland areas were [later] characterised by more nucleated patterns of settlement" (Williamson 2003, 4).

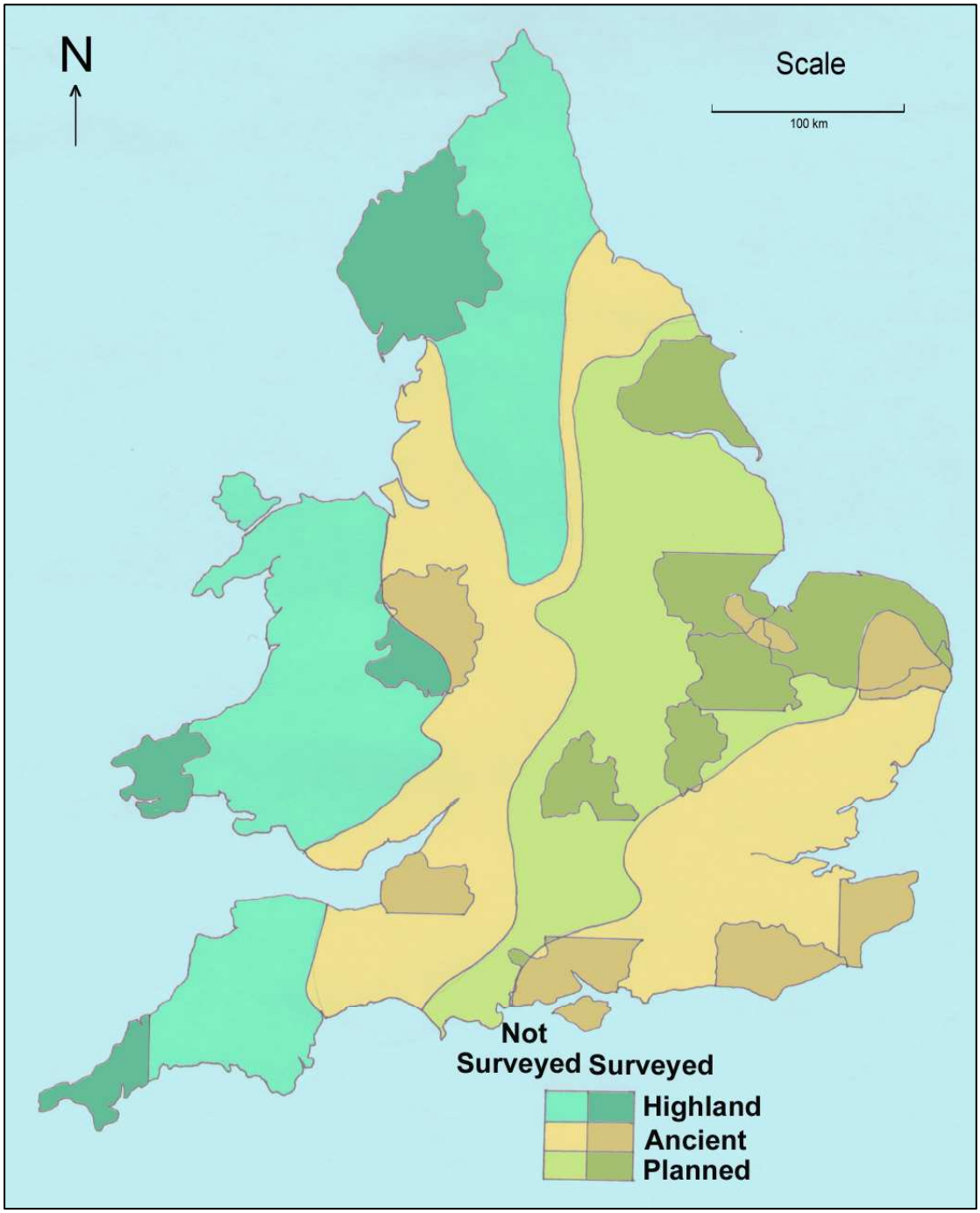


Figure 3.14 – Landscape classifications after Rackham 1986, showing the areas of churches surveyed for this thesis

Early settlement development

Before the 1970s it was generally assumed that villages were established by the Anglo-Saxon people who colonized England in the fifth century, after the Romans left. The subject was considered in Hoskins' publication *The making of the English landscape* in 1955 and he supported the idea by writing that "the English landscape as we know it today is almost entirely the product of the last fifteen hundred years, beginning with the earliest Anglo-Saxon villages in the middle decades of the fifth century" (Hoskins 1955, 20). He went on to describe several different village types – Green villages, Street villages and Crossroad villages, and he also referred to "mixed types" which he ascribed to "later changes" (1955, 60), but which may have been the polyfocal settlements later described by Christopher Taylor (1977) and Trevor Rowley (1978). Hoskins also referred to planned villages, which he thought were "mostly of eighteenth century date" (Hoskins 1955, 60). He felt that all these various types of villages reflected cultural and historical differences, but acknowledged that "the result may be due to successive changes" (Hoskins 1955, 60).

Similar settlements to those noted by Hoskins (green villages and street villages) were built in Holland and northern Germany, and it "might legitimately have been expected that similar types were built here" (Rowley 1978, 72), except that there is a "fundamental flaw in this assumption in that there is no evidence that villages were built [anywhere] by the early Saxons" (Rowley 1978, 72). By this time, thinking had changed considerably and there were "many theories on village formation, but all were united in their opposition to the traditional beliefs" (Rowley 1978, 70). It was suggested that "the traditional view of nucleated villages [only] provided a comfortable picture of stability and antiquity in our landscape" (Taylor 1983, 110). In fact it was proposed that villages were "an aberration" in the landscape (Taylor 1983, 125; Aston 1985, 82) and that in many cases the hamlets and farmsteads that predated the villages were in some way a more normal form of settlement (Aston 1985, 82; Brown & Taylor 1989, 61), whether through forest clearance (Taylor 1983; Williamson 2003), continuity of the Roman pattern of scattered settlement (Hoskins 1955; Rodwell & Rodwell 1985; Williamson 2003), or through development in late Saxon times (Brown & Taylor 1989, 61; Warner 1991).

Researchers in many areas across the country have "uncovered a continuous and often extensive change in medieval settlement, with the former idea of village

stability swept away" (Taylor 1992, 7), revealing a similarity of dispersed settlement types that were common to all areas before the communal systems of agriculture with their nucleated villages in the Midlands (Taylor 1983, 63-108; Williamson 1988, 9-10). Scattered early- to middle-Saxon sites, with several to a parish, have been discovered in many places, although it is not always clear whether these were contemporary or successive. For example, excavations at West Stow (Suffolk) and Mucking (Essex) were interpreted as shifting clusters of houses (Hamerow 1991; Taylor 1992, 8), whereas at Brixworth (Northamptonshire), it has been suggested that they may have been contemporary, or at least evidence for early nucleation (Jones & Page 2006, 88). Another example is Goltho in Lincolnshire, where excavation "provides the first real date for an English village on the site", as being laid out in the tenth or eleventh century on a pattern unrelated to the eighth-century timber houses beneath it (Taylor 1983, 122; Beresford 1975), in a similar way to Bishops Waltham (Hampshire) and Brandon (Suffolk) (cited in Taylor 1983, 122-3). These examples have confirmed that there was "an early- to middle-Saxon pattern which was different from, and unrelated to, the later medieval nucleated villages" (Williamson 1988, 6; Taylor 1992). A pattern of dispersed settlements has also been found in Buckinghamshire and Leicestershire, with small outlying sites revealed by scatters of mid-Saxon pottery, but which seldom produce late-Saxon pottery on the same site (Lewis *et al.* 2001, 81), indicating their disappearance by then.

During this period, a pattern of large estates, which contained many hamlets and scattered farmsteads, that may have perpetuated boundaries from at least Roman times, has been suggested in the past, particularly by Glanville Jones (Jones 1961 & 1979). The idea was developed and summarised by Mick Aston as "… a series of large units in the landscape from the seventh century onwards. These estates were centred on some of the most significant places in the landscape with all other settlements dependent on them and may be reflected later on in the lands of the old established monasteries and bishoprics, or in some of the Hundredal arrangements" (Aston 1985, 36). Examples were suggested by Glanville Jones across much of the country – Wales, Yorkshire, Hertfordshire, Sussex, Wiltshire, Cumberland and Durham (Glanville Jones 1961 & 1979; Aston 1985, 34), thus demonstrating that a similar form of dispersed settlement was common to all areas of the country, irrespective of soil type and region,

prior to the divergence of settlement patterns that later characterized the planned and ancient countryside areas.

Despite Rackham's comment, noted earlier, that there was often a sharp division between the two areas of countryside, many areas at the margins of the main landscape regions exhibit characteristics of both. As Christopher Dyer puts it "Village England runs down the middle of the country … areas of dispersed settlement lie on either side, although there are pockets of farms and hamlets in village-dominated regions and there is a scatter of nucleated villages in every corner of the country" (Dyer 1994, 47). Christopher Taylor points to "marginal areas of mixed settlement" (Taylor 1983, 77-85) and Roberts and Wrathmell describe "sub-provinces" in south Huntingdonshire and adjacent areas, in which a mixture of 'Central' and 'South-Eastern' settlement characteristics appear (Roberts & Wrathmell 1998, 102).

Scholars broadly agree as to why nucleated settlements and open field agriculture appeared; shortage of pasture, innovations in ploughing technology, partible inheritance, rising population, administrative reasons such as tithes and parishes, as well as market surplus arising from improved techniques of open-field farming, have all been considered (Taylor 1983, 125-150; 2002, 53; Brown & Foard 1998, 82; Williamson 1988, 7; Lewis *et al*. 2001, 193), in addition to soil (Williamson 2003) and lordly power (Hamerow 2002, 87; Williamson 1988, 7; Dodgshon 1980). However, recent work in Northamptonshire has highlighted the substantial amount of grazing land remaining after the open fields were fully developed (up to 40% of the area), suggesting that re-assessment is needed of the idea that it was the shortage of pasture for grazing that led to the need for fallow fields, and therefore the 'three-field' system (Williamson in prep.). An additional problem is that the 'pressure of population' effect was not realised on all the areas of heavy clay. The claylands of Essex, Norfolk and Suffolk, in the 'ancient countryside' area, were not subject to the same settlement developments as the claylands of the midland counties (Williamson 1988, 10), even though the Domesday population density was greater there than in the Midlands (Darby 1976, 46). Christopher Taylor asks whether nucleation was an evolutionary process that started in one place and spread (Taylor 2002, 54), which is also hinted at by Carenza Lewis (Lewis *et al.* 2001, 214), but, if nucleation spread from the centre of the area, then villages at the edge would be expected to have nucleated later than those in the

centre (Taylor 2002, 55), a situation which has not been identified by any of these writers' published researches.

Chronology

The chronology of the change is more problematic. The original theories of fifth-century Saxons importing the village structure and agricultural technique have been shown to be wrong, and at the other extreme, Joan Thirsk put village formation as late as the twelfth or thirteenth centuries (Thirsk 1964), which has also been disproved; both from documentary sources, with Saxon charters referring to headlands, furlongs and yardlands (Pollard & Reynolds 2002, 219) and from field-walking finds of concentrations of earlier pottery (Jones & Page 2006, 81). There are two current schools of thought on chronology; firstly a middle-Saxon phase of nucleation of the late eighth or early ninth century (Taylor 1983, 130; Williamson 2003, 66), with "much of the nucleation completed before the middle of the ninth century" (Williamson 2003, 67), although some have suggested a seventh-century start, such as at North Elmham in Norfolk (Wade-Martins 1980a), and others have suggested a nucleation in the late seventh or early eighth century, with open fields started in the ninth or tenth century as part of the replanning of agricultural methods (Brown & Foard, 1998, 91). The second school of thought involves a longer chronology with a later beginning, suggesting settlement nucleation starting between the middle of the ninth century and the eleventh century, but not finishing in parts until as late as the thirteenth century (Lewis *et al.* 2001, 81; Taylor 1983), a period which has been called the "village moment" (Lewis *et al.* 2001, 191) and partly echoing Thirsk's suggested timing, mentioned earlier.

There is also considerable discussion over the issue of whether settlement change or replanning was a lordly effort or organized by the peasants through economic necessity. The majority of authors seem to favour the idea of lordly replanning of settlements and have suggested that it fits in well with the other changes during the period; of feudal transformation, with an increase in the number of local lords (Faith 1997, 1-15), coupled with urban growth, rapid population growth and a concomitant increase in demand for food production (Taylor 1983; Lewis *et al.* 2001, 194-195; Gerrard & Aston 2007). Bruce Campbell has doubts as to whether communities were sufficiently organized and capable of making the appropriate

decisions before the commonfield systems came into existence, and that "strong and undivided lordship" was more likely (Campbell 1981, 127), a position echoed by Richard Hodges, who considered that the "nucleation of villages cannot be ascribed to the collective zeal of the peasantry … it was surely the work of the manorial class" (Hodges 1989, 168). Carenza Lewis sees an obstacle to the assumption that lords were the principal agents in the planning of villages and fields by noting that "there are frequently differences between the boundaries of manor and township" (Lewis *et al.* 2001, 175), implying that the two are not contemporary features. Christopher Taylor, however, has also argued that nucleation could have been brought about by a conscious decision by a group of residents to occupy a single site, rather than being a function of lordship (Taylor 1983, 133), a similar view to that of Christopher Dyer concerning the development of villages and open field farming (Dyer 1994, 11).

Development of open-field agriculture

Some feel that there is a "strong likelihood" that open fields came into existence at the same time as the nucleation of villages (Lewis *et al.* 2001, 171), and Margaret Faull (1984) also saw village and agricultural development happening in parallel, between the ninth/tenth century and the twelfth century. There is pottery evidence of scattered Saxon settlements covered by later open fields (Foard 1978, 364), although this just appears to show that scattered settlements preceded the fields, but not by how long. In other words, this evidence could support either a contemporary change to both settlement and agriculture, or a later change in agriculture. Carenza Lewis mentions this as part of the problem with an evolutionary model of growth of nucleation, and suggested that once the change to nucleation was started in a particular vill it had to happen quickly, perhaps within a year, in order to avoid the conflict of land use between field and scattered settlement, clearly meaning that settlement nucleation and the creation of open-fields had to be contemporary (Lewis *et al.* 2001, 171). However, others felt that the open-fields may have been developed some time after the village nucleation process. As Tom Williamson puts it, "exactly what form that those open fields, as they existed by the twelfth and thirteenth centuries, took in late-Saxon times, is still open to debate" (Williamson 2003, 89), with suggestions by some that there may have been an intermediate form of communal agriculture, known as 'long furlongs' (Hall 1981, 36-37), although others have suggested that it was basically pastoral

(Brown & Foard 1998, 91-92). Whether there was a contemporary change in agricultural methods or not, there must have been "some reorganization of the lands that were attached to the hamlets as they combined" (Brown & Foard 1998, 80). At Shapwick in Somerset, the village nucleated in the tenth or eleventh century in the centre of a new larger parish, based on the lands of at least two earlier hamlets or manors (Gerrard & Aston 2007, 980-981). The new village was located in the centre of the new open fields, for which fieldwalking has uncovered a late-Saxon manuring scatter slightly in excess of 200 acres (Gerrard & Aston 2007, 980-981); what cannot be resolved is whether the creation of a new village and the introduction of open-field farming there were contemporary.

'Ancient countryside' settlement

In 'ancient countryside' areas, for example on the clays of central Norfolk, early-Saxon settlement continued the dispersed character of Roman settlement, although more sparsely, but during the middle Saxon period, settlement began to be concentrated, usually only one settlement to a parish (Wade-Martins 1980b; Davison 1990, 16-19; Newman 2001, 7; Williamson 2002, 95). This area was characterized in later times by a variety of dispersed settlement forms, in many cases surrounding commonland, which "began developing in the eleventh, twelfth and thirteenth centuries" (Williamson 2003, 92; Martin 2001, 6; Warner 1991, 13). In the majority of cases where fieldwalking has been possible, similar foci to the middle-Saxon sites for settlement were retained in the late Saxon period (Wade-Martins 1980b; Davison 1990), although some of these identified middle-Saxon sites may only have grown into villages in the late Saxon period (Williamson 1993, 85). On the lighter soils to the east of the claylands in East Anglia, "a similar pattern is apparent … … the movement away from middle-Saxon sites to the common edge evidently began in pre-Conquest times", and is "probably typical" (Williamson 2003, 98). Williamson feels that this indicates that there were strong forces operating in pre-Conquest times that prevented the growth of the nucleation of settlement, rather than settlement dispersing to the common edge (Williamson 2003, 98-99). Further south, in Suffolk and north Essex, where there were fewer large commons, most parishes had a cluster of settlement, but with numerous small isolated settlements often close to small greens (Warner 1991, 28-29; Williamson

2003, 101-2), a proportion of which became villages before Domesday, the rest remaining as subsidiary hamlets (Warner 1991, 29).

Highland Zone settlement

This zone has also been referred to as the "Northern & Western Province" (Roberts & Wrathmell 2002, 5). Settlement patterns in the Highland Zone are considerably simpler, basically remaining dispersed throughout the period of interest here, but with exceptions particularly along the coast and in the larger valleys (Roberts & Wrathmell 2002, 116-117), where some village nucleation occurred with sizeable associated township fields. Most of the area concentrated on an agricultural economy that was basically pastoral in nature, with settlement and farmsteads scattered along valley floors with associated upland grazing sites (Roberts & Wrathmell 2002, 162-170).

SETTLEMENT: CONCLUSIONS

There appears to have been a similarity in settlement patterns across much of the country at least until middle-Saxon times and possibly after; a dispersed settlement of farmsteads and hamlets, often assarted from woodland, which appeared, shifted, and disappeared, from the Roman period until the beginning of nucleated village settlements across most of the country during either the middle-Saxon or late-Saxon period, depending on which school of thought is followed. After this point a divergence in pattern began; in the 'ancient countryside' areas the nucleated settlements began to break up with some, if not most, settlement moving towards the edges of grazing land (the commons), during the post-Conquest period and possibly just before it; whilst in the 'planned countryside' areas, the nucleated settlements remained on the same site. There were some differences in patterns at the edges of the two countryside areas, with pockets of one type of settlement contained within the boundaries of the other.

The question of when 'planning' started – in early or middle-Saxon hamlets, or only as part of the settlement nucleation process, or possibly when open-field agriculture started – is still debated. In addition, the question whether this was 'lordly replanning' or some form of peasant communal effort is also unclear. From a practical

point of view, it makes sense to locate the nucleated village close to the centre of the combined fields, rather than close to one boundary, leaving the question of whether settlement nucleation only happened on a new site, rather than by the growth of one of the constituent hamlets, when none of the hamlets was conveniently placed in the new combined lands?

In later chapters, the results of this survey, particularly in Norfolk and Suffolk, will be used to assess whether a local graveyard was set up as a contemporary process with the nucleation of the village, and then the church was built later on the graveyard site, or whether the nucleation of the settlement was followed by the building of a church on a new site much later.

PART TWO

SURVEY DESIGN AND BASIC RESULTS APPLIED TO EARLIER THEORIES

CHAPTER FOUR

THE SURVEY METHOD AND BASIC RESULTS

But churches face east, don't they?
(Anon: many times to the author, 2000 - 2008)

INTRODUCTION

This chapter describes the survey of 1,926 medieval rural parish churches conducted for this thesis. It explains the sample selection; outlines the survey methodology; presents the main results and provides an initial analysis of them.

SURVEY SAMPLE

In order to provide a large dataset and one which would allow an area-based analysis, the survey has a structured sample which covers a geographic spread of fifteen counties across the country (Cumbria, East Riding of Yorkshire, Shropshire, southern Lincolnshire, northern Cambridgeshire, Norfolk, northern Suffolk, northern Oxfordshire, Bedfordshire, Pembrokeshire, northern Somerset, southern Hampshire, East Sussex, eastern Kent and western Cornwall), shown in Figure 4.1. Some of these areas use county boundaries that predate the boundary reorganization of 1974, because some of the volumes of *Pevsner's Buildings of England*, on which the sample was based, were written and printed prior to this date, and references to the churches will use these old County names and boundaries throughout this thesis. All of the rural medieval parish churches in the resulting areas were surveyed, except those described in the relevant volume of *Buildings of England* as having had their naves rebuilt in relatively recent times. The exclusion of these churches was to ensure that a post-medieval, especially Victorian, rebuild had not affected the alignment of the church. Where Pevsner noted that the nave was rebuilt above a particular level, for example above the window cills, and the earlier construction could still be seen, measurements were taken from the latter. In some counties (Cambridgeshire, Cornwall, Hampshire,

Lincolnshire, Kent, Oxfordshire and Somerset) only part of the county was surveyed due to limitations in the time available for the survey. In these cases, the survey was started at one end of the county and as many as possible of the churches that fitted the parameters were surveyed during the time available, after which a suitable north-south or east-west Ordnance Survey grid line was chosen as a cut off point, prior to the commencement of the analysis of the data. The part of northern Suffolk that was surveyed represents the extent of the Waveney Valley catchment in Suffolk which was the subject of the initial survey, undertaken for a Diploma in 1999, and subsequently incorporated into the larger survey.

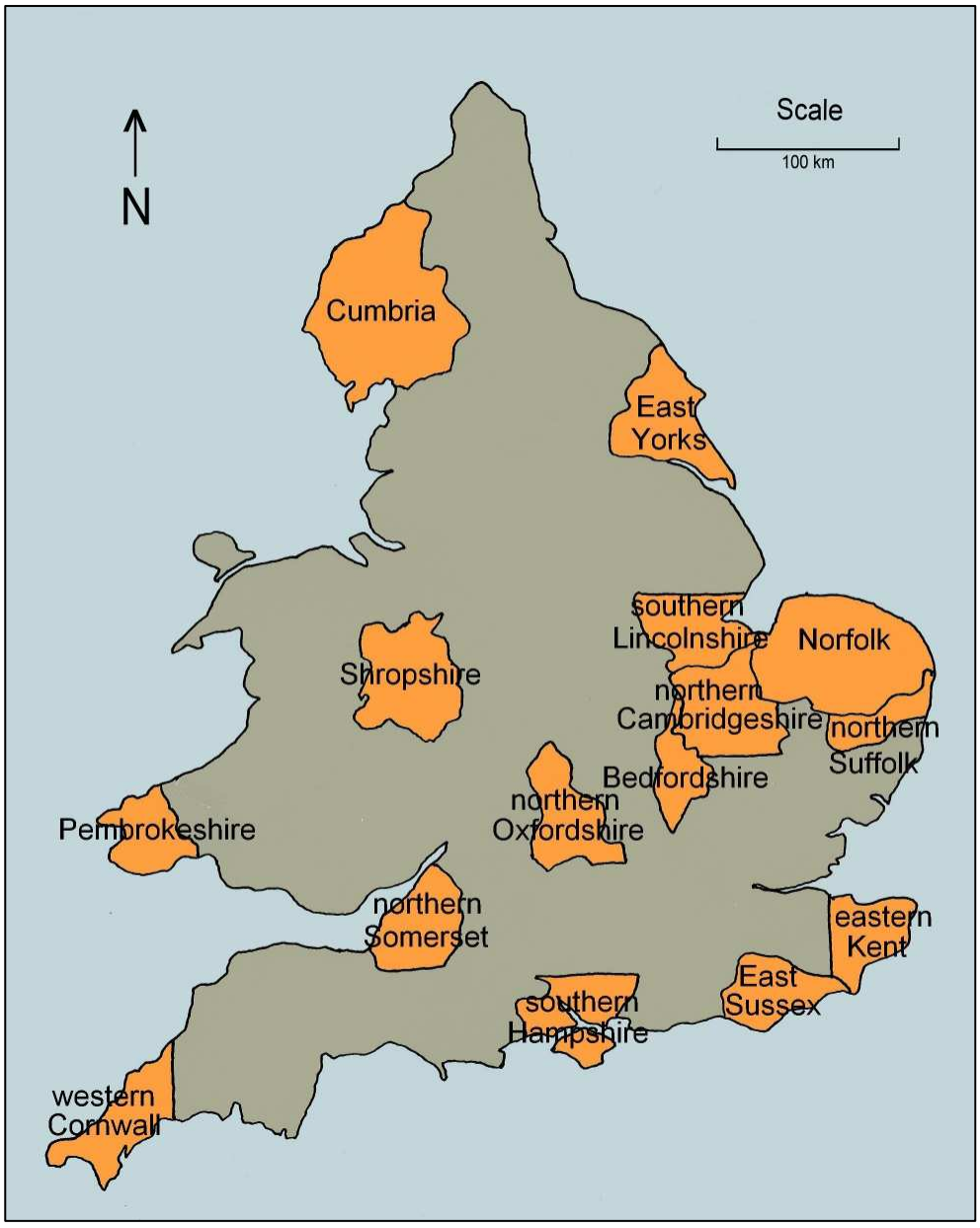


Figure 4.1 – Survey areas

Data were collected about each church building itself, about its immediate surroundings and about the wider landscape. For the church, these included the floorplan; the type of tower; the size of the nave and chancel; the alignment of the nave and chancel; the height above sea level; the latitude and longitude and an assessment of whether the building lay parallel to the churchyard's principal boundary. For the churchyard, they included overall size; the closest proximity between church and yard boundary; the topography of the site and the angle and direction of any slope of the yard. For the wider landscape, an assessment was made of the surroundings, including the presence and location of any adjacent large house, the location of the village that the church served, and the current morphology of the village. For almost two-thirds of the churches (1,105), measurements were also made of the elevation of the eastern horizon; this was started when it became clear that the horizon elevation was important, particularly when dealing with sunrise. A completed example of the form used for the collection of the data is shown as Appendix 3 on pages 325-326.

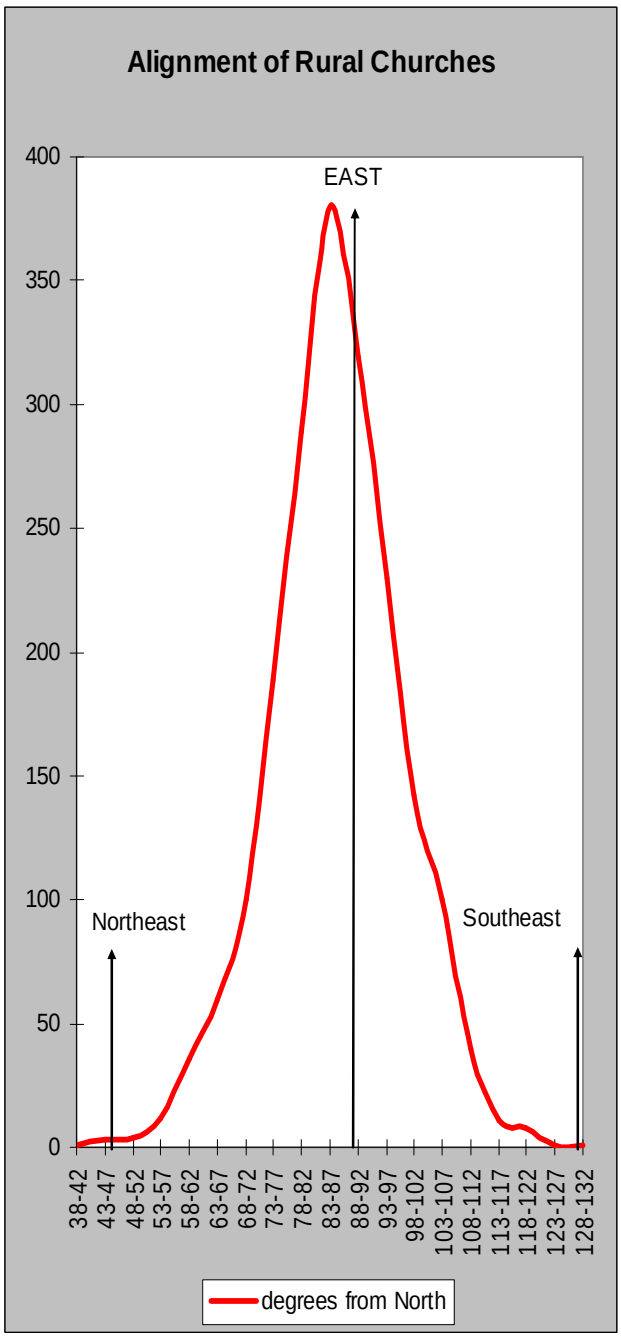
SURVEY METHOD

To assist in standardizing alignment readings, especially on undulating walls or those built of materials such as cobble flint, they were taken with a Silva Type 15 compass fixed to a piece of hardwood 75 centimetres in length (with brass screws). Where possible, readings were taken inside the church, two on each side of the nave and two on each side of the chancel. If external readings were required due to lack of access, three were taken on both the north and south sides of the chancel, and of the nave, in an attempt to remove anomalies resulting either from local magnetic variations caused by iron in, or near, the walls, or caused by north and south walls not being exactly parallel. If there were differences of more than one degree between the readings for either part of the building, they were retaken at different places. A mean was taken of the results, to provide single readings for the nave and for the chancel. Finally, the magnetic compass readings were adjusted to True readings by deducting the contemporary magnetic declination in the area, as listed in Appendix 4 on page 327. The angular elevation of horizons of churches in eight of the counties in the survey, Bedfordshire, Cumbria, Hampshire, Lincolnshire, Norfolk, Oxfordshire, Pembrokeshire and Suffolk were taken with the same Silva compass as the church alignments. Placed on its side

and held against the south wall of the chancel, the horizon was sighted along the piece of wood on which the compass was mounted and the reading taken from the integral clinometer, in degrees.

The slope direction of the churchyard was measured by taking a bearing of the lowest part from the highest part using a prismatic sighting compass. With practice it is possible to get repeat readings, taken blind at different times, within two or three degrees of each other, so, since the lowest and highest parts of a churchyard are usually easy to assess, the readings should be within two or three degrees of the actual slope direction. On difficult sites, a backsight was taken from the lowest part of the yard towards the highest, and an average reading taken. To reduce any possible bias in the readings, each was rounded to the nearest five degrees. The slope of the yard was assessed at the church itself. The actual drop in the land was measured on the church walls, and then calculated as a percentage slope measured against the length, width or diagonal measurement of the church as appropriate.

Urban churches were omitted from the main survey in order to avoid buildings that were more likely to have been influenced in alignment by the character of their site. Much has been written about this subject in the past (for example: Biddle 1976b, 20-22, Morris 1989, 208-209; Rodwell 1984) but a supplementary sample of 70 urban churches (in Norwich, York (some of which follow the alignment of the original Roman street pattern noted in Chapter One) Lincoln and Stamford) was surveyed. They exhibit a completely different pattern of alignment from the rural sample, which appears to support the earlier writers' assertions of alignment influence. The rural churches of this survey display a statistically "normal" result graph, described as a bell curve, whereas the urban sample displays no apparent pattern in alignment, being fairly equally spread across their range of alignments, which, despite the small numbers involved (70 churches), has exactly the same range as the considerably larger rural group of 1,926 churches, both varying by 90º between 38º and 128º True. The graphs of the alignment of urban and rural churches are shown at the same vertical scale below.



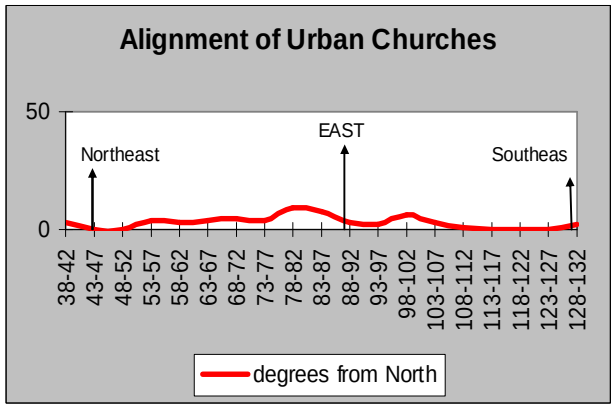


Figure 4.2 –

Rural and Urban church alignment from this survey - comparison at the same vertical scale

THE SURVEY RESULTS FOR MEDIEVAL CHURCHES

Analysis and results of an interim stage of this survey were written up as part of a Masters dissertation (Hinton 2003). At that time, the total survey amounted to 993 churches in nine counties. An additional 933 churches in a further six counties have since been surveyed, bringing the total to 1,926 churches in fifteen counties. The overall results, analysed here, closely confirm the earlier findings and bring an even greater statistical validity to the results. They have also allowed new conclusions to be

drawn about the causes of alignment variation due to the improved geographical coverage and the inclusion of counties further from the coast.

The mean alignment for all churches in the survey is 86.1º (interim survey 85.8º). This confirms the results of earlier writers, discussed in Chapter One, where the mean alignments ranged from 85° to 90º, and had a mean value of 86.0º. None of these earlier surveys splits its results within the country, either because the sample was too small or because it concentrated on a single area. It has never been possible to compare results between studies due to the different methodologies used with unknown levels of accuracy. Consequently the differences in alignment between the east and west of the country, shown in the table below, have not been revealed previously.

Table 4.1 Summary of church alignment by County

	Number	Range	Mean	% North of East
western Cornwall	72	50-111°	**80.4°**	76
Pembrokeshire	77	48-116°	**82.0°**	77
Cumbria	74	62-104°	**82.3°**	76
Shropshire	104	55-126°	**82.4°**	71
northern Somerset	91	54-107°	**82.5°**	74
East Riding Yorkshire	110	51-111°	**83.0°**	76
northern Oxfordshire	130	47-107º	**83.1º**	70
Bedfordshire	96	38-107º	**84.4º**	75
southern Hampshire	76	59-116º	**85.6º**	62
northern Cambridge	123	57-121°	**86.2°**	67
southern Lincolnshire	103	45-103º	**86.5º**	69
East Sussex	104	54-118°	**86.8°**	57
Norfolk	549	56-128º	**88.9º**	56
northern Suffolk	125	65-119º	**88.6º**	55
eastern Kent	92	58-120°	**92.4°**	40
TOTAL	**1926**	**38-128º**	**86.1º**	**63.8**

The results analysed by county clearly show a difference of 12° (**80.4°** - **92.4°**) between the mean alignments of churches in Kent and Cornwall. The use of statistical confidence limits in this table is not applicable since in each county all the churches that fit the criteria were surveyed, so the 'sample' and the 'whole group' are one and the same. The additional counties surveyed since the interim survey (Norfolk, Hampshire, Lincolnshire, Bedfordshire, Oxfordshire and Pembrokeshire) were all selected to confirm or deny the pattern of alignment variation that had been observed in the interim survey across the country; in the cases of Oxfordshire and Hampshire, by

providing results for the centre part of the country which was not represented before; in the case of Norfolk, to provide a larger survey base in the east of the country to check the consistently higher mean alignment already observed (and because it was close to home); while Pembrokeshire was added to the sample to give additional weight in the west of the country. The results for each of these counties fit the previously identified pattern, with mean church alignments in Oxfordshire, Hampshire, Lincolnshire and Bedfordshire fitting numerically between those for Somerset and Cambridgeshire, and the mean alignment in Norfolk matching that from the previously surveyed areas of northern Suffolk. The results in Pembrokeshire are very similar to those from the other counties in the west.

Broadly speaking, the numerical range between the most northerly and the most southerly individual church alignments in each of the counties surveyed is similar; it is the concentration of the numbers of churches aligned to one side of east or the other which causes the mean results to be different. In eastern Kent only 40% of churches are aligned to the north of east, shown in the final column in table 4.1, whereas almost twice as many, 76%, are aligned north of east in Cumbria and western Cornwall, and 77% in Pembrokeshire. Possible reasons for this pattern will be discussed in Chapter Six.

Table 4.2 below shows the variation of the alignment results each side of the mean value for each of the categories in the survey, for example, the mean alignment value for each the categories of “Churchyard topography”; Flat, Almost flat, Sloping, Platformed and Knoll, varies by **0.4°**, or less on one side of the mean figure, and by **0.7°** on both sides added together - the overall mean is 86.1° and the mean for each of the categories is 85.8°, 85.9°, 86.1°, 86.4° and 86.5°. This stability of the results applies to all of the first eight factors in the table below, relating to churchyard topography and size; the planform, and size, of the church; or its number of aisles; whether the church is built parallel to its principal boundary and how close to it; as none of them varies by more than three degrees from the overall mean direction. It is not being suggested that any of these factors is actually likely to have influenced the alignment of the church when it was first built, (except perhaps the proximity to, or parallelism with, the principal churchyard boundary) but rather that a significant difference in one of them may have highlighted an element that required further investigation. Location of the church in relation to its village is a special case. Without taking into account the small

group of nineteen churches (out of a total of 1,926) with either 'no village' or a 'scattered settlement', the total variation in mean alignment falls from 4.6º to 1.4º. The remaining categories where the church is either located in, or on the edge of, the village, or is 'remote' or 'isolated' from the village, are far closer to the overall mean alignment.

Table 4.2 - Variation in mean alignment by category		
When analysed by:-	Maximum variation one side of mean value - in degrees	Total variation both sides of mean value - in degrees
Churchyard topography	**0.4**	**0.7**
Season of the patron saint	0.6	0.7
Church/churchyard ratio	0.9	1.4
Church planform	1.1	1.5
Whether parallel to boundary or not	1.4	1.8
Number of aisles	1.4	2.3
Proximity of churchyard boundary	1.8	2.4
Size of church	1.4	2.6
Location in relation to village (see text)	3.9 (0.7)	4.6 (1.4)
Latitude	2.6	3.9
Type of tower	2.4	4.2
Height above sea level	3.9	5.4
Longitude	4.7	8.7

In the analysis of the last four factors in the table, latitude, type of tower, height above sea level and longitude, church alignment varies by a considerably greater amount either side of the mean value. Both of the first two can be explained because of their relationship to longitude in the areas surveyed. The major variation in mean alignment between churches built on sites less than 30 metres above sea level (87.6º) and those built on sites above 110 metres above sea level (82.7º) (for the detailed figures, see table 4.9 on page 122), is explained by the fact that counties in the east of the country; Norfolk, Suffolk and Cambridge (where the mean alignment is high – 89º) have by far the highest proportion of churches built on lowland sites, whereas in the west of the country, Cumbria, Cornwall and Shropshire (where the mean alignment is low - 82º) have the highest proportions of churches built on upland sites. Similarly, the type of tower varies by longitude. The higher mean alignment for round-towered churches (87.9º) is because they are almost exclusively found in East Anglia, where alignments are generally higher (see table A5.2 on page 329), and churches with no

towers (mean alignment 83.7º) are over represented in the west of the country, particularly Cumbria and Pembrokeshire. The variation in mean alignments by latitude can also be explained by underlying differences in the longitude of the survey areas. The low mean alignments for the northernmost and southernmost categories (around 83º) are reflections of the fact that these survey areas are located in the west of the country, and the higher value (87.7º) for the area between latitude 52º 30′ and 53º North is a reflection of the large number of surveyed churches in the east of the country at this latitude, particularly in Norfolk.

Quite why the variation in mean church alignment can apparently be described by variations in longitude is not at all clear. There is no obvious reason why any difference in longitude itself should cause, or be reflected in, differences in the alignment of churches. It must be remembered that the 'mean alignment' figure that has been used as an indicator of difference of alignment between categories, and between areas, is a reflection of the skewed nature of the data around east, in other words, a numerically lower mean alignment indicates that a greater number of churches in that category or area is aligned to the north of east (having a numerically lower value). This complicates the situation even further. Why should the difference in longitude between Cornwall and Kent cause twice as many church builders in Cornwall to align their church to the north of east compared with those in Kent? There may be another variable which could explain this difference and which is linked in some way to longitude, but it is none of the physical and topographical factors that have been surveyed here. These questions will be discussed in more detail in Chapter Six.

Analysis of church alignment by each of the elements of the church and churchyard characteristics that were listed in table 4.2 is set out below in the same order as shown in the table. In a few cases, the data tables, and the analysis of alignment, for aspects of the church building itself, such as planform, number of aisles and type of tower are presented in Appendix 5 as the figures show little variation, are internally consistent, and add little to the analysis. The remaining category shown in the table – season of the patron saint – is discussed in more detail in the next chapter, where the survey results are used to test one of the earlier published theories of alignment, that churches were aligned with sunrise on the feastday of their patronal saint.

Churchyard topography

Without any data, it might be assumed that a sloping site, particularly a steeply sloping one, would have an effect on the alignment of the church. The stresses within the building are considerably more complicated if a church is not built either up and down, or across, a slope. However, as the figures will show, there is almost no difference at all (0.2º) between the mean alignment of churches built on slopes and the overall mean, and with the same proportion of churches (63.8% - 64%) aligned to the north of east.

One in five of all the churches in this survey was built directly on a slope of greater than two per cent (with no levelling of the site). This represents a slope of at least one in fifty, or approximately 60 – 100 centimetres over the length of the churches in this survey. There are 131 churches built on slopes steeper than one in twenty, and fourteen on slopes greater than one in ten, with the steepest slopes close to one in six; at the steepest site, St Issels in Pembrokeshire, the land falls 3.3m over the church length of 19.4m. The slope of two per cent was chosen as a cut off value so as to provide a large enough sample for analysis, but little variation occurs if only churches built on steeper slopes are examined. There are 373 churches in this survey that are built on sites with a slope of two per cent or more, with a mean alignment of 85.9º, 64% of them are aligned to the north of east. The 131 churches built on sites with a slope of five per cent (1 in 20) or more have a mean alignment of 84.0º, still only 2.1º from the overall mean, and 70% are aligned to the north of east, but they are disproportionately represented in the west of the country, where alignments are numerically lower. It appears, therefore, that neither gentle, nor steeper, slopes have had any real affect on church alignment.

In many cases the slope of part of the churchyard has been artificially altered to create a more level surface on which to build the church. Described here as "platformed", they were created either by raising the ground at the lower end of the slope; by building into the slope at the higher end, with retaining walls to hold back the land; or a combination of the two. What is difficult to assess is whether a platform relates to all phases of the building of the church, or whether it was created to accommodate a later extension, or remodelling, of the church. But either way, it is clear that any re-profiling of the churchyard slope, by the making of a platform, appears to have had no effect on the alignment of the churches built on them, with a mean alignment direction within 0.4° of the overall mean. Levelling part of a sloping

churchyard to enable the church to be built more easily also provided more flexibility in the setting out of the building, allowing the builders to align their church closer to a specific target if there was one, without having to deal with the constructional problems of building diagonally down a slope. However, the resulting 283 churches have almost as wide a range of alignments as the overall sample (between 50° and 128º), so they apparently chose not to use the opportunity of building on a level platform to align their churches any differently.

Similarly, the desire, in some cases, to build churches on high points in the landscape, whether natural or artificial, also has an impact on the assessment of slope in relation to the church. In the majority of cases where churches are built on 'knolls', the land slopes away from the church in three directions and in many cases, in all directions. Even though there may be a slight overall slope from one end of the church to the other, with a rise in the centre, this has not been included in the analysis of slope. Even this relatively small group of 118 churches is aligned in a similar way to the whole sample, its mean being exactly the same as the overall mean. In summary, it appears from these figures that by itself the topography of the churchyard has had no measurable effect whatsoever on the alignment of the church.

The presentation of 95% confidence figures in the following tables is to show that, for example from table 4.3 below, the mean alignment of all churches built on slopes greater than two per cent is likely to be within **1.3°** of the mean figure of **85.9°** measured in the survey. The small values for each of the confidence figures shown in the following tables indicates the general robustness of the survey figures.

Table 4.3 – Overall results by topography of churchyard

Slope of yard	No	Range	Mean	95% Conf.	% N of East
Slope >2%	373	48-121	85.9	±1.3	64
Flat	783	38-126	85.8	±0.8	65
Almost flat	369	59-118	86.4	±1.1	63
Knoll	118	59-119	86.1	±2.0	64
Platformed	283	50-128	86.5	±1.4	61
	1,926		**86.1**	**±0.5**	**63.8**

Ratio of church floorspace to churchyard area

It might also be assumed that the size of the churchyard would have had an effect on the alignment of the church, where, on a restricted site, a free choice of alignment might not have been available. Although urban churchyards often show signs of reductions in the size of their yard through encroachment, this does not often seem to be the case with the rural yards in this survey. In fact, a good proportion of them have been enlarged to cope with increased interments, and where an earlier boundary was obvious, such as a remnant hedge-bank, the earlier boundary was used for the calculations. Despite possible changes to the yard, this analysis is still worthwhile as it shows there is little difference in alignment irrespective of boundary proximity, as the table below demonstrates, with less than a 1° variation between the mean alignments of churches built in the smallest and the largest yards and the overall mean, and little difference in the proportions aligned north of east.

Table 4.4 – Overall results by ratio of church floorspace to churchyard area

Yard/church ratio	No	range	Mean	95% conf.	% N of East
< 7	259	45-119	87.0	±1.4	58
7 – 10.99	657	48-120	86.3	±0.9	65
11-14.99	516	47-126	85.6	±1.0	63
15+	494	38-128	85.6	±1.0	65
	1,926		**86.1**	**±0.5**	**63.8**

Parallel with principal churchyard boundary

Urban churches exhibit many examples of churches lying parallel with aspects of local topography, particularly street patterns. The alignment of churches with the grid patterns of towns with Roman origins is cited in studies noted earlier, covering much of the country, particularly churches in York, Winchester, Exeter and Chichester. Similarly, in planned and planted medieval towns, the churches tend to follow the street alignment (Butler 1976), especially those with grid-like street patterns, such as New Buckenham (Norfolk), Winchelsea (East Sussex) and Ludlow (Shropshire).

Rural churchyards are usually larger and less formal in shape than urban yards, so assessing whether the church is parallel or not with its boundary becomes more difficult. For the sake of consistency, the side containing the main entrance to the churchyard has been used as the 'principal' boundary for this analysis. The fact that it contains the main entrance generally means that this part of the boundary is adjacent to a road.

Churches parallel to their principal boundary have a slightly higher (more southerly) mean alignment, of 1.4º above the overall mean, but with a similar proportion of churches aligned to the north of east. This seems to indicate that, in rural churches, the fact that a church may be parallel to its principal boundary does not really affect its alignment.

It is not easy to understand why a church and its churchyard boundary should be parallel, other than on a restricted site where space was at a premium, when in the cases where two churches built in the same yard, were, with one exception, never built parallel (this subject is discussed in more detail in Chapter Five). The argument that parallel is, in some sense, architecturally "good" does not seem reasonable when two of the most important buildings in a settlement were not built parallel to each other, apparently on purpose.

Table 4.5 – Overall results by parallelism to the principal churchyard boundary

Parallel to principal boundary	No	Range	Mean	95% conf.	% N of East
Yes	346	45-126	87.5	±1.3	61
No	1,580	38-128	85.7	±0.6	64
	1,926		**86.1**	**±0.5**	**63.8**

Proximity to the churchyard boundary

Site restrictions do appear to have influenced the alignment of urban churches, but they do not appear to have affected the rural churches studied here. Although churchyards boundaries will probably have changed since the church was built, either because of an increase in size to accommodate the growth of interments, thereby hiding any possible earlier influence; or through a reduction in size by subsequent encroachment; this analysis is still worthwhile as it shows there is little difference in alignment, irrespective of boundary proximity.

The range of alignments, between the most northerly and southerly in each of the groups in table 4.6 below, is almost exactly the same – a 74° range (45-119°) for those churches between two and four metres from their closest boundary, and 72º, 73° and 88° for the other large groups. Even the smallest group, where the boundary is closest to the church, has a range of 51°. The fact that this last group is smaller means that the mean alignment, although 1.8° higher than the overall mean, is less likely to be a significant difference.

The figures clearly indicate little difference in mean alignment between those yards that are restricted and those which are not restricted, a strong indication that boundary proximity has never had a significant effect on church alignment.

Table 4.6 – Overall results by proximity of closest churchyard boundary

Closest Boundary	No	Range	Mean	95% Conf.	% N of East
<2 metres	93	62-113	87.9	±2.3	57
2-4 metres	349	45-119	85.6	±1.3	63
5-9 metres	677	47-120	85.5	±0.9	66
10-14 metres	546	38-126	86.6	±0.9	64
15+ metres	261	56-128	86.3	±1.3	61
	1,926		**86.1**	**±0.5**	**63.8**

Size of the church

There is no apparent reason why the size of a church building as it exists today after several hundred years of alterations and additions might have affected its original alignment. Apart from churches larger than 300 square metres, this is borne out by the fact that the remaining size categories have mean alignments within a degree or so of the overall mean alignment and have between 64 and 66% aligned to the north of east, compared with the overall mean of 63.8%. Larger churches are slightly under represented in the west of the country, particularly Cornwall, Pembrokeshire and Shropshire, where mean alignments are lower, again pointing to the 'effect' of longitude.

Table 4.7 – Overall results by size of church

Size of church	No	Range	Mean	95% conf.	% N of East
<150 sq m	346	48-128	84.7	±1.3	66
150-189 sq m	348	47-114	85.8	±1.2	64
190-229 sq m	329	47-120	86.1	±1.3	64
230–299 sq m	391	38-126	85.8	±1.1	65
300 + sq m	512	45-121	87.3	±1.0	61
	1,926		**86.1**	**±0.5**	**63.8**

Location in relation to settlements

This is a particularly difficult category to interpret since the focus of so many settlements has shifted since the church was first built, particularly in East Anglia. However, since there is little variation between either the mean alignments of churches, or proportions of churches aligned to the north or south of east, for all the groups, apart from the small group of nineteen churches in scattered villages or which have no village at all, it is apparent that the location of the church had little effect on its alignment. It also means that any later changes in the relationship between church and village will not affect the results.

Table 4.8 – Overall results by location of church in relation to its village					
Location	No	Range	Mean	95% conf.	% N of East
In village	957	38-121	86.0	±0.7	64
Village edge	501	54-126	85.4	±1.0	64
Isolated	241	47-119	86.8	±1.3	63
Remote	179	48-128	86.7	±1.7	61
Scattered/No village	19	74-107	90.2	±4.7	58
	1,,926		**86.1**	**±0.5**	**63.8**

Height above sea level

As mentioned earlier in this chapter, the higher (more southerly) mean alignments for churches built on sites below 30 metres above sea level (AOD) is a reflection of the predominance of this type of site in the lowland east of the country, where alignments are generally numerically higher. Conversely, the lower mean alignments, and higher proportions of churches aligned to the north of east, of churches built on sites above 70 metres AOD is a reflection of the predominance of these sites in the hillier west of the country.

Table 4.9 – Overall results by height above sea level					
Height A.O.D.	No	Range	Mean	95% conf.	% N of E
0-10 metres	405	45-118	87.0	±1.1	62
11-30 metres	426	54-128	88.0	±1.1	58
31-50 metres	412	38-120	86.9	±1.2	59
51-70 metres	238	54-126	85.3	±1.5	69
71-100 metres	206	47-110	83.1	±1.6	68
101+ metres	239	55-107	82.8	±1.3	75
	1,926		**86.1**	**±0.5**	**63.8**

Longitude and latitude

As was shown in table 4.1 earlier, mean church alignments vary across the country by almost 12º when alignments in the east are compared with those in the west; a greater variation in alignment than within all of the other factors. The lower graph in Figure 4.3 below clearly shows that the mean alignments rise numerically (become more southerly) as one moves from west to east across the Country. The mean alignment for each longitude group is shown by the central bar, and the ranges at 95% and 99% confidence are represented by the edges of the shaded boxes. It can be clearly seen that at 95% confidence the lowest alignment in the east of the country is more than 6º higher than the highest alignment in the west. Even at 99% confidence, the difference between the lowest alignment of the range in the east is 5.4º higher than the highest alignment in the west (shown in table 4.10).

By comparison, the differences in mean alignment by latitude are shown in the graph on the right of the Figure 4.3. Although there are variations between different parts of the country, unlike longitude, they do not form a linear pattern.

The results of the Danish survey by Abrahamsen (1992), summarised earlier in Chapter One, serve to emphasise the east-west pattern in the change of mean church alignments by longitude, as the churches there have a mean alignment of 94°, some 2 to 4° more southerly than in the East of England. Although a relatively small number of churches was surveyed (204), and there was a substantial difference between the two areas surveyed (5.5°, even though they were close together), these results are higher (more southerly) than any of the results in England and they continue the pattern of increases in mean alignment by longitude eastwards so clearly displayed in this survey. The reason for this is not at all obvious.

Chapter Six will consider factors which could vary with longitude and latitude, such as the spatial variations in the position of Magnetic North and west-east climatic variation, to see if longitude is masking a pattern that is caused by other factors.

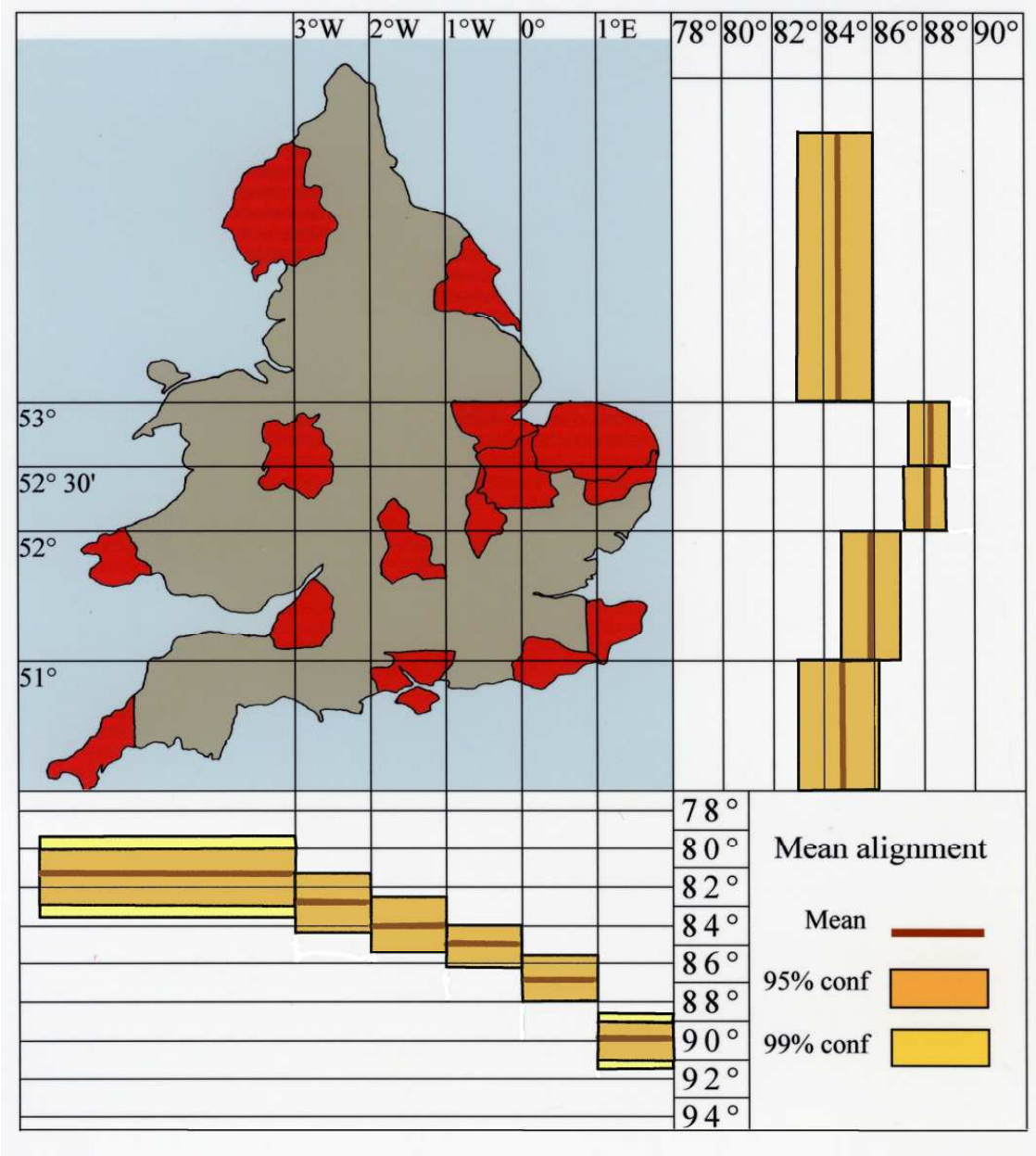


Figure 4.3 – Rural church alignment by longitude and latitude

Table 4.10 – Overall results by longitude								
Longitude (decimal)	No	Range	Mean	95%	Range at 95% conf.	99%	Range at 99% conf.	% N of East
1.70° - 1.00 ° E	537	56-120	**90.1**	±0.9	**89.2** - 91.0	±1.2	**88.9**-91.3	50
0.99ºE – 0.00	365	54-128	**86.8**	±1.2	85.6 – 88.0	±1.6	85.2-88.4	60
0.01ºW – 0.99º W	402	38-121	**85.1**	±1.1	84.0 – 86.2	±1.4	83.7-86.5	72
1.00° – 1.99º W	204	47-126	**84.0**	±1.6	82.4 – 85.6	±2.1	81.9-86.1	67
2.00° – 2.99º W	219	54-126	**82.8**	±1.5	81.3 – 84.3	±2.0	80.8-84.8	72
3.00º W +	199	48-116	**81.4**	±1.6	79.8 – **83.0**	±2.1	79.3-**83.5**	78
Overall	**1,926**		**86.1**	**±0.5**	**85.6 – 86.6**	**±0.7**	**85.4-86.8**	**63.8**

Table 4.11 – Overall results by latitude						
Latitude (decimal)	No	Range	Mean	95%	Range at 95% conf	% N of East
53.00º N +	201	51-113	**83.5**	±1.5	82.0 – 85.0	75
52.50°-52.99º N	683	45-128	**87.4**	±0.8	86.6 – 88.2	60
52-00°-52.49º N	427	38-120	**87.1**	±1.0	86.1 – 88.1	62
51.00°-51.99º N	433	47-120	**84.9**	±1.2	83.7 – 86.1	65
< 51.00º N	182	50-118	**83.8**	±1.8	82.0 – 85.6	66
Overall	**1,926**		**86.1**	**±0.5**	**85.6 – 86.6**	**63.8**

To remove the possibility that these differences have been brought about by a combination of longitude and latitude, the results for the churches in a ¼º wide strip across the country, including parts of Norfolk, Cambridgeshire, Lincolnshire and Shropshire, have been analysed and the results shown in table 4.12. Each longitude group in the strip shows similar results to the whole sample, with the mean alignment for each longitude group in the strip close to the value for the same group in the survey as a whole, with very similar proportions of churches aligned to the north of east, shown in the last two columns.

Table 4.12 – Results by longitude for ¼º wide slice across the country, between 52° 30′ and 52° 45′ N							**Whole survey**
Longitude (decimal)	No	Range	Mean	95%	Range at 95% conf.	% N of East	% N of East
1.70 - 1.00 º E	197	56-111	**89.6**	±1.4	**88.1** – 90.9	**51**	**50**
0.99ºE – 0.99ºW	166	45-121	**85.8**	±1.7	84.1 – 87.5	**65**	**66**
1.00 – 1.99º W	0						67
2.00 – 2.99º W	59	55-126	**82.5**	±3.5	79.0 – **86.0**	**73**	**72**
3.00º W +	0						78
Overall	**424**	**45-126**	**87.1**	**±1.1**	**86.0 – 88.2**	**61**	**64**

SURVEY RESULTS: CONCLUSIONS

This large-scale survey provides a statistically sound basis for the consideration of the general alignment of churches and for the analysis of the discovery that there is a significant difference in the mean alignment of churches across the country which has been identified here. None of the physical aspects of this survey, the churches themselves, their sites or their environments, appear to have been linked with their overall alignment, with one exception – their longitude. Possible reasons for this variation in alignment between the east and west of the country will be investigated in Chapter Six.

The overall results, shown graphically in Figure 4.3 on page 124, seem to confirm that there was an intention on the part of church builders to align their churches roughly eastwards. Accuracy was not apparently paramount; an approximate direction appears to have been sufficient as demonstrated by the considerable variation between individual churches. The similarity of this pattern with those of prehistoric tombs and inhumations, discussed earlier, where the basic alignment direction was also eastwards, but with individual variations within the arc of sunrise, is striking, and begs the question of whether the alignment of churches is merely following an age-old tradition. However, if that were the case, it would not explain the significant variation in alignments between churches in the east of the country and those in the west. A simple desire to face east does not explain the fact that twice as many churches are aligned to the north of east in the west of the country than in the east, resulting in a difference of 12° between the mean alignment of the churches in Cornwall and of those in Kent. This difference between Cornwall and Kent is reinforced by the results for the other counties surveyed, which fit neatly in succession across the country, in between these extremes, confirming the east-west nature of the variation. Abrahamsen's results appear to extend this pattern as far as Denmark. The possible reasons for this difference are explored in later chapters, where these results are expanded.

CHAPTER FIVE

SURVEY RESULTS APPLIED TO EARLIER THEORIES

I have measured quite a number of churches in different parts of England, and they suggest that what I have found in Oxfordshire [Patronal-saint sunrise alignment] is broadly typical of England as a whole.

(Rev. H. Benson 1956, 212)

INTRODUCTION

This chapter applies the results of this survey to each of the five theories advanced in the earlier studies of church alignment outlined in Chapter One, in particular the ideas that churches were aligned with sunrise on the feastday of their patronal saint and that there was religious symbolism in the frequently found misalignment of nave and chancel at the same church. Additionally it applies them to the less widely published theories that suggest that the observed variation in the alignment of churches is due to the fact that they were aligned with sunrise on the day on which they were set out; that they were aligned towards sunrise at Easter, or that they were aligned towards Jerusalem.

Since the variation in church alignment between the east and west of the country has been revealed for the first time in this survey, none of the earlier studies addressed this issue, as none was large enough, or suitably structured, to allow the pattern to be revealed, and each was solely focussed on the observed differences in alignment between, or within, individual churches. The considerably larger sample surveyed here allows a more statistically robust assessment to be made of each of the theories that have been proposed in the past.

1) ALIGNMENT WITH SUNRISE ON THE PATRON-SAINT'S FEASTDAY

William Wordsworth's reference to the alignment of Rydal chapel in a poem in 1823 was discussed in Chapter One, along with the survey details that show that the church apparently aligns with sunrise on one of the feastdays of St Mary. The poem itself, rather than any measurements on the ground, has been used by other researchers to validate the idea that all churches were set out this way. Even though the church does face a Marian festival sunrise, it was shown that the alignment might equally have been determined by practical concerns about the steep slope of the churchyard and the liturgical and building problems that the slope would introduce.

The three main factors affecting the position of sunrise on a specific date; horizon elevation, calendar change and church rededication, were also discussed in Chapter One. There it was shown that the elevation of the horizon above the level of the church will delay sunrise and make it appear further south along the horizon, and that calendar change since medieval times has further complicated the issue due to the fact that, in some cases, accounting for the adjustment depends not only upon the year in which the church was set out, but also on the specific season of that year. If the time of the year when the initial alignment of individual churches was determined was spread throughout the year, then the differences noted above would tend to cancel each other out. In order to allow for the possibility that they might not cancel each other out, the general analyses presented in this chapter incorporate a range of 15° either side of the level horizon sunrise position. A separate analysis of the alignment of the churches in seven of the fifteen counties covered in this survey, where actual horizon elevation has been measured, is presented afterwards. The third issue affecting patron-saint sunrises involved church rededications. This was also discussed earlier in Chapter One, where it was concluded that although a variable proportion of churches in different parts of the country have been rededicated since they were first built, it is still important to examine whether churches face specific saint's sunrises to place the earlier studies in context. The churches in the survey will firstly be analysed by their current dedication and broad conclusions drawn, then a summary analysis of dedications by their saints' "season" will be presented and the results compared.

The 1,926 churches examined in this survey are dedicated to over 150 different saints. Most of the analysis that follows concentrates on the most common dedications and those with a single main feastday (based on the calendars of saint's days in Cheney 2000 and Farmer 1991). Churches dedicated to St Mary have been excluded in the majority of instances because, without knowing which of the six major feast days was originally celebrated at specific churches, the introduction of so many additional possible sunrise points for a large number of churches complicates the issue.

General analysis of saint's day sunrise over a level horizon

The curves in Figure 5.1 below show the position of sunrise throughout the year over a level horizon, for the dates shown on the horizontal axis, for the extremes of latitude in England – Cornwall, the red line (50°N) and Cumbria, the green line (55°N). They are shown in degrees from true north (the vertical axis), with east at 90° (the bold horizontal line in the centre), showing sunrises at the spring and autumn equinoxes where the curves cross the 'east' line. Superimposed are columns (in red) indicating the ranges of alignments in degrees for all the churches in this survey dedicated to a major saint that has a single main feastday, and are shown for each individual dedication on the date of the saint's feastday (the horizontal axis).

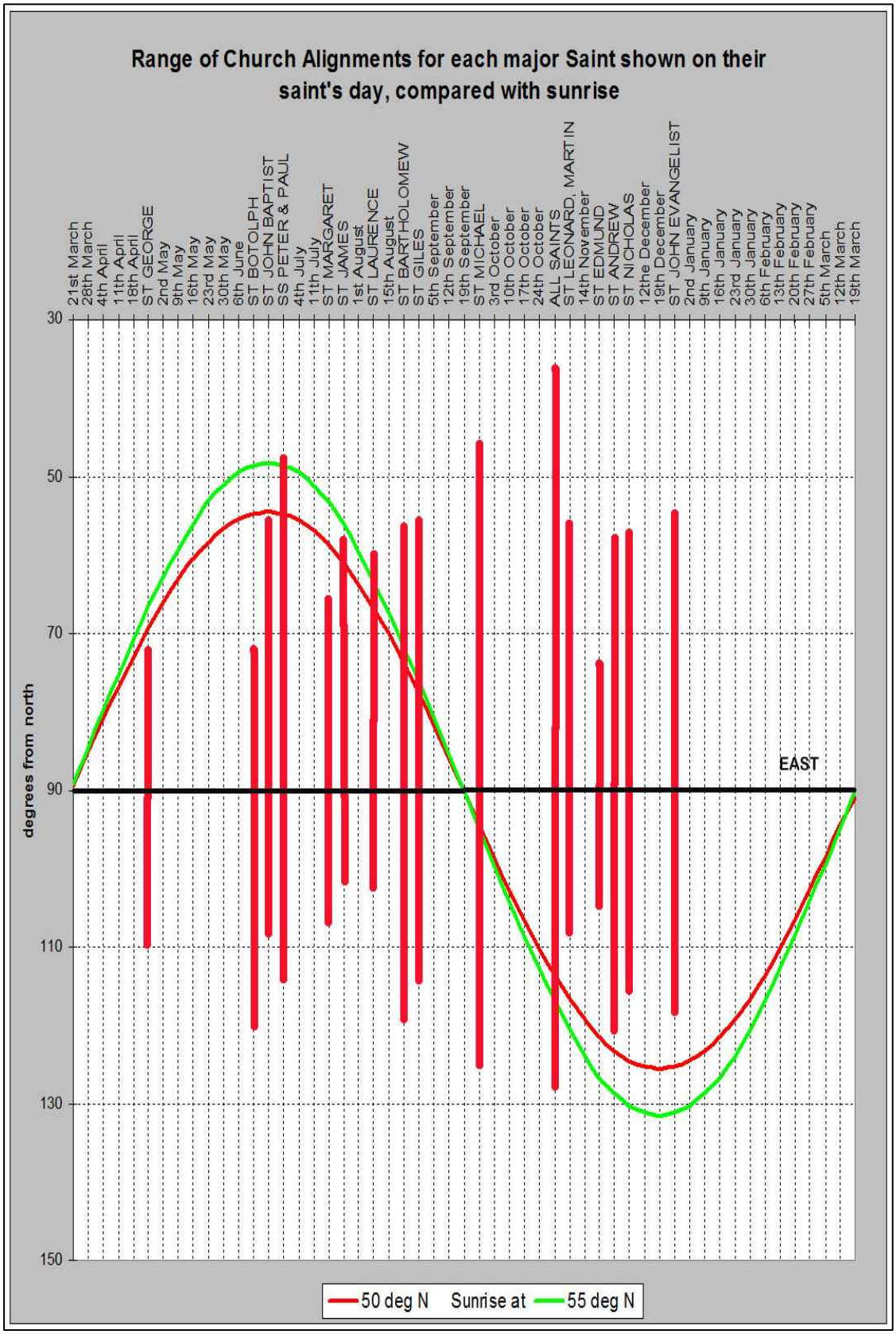


Figure 5.1 – Sunrise azimuth and church alignment

It is immediately apparent from the Figure above that few churches are aligned towards sunrise on their patronal-saints' day, shown by the fact that more than half of the columns fail to meet the sunrise curve at all, which shows that none of the churches dedicated to those saints face their sunrise. These include almost all churches dedicated to saints with festival days around midsummer (such as St. Botolph, St John the Baptist and St Margaret), or during the later autumn and winter (such as St. Andrew, St. Martin, St. Leonard, St. Nicholas and St John the Evangelist). The only dedications that have any churches facing their sunrise are those where the column crosses the sunrise line, mostly those dedicated to saints with feastdays closer to the equinox, such as St Bartholomew, St James, St Laurence and All Saints, although the sunrise line intersects with the extreme ends of most of these columns, in other words only close to the extreme end of the alignment range, thereby excluding the possibility that the vast majority of these churches, with alignments clustered around the middle (mean value) of the alignment range, face their sunrise.

Most of the saint's dedications have columns of roughly similar length and position, centred approximately on east, showing that almost all dedications have fairly similar alignment ranges, despite the fact that festival day sunrises vary between St John the Baptist and SS Peter and Paul, around 50°, and St Andrew and St Nicholas, at around 124°. Even the results for St Michael, whose feastday is September 29th, when sunrise is close to east, at around 95º, are inconclusive, as the alignments of the 110 churches dedicated to St Michael in this survey vary between 45° and 126°.

The same information is shown in the table below and confirms how similar the mean alignments, and ranges of alignments, are across churches with different dedications. Only the small group of churches dedicated to St John varies by more than 2º from the overall mean, but with a small sample of twenty-nine churches.

Table 5.1 - Alignment of churches by dedication					
	total	Range of alignments	MEAN Alignment	95% conf.	% North of East
All Saints	256	38-128	**86.5**	±1.1	64
Holy Trinity	27	59-106	**84.9**	±3.3	65
SS Peter&Paul	58	47-115	**87.3**	±2.3	55
St Andrew	147	58-120	**87.4**	±0.9	56
St Bartholomew	23	56-118	**87.9**	±4.1	59
St Botolph	17	73-118	**84.5**	±4.9	80
St George	22	73-110	**87.0**	±2.3	65
St James	38	58-112	**86.9**	±3.7	52
St John Baptist	52	55-108	**84.5**	±2.4	63
St John	29	54-118	**82.3**	±5.0	72
St Laurence	41	60-103	**84.1**	±2.9	71
St Leonard	20	57-109	**84.4**	±4.4	74
St Margaret	78	57-111	**87.8**	±1.7	49
St Martin	25	65-107	**84.1**	±2.7	74
St Mary	399	56-116	**86.9**	±0.4	63
St Mary Magdalene	16	68-110	**87.8**	±4.9	63
St Michael	110	45-126	**85.9**	±0.9	61
St Nicholas	70	57-116	**86.4**	±1.8	63
St Peter	148	55-116	**86.2**	±0.8	64
Other Saints	297	50-121	**84.3**	±0.9	66
No saints day	27	48-111	**84.3**	±4.8	67
No dedication	26	54-103	**84.5**	±5.3	54
TOTAL	**1,926**	**38-128**	**86.1**	**±0.5**	**63.8**

Comparison of church alignment with saint's day sunrise over a level horizon, and East

The consistency in alignment eastwards, irrespective of dedication, rather than towards different sunrises, demonstrated in Figure 5.1, is emphasised by the figures shown in Table 5.2 below. Four of every five churches in the survey (**80**%) are aligned within ±15° of east, varying between 65%, for churches dedicated to St. Botolph, and 86% for those dedicated to All Saints, whereas only **18**% of all churches are aligned within ±15° of their saint's day sunrise position. In addition, half of all the churches in the survey (**50**%) are aligned more than 30° away from their saint's day sunrise, but only **2**% of churches are aligned more than 30° away from east.

There are only two saints, St Bartholomew and St Michael – whose feastdays are close to the equinox – who have more than 50% of the churches dedicated to them aligned within ±15° of their feastday sunrise position, and even then, a greater

proportion of these churches (75%) is aligned within ±15º of east, suggesting that even with a feastday sunrise close to east, east itself was a greater focus for the church builder. Every dedication analysed has a greater proportion of its churches facing east than facing its sunrise. The fact that no churches dedicated to St Botolph are aligned within ±15° of sunrise, and only one church dedicated to saints Peter and Paul is within 15°, out of a total of 75 churches, whereas 59 of them (79%) face within ±15° of east, confirms the consistency with which churches of all dedications face generally eastwards rather than generally towards their patronal-saint's sunrise point. If churches were intended to be aligned with their feastday sunrise, then it would be expected that any errors in setting out would mean that their alignments would vary either side of the saint's sunrise position, rather than consistently varying around a point close to east.

Table 5.2 - Church alignment compared with Saints day sunrise over a level horizon and Due East, by dedication

		degrees from Saints day sunrise					degrees from Due East				
	total	±15° No.	%	16º-30°	31+° No.	%	±15° No.	%	16º-30º	31+° No.	%
All Saints	256	30	**12**	117	109	**43**	220	**86**	32	4	**2**
SS Peter&Paul	58	1	**2**	14	43	**74**	48	**83**	9	1	**2**
St Andrew	147	7	**5**	30	110	**75**	120	**82**	26	1	**1**
St Bartholomew	23	13	**57**	8	2	**8**	19	**83**	3	1	**4**
St Botolph	17	0	**-**	7	10	**59**	11	**65**	6	-	**-**
St George	22	8	**36**	11	3	**14**	17	**77**	5	-	**-**
St James	38	5	**13**	15	18	**47**	31	**82**	6	1	**3**
St John Baptist *[20]	51	5	**10**	13	33	**65**	37	**73**	13	1	**2**
St Laurence	41	14	**34**	21	6	**15**	34	**83**	7	-	**-**
St Leonard	20	2	**10**	9	9	**45**	15	**75**	4	1	**5**
St Margaret	79	9	**11**	25	45	**57**	62	**78**	16	1	**1**
St Martin	25	3	**12**	4	18	**72**	17	**68**	8	-	**-**
St Michael	110	74	**67**	29	7	**6**	81	**74**	27	2	**2**
St Nicholas	70	2	**3**	9	59	**84**	57	**81**	11	2	**3**
St Peter	148	9	**6**	47	92	**62**	120	**81**	27	1	**1**
Other (with saints day)	369	95	**26**	99	175	**47**	289	**78**	67	13	**4**
TOTAL	1,474	277	**18**	458	739	**50**	1,178	**80**	267	29	**2**
Other (no saints day)	27						22	**82**	4	1	**4**
St Mary	399						333	**84**	64	2	**1**
No dedication	26						19	**73**	6	1	**4**

The detailed results here seem to argue conclusively against the idea of patronal-saints' day alignment. Some of the groups are small, but, if churches did

[20] *One church was dedicated to St John the Baptist's decollation (beheading), with a festival at the end of August, so was included in the "other" group

indeed face their sunrise, then all the churches of each dedication would tend to align closer to a single direction some distance away from east. It can be clearly seen, however, that churches of each dedication do not align in different directions, as is shown by the fact that around 80% of churches in each dedication are less than 15° from east. Added to this is the fact that churches in the "other saints" group, which consists of 369 churches dedicated to over 130 different saints, displays a similar range of alignments and has a similar mean direction to that of each of the individual saints, and has an almost identical proportion of churches facing within 15° of east (78%).

Analysis by the season of the patron saint

Since most churches are aligned close to east and most saint's day sunrises are closer to the solsticial extremes, saint's day sunrise alignment can be examined from the opposite perspective. Are the churches that are aligned furthest from east aligned towards specific saint's days and could this display the remnants of a pattern that had existed in the past? For instance, it might be expected that churches dedicated to summer saints, such as St Botolph (June 17th), St John the Baptist (June 24th), Saints Peter and Paul (June 29th), St Margaret (July 20th), would be aligned well to the north of east, and conversely, churches with dedications closer to midwinter, St Martin (November 11th), St Edmund (November 20th), St Andrew (November 30th), St Nicholas (December 6th) and St John the Evangelist (December 27th), would be aligned well to the south of east. This is not the case, as is shown in table 5.3 below. Confirming the conclusions from the earlier detailed results, the churches dedicated to summer saints have the same relationship between the proportions of churches aligned towards northerly (summer) sunrises (**16**%) and southerly sunrises (**13**%) as do churches dedicated to "winter" saints (**15** - **12**%). Not only are the patterns of alignment between the two groups the same, but there are slightly more churches with "winter" saint dedications aligned towards summer sunrise (**15**%) than towards winter ones (**12**%). The mean alignment of each of the seasonal groups is within 0.4º of the overall mean for the whole survey and each of the seasonal groups has an almost identical alignment profile to that of the whole sample (shown in the fifth row), further confirming the complete lack of a seasonal pattern.

Table 5.3 – Alignment of churches by Season of saint's dedication								
Church Alignment	<75°		76-99°		100°+		Total	Mean Align
	No	%	No	%	No	%		
SUMMER SAINTS SS Botolph, Bartholomew, John the Baptist, Peter & Paul, Margaret	82	**16**	360	**71**	68	**13**	510 (100%)	86.5
EQUINOCTIAL SAINTS SS Lawrence, Michael, George, All Saints	92	**16**	428	**72**	72	**12**	592 (100%)	85.5
WINTER SAINTS SS Martin, Leonard, Edmund, Andrew, Nicholas, John the Evangelist	55	**15**	274	**73**	44	**12**	373 (100%)	86.4
OTHER Mary, No Saints day	55	**12**	341	**76**	55	**12**	451 (100%)	86.5
All churches in survey	284	**15**	1,403	**73**	239	**12**	1926 (100%)	86.1

These results show that it is certain that churches are not *now* aligned with their patronal-saints' sunrise. Whether a large number of these churches has been rededicated so that they are still aligned towards their original patronal-saint's sunrise is not known, but if that were the case, then all the churches that were rededicated would have to have been originally dedicated to saints whose feastday was close to the equinox (sunrise due east [90º]), such as St Michael, St Giles or St Bartholomew, since the majority of churches surveyed here are aligned within 10º of east. It would also mean that churches dedicated to some of the most popular saints whose feastdays are close to the solstices – for example St Andrew, St Nicholas, St John the Evangelist, St John the Baptist and St Peter – could never have been aligned towards their sunrise. It therefore seems almost certain, on this evidence, that the concept of churches facing their patronal-saint's sunrise has never been true.

Comparison using measured horizon elevation

Two of the writers mentioned in Chapter One (Benson in 1956 and Muirden in 2005) held that taking the elevation of the horizon into account was crucial to the study of patronal-saint sunrise alignment. It is true that an elevated horizon does delay sunrise making the actual point of sunrise appear further to the south, as shown in Figure 1.1

earlier. To take this into account, the horizons of 1,105 churches in seven counties, Bedfordshire, Cumbria, Hampshire, Lincolnshire, Norfolk, Oxfordshire and Pembrokeshire were measured, and calculations of their actual sunrise position made (See Appendix 6 for the formulae), and the results used to calculate the overall effect. Similar analyses to those shown in table 5.2 above (for sunrise over level horizons) are presented below using the actual sunrise point over the survey's measured horizon elevation for these 1,105 churches. The results, in table 5.4, using the calculated sunrise positions, demonstrate the same alignment patterns as those in table 5.2 - within a few percent in every case. Overall, almost one in five churches (**18**%) is aligned within 15° of its saint's day sunrise (c/w 18% over a level horizon), and half of all churches (**52**%) are aligned more than 30° away from the actual sunrise point (c/w 50% over a level horizon). In addition, more than four of every five churches (**81**%) are aligned within 15° of east (c/w 80%), with only eleven churches (**1**%) aligned more than 30° away from east (c/w 2% over a level horizon).

Table 5.4 - Church alignment compared with actual saints day sunrise and Due East, by dedication, using horizon elevation (Churches in Bedfordshire, Cumbria, Hampshire, Lincolnshire, Norfolk, Oxfordshire & Pembrokeshire)

		degrees from saints day sunrise					degrees from Due East				
		±15°		16º-30°	31+°		±15°		16º-30º	31+°	
	total	No.	%		No.	%	No.	%		No.	%
All Saints	154	18	**12**	65	71	**46**	133	**86**	17	4	**3**
SS Peter&Paul	37	2	**5**	9	26	**70**	29	**78**	7	1	**3**
St Andrew	98	4	**4**	20	74	**76**	82	**84**	16	0	**-**
St Botolph	13	1	**8**	5	7	**54**	8	**62**	5	0	**-**
St Edmund.	12	1	**8**	4	7	**58**	12	**100**	0	0	**-**
St George	12	5	**42**	5	2	**17**	10	**83**	2	0	**-**
St James	23	1	**4**	9	13	**57**	21	**8**	2	0	**-**
St John Baptist.	29	3	**10**	7	19	**66**	22	**76**	7	0	**-**
St Margaret	47	6	**13**	15	26	**55**	38	**81**	9	0	**-**
St Michael	60	38	**63**	15	7	**12**	42	**70**	17	1	**2**
St Nicholas	43	0	**-**	4	39	**91**	36	**84**	7	0	**-**
St Peter	85	6	**7**	32	47	**55**	70	**82**	15	0	**-**
Other (with saints day)	235	64	**27**	65	106	**45**	187	**81**	43	5	**2**
TOTAL	848	149	**18**	255	444	**52**	690	**81**	147	11	**1**
Other- no saints day	8						7	**88**	1	0	**-**
- no dedication	10						7	**70**	3	0	**-**
- St Mary	239						203	**85**	35	1	**1**
OVERALL	1,105						907	**82**	186	12	**1**

To test more closely the overall impact that horizon elevation actually has on the results, table 5.5 below presents the results for the actual sunrise positions for the 1,105 churches, compared with their notional (level horizon) sunrise position. As would be expected, an elevated horizon which delays sunrise and therefore appears in a more southerly position on the horizon, means that summer sunrises (such as St John the Baptist and St Peter, close to northeast), when moved southwards, were brought closer to the alignment of the majority of churches, which are aligned close to east; whilst delaying a sunrise in winter (such as for All Saints, St Andrew and St Nicholas, already close to southeast) takes it further away from the alignment of most churches. This means that those sunrises that become closer to church alignments by taking the horizon elevation into account are offset by those that are shifted further away. The end result is that there is very little change in the overall pattern when horizons are taken into account. The number of churches aligned within 15º of their saint's day sunrise decreases from 152 to 149, but stays at **18%**, and the number aligned more than 30º from sunrise increases from 437 to 444, but stays at **52%**.

This clearly demonstrates that the assertion that the researcher *has* to calculate the effects of the delay of sunrise caused by elevated horizons, in order to test the patronal-saint sunrise theory, is not true. Whilst it is crucial at the level of an individual church, as soon as a larger sample is used the differences cancel themselves out. The 1,105 churches tested here show that there is no overall variation, and that improvements in alignment at some individual churches dedicated to summer saints are clearly offset by the opposite effect at others which are dedicated to saints with winter sunrises.

Table 5.5 – Comparison of notional and actual sunrise points by dedication (Churches in Cumbria, Pembrokeshire, Bedfordshire, Hampshire, Lincolnshire, Oxfordshire and Norfolk)

		degrees from **LEVEL HORIZON** saints day sunrise					degrees from **ACTUAL** saints day sunrise				
saints in date order	total	±15° No.	%	16º-30°	31+° No.	%	±15° No.	%	16º-30º	31+° No.	%
St George	12	3	**25**	7	2	**17**	5	**42**	5	2	**17**
St Botolph	13	0	**-**	6	7	**54**	1	**8**	5	7	**54**
St John Baptist.	29	3	**10**	5	21	**72**	3	**10**	7	19	**66**
St Peter	85	5	**6**	26	54	**64**	6	**7**	32	47	**55**
SS Peter&Paul	37	1	**3**	10	26	**70**	2	**5**	9	26	**70**
St Margaret	47	4	**9**	15	28	**60**	6	**13**	15	26	**55**
St James	23	1	**4**	9	13	**57**	1	**4**	9	13	**57**
St Michael	60	40	**67**	16	4	**7**	38	**63**	15	7	**12**
All Saints	154	22	**14**	72	60	**39**	18	**12**	65	71	**46**
St Edmund.	12	2	**17**	3	7	**58**	1	**8**	4	7	**58**
St Andrew	98	6	**6**	23	69	**70**	4	**4**	20	74	**76**
St Nicholas	43	1	**2**	6	36	**84**	0	**-**	4	39	**91**
St James	23	1	**4**	9	13	**57**	1	**4**	9	13	**57**
Other (with saints day)	235	64	**27**	61	110	**47**	64	**27**	65	106	**45**
TOTAL	848	152	**18**	259	437	**52**	149	**18**	255	444	**52**
No dedication/day	18										
St Mary	239										
OVERALL	1,105										

Shared Churchyards

Shared churchyards enable an additional view of church alignment to be taken, particularly of patronal-saint sunrise alignment, and they also enable reflection on the issue of 'parallelism'. Parallelism was raised earlier when the alignment of churches was considered with reference to the principal boundary of the churchyard, where it was noted that there was little correlation between church alignment and boundary alignments, implying that a desire to build the church parallel with a close boundary was not an important consideration, and that visual neatness was not apparently an issue.

Shared churchyards are a phenomenon which is concentrated in East Anglia with as many as 30 examples known, although most only have a single church now

(Batcock 1991, 10-11; Williamson 1993 158-161; Groves 1995, 108). There are only nine of those 30 shared churchyards remaining where sufficient parts of both churches still exist to enable accurate measurements of alignment to be taken (one of them - South Walsham (Norfolk) is illustrated in the frontispiece). The churches in each of the pairs are dedicated to different saints but are aligned in similar but, with one exception, specifically not the same, direction. Each of the pairs includes one church dedicated to St Mary, but all the pairs are aligned within 11° of each other, whereas the sunrise positions for the festival days of the saints to which they are currently dedicated can be as much as 50° apart, depending on which festival of Mary was celebrated. If any of these churches has been rededicated and therefore still faces its original dedication sunrise, it would mean that each of these nine pairs of churches was dedicated to saints that had festival days just a few degrees apart as well as both being close to East. This would confine the possible dedicatees to festival dates only two or three weeks apart and close to the two equinox dates.

Peter Warner considers that in the majority of these cases the church dedicated to St Mary was the second of the pair to be built, usually in the eleventh century, by groups of freemen (Warner 1986, 45), although it is difficult to see why this might have affected their alignments. The six major festivals celebrated for St Mary complicate the investigation of sunrise alignment as they cover most of the year. The sunrise point on Marian festivals in Norfolk varies between 54º and 123º, whereas the eight churches dedicated to St Mary are aligned at: 77º, 79°, 84°, 90°, 93°, 96°, 99° and 108º, with a mean of 90.8º.

In each of the cases, except at Reepham illustrated in Figure 5.2 below, the churchyards are large enough to allow the church builders a free hand in selecting the alignment of both churches. The fact that each of these pairs of churches is aligned fairly closely together and that none is very different, implies that the alignment of the first of the two to be built has had some influence on the alignment of the later one. Since they do not appear to be aligned towards different saint's day sunrises, it leaves the question – why were they not built on the same alignment? It is possible that alignment did not matter at all, but this is contradicted by the consistent general alignment eastwards, but it seems that the difference in alignment between the two churches did not matter enough to go to the (little) effort of aligning them in the same direction.

At Reepham, there was once a third church built in the same churchyard – All Saints', Hackford – but which was largely destroyed by fire in 1549. It is shown on a plan drawn in 1750 (shown in Batcock 1991, 22), and appears to have been built on the same alignment as the other two. The situation in this yard is different from the others with more than one church as it is considerably smaller and the size of the yard seems to have forced the builders to align their churches in the same direction, as the two remaining churches actually overlap now, and the tower of St Michael's, Whitwell had to be built on the south nave wall as it could not be located in its traditional place at the west end.

Figure 5.2 – St Mary's, Reepham and St Michael's, Whitwell, built on the same alignment. The space to the left was originally occupied by All Saints', Hackford

2) MISALIGNED CHANCELS AS RELIGIOUS SYMBOLISM

The difference between the alignment of the nave and the chancel of churches has been discussed by many writers in the past. Although commonly known as weeping chancels, they have also been referred to as "crooked" chancels (Benson 1956; Muirden 2005), and "skewed" chancels (Cave 1950). It has been suggested that the misalignment represents religious symbolism, but applying the results of this survey will offer a more probable cause for the phenomenon. One in five of all churches is misaligned this way, and the theory holds that, particularly in cruciform churches, chancels align to the left of naves (more northerly), where the nave represents the body of Jesus on the Cross, with his head, the chancel, inclined to the left. This appears to be an extension of the proposal by William Durand, in *The Symbolism of Churches*, that the church represented the human body with the chancel as its head (Durand 1906, 17). Some of the writers found for the proposal (Benson 1956; Muirden 2005) and others against (Cave 1950; Hoare & Sweet 2000). In their introductory preface to Durand's book, Neale and Webb (the kingpins of the CCS) also explained the misalignment as a reference to the Crucifixion, but commented that misalignment was "more frequently

Figure 5.3 –

St Andrew's, Lamas, Norfolk. The chancel is misaligned 14° to the north - 'weeping', and improving the alignment towards east (110° > 96°). One of the two most extreme northward realignment examples of 165 such churches in this survey

to the south" (Neale & Webb 1906, lxxxii), thereby undermining their explanation of its symbolism of the Crucifixion.

Thompson, in the early years of the last century, referred to the "popular explanation" of the symbolism of the cross, commenting on the "general northward inclination of chancels of churches where the axes of the nave and chancel were different" (Thompson 1913, 131). He went on to say that "like most symbolical explanations, this is founded entirely on fancy" and noted that the phenomenon was not limited to churches with cross plans. According to Thompson, "others" had sought to explain the subject by suggesting the orientation of the chancel followed the direction of sunrise on the morning of the Patronal feast[21]. He also cited examples of realignments on sloping sites, where "masons kept as high on the slope as they could, so twisting the axis of the chancel" (1913, 132). Each of these issues will be considered using the results from this survey.

Figure 5.4 –

St Hermes', St Ervan, Cornwall. The chancel is misaligned 7° to the south – not 'weeping', but improving the alignment towards east (81° > 88°). The most extreme southward realignment of the 150 such churches in this survey

[21] This appears to be another example of a more widespread discussion of these issues than has been published - highlighted in Chapter One. Whilst Benson took up the idea in 1956 that crooked chancels reflected calendar drift it does not seem to have appeared in print before that.

Francis Bond, writing at a similar time, referred to the same general issues, but argued that misalignment, as ecclesiastical symbolism, "had escaped the notice of the ancient liturgists" (Bond 1914, 248). He also pointed out the images of Christ on the Cross were usually represented with his body and head in a straight line "until the twelfth century or later" (1914, 248), effectively excluding the possibility that this image might have been copied for churches set out before this time. The remainder of the points that he made concern large and urban churches, of the kind which are not included in this survey, firstly, where the choir was rebuilt in such a way as to encase the earlier choir, making it "impossible to see whether the axis of the new choir was being set out precisely in the line of the old nave" (1914, 249), and secondly, he mentioned the possibility that site restrictions in urban situations might be a potential cause of misalignment.

Cave, in his pre-war survey, concluded that the small percentage of skewed chancels (16%), and the way that the numbers fell off as the skew became larger, indicated that they were accidental faults in setting out (Cave 1950, 51). More recently, Warwick Rodwell has referred to "setting out errors which equate to the thickness of one side wall, a very commonly found fault" (Rodwell 1981, 61) as an explanation for many of the strange contorted shapes that some church floorplans take. As far as the issue of alignment differences between nave and chancel is concerned, it will be shown here that the majority of these 'errors' can be better explained as having been a deliberate act and as having a particular purpose.

The results from this survey

Of the 1,926 churches in this survey, 377 (20%) have naves and chancels aligned differently by two degrees or more. Two degrees was taken as the cut-off point for the measurement of difference between nave and chancel as the compass used for the survey can only be guaranteed accurate to one degree. It is therefore possible (although unlikely) that a nave measured at 80° and a chancel at 82° could both really measure 81°. Despite the fact that with internal access to the church it can be seen that they *are* aligned differently, only external access was possible at some churches, where a difference was not necessarily so noticeable; so for consistency, all variations of less than two degrees have been excluded. Figure 5.5 shows an alignment difference of two degrees seen from inside a church, showing how obvious the misalignment is.

Figure 5.5 – An alignment difference of 2° between nave and chancel – at St Lawrence's, Castle Rising, Norfolk, (left) and at Holy Trinity, Goodramgate, York (right)

Sixty-two of the 377 misaligned churches in the survey have naves that are aligned close to east, or exactly east, so that they have naves that are aligned to the one side of east and chancels aligned the other side of east. Their alignments might be explained by the inability of the builders to locate east exactly, in which case they could have thought their realignment of the chancel was actually closer to east, rather than straddling it. Whatever the reason, they present a confused picture and are therefore only included in the total line of table 5.6 below and are excluded from the other tables and analysis in this section.

Figure 5.6, below, illustrates the four possible situations involving churches where the nave and chancel have different alignments. It is immediately obvious that in only two of the four cases is the chancel inclined to the left - weeping (1 and 3), that in two of the four cases, the alignment of the chancel is closer to east (2 and 3) and in the last case (4), that the alignment is neither weeping nor closer to east.

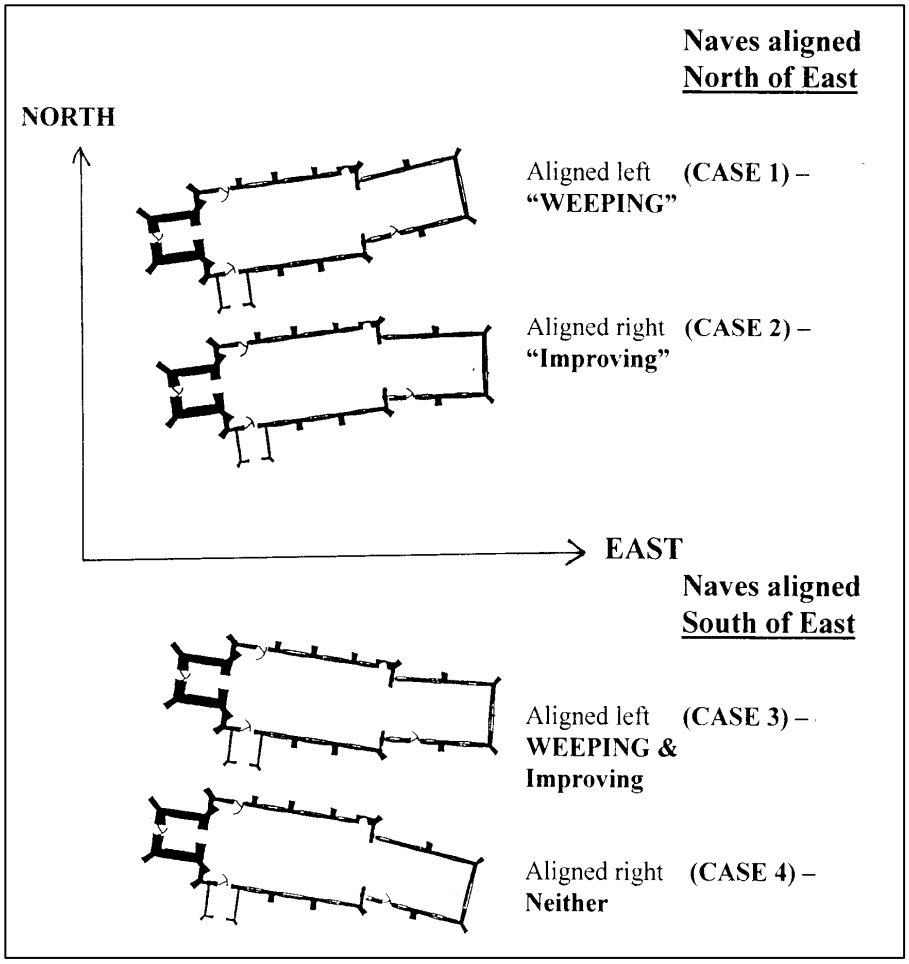


Figure 5.6 – Possible variations in nave/chancel alignment

Excluding the 62 churches mentioned earlier, the 315 remaining misaligned churches in this survey fit into one of the four cases shown in Figure 5.6 above; of these, 165 (52%) are in categories 1 and 3 (weeping), whilst 150 (48%) are in categories 2 and 4 (not weeping) which immediately destroys the idea of the folk tale, as in almost half the cases the chancel is misaligned the opposite way for the symbolism of the Crucifixion. The near equality of these two figures lends weight to the noted suggestion by both Cave and Rodwell that misalignments were accidental, as a roughly equal split would be expected of an accidental action. However, although on the surface it appears that the errors could be random, there are several factors that point to this having been a deliberate, or at least a non-accidental, act.

Firstly, and most importantly, if the errors were random, or consisted merely of setting-out errors, then it would be expected that they would be the same through all

the ranges of nave alignment and therefore the numbers in each of the four cases in Figure 5.6 would be equal. They are not at all equal; case 1 has 80 churches, case 2 has 121 churches, case 3 has 85 churches and case 4 has 29 churches, strongly indicating that it was not random. There is a marked element of the alignment of the chancel being closer to east than that of the nave. In other words, chancels are aligned closer to east than their naves regardless of whether the alignment of the nave is to the north or south of east, with 206 chancels improving the alignment towards east (cases 2 and 3) compared with 109 churches with chancels further from east (cases 1 and 4). Secondly, it would have been easy to set out lines parallel to an existing nave for a new or extended chancel to enable them to be aligned in the same way, even with the most basic of equipment such as two pieces of string. For some reason, they were not set out in that way. It would also have been equally easy to correct an early error in the setting out, at the trench or footings stage, even as small an error as 2°, which would have been noticeable very early in the process. Thirdly, the number of churches involved adds weight to the idea that misalignment was not accidental; it seems very unlikely that easily avoided errors should affect every fifth church in the land. Lastly, the end result offends the modern eye and it seems reasonable to assume that it would have had a similar effect in medieval times. If there was no other intention behind the realignment, it would have been easier, and neater, to follow a single alignment either when originally setting out, or rebuilding part of, a church.

Table 5.6 shows that of the 201 churches with their nave aligned to the north of east, the majority (121 - **60%**) - are improving the alignment towards east, but not weeping (case 2), whereas the majority of churches with naves aligned to the south of east (85 of 114 – **75%**) have chancels which are weeping but also aligned closer to east (case 3). The misalignment of the churches in the more extremely aligned groups is even more strongly biased towards east than that of the group of misaligned churches as a whole. In other words, the further the nave of a church is aligned from east, the more likely the chancel is to be realigned closer to east. Whilst **60%** of all naves aligned to the north of east have chancels closer to east, this rises to **69%** of churches where the nave is aligned north of 77°. Similarly for churches where the nave is aligned to the south of east, the overall proportion of **75%** of chancels aligned closer to east rises to **78%** of churches with naves aligned to the south of 103°. The full table is shown as table A7.18 in Appendix 7 on page 335.

Table 5.6 - Nave/chancel misalignment by alignment of nave									
	total	Improving		Not improving		Aligned left		Aligned right	
		No	%	No	%	No	%	No	%
All <77°	74	51	69	23	31	23	31	51	69
All 78-87º	127	70	55	57	45	57	45	70	58
All <88º (north)	**201**	**121**	**60**	**80**	**40**	**80**	**40**	**121**	**60**
All >92º (south)	**114**	**85**	**75**	**29**	**26**	**85**	**75**	**29**	**25**
All 93-102º	77	56	72	21	28	56	72	21	28
All 103°+	37	29	78	8	22	29	78	8	22
Total exc 88-92º	**315**	**206**	**65**	**109**	**35**	**165**	**52**	**150**	**48**
88-92º See page 144	62					49	79	13	21

The block-coloured cells in the table refer to Figure 5.7 below

The overall proportions are shown pictorially in Figure 5.7 below. The left pie shows plainly that the majority of churches with naves north of east are misaligned right, therefore improving the alignment (40% left : 60% right), and the majority of those with naves aligned south of east have chancels that are misaligned to the left, both weeping and improving the alignment (75:25) (centre pie). Taken overall, as the right-hand pie shows, those misaligned left (weeping) are almost exactly balanced by those misaligned right, 52:48. If there was no particular reason for the misalignment, then it would be expected that the balance shown in these overall figures in the pie on the right, would be mirrored in the two groups that make it up. Instead there is a definite pattern of alignment of chancels closer to east than their nave.

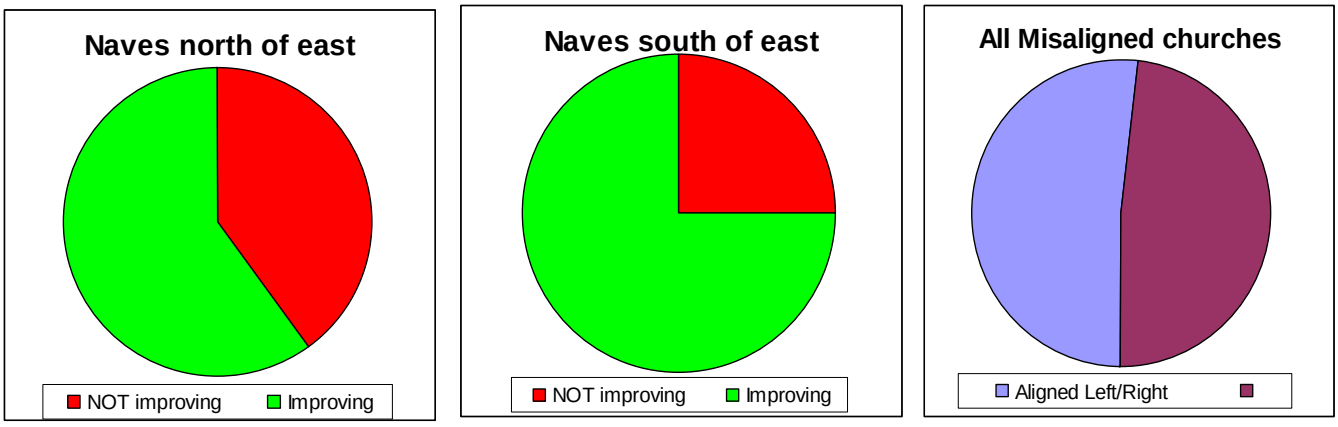


Figure 5.7 – Proportions of all misaligned churches shown in table 5.6 – the chancel either improving, or NOT improving, the alignment towards east

Cave proposed that the number of misalignments "fell away" as the nave became aligned further from east, and he used this as a reason for his 'accidental' explanation for misalignment generally (Cave 1950, 53). However, the fact that the further a nave's alignment is from east the more likely the chancel is to be realigned suggests strongly that Cave's view is incorrect – this was not accidental, but implies both knowledge that the nave was not aligned eastwards and a desire to correct it. It is also reasonable to assume from these figures that there was not such a pressing need to deal with the problem if the church nave was originally aligned closer to east.

Chancel rebuilding

Many chancels were extended or completely rebuilt during the thirteenth and early fourteenth centuries for liturgical and space reasons after the Fourth Lateran Council of 1215 (Cook 1961, 42; Duffy 1992, 54). Were they realigned at this stage? Without the ability to deconstruct every church that has different nave and chancel alignments to establish construction sequences and with the problems of dating the earliest parts of church fabric from external examinations, published sources have to be relied upon. The assessments of church building period for this analysis have been taken from the relevant volume of *Pevsner's Buildings of England*, and the results shown in Table 5.7. Whilst admittedly not perfect, the use of Pevsner's assessment provides a level of consistency to the results, rather than using different, more local, architectural analysts in some of the areas, where their work is probably of differing standards.

Date of Rebuilding

Of the 315 churches in this analysis, *Pevsner* considered 101 chancels to be later than their nave; 83 naves and chancels to be of the same period; 124 churches where no comment is made on the period of either the nave, the chancel, or both; and seven churches where the naves are later than their chancels.

The chancels of all the 101 churches with later chancels are exactly equally divided between those that are misaligned left and those misaligned to the right (**50**:50), whereas almost three-quarters of them (72:29) are aligned closer to east.

Table 5.7 – Alignments by relative dates of naves and chancels (excluding those aligned between 88 and 92º)

All misaligned churches	Total	Imp. align	Not Imp	% improving alignment	% aligned left
Churches with later chancels					
Post medieval chancels	26	19	7	73	46
Medieval chancels	75	53	22	71	51
All later chancels	**101**	**72**	**29**	**71**	**50**
Nave/Chancel of Same period	83	49	34	59	49
Other churches	131	85	59	65	56
Total	**315**	**206**	**109**	**65**	**52**

The block-coloured cells in the table refer to Figure 5.8 below

Within this group, the proportions of post-medieval chancels that are realigned closer to east is almost the same as churches with chancels rebuilt in the medieval period (73% compared with 71%), shown in Figure 5.8 below, although the sample is fairly small. However, the fact that both the medieval and post-medieval groups are split equally between those aligned left and right of the nave lends further weight to the arguments for the improvement of alignment towards east; if the samples were particularly biased due to their small size it would be reasonable to expect the bias to show in the left/right figures as well. It appears, from these results, that chancels that were rebuilt in the post medieval period were aligned slightly more accurately towards east than their medieval counterparts.

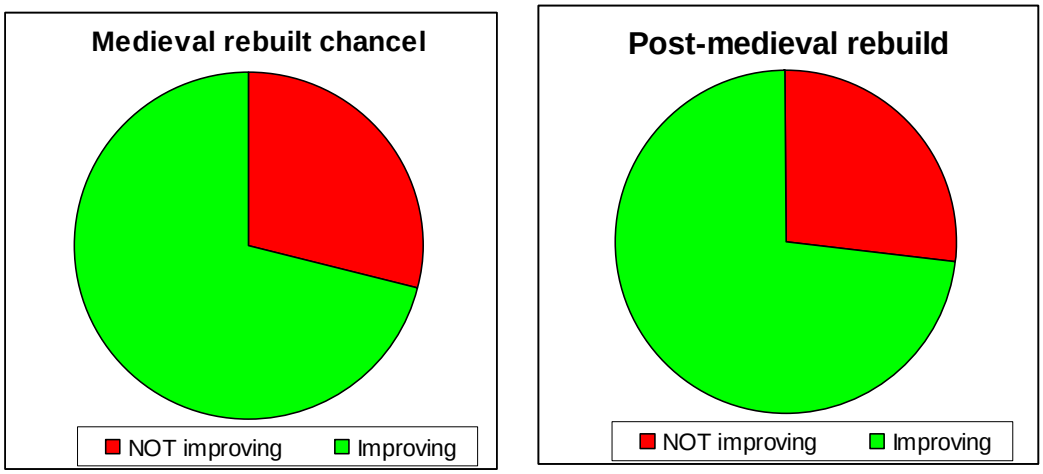


Figure 5.8 – Proportions of medieval and post-medieval rebuilt chancels either improving or NOT improving the alignment to east, shown in table 5.7

This leaves two further groups of churches that have different nave/chancel alignments. The first, shown in row 4 of table 5.7 above are those churches which, according to Pevsner, have naves and chancels built in the same period. Quite why a church should have a nave and chancel aligned differently if it was built in one campaign is difficult to envisage. It is just possible that these churches were actually originally built misaligned with the specific aim of aligning the chancel more closely to east, although this leaves the question of *why* the whole building was not aligned more 'correctly'. A series of simple setting out errors would produce a random result, rather than one where **59%** of the chancels are aligned closer to east than their naves. The more likely explanation is that the chancels were rebuilt shortly after the original build, but within the same architectural period, hiding the fact that there was a rebuild, and the opportunity to realign closer to east was used at this time.

The 'other churches' group, shown in row five of table 5.7 – those where no assessment was made of the building periods of either one or both of the nave or the chancel, or have an earlier chancel – has **65%** of its chancels aligned closer to east than the naves, 56% of them are aligned to the left and 44% aligned right of the nave, also indicates that Pevsner has probably not identified all the churches with rebuilt chancels. Post-medieval chancel rebuilds, particularly Georgian and Victorian ones, are much easier to identify, either from a stylistic point of view or through the use of different materials – particularly brick.

How was the realignment of chancels achieved?

It has been shown that rebuilt and realigned chancels improve the alignment of the churches towards east, but this poses several further questions. Firstly, was the new alignment closer to True east or to magnetic east at the time of the realignment? Secondly, where was magnetic east when the church was realigned? Thirdly, as proposed by Benson and Muirden, was the new alignment closer to the position of sunrise on the patronal-saint's day? Lastly, as suggested by Thompson, were the chancels misaligned or realigned because of problems with a sloping or restricted site.

Realignment towards east using a compass

The difference between the true direction and that shown on a magnetic compass, known as *magnetic declination*, was described in the Glossary on pages x-xii, as was the fact that the difference between the two directions was not first measured until 1576 CE. The possible effect that it may have had on overall church alignment is discussed in detail in Chapter Six on pages 179 – 184, alongside the details of when the compass may have first been used for churches. In this section the subject of interest is whether a compass may have been used in the realignment of chancels during rebuilding. The full analysis and tables are shown in Appendix 4 on pages 327-328, with the results summarised here.

Overall, 47% of chancels rebuilt in the medieval period were realigned closer to Magnetic East (which was at an average of approximately 100° True during the medieval period (see Clark et al. 1988, 649)), whereas 71% were realigned closer to True East, strongly indicating that east was the focus and that a magnetic compass was not used. The post-medieval rebuilding of chancels, often a Georgian exercise, took place in a period when magnetic north was west of true north. In 1800, magnetic north was approximately 24° west of north (Clark *et al*. 1988, 649; Merrill *et al.* 1996, 46), so if a compass was used without adjustment for declination, it would result in alignments for east of 66°True. Forty-five per cent of the post-medieval chancel rebuilds were realigned closer to Magnetic East whilst 73% were realigned closer to True East, therefore, either a compass was not used for the realignment or appropriate adjustments were made to the readings to take declination into account.

Realignment towards patronal-saint's sunrise

Whether the whole church faces its saint's day sunrise or not was considered earlier, along with the related issues and problems of horizon elevation, calendar drift and church rededication. Both Benson and Muirden concluded that, as the position of sunrise on the required saint's day had shifted along the horizon due to calendar drift, the rebuilding of the chancel was used as a chance to realign the east end of the church to maintain the 'correct' alignment towards sunrise. The issue examined in this section is whether the results of this survey show that the chancels of misaligned churches are aligned closer to their patronal-saint's sunrise than the nave. Only churches with a sufficient number dedicated to the same saint are included in this analysis.

Table 5.8 shows the results for all churches with misaligned chancels, whether the relevant volume of *Buildings of England* noted them as rebuilt or not. Despite the variation in sunrise positions on the various saint's days, between St Peter (50°) and St Andrew 116°), less than half of all chancels (**41%**) were realigned closer to their sunrise and **59%** were realigned further away. More than half of the churches dedicated to St Michael, with a feastday close to the equinox (29th September), had their chancels aligned further from sunrise than their nave, demonstrating that sunrise on saint's day played no apparent part in the ultimate alignment of the chancel. However, almost two-thirds (61%) of the chancels of the churches dedicated to these saints were aligned closer to east than their nave.

Table 5.8 – Alignment of chancels in all misaligned churches in relation to patronal-saint's day sunrise

	Sunrise position	No. of churches	Alignment to saints Day		Alignment to EAST-		
			improv	further	improv.	further	neither
All Saints	105°	52	17	35	28	20	4
St Andrew	116°	22	11	11	13	7	2
St Margaret	64°	16	8	8	9	6	1
St Michael	92º	23	9	14	14	8	1
St Peter and SS Peter & Paul	50º	44	20	24	26	17	1
TOTAL		157	65 (**41%**)	92 (**59%**)	90 (61%)	58 (39%)	9

Rebuilding the chancel gave the builder the opportunity to improve the alignment towards the intended target. Table 5.9 shows that his target was not the saint's day sunrise, with an even smaller percentage (**37%**) of churches dedicated to All Saints and St Peter realigned towards their sunrise. The number of churches in the remainder of the dedications is too small to analyse. As with the analysis of all misaligned churches, a far greater proportion has been realigned towards east (**63%**)**.** The numbers involved here are very small, but mirror closely the repeating pattern of realignment towards east, rather than towards sunrise.

Table 5.9– Alignment of rebuilt chancels in relation to patronal-saint's day sunrise and east

	Sunrise Position (approx)	No. of churches	Align to saints Day		Alignment towards EAST		
			Improv.	further	Imp.	further	neither
All Saints	105°	18	7	11	9	7	2
St Peter	50º	25	9	16	16	8	1
TOTAL		43	16 **(37%)**	27 (63%)	25 **(63%)**	15 (37%)	

Misalignment due to slope?

It has been suggested that the misalignment of chancels may have been to compensate for, or take into account, the slope of the churchyard, either by building, or rebuilding, the chancel away from the axis of the slope (Thompson 1913, 31). Although particular problems are raised by building on sloping sites, the slope does not appear to have figured in the decision to rebuild the chancel in the churches here, as there is a similar proportion of churches with rebuilt chancels on slopes as there is in the whole survey sample.

In order to test whether the slope of the site was a factor in either the misalignment of chancels, or their realignment, the proportion of misaligned churches and of all churches on sloping sites must be compared. If the slope had been a problem, then a greater proportion of misaligned churches would appear on sloping sites. Table 5.10 shows that 84 of 377 (**22**%) of all misaligned churches in this survey are built on a slope of more than two per cent, while the equivalent figure for all the churches in the survey is **19**% - indicating that the slope itself was not a determining factor in the misalignment. Misaligned churches with rebuilt chancels do form a slightly higher proportion of all the churches with rebuilt chancels (30 of the 111 - **27**%), so some of them might possibly occupy sites where the slope was a particular problem and had therefore been a factor in the rebuilding.

Table 5.10 – Effect of slope on churches

Churchyard slope:	All Churches		All misaligned churches		All Rebuilt (later) chancels	
	No.	%	No.	%	No.	%
Flat or slope less than 2%	1,553	**81**	293	**78**	81	**73**
Slope more than >2%	373	**19**	84	**22**	**30**	**27**
Total	1,926	100	377	100	111	100

It is possible that the direction of the realignment of a rebuilt chancel could reflect attempts to deal with structural problems caused by sloping sites, as Thompson suggested earlier, where builders were rebuilding to avoid the slope (1913, 131). If the slope had caused problems in the building, any realignment to solve this would need to be closer to the direction of the slope to ease the stresses in the building. These **30** churches are equally divided between those that are realigned closer to the axis of the slope (or across it) and those which are aligned further from the axis of the slope,

indicating that the direction of the slope played no part at all in the need to rebuild the chancel, reconfirming that the slope had no effect on the misalignment of the chancel.

Misalignment due to site restrictions?

It has also been suggested that restrictions of the churchyard may have caused the church to have been built misaligned in an attempt to align the church towards east on a site with insufficient space to align the whole church the same way, a situation mentioned by Bond, particularly in relation to urban churches on cramped sites (1914, 249). Alternatively, it may reflect a situation where the ability to extend the chancel by the required length was prevented by site restrictions and that the realignment was necessary to fit the extended chancel into the site. This analysis is complicated by the fact that the churchyard boundaries will probably have changed over the centuries, although unlike churches in towns, rural churchyards in general are more likely to have expanded than to have contracted, to deal with the pressure of extra burials, and are more likely to have space around them to allow this.

Table 5.11 – Effect of proximity of churchyard boundaries on churches

Closest churchyard boundary:	All Churches		All misaligned churches			All rebuilt chancels	
	No.	%	No.	%	As % of All	No.	%
Less than 2 metres	93	**5**	17	**5**	**18**	6	**5**
2 – 4 metres	349	**18**	84	**22**	**24**	24	**22**
5 – 9 metres	677	**35**	131	**35**	**19**	41	**37**
10 metres or more	807	**42**	145	**39**	**18**	40	**36**
Total	1,926	100	377	100	**20**	111	100

Those churches that are still close to one of their boundaries show no increased likelihood of being misaligned. As table 5.11 shows, similar proportions of churches are misaligned (around one-fifth (**20%**) – shown in column five of the table), whether they are in restricted churchyards, as indicated by the distance of the closest boundary, or located in larger yards. This confirms that site restriction has not played a part in the fact that these churches are misaligned. Neither does site restriction appear to have played a part during the rebuilding of chancels. The 111 churches with rebuilt chancels have the same profile of proximity to their boundaries as does the whole survey sample, with **5%** in the closest category and around **40%** in the largest.

Characteristics of Churches with misaligned chancels

In order to determine whether there are any other specific differences between those churches with misaligned chancels and the whole sample, which might indicate a possible reason for the misalignment or highlight another avenue to research, the characteristics of the misaligned group as a whole is compared to the whole sample in tables 5.12 and 5.13 below.

Their distribution between the counties surveyed is shown in Table 5.12 and demonstrates that the situation is a countrywide one, but is not equally distributed. Overall, one in every five churches is misaligned, varying between seven per cent in Cornwall, which is accounted for by the very high proportion of what John Betjeman called "Cornish Ends" (Betjeman 1968, Volume 1), where axial chapels are built flanking the chancel on both sides, thus preventing measurements being taken, and 36% of churches in East Sussex, which is much higher than in every other county and for which no explanation can be offered.

Table 5.12 – Distribution of misaligned churches

	All churches	Misaligned	%
Bedfordshire	96	8	8
northern Cambridgeshire	123	24	19
western Cornwall	72	5	7
Cumbria	74	16	22
East Sussex	104	37	36
eastern Kent	92	22	24
southern Hampshire	76	12	16
southern Lincolnshire	103	22	21
Norfolk	549	93	17
northern Oxfordshire	130	28	22
Pembrokeshire	77	16	21
Somerset	91	17	19
Shropshire	104	25	24
northern Suffolk	125	23	18
East Riding Yorkshire	110	31	28
TOTAL	1,926	377	20

Apart from the difference in nave/chancel alignment, there appears to be no other differences between this group of churches and those with a single alignment constituting the remainder of the survey sample. When analysed against other factors, for example: size, floorplan, tower type and dedication, the proportions in each category are remarkably similar. They cover the full range of sizes, from the smallest to

the largest; they have similar floor plans in terms of the number of aisles and they have similar tower types.

Table 5.13 – Comparison of misaligned churches with all churches in the survey					
Category	Misaligned Churches Number	%	All churches in Survey Number	%	% that misaligned churches form of 'all churches' in the same category
No Aisles	151	**42**	770	**40**	**20**
One Aisle	93	**26**	465	**24**	**20**
Two Aisles	133	**32**	691	**36**	**19**
Church <190 sq m	132	**36**	694	**36**	**19**
190-300 sq m	155	**41**	720	**37**	**21**
>300 sq m	90	**23**	512	**27**	**18**
No tower	40	**10**	227	**12**	**18**
Round tower	29	**8**	140	**7**	**21**
Square buttressed	192	**50**	1036	**54**	**19**
Square unbuttressed	116	**31**	523	**27**	**22**
	377	100	1,926	100	**20**
MEAN ALIGNMENT	86.3°		86.1°		

The column on the right of table 5.13 shows that an almost identical proportion of each group of churches is misaligned. Overall, one in five churches is misaligned (**20%**) and this proportion is repeated in most of the table rows. For example: **20%** of churches with no aisles; **19%** of churches of less than 190 square metres in area; **21%** of churches with a round tower, indicating no bias at all in the types of church involved. Finally, as a group, they are aligned almost exactly the same way as the overall sample – the mean alignment of the nave of misaligned churches is within 0.2º of the survey as a whole, at 86.3°. All of which appears to point to a random occurrence, which would be expected if random setting out errors were the cause of the misalignment. But that ignores the undeniable fact that for the majority of the misaligned churches, their chancels now face closer to east than their naves, implying that there was only one desire when realigning the chancel of the church – to face closer to east.

Misaligned chancels as symbolism: Conclusions

Misalignment of chancels, or their realignment, cannot be explained by any of the topographical factors analysed here; patterns of churches which are misaligned or realigned are in most cases the same as those for churches as a whole. Patronal-saint sunrise also plays no part in the alteration of alignment. The only influence that can be shown to have occurred consistently throughout this analysis is east; the alignments of the majority of chancels are closer to east in each of the analyses, further confirming the overall intention in the alignment of church buildings.

The fact that the symbolism of different nave and chancel alignments had evaded even William Durand must surely indicate that there was no contemporary symbolic intent in the minds of the builders. Durand found symbolism in every aspect of church doctrine, church buildings and church fittings. Symbolism towards such an important aspect of church teaching as the Crucifixion would have been the first, and most important, symbolic reference he would have identified. He lived until the end of the thirteenth century (Neale & Webb 1906, ix) during the last fifty years of which many of these chancels were being rebuilt and realigned. Had there been any intentional symbolic representation of the Crucifixion behind the different alignments of nave and chancel it must have come from the senior church hierarchy rather than from the individual builders themselves, so therefore it must have been discussed by the Church and would therefore have been known by Durand. Perhaps a simple realignment closer to east did not contain sufficient symbolism to mention.

3) ALIGNMENT WITH SUNRISE AT THE TIME OF THE SETTING OUT OF THE CHURCH

The third theory to examine with the results of this survey is that stated in Chauncy's quotation in the general introduction to this thesis – the assumption that churches faced sunrise on the day their foundations were laid. Chauncy assumed that churches that were aligned close to northeast were laid out near midsummer and those aligned close to southeast were laid out near to midwinter sunrise.

The ritual setting out of the church foundations could have taken place at any time of year, but whilst this may explain the variation between the alignments of individual churches, it fails completely to explain the observed differences in mean church alignment across the country. Although church foundations could have been pegged out at any time of year, the previous sections have proved that this opportunity was not taken to align the church on its patronal-saint's feast day. If churches were laid out throughout the year towards sunrise, a pattern of alignment that followed the movement of sunrise would be expected, where sunrise moves swiftly along horizon at the equinoxes, but slows to a standstill at the solstices. The result is that sunrise is only within 10º of east on **18**% of days throughout the year (author's calculations based on published sunrise data by the British Sundial Society (Davis 2004)), whereas it is more than 30º from east on **40**% of days. The pattern of church alignment is the inverse of this, with **63**% of churches aligned within 10º of east and only **2** % of churches aligned further than 30º from east, indicating again that there was purpose behind the alignment of churches as a whole, and that their general focus was generally eastwards.

Table 5.14 Sunrise position throughout the year compared with church alignment

	Sunrise (days)		Church alignment	
	No	%	No	%
>30º from East	147	**40**	33	**2**
±21-30º from East	86	**23**	160	**8**
±11-20º from East	68	**18**	525	**27**
±10º from East	64	**18**	1,208	**63**
Total	365		1,926	

There are certain seasonal issues surrounding the building of a church which need to be examined. The first action in the actual construction of a church would be the digging of the foundation trenches, which would tend to fix the alignment of the subsequent structure fairly closely. Without specialist labourers, the use of local labour would mean that the digging foundations for a rural church would have been likely to be more of a winter activity, when there was more free time from working on the land. Alignments fixed towards sunrise at the time of trench digging during the winter would be aligned well south of east. The great majority of foundation trenches cannot have been dug in the winter and aligned with sunrise, since almost two-thirds of all the churches surveyed here were aligned north of east, which would mean alignment towards sunrise during the spring, after the spring equinox, or in the late summer before the autumn equinox, both of which can be periods of intensive activity on the land. The second of these periods is discussed in more detail in Chapter Six in relation to harvest.

Was the start of building above ground a more likely point to fix the alignment? Church builders had to take into account the likelihood of frost, especially where the local materials required the use of a considerable amount of mortar. Building contracts for churches in East Anglia often made specific references to start dates for building each year. At St Mary's, Helmingham in Suffolk, for example, the contract for the tower specified that building (in flint) could only be undertaken between Whitsun (6 weeks after Easter - between May 5th and June 5th) and the 8th of September (Salzman 1992, 547-548), a season of no more than four months, and in some years, only a few days over three months. In order to maximise the amount of building in the first year, it would seem reasonable that building would start as soon as feasible, or as soon as the contract allowed, in that year. Sunrise at Whitsun in East Anglia is between 62° (5th May) and 54° (5th June). As only two of the 674 churches surveyed in Norfolk and Suffolk are aligned north of 62°, alignments with sunrise at the start of building are not indicated, at least in East Anglia. In areas where soil could be used instead of mortar to bed large non-calcareous stones, such as granite and slate in Cornwall, Pembrokeshire and Cumbria, or in areas in which the use of large limestone or sandstone ashlar blocks meant the use of considerably less mortar, late frosts would not be so important, which would mean that the start of building could be earlier in the year and allow the continuation of building later on in the year. As an example, the contract noted above

for the 60 foot tall flint-built Helmingham tower was for ten years, whereas the 100 foot tall ashlar-built tower of St George's, Dunster (Somerset) was to be completed in three years (Salzman 1992, 548 & 514).

Figure 5.9 – St Mary's, Helmingham, Suffolk, flint tower (10 year contract)

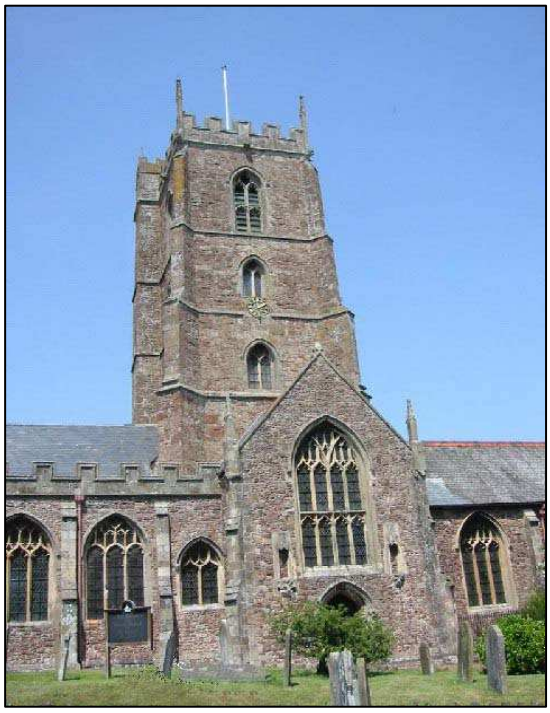


Figure 5.10 – St George's, Dunster, Somerset, ashlar tower (3 year contract)

If church building was started earlier in the year in Cornwall, Pembrokeshire and Cumbria, and the church aligned with sunrise at that time, this would result in alignments further south on average than in the remainder of the country. The results do not bear this out, as these counties exhibit numerically the lowest (most northerly) mean alignments of any of the areas surveyed.

Detailed regional climate patterns in medieval times are unknown, but modern summary climate records obtained from the Meteorological Office[22], especially of the number of frost days, and the timing of the last frost in the year, do not indicate any regional patterns, either north-south or east-west. In the three decades after 1960, Shropshire had the most frost days and Cornwall had the least, the latest frosts occurring in Kent and the earliest cessation of frost was shared by Cornwall, East Sussex and Suffolk.

[22] http://met-office.gov.uk/climate/uk/averages/station.html (accessed 9th June 2001)

More recent, and more detailed, summary records published by the Meteorological Office (for 1971 to 2000)[23] do show a slight east-west spatial variation in the number of frost-days, shown in Table 5.15 below. The counties closest to the sea seem to have the fewest frost-days, particularly those on the west coast, even if further north (Cornwall, Pembrokeshire and Cumbria) compared with counties on the east coast (Suffolk, Norfolk, Lincolnshire and East Yorkshire), but the counties in the centre of the country – Cambridgeshire, Shropshire, Bedfordshire and Oxfordshire – have the highest number of frost-days. Whilst the difference in the number of frost-days between the east and west coast might begin to explain the difference in alignment of churches there, the far greater number of frost-days in the centre of the country means that churches there would not be aligned between those in the east and west, as the later start due to the extra frost-days would mean an even more northerly alignment in the central area, rather than the reality of mean church alignment in the central area fitting numerically in between the alignments in the east and west.

Table 5.15 Numbers of frost-days per year 1971-2000

County	Days of frost	Mean
Cornwall	0-100	50
Pembroke	10-110	60
Cumbria	20-140 20-120 exc. fells	70
Sussex, Hampshire	25-110	67
Kent	25-130	77
Suffolk, Norfolk, Lincolnshire, East Yorkshire	35-125	80
Somerset	40-120	80
Cambridge	70-125	97
Shropshire, Bedfordshire, Oxfordshire	102-144	123

The issue of general climatic differences between the east and west of the country, rather than just using frost-days as an indicator, is considered in more detail in the next chapter.

[23] http://metoffice.gov.uk/climate/uk/averages/19712000/regions.gif (last accessed 16th Sept 2008)

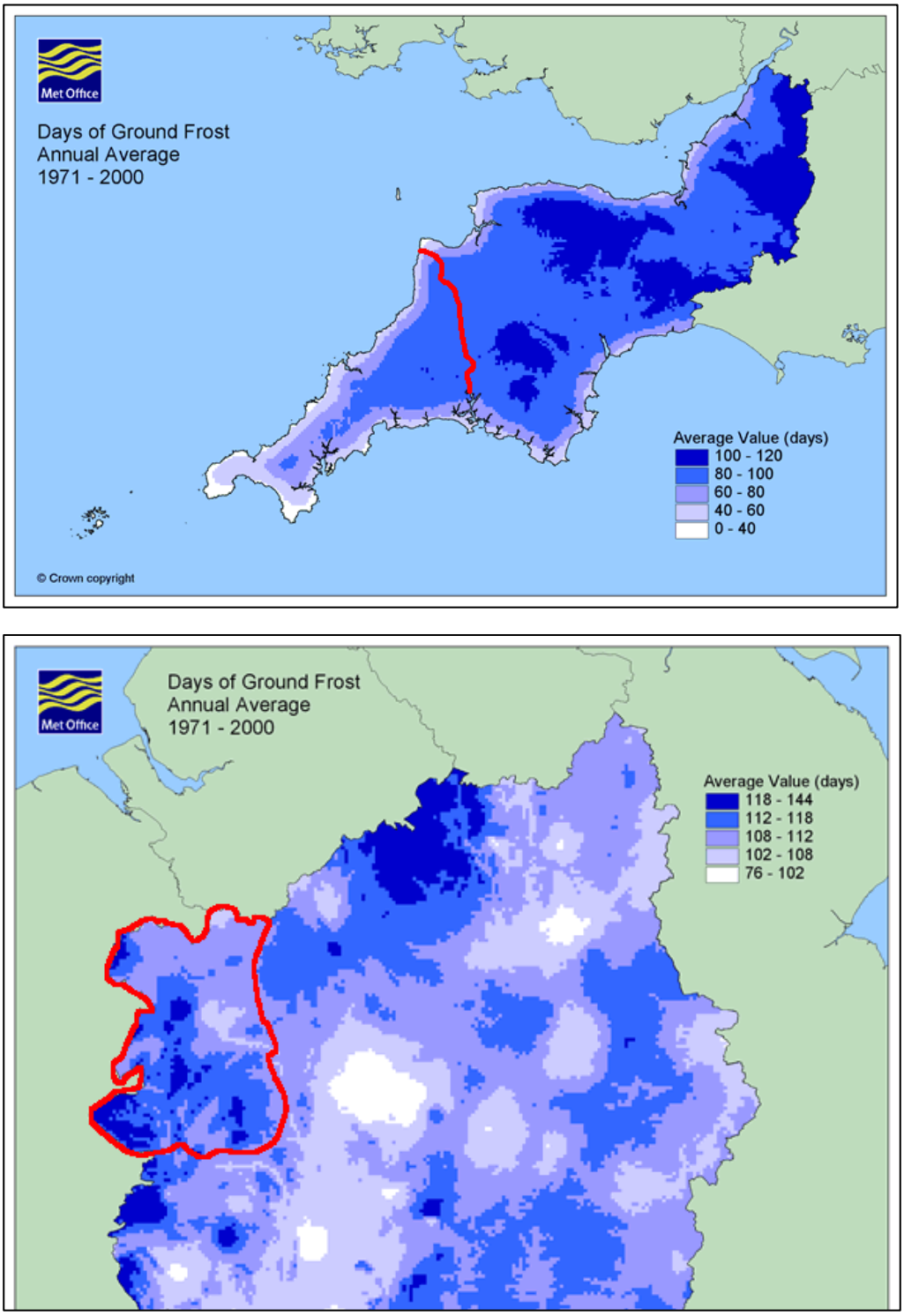


Figure 5.11 – Examples of Meteorological Office Climate maps used for the frost days data shown in table 5.18 - for Cornwall and Shropshire

(Although the Met. Office has used similar colours for these two counties, the values they represent are very different – the lowest values found in Shropshire (102 -108) are higher than the highest category found in Cornwall (80-100 – royal blue))

Sources: http://metoffice.gov.uk/climate/uk/averages/19712000/regions.gif last accessed 16th Sept 2008)

4) ALIGNMENT WITH SUNRISE AT EASTER

The fourth theory that has been suggested may have caused the differences between individual church alignments is that churches were aligned with sunrise at Easter, and that the pattern of movement of Easter day is then reflected in church alignments built in different years. Easter is universally considered to be the most important festival of the church. Its date falls on the first full moon after the first Sunday after the northern-hemisphere Spring Equinox, varying between March 22nd and April 25th. Sunrise on these days ranges between 90° and 67/69° in England, depending on latitude, with a mean of approximately 78°. This is between 2° and 14° more northerly than the mean direction of church alignment in any of the areas surveyed here, so it is not likely that the position of sunrise at Easter was the focus for the alignment of churches.

The Roman and Western churches frequently celebrated Easter on different dates which could be reflected in a difference in church alignment between adherents of the two doctrines in the west and east of the country. The issue was discussed at the Whitby synod in 664 CE which fixed the calculation of the date of Easter using the Roman method and all but the Ionian church followed (Colgrave 1927, 9; Mayr-Harting 1972, 131-135). However, so few churches had been built by this time that any differences in the date of Easter cannot explain the observed alignment variations between east and west.

5) ALIGNMENT TOWARDS JERUSALEM

The final theory to examine that has been suggested to explain the differing alignment of churches is that raised in the commonly heard tale[24] that churches face east because they face Jerusalem, thereby following the Jewish tradition to face Jerusalem for prayer, although Davies alluded to facing east for prayer as a *contrast* to the Jewish tradition of facing Jerusalem (Davies 1972, 303). Unlike the other theories tested in this chapter, this one does not seek to explain why church alignment varies, merely suggesting that churches are aligned with Jerusalem. Apart from the more complex issue of the degree of medieval knowledge of the directional location of Jerusalem, this

[24] Including the Council for British Archaeology website - http://britarch.ac.uk/yac/leaderdocs/skillstraining/english_parish_church.pdf (accessed 13th Dec 2009)

theory can be simply dismissed on general grounds. There were many thirteenth-century world maps which formed the basis of the medieval world awareness among the educated (Harvey 1996, 35). The Hereford *Mappa Mundi* is the largest and most detailed surviving example of these (Harvey 1996, 38) and, like the others, shows Jerusalem to be (geographically correctly) located to the southeast of Britain, rather than to the east. However, all the medieval maps show an island called "terrestrial paradise" – representing The Garden of Eden – at the eastern edge of the world, except the Psalter map, which is considerably smaller than the others (Harvey 1996, 34) and which shows paradise to be located within Asia, but still at the eastern edge of the world (Harvey 1996, 29). Therefore, in facing east, churches are unlikely to be facing Jerusalem, but appear to be aligned with paradise. It is also important to note that medieval map notation locates east at the top of the maps, rather than the modern location to the right, further emphasising the medieval importance of east.

SUMMARY OF THE VALIDITY OF THESE EARLIER THEORIES

Despite the certainty of the conclusions arrived at by many of the earlier students of church alignment, the data from this survey argue convincingly against them all. Many of these theories were first proposed over one hundred years ago and at least one of the writers on the subject was a vicar – Benson 1956 – who may have had a vested interest in attempting to prove a religious significance in his results. The large sample of this survey has enabled a more secure view to be taken of many of the statistical aspects of the results. Each theory has been shown to fail and in many cases a more pragmatic or logical explanation and conclusion is indicated.

Alignment with Patronal saint sunrise

Churches are not aligned with their patronal-saint's feastday sunrises, nor with any other specific sunrises. This conclusion is confirmed by all the analyses here, ranging from the summary statistics of winter and summer saints, which indicate virtually identical alignment patterns for saints of all seasons compared with sunrise differences

of up to one-fifth of the horizon, to a specific analysis of the actual sunrise point of the 1,105 churches surveyed in seven counties, showing virtually no correlation at all between saint's day sunrise and alignment. No amount of tinkering with the results, to take horizon elevation and calendar change into account, can alter the fact that exactly half of all churches are aligned further than 30º from their sunrise (table 5.2), whereas less than two percent are aligned more than 30º from east. Even the argument about the possible rededication of churches cannot help. Since the vast majority of churches are aligned close to east, rather than exhibiting a wider pattern of alignment towards multiple foci, spread throughout the year, it seems certain that they never did align with sunrise on the feastday of their patronal saint. Taken to its extreme, if the proposal that churches were aligned with the sunrise on their patronal-saint's day was true, the overwhelming concentration of churches aligned close to east would have to mean that they were nearly all dedicated to saints with feast days close to either of the equinoxes (late March and late September) rather than the range of saints that have feast days widely spread throughout the year, with concentrations of feastdays closer to the extremes of sunrise, near the summer and winter solstices, where the majority of sunrises occur.

Religious imagery of misaligned chancels

This theory is also without foundation. Close to half of all the chancels that are aligned differently from their naves are aligned to the north of the nave (to the left when looking down the nave towards the chancel) and half are aligned to the south (right). The proposition that this misalignment represents religious imagery of the Crucifixion fails at that point, irrespective of the consideration that the representation of the Crucifixion was different in early times, both of which appear to have been ignored by the proposers of the theory. Further confirmation of the lack of intent for religious imagery is the fact that William Durand did not include this as a symbolic reference in his comprehensive treatise on church symbolism, despite finding symbolism in every other aspect of church buildings.

The roughly equal division in misalignments left and right identified in the survey is what would be expected of a sample of this size if the distribution was a random one. However, within this apparently random result is hidden a more reasonable explanation. Firstly, where churches had their chancels rebuilt, three-

quarters were realigned closer to east, probably as part of the rebuilding process, although it is possible that the new chancel was repeating an original misalignment. The improvement of alignment during rebuilding, even though it is usually only by a few degrees, is further emphasised by the fact that the later the rebuilding of the chancel, the more likely there is to be an improvement in alignment towards east. The eastward focus is also supported by the fact that the further the nave is aligned from east, the higher the proportion of chancels that are realigned more closely with east, even if the nave and chancel appear to be of the same architectural period. Overall, these results strongly suggest that misalignment was not an effort on the part of the builders to reflect religious imagery, neither was it an accident of setting out. Indeed, it appears to indicate a desire to achieve a more accurate eastward alignment, thus further confirming the importance of east, as well as indicating that it was appreciated that these alignments required correction.

Finally, neither sunrise on the patronal-saint's day, nor sloping sites, nor site restrictions appear to have been factors in misalignment or realignment. Analysis by sunrise on the feastday of the patronal saint shows that less than half the chancels were aligned closer to, and more than half were aligned further from, the relevant sunrise position. Similarly, half of the chancels appear to align closer to the axis of the slope of the churchyard and half further away. Lastly, churches in more restricted churchyards are no more likely to be misaligned than those in large yards.

Alignment with sunrise at Easter

The average date for the celebration of Easter between 900-1200 CE was April 9th (author's calculation of Easter, based on the standard algorithm, set out in Appendix 8), when the sun rises at around 77° or 78º depending on the latitude. This is close to the mean alignment in the west of the country, but is several degrees different from the mean alignment in the east of the country. Although the position of sunrise at Easter varies depending upon the date of the festival (between 67° and 90º), this cannot be used as an explanation for the range of church alignments on the ground as the range is insufficient. Even the differences in dates between western and Roman Easter, which might have had an east-west impact on the figures, cannot be a factor, firstly because very few churches were built before the date of Easter was standardized, but mainly because western Easter was usually *earlier* than Roman Easter (Cheney 2000 47-54)

(for details - see table A8.1 in Appendix 8 on page 336). This would have resulted in more southerly sunrises on Easter Day in the west – which would mean that churches in western areas would have numerically higher mean alignments than those in the eastern areas – the complete opposite of the pattern actually seen on the ground.

Alignment with sunrise when the church was built

Similarly, delays in the start of springtime building due to climatic variations cannot explain the variations either between individual church alignments or the observed pattern of variations in church alignment across the country. Although the regional details of the medieval climate are unknown, modern climate frost records do not indicate any consistent pattern across the country, either north-south or east-west, as the centre of the country away from the sea has both more, and later, frost-days. If the mean direction of church alignment in each area was to reflect the most popular period of the year for the commencement of church building, it would require that building in Cornwall started later than everywhere else, and in particular, that twice as many churches had later building starts here than in Kent, in order that twice as many churches were aligned north of east. In addition, the fact that the mean alignment in Cornwall is even further north of east than in Cumbria, therefore aligned with a more northerly (later) sunrise in Spring, would mean later building starts in Cornwall than in Cumbria. This appears to confirm that sunrise at the time of building commencement was not a determinant of alignment.

Churches aligned towards Jerusalem

This theory can also be seen to have no basis, as Jerusalem was shown to the southeast of Britain, even on medieval maps. Southeast is 135º True and not one medieval church in the whole of this survey is aligned in that direction.

ALIGNMENT THEORIES: OVERALL CONCLUSIONS

When tested against a large dataset, none of the earlier explanations for the variation in the alignment of churches can really be seen to have any validity. The earlier theorists have frequently used very small samples of churches which can provide misleading results; some have interpreted information to suit their arguments, such as Benson (1956) and Searle (1974) (discussed in Chapter One), while others have based their theories on little more than half of the churches they surveyed and have simply ignored the other half that did not fit their proposition (such as 'weeping' chancels).

In general, it seems reasonable to conclude that churches were originally vaguely aligned eastwards but with a variance between the extreme alignments of 90º - one quarter of the horizon. In some instances it is possible to interpret particular patterns, such as misaligned chancels (particularly rebuilt ones) as reflecting a need for realising a more accurate orientation over time, which was achieved when the opportunity arose through rebuilding. What is not clear is whether the intention of church-builders changed over time from a general sunrise alignment to one which aligned churches more generally towards east, or whether developing technology allowed a more accurate realisation of an original intention to align eastwards.

PART THREE

ANALYSIS AND SYNTHESIS

CHAPTER SIX

VARIATION IN CHURCH ALIGNMENT ACROSS THE COUNTRY

Oh, East is East, and West is West, and never the twain shall meet.
Rudyard Kipling, *Barrack-room ballads*, 1892.

INTRODUCTION

This chapter examines in more detail the east-west pattern of spatial variation in church alignments across the country that was established in Chapter Four and demonstrates that it also exists for the parish churches within the county of Norfolk, where the density of churches is so much greater than elsewhere and therefore provides a large sample in a relatively small geographic area.

It explores a number of possible reasons for the differences in alignment; firstly that the use of a compass to set out churches may reflect the movement of magnetic north over the period in which the churches were built; secondly, that churches may have been aligned differently in different periods of church building for other reasons than the movement of magnetic north, such as shifts in belief or in the importance of specific directions. It had been hoped to examine another aspect of chronology by comparing the alignment of possible minster, or mother, churches with the remaining churches in the survey, which are more likely to have been built later. Unfortunately, it is not possible to identify a sufficient number of known minster churches to provide a large enough sample of alignments for a robust comparison, particularly when the data are sub-divided by longitude. Lastly, climate differences across the country are examined. Although climate differences in Spring, as measured by the number of frosts and their dates, have been shown not to have created the observed east-west pattern of alignment by affecting the date at which church-building began, the climatic differences across the country later in the year are investigated here to assess whether they may have affected harvest times which, combined with the prospect that an early successful harvest may have been seen as an auspicious time to build a church, may have caused the different patterns of alignment across the Country.

SPATIAL VARIATION IN CHURCH ALIGNMENT RESULTS

In this survey, the mean alignment results for the counties in the extreme east and west of the country exhibit a difference of 12° (80.4° – 92.4°), as shown earlier in table 4.1 on page 112. The sample size in the individual counties is necessarily limited (as there were no more churches to survey), but since adjacent counties have very similar results, and the results were shown earlier to vary by longitude but not latitude, they have been re-analysed below by longitude. Due to the location of the counties used in the survey, there are natural gaps in the survey data at 4º West and 2º West. The greater number of counties surveyed in the east, and the greater density of churches within them, means that there are no other natural breaks in the data, but the two degree classification was continued for consistency. In order to ensure large enough groups for analysis and to provide more robust results, all the churches located at more than 2° west were amalgamated into a single group.

At this level of aggregation, the difference between the mean alignment values in the east and west falls to 6.6° (**82.2°** to **88.8°**), but the larger sample size in each group means that the difference between the extreme ends of the ranges for the east and west at 99% confidence, is still 4.2° (**83.6°** to **87.8°**). In other words it can be stated with near certainty that the mean church alignments for these areas are significantly different and this difference did not happen by chance. The fact that the standard deviation for the mean figure in each of the areas, shown in the seventh column, (which indicates the spread of the data about the mean value), is so similar to the standard deviation for the overall figure, surely indicates that the same procedure for setting out churches was used everywhere, with the same sort of variability (hence the wide range of individual alignments) but subject to a systematic east-west bias.

Table 6.1 – Summary of results by longitude

Longitude (decimal)	No	Range	Mean	95% conf	Range at 95%	Range at 99%	Standard Deviation	% N of East
WEST 2.00º W +	418	48-126	**82.2**	±1.1	81.1 – **83.3**	80.8 – **83.6**	11.45	75
CENTRAL 0.01ºW – 1.99º W	606	38-121	**84.7**	±0.9	83.8 – 85.6	83.5 – 85.9	11.35	70
EAST 1.70ºE - 0º E	902	54-128	**88.8**	±0.7	**88.1** – 89.5	**87.8**– 89.8	11.22	54
Overall	**1,926**		**86.1**	**±0.5**	**85.6 – 86.6**	**85.4 – 86.8**	11.62	**63.8**

In Figure 6.1 below, the alignment of every church in this survey (vertical scale) is plotted against its longitude (horizontal). It also shows the calculated mean alignment across the country (the solid red line) which confirms the values shown in the county table (table 4.1, page 112) from around 80° in the west to 90° on the east. The apparent vertical lines in the data are because the longitude of each church was recorded to the closest 5′ (minute) interval, for example 1°, 1°5′, 1°10′, except in Norfolk, where 1′ intervals were used.

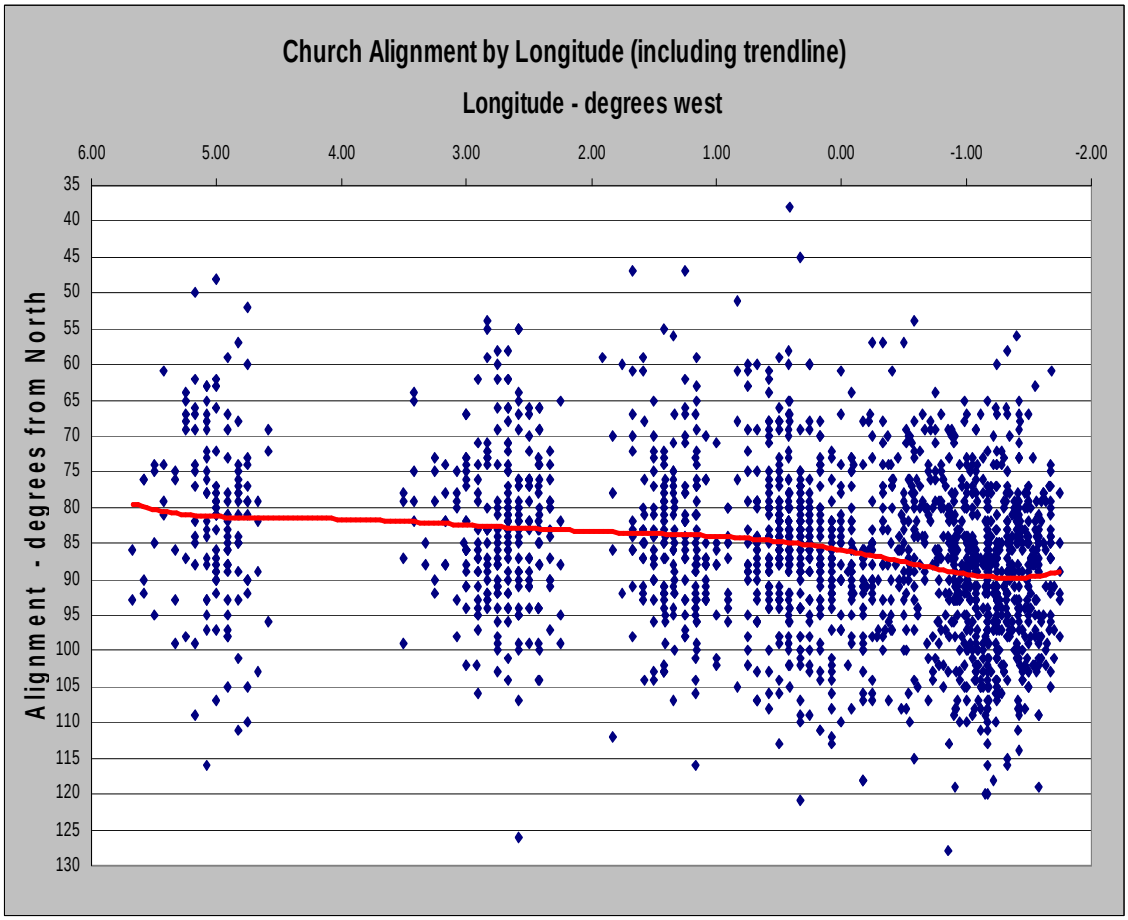


Figure 6.1 – Scattergram of alignment by the longitude of every church in this survey, including the calculated 'trendline'[25]

[25] A Microsoft Excel function which calculates moving mean values using the least squares fit through points.

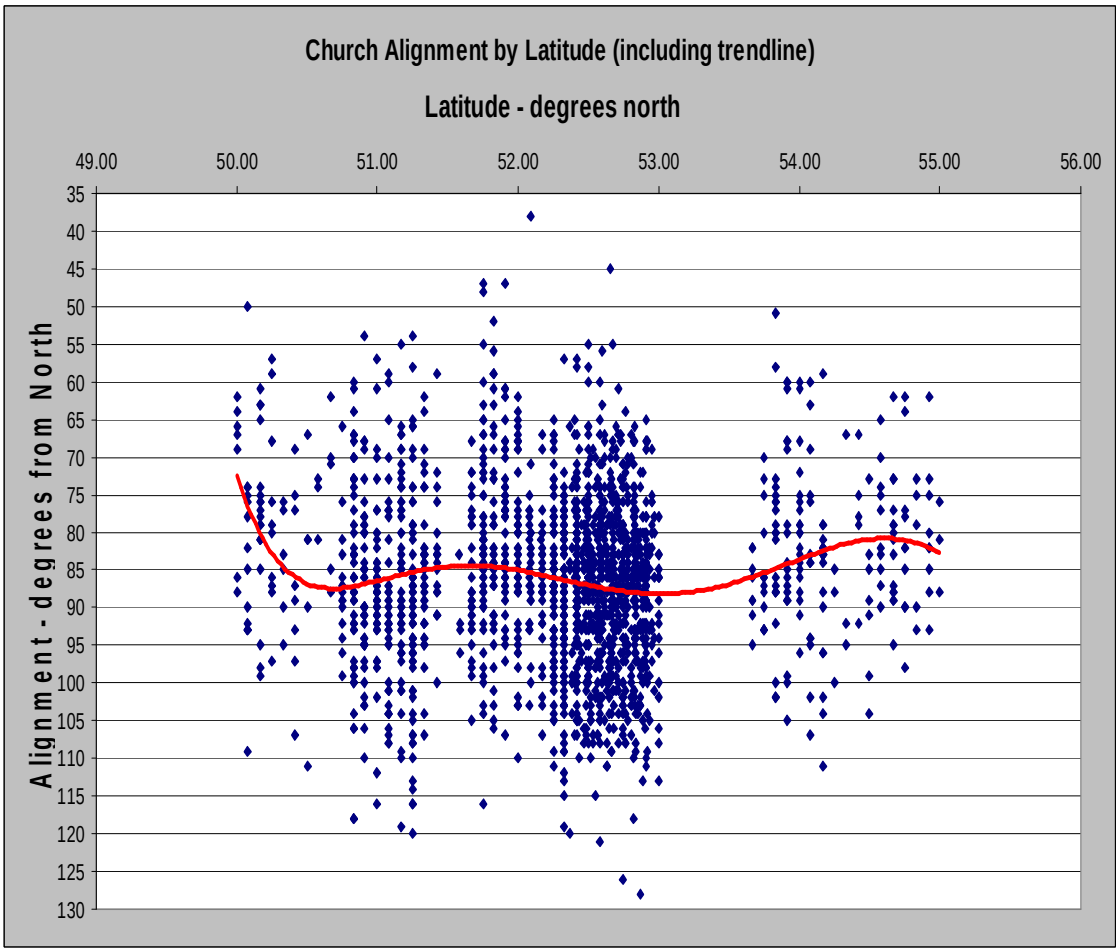


Figure 6.2 – Scattergram of the alignment by latitude of every church in this survey, including the calculated 'trendline'[25]

Figure 6.2 presents the same alignment data as shown in Figure 6.1, but analysed by latitude. The trendline closely reflects the longitude data in Figure 6.1, as the most southerly and northerly survey areas (at 50° and 55°N) are in the west of the country (with numerically low alignments) shown by the rises in the trendline at either end; the large concentration around 52.5° - 53°N is mostly Norfolk in the east (high alignment) which shows as the depression in the trendline, and even the small volume of Kent data, where churches also have a high numerical alignment, shows as a dip in the trendline at around 51°N. Taken together, these two diagrams confirm the generalised pattern shown earlier in Figure 4.3 on page 124, by illustrating a distinct east-west (longitudinal) pattern of alignment variation across the country. The north-south (latitudinal) analysis does not show a similar trend up and down the country, but it does reinforce the longitudinal variation.

General discussion of possible causes for the spatial variation in alignment

As demonstrated in the previous chapter, there appears to have been an overall desire to orientate churches generally eastwards, rather than towards the specific sunrises that were tested, whether that of the church patronal-saint's day, Easter day, or on the day when building might have started. The majority of churches (63%) are aligned within 10º of due east. However, tables 6.1 and 6.2 above show clearly that medieval church alignments across the country exhibit significant differences between those in the east and those in the west. The statistical tests of confidence show that this is not a statistical fluke, but represents a real overall difference. This is confirmed by the fact that around three-quarters of churches are aligned to the north of east in counties in the west of the country, whereas church alignment is almost equally divided between those aligned north and south of east in counties in the east of the country. As an indicator of the size of the actual difference between church alignment in the east and west, almost one in every three churches in the west of the country – 239 in all – would need to have its alignment shifted from north of east to south of east to achieve the balance of alignments either side of east that occurs in the east of the country.

This raises several broad questions. Since the intention of the builder appears to have been to align the church in a broadly easterly direction, what is the reason for the difference across the country in the overall mean alignment? There are four main possibilities, *viz*:–

a) There was a single overall influence in church alignment, not exactly due east, but close to it, and with a shifting point of focus across the country, or

b) There was a single influence, but with stronger or weaker effects in different parts of the country. This could work in either a positive or negative way; in other words, it could result in an increasing number of churches having a more northerly alignment from east to west, or alternatively, a reducing number having a more southerly alignment east to west, or

c) There was a single overall influence but one which was counterbalanced, more in some areas and less in others, or

d) There were two different influences, one acting in the east, and another in the west of the country.

In addition to these possibilities, how did the influence(s) actually work? Was a conscious decision on the alignment taken when each church was set out, or was it a series of unconscious decisions of individual builders, whether influenced by external

factors or not, that taken together, realised the pattern? Further, if the difference was the result of a conscious decision was it ever written down or was it merely part of the unwritten 'craft' aspects of early masons and architects or some other group that was involved in church planning?

The idea that this pattern was created by chance – that hundreds of individual church-builders have caused this configuration west to east across the country without any outside influence at all – seems impossible. Even in East Anglia, where the density of medieval church buildings is at its greatest, few churches are sufficiently inter-visible to allow the alignment of one to influence that of another. It does raise the possibility of a local focus, for example something on the horizon, but variations in the actual point of focus would be expected to produce a random pattern, so this does not begin to answer the question of why the difference between alignments in the east and west of the country exists.

If churches everywhere were intended to be aligned exactly towards east, and this was done with complete accuracy, then all churches would face east, irrespective of where they were in the country. The introduction of errors in setting out would produce a variation in alignments. If those errors were unintentional, then errors one side of the mean value would be mirrored by those on the other side, producing what statisticians call a 'bell-curve', but retaining the same mean value. As the number of errors increases, especially when they differ from the mean by a greater amount, the curve becomes flatter – that is, wider and less tall (resulting in a larger 'standard deviation'), but if there are similar errors either side of the intended direction, then the same mean value is retained. The 'bell-shaped' nature of the church alignments in this survey is clearly illustrated in Figure 6.3 below, where the peak of each curve – red for those in the east of the country and green-dashed for those in the west shows a distinctly different value. This seems to indicate that either the first or last possibility listed earlier is correct, either that there were different points of focus for church alignment east to west across the country from a single influence, or that there were two different influences: one in the east and another in the west. The fact that the alignment curve of the churches in the centre of the country in Figure 6.3 (blue pecked line) sits between those of the east and west seems to point to the first of the two possibilities, in other words, a single influence with a shifting point of focus, rather

than introducing a third different influence in the centre of the country for the last possibility. This just leaves the problem of establishing what the influence was.

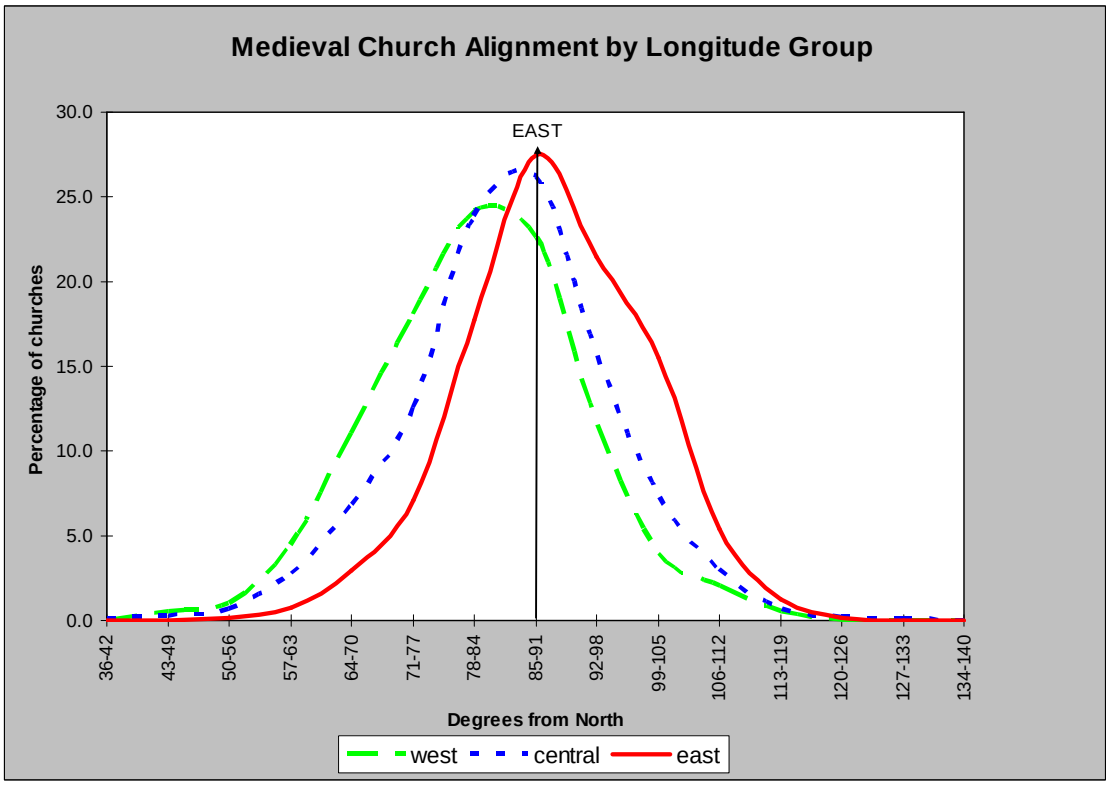


Figure 6.3 – Alignment of medieval churches, summarised by the 2º longitude group used in table 6.1

Variation in church alignment within Norfolk

The survey results for the alignment of churches within Norfolk provide, at a local level, another strong confirmation of the pattern of variation in mean church alignment by longitude. Rather than selecting a possibly arbitrary numerical division for this breakdown, the results for the county as a whole have been divided in half and are shown in table 6.2 below. The ranges of the mean results do not overlap at 95% confidence, indicating a likely statistically significant difference in the results, even within this short distance (fractionally over 100 km in total and only 50 km between the centres of these two areas). The different proportions of churches aligned to the north of east in the two halves of the county serve to confirm the real variation in the results – with **62**% of churches aligned north of east in the western half of the county and only **50**% in the east.

Table 6.2 - Alignment of churches in Norfolk by Longitude							
Longitude (decimal)	No.	range	Mean	95% conf.	Range at 95%	Stand. Dev	%N of E
(East) 1.11º – 1.70ºE	279	56-120	**90.3**	±1.2	89.1-91.5	10.5	**50**
(West) 0.20º – 1.10ºE	270	64-128	**87.4**	±1.3	86.1-88.7	11.0	**62**
	549		**88.9**	**±0.9**		**10.8**	**56**

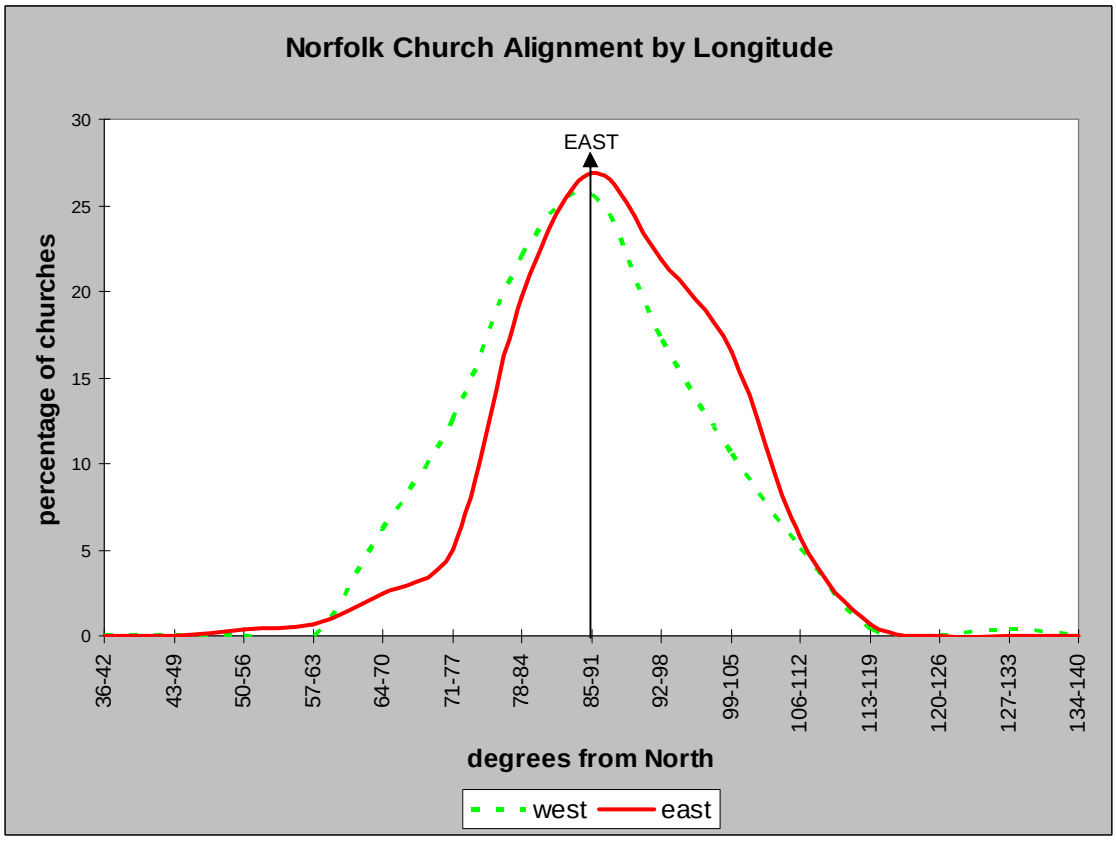


Figure 6.4 – Norfolk church alignment by longitude, shown in Table 6.2

The two curves clearly show that there is a greater number of churches in the west of the county with alignments north of east (numerically low), shown by the fact that the green-pecked line is further to the left than the solid red line on the left-hand side of the graph, and more churches in the east of the county with alignments to the south of east, shown by the solid red line being further to the right than the green-pecked one on the right-hand side of the graph. This reflects the similar pattern shown in the whole survey results, in Figure 6.3 above, but with a smaller difference between the two curves, which is probably due to the smaller geographical distance between the west and east of Norfolk, rather than between the west and east of the country.

POSSIBLE REASONS FOR THE SPATIAL ALIGNMENT VARIATION

As demonstrated in the previous chapter, variations in specific sunrises cannot explain the noted difference between church alignments in the east and west of the country. A discussion of other factors that may explain the differences in church alignment between east and west are set out below; firstly, changes in the magnetic field of the Earth; secondly, possible chronological differences in church building, and lastly, variations in climate.

1) MAGNETIC VARIATION

The idea that churches were set out magnetically towards east, and that the variations in alignment between individual churches built at different dates reflects the changes in magnetic declination (the difference between a magnetic direction as shown on a compass, and the true direction), seems, on the face of it, to provide a simple explanation for the variation in the alignment of churches. The subject of how churches were set out, and whether the compass was a known instrument at the time of much of the church building in England, has been discussed before (see Abrahamsen 1992, 292-303; Hoare and Sweet 2000, 167; Ali & Cunich 2001, 156-157). The results were inconclusive; both Abrahamsen and Ali & Cunich feel that some churches were set out magnetically, but Hoare and Sweet do not; but all acknowledge that the compass was known to the Church by 1187 CE from documentary evidence (Hoare & Sweet 2000, 167), and possibly long before (Ali & Cunich 2001, 156).

North, as measured by a compass, is not a fixed point. Due to the constitution of the earth's core, the magnetic field that the planet generates shifts in relation to the geographic North Pole. This difference is known as *secular magnetic variation* and has two components – magnetic declination, which is variation in an east-west direction, and magnetic inclination, which is variation in a north-south direction (Merrill *et al.* 1996, 5-6; Abrahamsen 1992). Magnetic declination was first measured in London in 1576 (Merrill *et al.* 1996, 3 & 46-47), and has been projected backwards in time by using datable objects which have thermo-remanent magnetism (Clark *et al.* 1988, 646), enabling a graph of the movement of the magnetic pole to be plotted (archaeomagnetic

calibration). These measurements and projections (in Figure 6.5 below) show a combination of magnetic declination (across the graph) and inclination (up and down the graph).

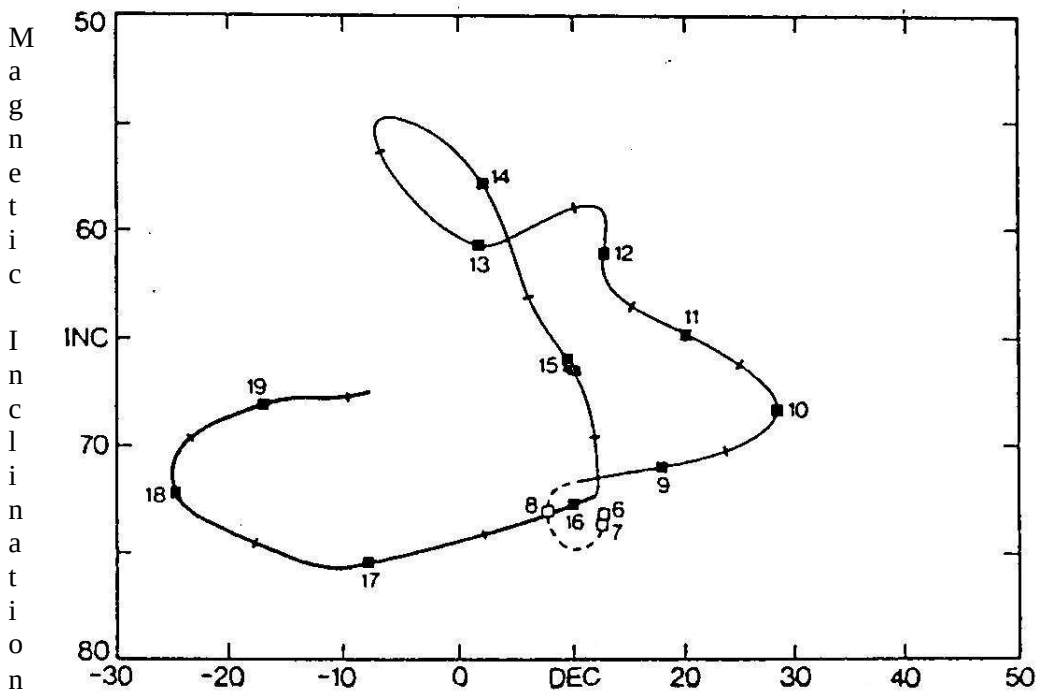


Figure 6.5 – Archaeomagnetic calibration for Britain, normalized for Meriden in Warwickshire (the geographic centre of England**)** (Clark *et al.* 1988, 659)

Figure 6.6 below shows the author's extract of the declination element of the combined declination and inclination plot shown above, by year. It also shows the approximate positions of magnetic north, and therefore magnetic east, at the extreme positions in the movement of the magnetic pole over the last 1100 years.

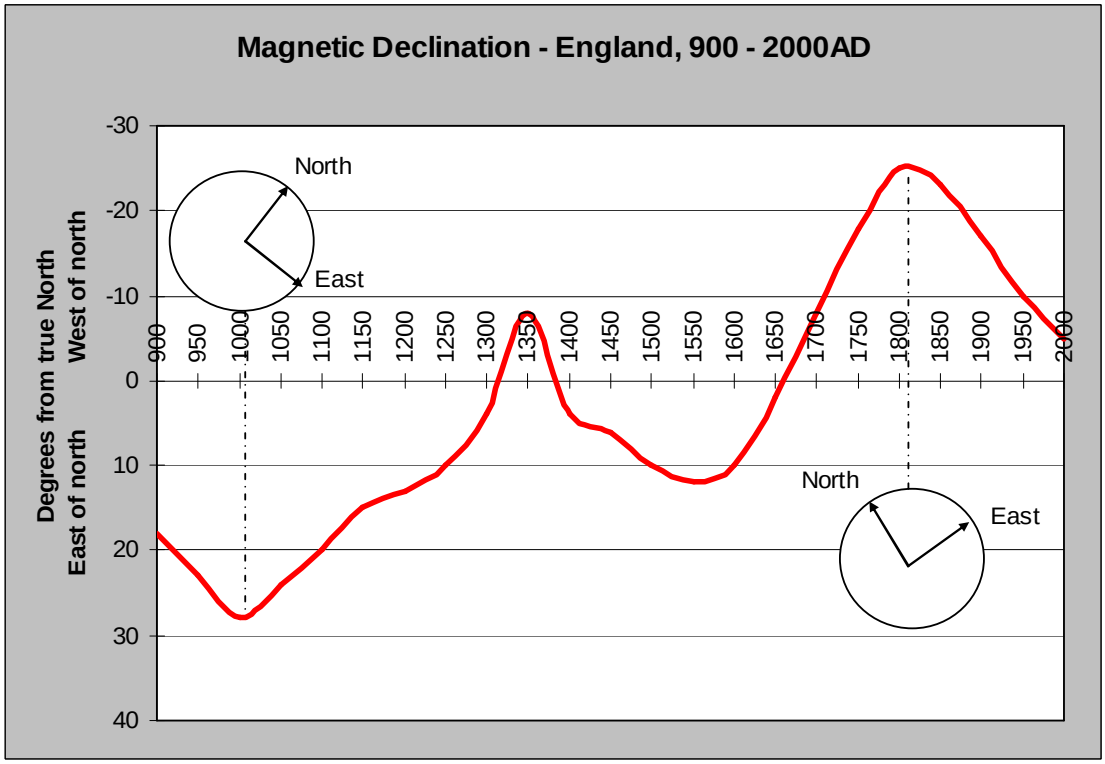


Figure 6.6 – Magnetic declination of North between 900 CE and 2000 CE for Meriden in Warwickshire **(**Author's extract of declination from the combined plot of magnetic declination and inclination shown in Figure 6.5)

During the medieval era, apart from a roughly 70 year period during the fourteenth century, magnetic east was always south of true east, peaking at almost 30º south in 1000 CE. In 1100 CE it was approximately 20° south of true east and was 15° south in 1200 CE, resulting in readings for magnetic east in these years of 120°, 110° and 105° True respectively, compared with True east (90°). Any alignment, or realignment during rebuilding, of a church using a compass before the date when magnetic declination was first measured would have to have been made towards magnetic east. This would mean that churches built between 1100 and 1200 CE, and set out using a compass, would have been aligned between 15º and 20º south of east (between 105° and 110° True), rather different from the observed alignments in this survey, which are concentrated between 80° and 90° True.

Table 6.3– Approximate magnetic declination in the medieval era		
Year	Declination - Degrees east of North	Magnetic East - °True
1000	28	118°
1100	20	110°
1200	15	105°
1300	7	97°
1350	-7	83°
1400	7	97°
1500	10	100°

It appears, therefore, that the magnetic variation not only occurs during the wrong period to explain the overall variation in church alignment, covering far too long a period between its *maxima*, but also has an insufficient medieval component to the west of north (when magnetic east was north of true east) to allow for the large number of churches aligned to the north of east. In addition, it also has an insufficient range. The overall range of some 55º in the position of north, and therefore east, is too small to explain the variation of 90º in the range of alignments of medieval churches, especially since more than 20º of the range of 55º has occurred since the middle of the seventeenth century, long after all the medieval churches were built.

As well as varying over time, magnetic declination also varies by location. In 2002, a compass in Kent showed magnetic north to be 2° 30′ west of true north, whilst at the same time in Cumbria, the difference was around 5° 0′ [26], meaning that magnetic east was north of true east across the whole of the country. This variation across Britain in 2002 is shown in Figure 6.7 below. If churches were aligned according to the magnetic declination then, churches in Cornwall and Cumbria would be likely to face a similar direction, as would churches in Sussex and Norfolk.

[26] http://geolab.nrcan.gc.ca/cgi-bin/geomag/MIRP/run_mirp – (accessed 5th April 2002)

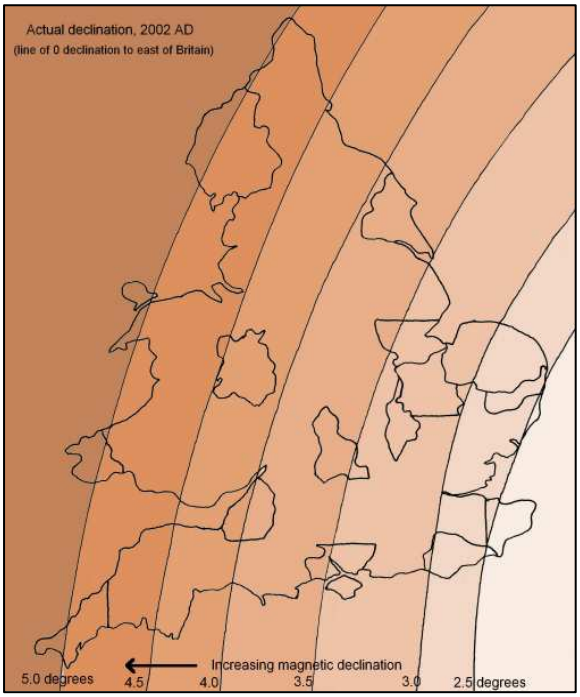


Figure 6.7 – Actual magnetic declination for 2002 when magnetic north was west of true north. Source[26]

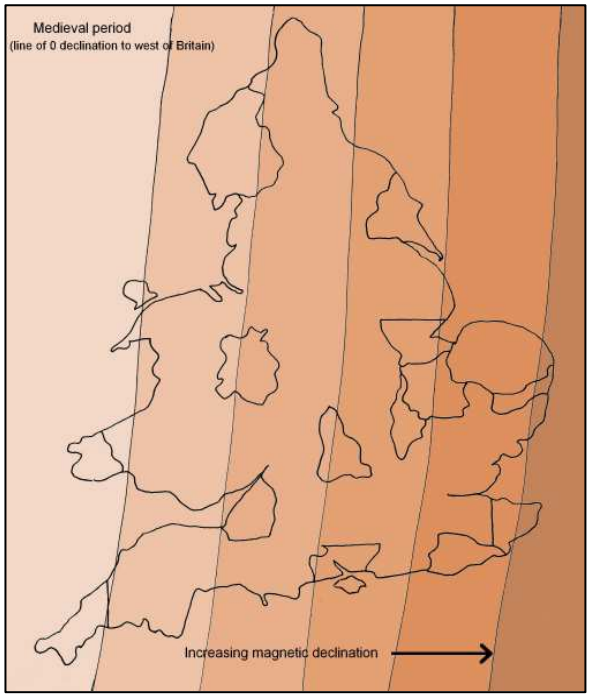


Figure 6.8 – Approximate magnetic declination during the medieval period when magnetic north was east of true north.

The alignments of the churches in this survey do reflect this pattern, with the mean alignment direction varying in a similar, east-west, direction, with western areas exhibiting numerically lower (more northerly) mean alignments. However, although it is not possible to calculate the exact variation in declination across the country for periods well into the past[27], it can be determined that any variation would have been in the opposite direction in earlier centuries. During most of the medieval period, when magnetic north was to the east of true north (the other side of true north from where it is now), local differences in declination would also have been reversed. In other words, slightly south of true east in Cornwall, becoming increasingly southerly as one moved east. Therefore, churches aligned with a compass during this period would all have been aligned to the south of east, but by differing degrees. It is also not possible to calculate whether the range of variations in declination across the country would have been more or less than the 2.5° difference currently exhibited.

The one published study which has examined church alignment in relation to building date concluded that there was no link between the two. The study of Saxon

[27] Pers. Com. October 2001, Larry Newitt, Canadian Geological Service, after being unable to refine his computer program for calculations of historical declination to better than a 10 to 12° range.

churches by Hoare and Sweet, summarised in Chapter One, shows that there is apparently no variation in mean alignment between early (seventh- to ninth-century) churches and late (eleventh- or early twelfth-century) churches, during which time magnetic east moved southwards by 20 degrees (Hoare & Sweet 2000, 173; Clark *et al.* 1988, 659). Overall, their sample of Saxon churches also has a similar mean alignment to all the other alignment surveys, which probably indicates that a similar method was used to set out churches both before, and after, the 'discovery' of the compass for church-building purposes (whenever that may have been), therefore precluding the possibility of any magnetic influence on church alignment.

2) POSSIBLE CHRONOLOGY OF CHURCH BUILDING

The second possibility is that the focus for the alignment of churches changed over time and was nothing to do with magnetic changes, but reflected some other shift, perhaps in church thinking. It is not obvious why a chronological difference in building might result in a spatial pattern of alignment variation, but every avenue has to be explored and if a pattern of alignment variation did appear when analysing different periods of church building, then the cause could be investigated more closely.

There are few published comments about a specific beginning of interest in, or indeed any changes in, church alignment. However, Richard Morris' comment, noted earlier, indicated that there was a new concern with the alignment of churches by the Normans (Morris 1989, 208), implying either that the Saxons had had less interest in the specific alignment, or that the focus had changed. Morris also suggests that realignments were not necessarily limited to larger churches and that there were signs of similar changes in the concern with alignment at village level (1989, 208), although this was shown earlier not to be the case for churches where excavation had been able to identify earlier phases beneath current buildings. This idea was also at the centre of the church research in Hampshire, noted in Chapter One, in which Shore identified the allegedly Saxon or Norman origin of churches by their alignment (Shore 1886, 95-98), but his readings have been shown by the measurements for this survey to be suspect.

Previous research by Hoare and Sweet, noted earlier, has indicated that there is no difference in the alignment of churches between the middle-Saxon and Saxo-Norman periods, but they examined only a small sample of churches (188 in all, and inevitably only a few from the earlier period). This section re-examines the issue based on the larger sample of churches surveyed here which affords an opportunity to achieve a more statistically reliable result in examining the possibility that churches on early sites were aligned differently from those on later ones. It starts with a brief examination of the churches in this survey analysed by the date of their earliest fabric as noted in the relevant volume of *Pevsner* and in *Anglo-Saxon Architecture* by *Taylor & Taylor*, followed by a comparison, for all the counties in this survey except Norfolk, between the alignment of churches on minster church sites (either known sites or probable sites taken from published sources), with the alignment of the remainder of the churches in the survey. In Norfolk, where records prior to Norse occupation are virtually non-

existent (Dymond 1985, 77; Williamson 1993, 92), possible minster-church sites will be identified in two ways. Firstly by using the churches identified by Gerry Barnes in his investigation of church siting in Norfolk (Barnes 1996, 23-36), and secondly by identifying possible sites by combining a series of proxy indicators, then comparing the alignments of both these sets of possible minster-church sites with the remaining churches in Norfolk. It has to be recognised that the current church on a 'minster-church' site probably bears little relation to the original minster church, but if the current building is an extension or remodelling of the original, then the original alignment will have been retained. Even if the church has been rebuilt, it may have retained the same alignment by utilising all or part of the same foundations. Before addressing this problem, the results of the exercise will be examined to see if these aspects warrant further investigation.

Church alignment by the age of the earliest fabric

The graph below shows the result of comparing the alignment of all 1,926 churches in this survey, divided into those with an element of Saxon fabric, taken from The Taylors' *Anglo-Saxon Architecture* and the relevant volume of Pevsner's *Buildings of England*; those churches with elements of Norman fabric as their earliest part, and finally those with only later fabric, again taken from the relevant *Pevsner* volume. It is appreciated that the assessment in Pevsner's work is only approximate and cannot take the place of detailed deconstruction of every building, but it is hoped that the evaluation is internally consistent. As Figure 6.9 below shows, there is virtually no difference between the pattern of alignment of churches allocated to the three periods, and it shows nothing like the variation in alignment as that when analysed by longitude, which was shown in Figure 6.3 on page 177. Here, the three curves are not only close together but their peaks are within a couple of degrees of each other, indicating little difference in alignment by the age of the building and therefore extending the conclusions drawn by Hoare and Sweet concerning the lack of alignment variation for Saxon church buildings. The very slight southerly shift in the Saxon curve (red-pecked) to the right is probably a reflection of the slight bias of Saxon buildings in the east of the country, where alignment is numerically higher.

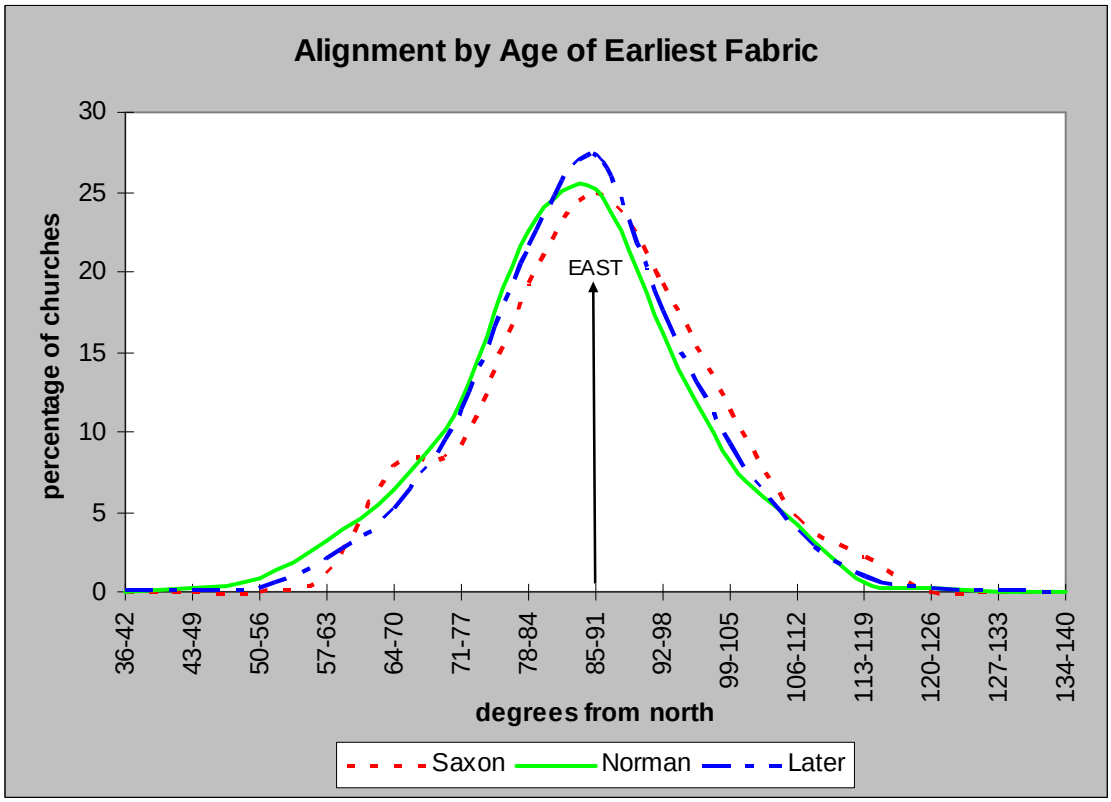


Figure 6.9 – Church alignment by age of earliest fabric

Comparison of the alignments of minster churches and other churches

Minster churches outside Norfolk

It had been hoped to use an additional indicator of church chronology to confirm that there was no real difference in alignment between early and late churches, by comparing the alignments of known minster churches which have been surveyed here with the alignments of the remainder of the sample, on the basis that a church on minster-church sites would have been built some time before the bulk of what are now parish churches. Unfortunately, the number of minsters that can be identified by examining earlier research has proved to be too small to provide a meaningful statistical comparison.

Minster, superior or mother churches were identified from the following texts for the counties surveyed here: John Blair - *The Church in Anglo-Saxon Society* (2005); Richard Morris – *Churches in the Landscape* (1989); John Blair in *Secular Minster Churches in Domesday Book* (1987), Richard Morris – *Churches, Settlement and the*

beginnings of the parochial system 800-1100 (1983), M. Franklin in *The identification of minsters in the Midlands* (1984); N. Rushton - *Parochialization and patterns of patronage in Eleventh-century Sussex* (1999); P. Hase in *The Mother Churches of Hampshire*, (1988) and J. Croom - *The Fragmentation of the Minster Parochiae of South-East Shropshire* (1988). Each of these writers bemoans the fact that documentary evidence is thin and is completely missing in some areas (for example Blair 2005, 319; Morris 1983, 46-48). Several methods were used by the authors to identify minsters: documents where available, particularly charters; evidence of Royal ownership at Domesday; in some cases placenames or large glebe allotments were also employed. In all, this enabled 67 superior churches to be identified from the volumes above which have also been surveyed for this thesis. Many other minster churches are now in towns (and may always have been part of larger settlements) so have not been surveyed as a part of the rural sample for this thesis.

Overall, there is little difference between the mean alignments of the two groups measured here – the 67 minsters have a mean alignment of 86.2°, compared with 84.9° for the remainder. Due to the small number of minsters, the statistical confidence in the results is so wide as to make it impossible to comment on the relationship between the two - the range of the mean values at 95% confidence overlaps almost completely. The fact that exactly 67% of both types of church are aligned to the north of east seems to indicate that there is unlikely to be much difference in their actual mean alignment. Unfortunately, the sample of minster sites is far too small to divide up by longitude to investigate whether the same spatial variation applies to them as that identified in the whole sample.

Table 6.4 – Alignment of churches on probable minster sites in all counties in this survey except Norfolk

	Number	Range	Mean	95%	Range at 95%	% N of E
Probable minsters	67	57-116	86.2	±2.5	83.7 – 88.9	67
Non-minsters	1,310	38-128	84.9	±0.6	83.3 – 85.5	67
	1,377		84.9	±0.6	84.3 – 85.5	67

Minster church sites in Norfolk

The east of England has few records of the pre-Viking church hierarchy (Williamson 1993; Scarfe 1987; Barnes 1997, 23), so attempts have been made to identify minster-church sites using other data as proxies. This was carried out firstly by Gerry Barnes in 1997 using the number of parish contacts (adjacent parishes), evidence of a royal manor or an archaic estate, and charter evidence (Barnes 1997, 23-36). As with the results for the other counties in this survey, the alignment of the minster churches identified that were examined in this survey, shows only a small variation from that of the remaining churches in the county. The sample of minster sites is too small, with too wide a range at 95% confidence level, to provide an accurate figure for comparison with the very much larger group of non-minsters, enabling no real conclusions to be drawn.

Table 6.5 - Alignment of churches on possible minster sites in Norfolk (Barnes 1997)

	Number	Range	Mean	95% conf.	Range at 95% conf	% N of E
Possible minsters	40	67-109	**87.6°**	±2.9	84.7 – 90.5	63
Non-minsters	509	56-128	**89.0°**	±1.0	88.0 – 90.0	55
	549		**88.9°**	±0.9	88.0 – 89.8	56

Secondly, the same exercise has been undertaken as part of this thesis incorporating a greater number of proxies. The full details of the method of assessment are contained in Appendix 9 and the results summarised in the table below.

Table 6.6 – Alignment of possible minster churches in Norfolk, based on the proxy assessment outlined in Appendix 9

	Number	Range	Mean	95% conf.	Range at 95% conf	% N of E
Top 27 (possible minsters)	27	67-110°	**88.3°**	±4.7	83.6 – 93.0	61
Remainder	522	56-128°	**88.9°**	±0.9	88.0 – 89.8	55
Total	549		**88.9°**	±0.9	88.0 – 89.8	56

Table 6.6 shows that there is virtually no difference between the possible minsters identified here and the remainder of the churches surveyed in the county (0.6° difference in the mean alignment), although again the sample of minster churches is so

small that the 95% confidence range is very wide and completely envelops the mean range of the much larger 'remainder' group.

Combining minster sites in Norfolk and elsewhere

Combining the 27 identified possible minsters in Norfolk (table 6.6) with the probable minsters identified by the other writers in the other counties of this survey (table 6.4), results in the following overall assessment.

Table 6.7 – Alignment of churches on probable or possible minster sites in all counties in this survey

	Number	Range	Mean	95% conf.	Range at 95%	% N of E
Probable & Possible minsters	94	57-116	**86.7**	±2.2	84.5 – 88.9	66
Non-minsters	1,832	38-128	**86.0**	±0.5	85.5 – 86.5	64
	1,926		**86.1**			64

As with the figures for Norfolk alone, there is no real difference in the alignment results for the probable/possible minster churches and the remainder. The mean alignment figures are close, the proportions aligned to the north of east are almost identical and the ranges of alignments at 95% confidence for the two groups overlap completely, indicating that a significant difference is not likely. Consequently, the question as to whether the current church on the minster site bears any relation to the alignment of the original church, possibly dating back to before 800 CE, does not need to be addressed here.

CHRONOLOGY OF CHURCH BUILDING: CONCLUSIONS

The investigations here into possible alignment differences through a chronological pattern of church building, by examining possible differences between minster or superior churches compared with daughter churches and by analysing the earliest fabric of the buildings, seem to confirm and extend the earlier findings for just Saxon churches by Hoare and Sweet, in that there was little difference in church alignment relating to the likely date of building. Little or no difference in alignment can be identified between churches that were likely to have been built at an early date and those likely to have been built later. Whatever method is used to try and establish which churches were minster churches, and whatever proxies are used, the resulting list of minster churches will never be long enough to allow a statistically sound comparison between their alignments and that of the remainder of churches. Different analyses may produce slightly different lists of minsters churches in Norfolk and elsewhere, but they will not produce a much *longer* list, therefore the same problem of having too small a sample still exists, and will continue to fail to provide a meaningful basis for comparison with the remainder of the churches.

3) CLIMATIC VARIATION

The third possible influence on church alignment across the country is climate. The date of the last frost in spring and the number of days with frost were both considered in an earlier chapter when examining the possibility that churches were aligned with sunrise on the day that building started. Although the earlier weather data (1960-1989) did not produce any specific climate patterns, either north-south, or east-west, the later more detailed data (1971-2000) did show a slight variation between counties in the east and west of the country – those in the east having more frost-days – but they did not directly explain the spatial variation in church alignment because the incidence of frost days was considerably higher in the counties in the centre of the country than on the coast, either west or east, away from the warming influence of the sea during the winter.

It is generally accepted that the west coast has a milder climate than the east coast and this relative mildness in the west owes much to the warm waters of the Gulf Stream and is evidenced by semi-tropical gardens all along the west coast of the Country, ranging from Tresco Abbey gardens on the Isles of Scilly in the south, to Inverewe in Scotland in the north, at latitude 57.8°N, which "contains many tender species from Australia and New Zealand despite being further north than Moscow or Hudson's Bay in Canada" (King 2003, 567-568).

The following section looks at the possibility that climatic differences across the country, rather than affecting the spring start of building, might affect the other end of the year, by examining the likelihood that climate variations result in different harvest times for the grain crop. Harvest is a particularly important time in any society that relies on local harvests for food availability. Thanksgiving for the successful harvest is a basic celebration for all concerned with the land; for the fertility of the soil, for the replenishment of stocks, for sufficient food for the following year and for seasonal employment for everyone, and it occurs in all arable economies (Evans 1971, 23-25; Baker 1974, 30). A successful harvest, particularly an early one, could have been a particularly good time for a Saxon land-owner to celebrate and express thanks to God by building a church on his estate. If there was a difference in harvest times across the country, could this have acted as an influence on church alignment, particularly the spatial element?

Harvest Celebrations

All the major world religions, except for Christianity, have a fixed date for celebrating harvest completion[28]; for example, the Jewish calendar celebrates the Feast of Tabernacles (also known as the Feast of Ingathering) on the fifteenth day of Tishri, the seventh month (September or October on the western calendar)[29]. The Celtic festival of harvest *commencement* (*Lughnasadh*) is celebrated on August 1st, the same date as the Anglo-Saxon *Hlaefmass* (loafmass) or Lammas[30] (Baker 1974, 126; Ross 1974, 289), but there never appears to have been an equivalent religious celebration after the completion of harvest. This was possibly due to the variability of harvest completion, thus making the establishment of a suitable fixed date difficult. As will be seen in the following analysis, harvest completion can vary by as much as three months in different areas of the country in different years. A fixed date that was reasonably close to harvest one year could easily occur early in the gathering-in during the following year, at great inconvenience. In the United States, Christian harvest festival is celebrated on October 31st [31], which, as will be shown, would allow for all but the very latest individual village harvests in the very worst years in England, but would be more than two months later than the earliest harvests in the best years.

Local harvest time is fixed each year by a combination of long-term regional climate throughout the year and the annual local harvest-time weather conditions. Overall climate determines the general time when ploughing, sowing and harvesting can be considered: when the ground is dry enough to plough; when it is warm enough to sow; when the seasons are warm and wet enough for the crops to grow; and dry and warm enough for them to ripen. Local harvest weather conditions, however, determine whether or not the crop can be gathered in when it is ready for harvesting, and, as will be seen in the following analysis, can vary by several weeks between villages that are close together which must benefit from the same overall climatic influences. In other words, local weather conditions determine when the days are dry enough for the cutting and bringing-in to be carried out; whether the crop is standing, rather than flattened, which slows harvesting; if the quality is good enough with little mould and rot (before large-scale grain drying became feasible); and in some cases, whether harvest was

[28] http://www.harvestfestivals.net/harvestfestivals.htm (accessed 27th June 2008)
[29] http://www.harvestfestivals.net/harvestfestivals.htm (accessed 27th June 2008)
[30] http//:www.bbc.co.uk/religion/religions/paganism/holydays/lughnasadh.html (accessed 12th June 2008)
[31] http://www.harvestfestivals.net/harvestfestivals.htm (accessed 27th June 2008)

actually finished at all, when the seed heads of flattened crops could lie sprouting on the ground.

For a robust statistical assessment of harvest times across the country to be made it would be necessary to collect thousands of records to ensure that the influence due to local harvest-time weather conditions can be identified and separated from any underlying variation caused by differences in climate. Sufficient harvest and local weather records do not exist for the eleventh or twelfth centuries (when many churches were being built) and it would be an immense task to collect sufficient later medieval harvest dates from bailiff's accounts and manor court records, with little possibility of finding accurate weather records to accompany them. It was therefore decided to use late nineteenth-century harvest festivals as indicators. Local newspapers regularly reported harvest completion and harvest festival dates as well as comments on, and assessments of, the local weather at harvest time. This substitution is based on the assumption that any variations in overall harvest times across the country in the nineteenth century which are due to climatic differences between areas are likely to be similar to those during the eleventh century. The overall climate in southern England for these two periods, as measured by the *Summer and Winter Indices*[32], was very similar. In both periods in southern England, on the Greenwich Meridian, there was a similar excess of wet summer months over dry ones, and a similar excess of mild winter months over cold ones (Lamb 1977, Fig 13.3, 35; and Table V4a & b, 562-5), so any variations in climate and local harvest weather between the areas studied will start from a similar base. Between these two periods, the climate was warmer during 'the little optimum' also known as the 'early medieval warm epoch', between 1150 and 1300, and colder during 'the little ice age', between 1550 and 1700 (Lamb 1977, 404-408). Twentieth-century harvest festivals were not used because, although weather records would be more accurate and less subjective in character, harvest festival dates would be less indicative of the actual date of harvest, more an indication of the limitations of the local church calendar, particularly with the growing prevalence of team ministries, where services in small rural churches may only be held every second, third or even every fourth week.

[32] Indices developed by H. H. Lamb to enable climate comparisons to be made for the last 1000 years (Lamb 1977)

Investigation of Harvest Festival dates in England

Harvest festival dates have been collected and analysed for the thirty years between 1870 and 1899 for four areas of similar landscape which are part of this survey, in order to establish if there was a consistent difference in harvest dates between the areas: the Vale of Taunton in Somerset; the north and west coastal plain of Cumbria; Holderness in the East Riding of Yorkshire, and an area which covers parts of south-eastern Norfolk, northern Suffolk and part of the eastern Norfolk Broads (known locally as the Isle of Flegg) [all of which will be called the "Norfolk Broads" for ease of reference]. The specific area harvest details are shown in Appendix 10 on pages 346-350.

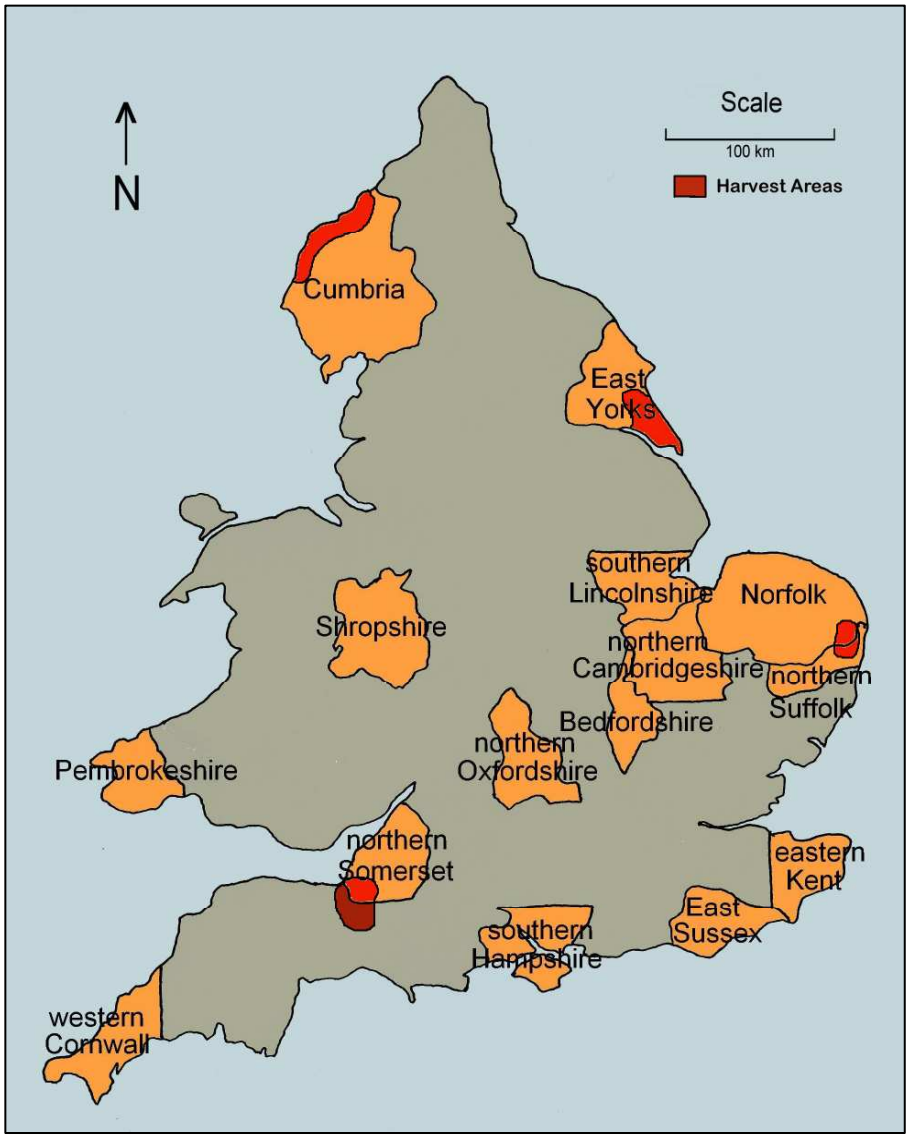


Figure 6.10 – Areas investigated for Harvest Festival dates

A harvest festival was first recorded as a church service in 1843, both at Morewenstow in Cornwall[33] and at East Brent in Somerset[34] and it became a regular feature of the church calendar in most areas in the following decades. By the 1870s, church harvest festival services in many parishes were becoming the norm and in most areas had taken over from the village-based or farm-based private harvest homes which had gained a reputation for drunkenness. As the *Beverley Guardian* reported on 24th September 1870, "Many harvest festivals in Yorkshire churches in the last week show the supremacy gained by the church over the old system of village festivals where feasting and riot were too prominent". These church-based festivals were frequently followed by large feasts or teas, but with no mention of alcohol. In some parishes in the early part of the period in the Broads area, private harvest homes were reported in the *East Suffolk Gazette* on specific estates/farms, particularly Sotterley in 1871, 1873, 1874 and 1878; Hales in 1873 and 1875; Earsham in 1875 and 1878 and Hedenham in 1879. When dates of these celebrations could be compared with services of thanksgiving in the parish church, there was a period of between four and seven days between the two, implying that harvest was completed just before the church service, which would have had to fit in with the regular church calendar with the approval of the rector or vicar. In Somerset, as in the Broads, private harvest homes appear to have gone out of fashion at the end of the 1870s, apart from on the estates of Viscount Bridport, particularly in Brent and Chard, and at an estate in Cricket St Thomas, with regular newspaper reports of 600 people sitting down to meals, right through into the 1890s, but where harvest homes were held and both dates recorded, there was a similar period between them as in the Broads. There were only two harvest homes recorded in the other areas studied, both in Cumbria at Ellerby, with none at all in Holderness. The quotation from the *Beverley Guardian* above, shows that the tradition of harvest homes had died out there by the beginning of the period studied. In a few of the larger parishes in the areas studied, particularly around Beverley (Holderness), Beccles (Broads) and Taunton (Somerset), announcements were made in the newspapers that the harvest festival would take place in the church on a particular date, usually on the next Sunday, presumably with the knowledge that harvest was almost complete and indicating that even in the largest, semi-urban, parishes there was still a tie between completion date and its more formal celebration.

[33] http://www.harvestfestivals.net/harvestfestivals.htm (accessed 27th June 2008)
[34] Somerset County Herald, Notes and Queries, April 30th 1927 & Nov 20th 1934

Harvest Festivals Examined

In all, 2,691 harvest festival dates were recorded for the four areas between 1870 and 1899. For the Norfolk Broads, the dates of 634 harvest thanksgivings or festivals at 97 parish churches were gleaned from reports in the *East Suffolk Gazette* and the *Yarmouth Mercury*. In Somerset, harvest celebrations were recorded from the *Somerset County Gazette & Bristol News* from 1870 to 1878, which incorporated the *Devonshire News* from 1879. Covering an area of approximately 15-20 miles radius from Taunton, a total of 940 harvest celebrations in 164 villages and towns were noted. Harvest celebrations in Cumbria were extracted from the *West Cumberland Times* from 1874 (when it began publication) to 1899, and from the *Cumberland Pacquet* between 1870 and 1873. In the years when both papers were published, considerably more local news was recorded in the *Times*; consequently the entries from the *Times* were used, rather than from the *Pacquet* throughout the period, and a total of 567 harvest celebrations in 92 parishes was recorded. The tradition of church celebrations of harvest completion seems to have come later to Cumbria than to the other areas studied, with few harvest services recorded before the early 1880s. Newspaper reports show that some clergy felt the service to be pagan, akin to nature worship, with specific references over the years in the *Cumberland Times*, in Great Broughton in particular, of "refusing to decorate our church like a horticultural show". Harvest festivals in Holderness were collected from the *Beverley Guardian & East Yorkshire Advertiser*, a total of 550 celebrations in 78 parishes.

The national weather picture for the period studied indicates a series of wet years in the 1870s, particularly towards the end of the decade; very cold years in 1880 and 1881; while the weather in the middle years of the 1880s was good, with a series of very dry and sunny years in the 1890s, particularly in 1893, 95, 96, 98 and 99 (Lamb 1977, table V33, 623; Stratton 1978). Thus there was a range of overall weather conditions within which any local variations should be able to be identified.

Comparison of harvest dates in Somerset and the Norfolk Broads

The mean date of harvest festivals during the thirty-year period was four days earlier in Somerset, on 21st September, compared with 25th September in the Broads. The earliest annual mean date during the period is five days earlier in Somerset (12th Sept to 17th Sept) and the latest mean date of any year was the same – the nationally disastrous

harvest of 1879 – on the 8th October. In all, the Somerset harvest mean date was earlier than the Broads in 22 years, on the same date in one year and later in six years, with no comparison possible in 1883 (damaged microfilm). In each of the six years when harvest in the Broads was earlier, local weather appears to have severely affected the Somerset harvest, with local rain or storms. In these years, the *Somerset County Gazette* reports mention:

> Poor harvest in many cases due to poor drainage and storm damage (*Somerset County Gazette* 23rd Sept 1872).
>
> More than 8″ of rain in ten days. Harvest delayed by rain (3rd Oct 1873).
>
> Prolonged harvest, longest in living memory (9th Oct 1875).
>
> Thunderstorms during harvest. Harvest disrupted due to tempestuous weather (14th Oct 1876). 2.35″ rain on September 30th (7th Oct 1876).
>
> Heavy rain during harvest. Harvest disrupted by tempests – 8.1″ of rain in September (6th Oct 1888).
>
> Crops beaten down very much due to incessant rain. Storms in the Taunton area (22nd Aug 1891).

This severity is not reflected in the weather reports for the same periods in the Broads area. In eleven of the twelve years where there were no exceptional local weather conditions (1870, 1874, 1884-87, 1892-93, 1895, 1897-99) and where the national weather was described as good or dry, Somerset harvest was an average of five days ahead of that in the Broads, indicating a basic difference in climate between the two areas, allowing Somerset to finish harvest earlier.

Examining the earliest celebrations of harvest in the two areas produces a similar relationship but with a greater difference. In Somerset, 23 harvest celebrations (2.4% of the total) were held in August, with nine of them in 1896, three of which were held as early as August 23rd. In the Broads, none was held in August, with only twelve (1.9%) held before the 10th September, the earliest held on September 4th in 1899. In Somerset, the early harvests occurred in 1876, 1887, 1892, 1896, 1897, 1898 and 1899, whereas in the Broads only four of these dates coincide, early harvests occurring in 1870, 1873, **1876**, 1884, **1896**, **1898** and **1899,** indicating that local weather conditions play at least as important a part as overall climate in determining when harvest could be completed. In 1873 the mean Broads area harvest date was two days earlier than that in Somerset, where harvest was "delayed by rain" (*Somerset County Gazette* 3rd October 1873).

Comparison of harvest dates in Cumbria and the Norfolk Broads

On average, harvest festivals were seven days later in Cumbria, with an overall mean date of October 2nd, compared with September 25th in the Broads. Despite this difference, the average harvest was actually earlier in Cumbria for five of the thirty years covered. In 1878, a very early harvest, the difference was nine days, and in 1879, a very late harvest, the average festival date was five days earlier in Cumbria, although only a few dates were recorded. In 1893, when very dry harvest weather was recorded in both areas, the mean date was two days ahead in Cumbria, whereas in 1896 the mean date in Cumbria was five days earlier, where the weather was dry, compared with a rain delayed harvest in the Broads. So, if the whole of the harvest period was dry in both areas, then the Cumbrian harvests were gathered in slightly before those in the Broads area. In two of these years, 1878 and 1896, the earliest harvest festivals in Cumbria were recorded in August, one on the 27th, two on the 29th and two on August 30th - considerably earlier than the earliest festivals in any year in the Broads (with only three dates before September 7th, and none before the 4th September). In the best years, the earliest harvests in Cumbria were as much as a week ahead of those in the Broads.

Comparison of harvest dates in Holderness and the Norfolk Broads

On average, harvest celebrations were nine days later in Holderness, on October 4th compared with Sept 25th in the Broads area, two days later than in Cumbria. Also, in a similar way to Cumbria, despite the regularly later average harvest date, in four of the thirty years examined, the mean harvest festival date was earlier in Holderness than in the Broads - in 1893, it was four days earlier, three days earlier in 1887 and 1899, and one day earlier in 1884. In most of the remaining years, the weather during all, or at least part, of the harvest in Holderness was a problem, with many poor weather reports in the *Beverley Guardian*, for example:

> Severe thunderstorms to the east of Beverley flattened almost all the remaining crop to be harvested in that area (20th September 1873).
>
> … the disastrous effects that the heavy cold rains and fogs during August have had on the crops (18th September 1875).
>
> Severe thunderstorms with copious hail fell yesterday, severely damaging the standing crop (1st September 1877).
>
> Harvest operations brought to a standstill due to the heavy rain of the entire last week (18th September 1880).

> Harvest operations continue extremely slowly, heavy rain has flooded all the low-lying land (3rd September 1881).
>
> There is still harvesting in some areas, the crops being laid down (November 25th 1882).
>
> Harvest in Holderness greatly interfered with since the weather broke, much has still to be reaped (15th September 1883).
>
> The cold northeast winds and absence on sun in August has delayed ripening in many areas (5th September 1885).
>
> A most unfavourable harvest month, with 31 days rain since St Swithin's day [in 60 days since July 14th] (14th September 1889)
>
> But for excessive heavy rains, we would be well on with harvest (30th August 1890).

In the nationally disastrous harvest of 1879, the latest recorded harvest festival was celebrated in Leconfield on November 2nd, with even later dates recorded in 1882 - November 5th in both Walkington and Middleton. The quote from the *Beverley Guardian* noted above, shows that in 1882, in some parts of Holderness, harvest was still going on at the end of November where harvest festivals were not celebrated at all. In the years when harvest weather did not interrupt the gathering-in in Holderness – 1884, 1887, 1892 and 1899 – the mean harvest date was earlier than in the Broads. In only one of these years, 1892, was the harvest in the Broads delayed by weather, where there was "a late start due to rain" (*East Suffolk Gazette* 10th Sept 1892). The earliest individual harvest festival dates in Holderness also happened in these years – 2nd and 3rd September in 1887, 2nd September in 1899, 4th September in 1874 and 4th and 5th September in 1884, which are between three and eight days earlier than the earliest harvest festivals in the Broads area in these years, and earlier than the earliest harvests in the Broads area of any of the 30 years studied.

Harvest-time weather and overall climate

Variability in the annual mean harvest festival dates *within* each area further emphasises the difference in local harvest weather conditions *between* the areas. In Somerset and the Broads the harvest-time weather was fairly stable. In Somerset, the mean festival date for each year was more than seven days different from the overall mean date for the area for the 30 years studied in only five of those years – two earlier and three later. Similarly, in the Broads area the mean date only varied by more than seven days in four years – two earlier and two later. However, in Cumbria, the mean harvest dates varied by more than seven days in ten years – six earlier and four later – and in Holderness it was more than seven days earlier in six years and later in seven

years, indicating far less stable harvest weather conditions. The detailed dates for each of the areas are shown in Appendix 10 on page 346.

When weather throughout the whole harvest period was equally good in Somerset and the Norfolk Broads, Somerset's harvest was several days earlier than in Norfolk. Despite the fact that weather almost always intervened in the Cumbrian harvest, when it was equally good in Cumbria and the Norfolk Broads, as it was in 1893, then harvest in Cumbria in some parishes was five or six days earlier than the earliest in Norfolk. Similarly, when harvest weather was good throughout the whole period in Holderness, the earliest festivals were several days in advance of those in the Broads area. So, given good weather at harvest time, the underlying climate appears to benefit the west of the country particularly, and to a lesser extent, East Yorkshire, more than in East Anglia. Perhaps this is because colder winters or later frosts in the southeast of the country might delay planting or germination. Arthur Young, in his report to the Board of Agriculture on the agriculture of Norfolk, implies this by referring to the "North and northeast winds … and the climate consequently colder and more backward in Spring" and that these winds also "severely affect Suffolk" (Young 1804, 2). This assessment is confirmed by a later report to the Board for the County of Lancaster (which includes the southern part of the Cumbrian area of the church survey) where Holt referred to the Pennines "screening Lancashire from the ungenial eastern blasts and frosts … which infest the countries (*sic*) that border upon the German Ocean" (Holt 1813, 2-3). In 1899, the mean harvest date in Taunton, Cumbria and Holderness was earlier than in the Broads, when references were made to "one of the earliest harvests recorded", but also to "the backward spring in the east" (Stratton & Houghton-Brown 1978, 129). So, in summary, when weather does not 'get in the way' of gathering-in, much, if not all, of the rest of the country enjoys earlier harvests than in East Anglia, certainly in the majority of years in Somerset, and at least in the occasional year in Cumbria and Holderness.

Despite these underlying differences in climate, which indicate a difference of a few days in harvest date east-west across the country, the local harvest-time weather patterns were very variable at a micro level in all of the areas; something illustrated by the fact that harvest times vary considerably in the same year between villages located fairly close together. Even in the years when the earliest harvests occurred, other villages close by were recording harvest festivals up to several weeks later. For

example, around Taunton in 1896, harvest festival was celebrated at West Monkton (4km northeast of Taunton) on 23rd August and at Kingston St Mary (3km north of Taunton) on August 30th, whereas at Combe Florey (some 7km further to the west) harvest was celebrated on 20th September, on September 27th at Staple Fitzpayne (6km to the south of Taunton), and on October 4th at Hatch Beauchamp, six weeks after Monkton, but only 8km apart.

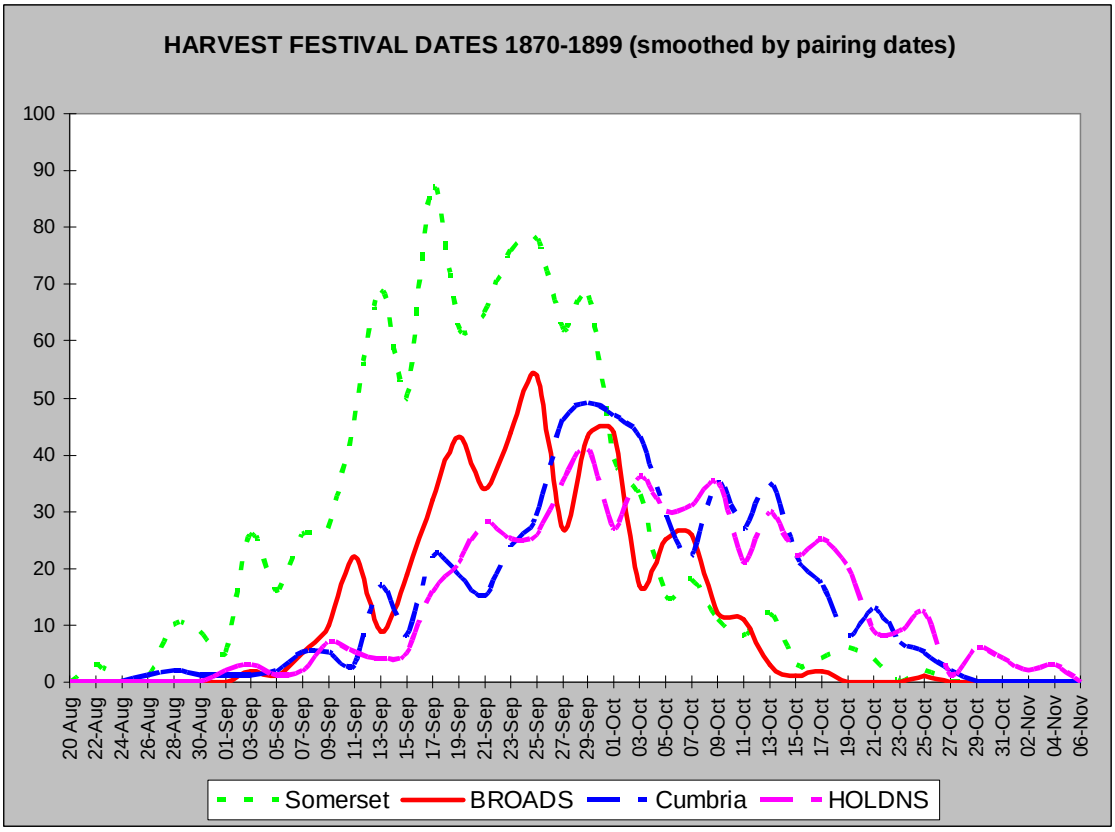


Figure 6.11 – Comparison of harvest festival dates in Somerset, Norfolk Broads, Cumbria and Holderness

Comparison of harvests dates in east and west Norfolk

Harvest Festival dates were collected for the west of Norfolk and the adjacent silt fenland in the north eastern part of Cambridgeshire to allow a comparison of the harvest dates here with those analysed earlier in this section for the Broads area in the east of the county. They were taken from the *Lynn News & County Press* for the period 1880-1899, as there were too few recorded during the 1870s to allow a meaningful comparison. In all, 389 harvest festivals held in 103 villages were noted.

Overall, the mean festival date was five days earlier in the west of Norfolk – September 21st compared with September 26th in the Broads area for the period 1880-1899. The mean date was earlier in the west on fifteen occasions, occurred on the same date in three years (1881, 1888 and 1891) and was later in two years – 1886 and 1889. In 1886, the *Lynn News* reported on September 4th 1886 that "Harvest is gravely deficient with backward crops only now ripening", whilst in 1889, on September 1st, that "harvest is well forward this year, with good weather it should be finished early", followed on September 8th by a note of "Incessant rain for the last week has set back cutting and gathering in". These same two years in the Broads were only average years, with mean dates of September 24th and 27th, and the newspapers in the east of the county reported no particular weather problems.

There were six individual harvest festivals in the west of the county which were earlier than the earliest in the east of the county (September 4th), three of them were held in August (27th, 28th and 30th) and three others held at the beginning of September (1st and two on the 3rd). In the four years that these early harvests occurred (1887, 1895, 1896 & 1897) the earliest harvest in the Broads area was on Sept 10th, Sept 15th, Sept 6th and Sept 12th respectively, indicating a larger gap between the earliest dates than the mean dates for the same years.

The harvest dates are consistently different between the west and east of the county throughout, not just between the mean dates and the earliest dates, but the overall pattern of harvest dates for the west of the county (shown in red on Figure 6.12) is consistently to the left of the curve (therefore earlier) than for the Broads area, shown by the blue pecked line. Thus, similar patterns exist within west Norfolk harvests as were noted in the four areas used in the main, national, analysis. Similar variation also exists in harvest dates at a micro level to that noted in the main analysis – even in the years of the earliest harvests, other settlements close by were suffering weather problems with much later harvest completion; for example, harvest festival was celebrated on 30th August in Terrington in 1896, but not until October 9th in Upwell, six weeks later but only some 10 km to the south. The earliest ten harvests occurred in ten different villages, with locations evenly balanced between Fenland, the lowland river valleys east of the fens, and the greensand scarp that defines the west Norfolk coast. The regularly later harvest dates for the east of the county also seems to confirm the earlier references by Holt and Young to the "backward climate" and "ungenial winds"

that affect the east coast, but do not appear to have such a great effect eighty kilometres further inland in west Norfolk.

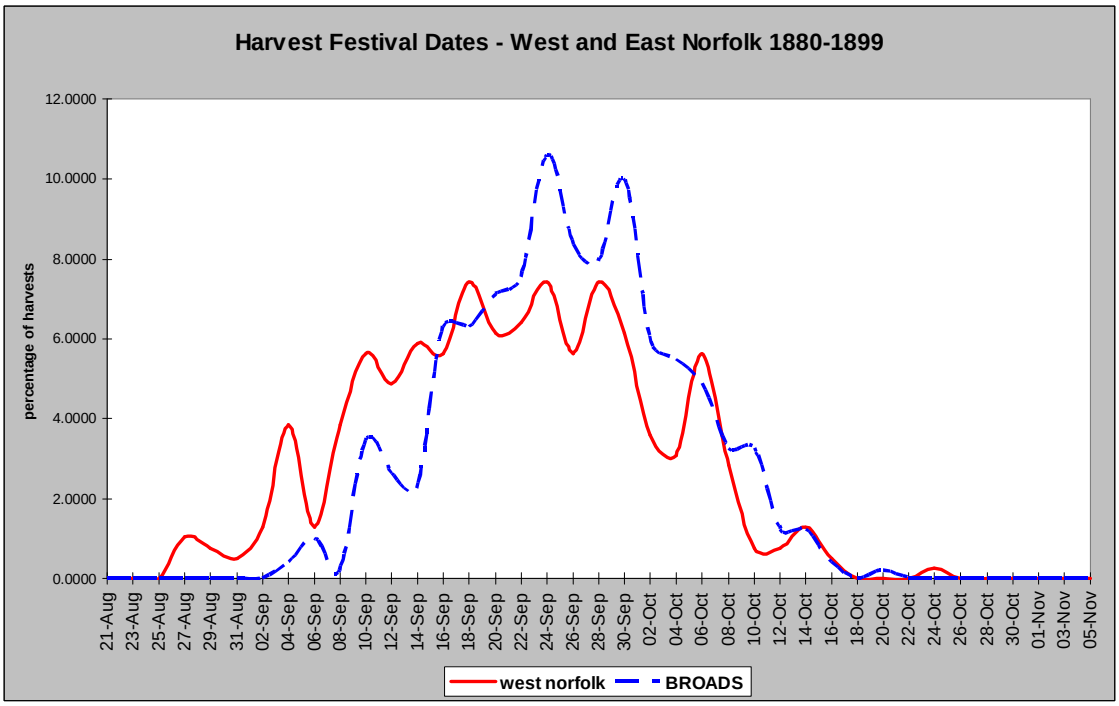


Figure 6.12 – Harvest festival dates in west and east Norfolk

Harvest dates and soil

The local variability of harvest festival dates, noted in the previous paragraphs, does not appear to be reflected in differences between soil groups. The mean harvest festival date for the Broads area as a whole between 1870 and 1899 was September 25th; this is made up of 390 festivals in parishes which are on predominantly clay soil of the Beccles series, where the mean date was September 25th, 66 festivals on the Brown Earth/Loam of the Sheringham series on the Isle of Flegg, where the mean date was September 24th and 60 festivals in villages on predominantly clayey and sandy marine alluvium around the Broads themselves where the average date was also September 25th. In the west of Norfolk a similar consistency of mean harvest date is apparent irrespective of the soil. The overall mean festival date for west Norfolk was September 21st; on the "Good sands" of the Fakenham series, the average festival date was September 20th; on the brown earths and sands of the Rudham series, on the western scarp, the average date was September 21st and on the alluvial soils of the fens, the mean date was September 22nd, each of which is consistently earlier than harvests in the east of the county, indicating that climate and weather has a greater effect on the

date of harvest than the soil in which the crops were grown. The details are shown in the Harvest spreadsheet as part of Appendix 18.

Availability of labour and the Husbandman's year

Although there is an argument that the setting-out of a church can be done at any time of the year, the digging of the foundation trenches and associated tasks would be best done at a time in the agricultural year when labour was available. In a good year, when harvest finished early, there was time left at the end of the farming year before Michaelmas, when labour could have been available for tasks such as digging foundation trenches and carting materials for foundations and walling. In fact, the earlier the harvest, the longer the period of labour availability.

There were few slack times in the medieval agricultural year. Manorial records of the thirteenth century illustrate the agricultural cycles through custom obligations, and Homans described four distinct agricultural seasons (Homans 1970, 353-381). The periods he allocated to each of these seasons differ little from those used by Young and others in their reviews of agriculture in various counties some 500 years later, though Winter and Hocktide were amalgamated, and harvest was reduced from eight weeks to around six weeks (for example, Suffolk – Young 1813a, 223; Sussex – Young 1813c, 90). There seems little reason to assume that the agricultural cycle was much different in general terms even as far back as the ninth, tenth or eleventh century; the major slack times were at Christmas, Easter and Michaelmas. At Christmas the ground was likely to be too wet, sticky or hard to dig trenches and too wet for carting materials, especially if it was too wet or frozen to plough; Easter was traditionally the time that the peasants managed their own plots, planting their own vegetables and gardens and Michaelmas was considered to be the end of the farming year. As a continuation of this season in later times, Michaelmas was the time of hiring for labourers and servants in husbandry on annual contracts for much of the country, particularly in the south and midlands, whereas further north, hiring fairs were held on Martinmas (Nov 11th) (Kussmaul 1981, 51). Kussmaul remarked that "the date of change [of contracts] corresponds to the slack after grain harvest, or sometimes followed the autumn ploughing" (1981, 50), although as the investigation of harvest dates in the previous section shows, further north in England, harvest was often not completed until November, perhaps an additional reason for the later end to labour contracts.

CLIMATE AND HARVEST: CONCLUSIONS

It is not possible to over-emphasise the importance to a small arable-based community of a good harvest for the following year, particularly before the international grain trade could even-out the fluctuations between good and poor years. In the early years of the fourteenth century, the beginning of what Lamb described as the "climatic worsening" of the later-medieval and early-modern period (Lamb 1977, 449-451), the grain harvest failed for at least three years in succession over almost all of Europe (Fischer 1996, 35-41), the subsequent famine and disease resulting in a loss of over ten per cent of Europe's population (Lucas 1930, 61; Fischer 1996, 37) when there were harrowing tales of peasants attempting to survive by eating cats, rats, insects, animal droppings and leaves (Kershaw 1973, 47-50; Fischer 1996, 35) and of parents killing their children for food and children killing their parents (Lucas 1930, 61; Fischer 1996, 37).

An early harvest was usually a good harvest as it meant that the crop was ripe and almost certainly gathered-in dry; a particular advantage at a time before large-scale industrial grain drying and resulting in fewer problems with mould. The later a harvest was completed, the more likely the crop was to be wet, either because wet weather delayed ripening or it delayed gathering-in. This is particularly evident in Cumbria and Holderness. In Cumbria, the earliest harvest festivals were six weeks ahead of the mean harvest date for the area, whilst in Holderness the earliest recorded harvest festivals were nine weeks ahead of the very latest – 2nd September compared with 5th November. In these cases, an early harvest would have been a definite reason for celebration, when, in some of the worst years, harvest was not even fully gathered in. These early harvests could easily have been seen as an auspicious time by the estate owner in the pre-Conquest era, and a time to celebrate by the planning of his first church. If it was aligned with sunrise at this time, a church in Cumbria and a church in Somerset would be aligned in a similar direction, which would have been considerably to the north of those set out after the earliest, but later, harvests in the Norfolk Broads, with churches in Holderness aligned in between those in Somerset and in the Broads area.

Local weather conditions played an extremely important part in the timing of harvest completion in all the areas studied, even within individual years in each of the areas, and appear to have played a greater part in the occurrence of an early harvest than other differences, such as between light and heavy soil. So much so, that the 23

recorded harvest festivals in August in Somerset occurred in eighteen different villages spread all over the area; the ten earliest harvest festivals in Cumbria were in eight different villages; in Holderness, the ten earliest festivals occurred in nine different villages and in the Broads area, the ten earliest harvest festivals occurred in ten different villages which were widely spread across the area. This spread of early harvest occurrences means that it is reasonable to assume that over an extended period, perhaps of a century or so, most of the villages in an area would benefit from an early harvest completion at some time and therefore have a similar possible "target" for church alignment.

CHURCH ALIGNMENT AND HARVEST

Overall, in the best local harvest years, the earliest celebrations were held twelve days earlier in Somerset, eight days earlier in Cumbria and three days earlier in Holderness, when compared with the earliest years in the Norfolk Broads. To reduce the possibility that one or more of the areas had an abnormally early harvest during the period studied which could bias the results, the calculation of sunrise position at harvest time, shown below, is based on date of the fifth earliest harvest in each area, in other words the earliest 0.5% to 1% of the recorded harvest festivals, resulting in dates of August 28th in Somerset, Sept 1st in Cumbria, Sept 4th in Holderness and Sept 7th in the Broads. At this time of year, the position of sunrise at latitude 52°N is moving southwards at 4.5° per week, therefore the ten days difference between Somerset and the Broads would mean a 6.5° difference in sunrise position over a level horizon at this time of year[35], with sunrise 6.5° further north along the horizon in Somerset. Due to the more northerly location of Holderness and Cumbria, where the daily change in sunrise position is slightly more rapid at this time of year, the seven days difference between Cumbria and the Norfolk Broads would mean a five degree difference in sunrise in Cumbria, and three days difference in Holderness would mean a two degree difference in sunrise position. The actual weekly positions of sunrise by latitude are shown in Appendix 2.

[35] http://aa.usno.navy.mil/cgi-bin/aa_rstablew.pl US Navy website for sunrise times for any given location, (last accessed 21st June 2008) converted to horizon positions by formulae from British Sundial Society (Davis 2004) – shown in Appendix 6

Consideration, earlier in this section, of possible differences between the agricultural year of medieval times and that of the Victorian period concluded that there was likely to be little difference between the seasons and crop cycles of the two periods. So, given identical conditions, seeds planted during the spring would take the same time to reach harvest whether in the eleventh or nineteenth century. As noted earlier, at the inception of the Julian calendar, the solar and calendar dates were the same, as they were again after the adoption of the Gregorian calendar in 1752. By the eleventh century, the calendar date had moved six days ahead of the solar date (Duncan 1999, 41-52), so harvest in the eleventh century would have been six solar days behind the same calendar date today. In other words, harvest completion on August 24th in the eleventh century would be the same solar day as August 30th after the calendar correction. Therefore six days have to be added to the medieval harvest date to be able to establish where sunrise occurred then, with reference to modern sunrise positions.

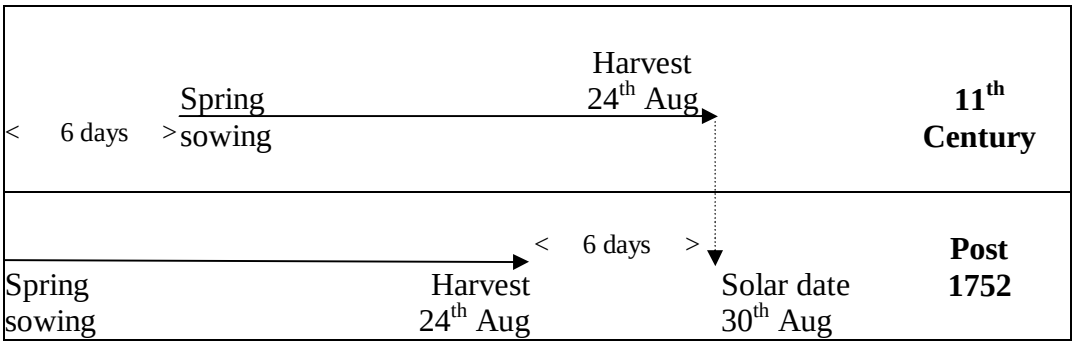


Figure 6.13 – Illustration of calendar drift for harvest times between the eleventh century and after the Gregorian calendar adoption

The position of sunrise at the early harvest dates in the four areas, adjusted for calendar change, is within 2° in every case of matching the different mean values in church alignment found on the ground in these areas of the survey, and is shown in table 6.8 below; 82º in Somerset and Cumbria, 83º in East Yorkshire and 89º in northeast Suffolk and east Norfolk. More importantly, the 7º difference between the sunrise positions related to the early harvest dates in the east and west is the same as the measured difference between the mean church alignments in the same areas.

Table 6.8 – Sunrise at end of early harvest					
Location	Latitude	Early harvest (earliest 5- top 1%) (Medieval date)	Post calendar-change date (+6 days)	Sunrise position – level horizon (see App. 2)	Mean Survey church alignment in County
Somerset	51ºN	28th Aug	3rd Sept	**80º**	82º
Cumbria	54.5ºN	1st Sept	7th Sept	**82º**	82º
Holderness	54ºN	4th Sept	10th Sept	**85º**	83º
Nflk Broads	52.5º N	7th Sept	13th Sept	**87º**	89º

The church alignments in the actual villages where the harvest festivals were recorded (approximately 350, as some of the Somerset harvest villages were outside the church survey area) follow a similar pattern to the county-based results – Cumbria 81.6º ±3.8, Somerset 83.8º ±3.1, Holderness 84.2º ±4.0 and the Broads 88.6º ±2.1.

A good case can therefore be made that sunrise after an early harvest provided the target for the alignment of a new church. Consequently, the different alignment curves shown by churches in the west and east of the country, as shown in Figure 6.1 earlier, indicate that the builders may well have had separate points of focus for the church alignment, with offsetting errors on either side of each mean value that provide the 'bell-shaped' results curves.

Lending weight to the idea that the mean church alignment in an area represents the result of 'focus' based on early harvests there, is the fact that in the four counties used for the harvest analysis, around three-quarters of all churches are aligned within 10° of the mean alignment in their county – 77% in Cumbria, 71% in Somerset and 70% in Norfolk/Suffolk and in East Yorkshire. These proportions are the same as all the other counties in the survey except in Cornwall and Pembrokeshire, which at 60% and 62% respectively, have the lowest proportions of churches close to the County mean alignment value, and are probably the counties with the smallest proportion of arable farming, perhaps meaning that harvest provided less of a focus there.

A particularly early harvest might not only be seen as a propitious time to start building a church in the mind of the land-owner, but in addition the fact that labour would have been available for a longer period after an earlier harvest seems to provide a happy coincidence of reasons why this would be the best time of year for such an action. Additionally, if the church was to be built in stone, annual building contracts for churches frequently came to an end in early September for climate-based reasons,

particularly in East Anglia (Salzman 1992, 499 & 547-548), so a mason could also have been available for the important task of setting out.

Church alignment and harvest within Norfolk

The apparent link between the countrywide pattern of sunrise at early harvest completion and church alignment can also be seen at county level within Norfolk - by using the same measures that were used in the national analysis. The fifth earliest harvests in the west and east of the county are on Sept 3rd and Sept 7th – a difference of four days. Adding six days for calendar correction, results in modern dates of September 9th and 13th which, at this time of year, when the sunrise position is moving southwards at 4.5° per week at Norfolk's latitude[36], or 0.65° per day, results in 2.6° difference in sunrise position for the four days between the dates, with sunrise in the west of the county 2.6° further to the north than in the east (84° in the west and 87° in the east – to the nearest degree). Mean alignments for all churches in the west and east of Norfolk, presented in table 6.2 on page 178, also showed a three degree difference between them (87.4° - 90.3°). Similarly, the mean alignments of churches in the villages where the harvest festivals were actually recorded also shows a three degree difference between west and east, (85.3° - 88.6°), shown in table 6.9 below. In both of these cases – all churches and the actual harvest churches – the difference in the mean alignments is a real one, rather than a statistical construct, as the different proportions of churches aligned to the north of east demonstrate, 66% in the west of the county and only 56% in the east.

Table 6.9 – Church alignment in the actual villages where harvest festivals were recorded

	No	Range	Mean	95% conf	Range at 95%	% North of East
'West Norfolk'	79	67-108	**85.3**	±2.2	83.1-87.5	66
'East Norfolk'	73	67-109	**88.6**	±2.1	86.5-90.7	56

[36] http://aa.usno.navy.mil/cgi-bin/aa_rstablew.pl US Navy website for sunrise times for any given location, (last accessed 21st June 2008) converted to horizon positions by formulae from British Sundial Society (Davis 2004) – shown in Appendix 6

The large number of monastic sites in Norfolk allows an additional examination to be made of church alignment within the county; in particular, whether the alignment of the naves of monastic churches presents a pattern which is similar to, or different from, that observed in the County's parish churches, and, by inference, whether they might have been subject to the same influences on alignment. The detailed analysis is presented in Appendix 11 and shows that monastic churches do not display the same spatial pattern of alignment across the county; the naves of those in the east of the county are aligned similarly to those in the west, with similar proportions aligned to the north of east. This lends further, if negative, support to the theory that harvest time influenced the alignment of parish churches, because, although monasteries were large landowners with large agricultural interests, monastic churches are most unlikely to have had any decision about building made by an individual or group of individuals who were likely to have been influenced by crop cycles, or indeed by restrictions brought about by lack of labour availability.

Religious belief after the Conversion

It is impossible to know whether church builders were using sunrise after harvest as a way of finding east or whether the alignment of the church follows the specific sunrise as part of a deeper meaning concerning harvest thanksgiving. Although aligning a Christian church with harvest sunrise might be considered un-Christian, seen in the light of the "Christianized magic of nature-worship and propitiatory rights that survived into the tenth century" (Blair 2005, 169) and that the "rhythm of the seasons and propitiation of the Gods was still a primary focus at this time" (Morris 1989, 50), it seems reasonable to suggest that there may have been other influences involved as well. There are so many local churches of tenth-, eleventh- or twelfth-century date that appear to have been consistently aligned with early harvest sunrise, creating a pattern across the country that lends weight to the idea. There might have been many estate owners who reacted to a particularly good harvest in a Christian way, but such a consistent practice carried out over such a long period and across such a wide area by so many church-builders seems to argue for something such as a fusion with a long-standing pre-Christian religious belief, such as that represented by the celebration of the beginning of harvest at *Lughnasadh* or Lammas.

The details of the overlap of paganism and early Christianity, described by Blair and Morris above, especially at a local level, are difficult to assess. This is exacerbated by the lack of material evidence and the meagre contemporary historical sources for Anglo-Saxon paganism which has been commented on a number of times (e.g. Wilson 1992, 173-175; Branston 1957; Owen 1981; Hutton 1993). However, it has been recognized that the new Christianity was "shaped by the heathenism of the old religion" (Chaney 1960, 197), and there is evidence of apostasy and the switching back and forth between the two religions in Kent and Essex for the amelioration of plague or drought (Wilson 1992, 173-174; Blair 2005, 167) soon after the Conversion, and in Sussex and Northumbria for similar reasons (Wilson 1992, 175). There is also firm evidence of the continuation of other pre-Christian ideas and rituals involving aspects of the worship of nature, such as the Corn Dolly at harvest festivals made from the last sheaf cut, which in Pagan belief used to contain the Spirit of Harvest (Anderson 1995, 17-19; Baker 1974, 28), and the widely seen Green Man. Richard Morris refers to this overlap in the middle-Saxon period as Christianity "forming a crust on the surface of popular culture" (Morris 1989, 62). Such blurring of the religious boundary continued for centuries as the early eleventh-century calls for the extinguishment of other aspects of nature worship in Edgar's Canons and the Northumbrian Priests' Law indicate (Morris 1989, 60-62; Rattue 1995, 79-81; Harte 2008, 21).

The conversion to Christianity in Estonia took place in the thirteenth century and incorporated a similar blurring of beliefs for a considerable period afterwards. Even five hundred years after the Conversion, some of the several hundred natural healing sites, consisting of groves, trees and wells, which existed alongside the churches, continued to be used, along with a second type of site which was thought to be capable of granting luck, success and welfare (Valk 2003, 572-575). This does seem to support the idea that a similar pattern of mixing Christian and earlier Pagan beliefs could have continued late into Anglo-Saxon England and affected church building.

SPATIAL ALIGNMENT VARIATION AND ITS POSSIBLE CAUSES: OVERALL CONCLUSIONS

The spatial pattern of alignment variation across the country is both real and statistically robust. During medieval times church alignment in counties in the west of the country had a focus which was some 10º more northerly than that of churches in counties in the east of the country. The possibility that there was more than one factor involved in this difference was investigated, and it was concluded that there was more likely to be just a single influence that caused this spatial variation.

It was shown that churches were not set out magnetically towards east because the variations in alignment between individual churches built at different dates did not reflect the known changes in magnetic declination over the same period. Investigations into the possible chronological differences in church building, firstly by comparing the alignment with the age of the fabric of the church; secondly by examining the alignment of early minster churches compared with ordinary parish churches, which are likely to have been built later, seem to confirm and extend the earlier findings of Hoare and Sweet; that there was little difference in the alignment of churches by the likely date of building.

However, it can be demonstrated that climate has a definite effect on harvest. When local harvest-time weather conditions do not interfere with gathering-in, there is an underlying difference in harvest dates between the east and west of the country brought about by climatic differences. The position of sunrise on the horizon on the dates of early harvests in five areas in the east and west of the country closely mirrors the observed differences in mean church alignment in this survey. Whether the church builders were merely using harvest sunrise to 'find east', or whether harvest sunrise had real meaning to them, there is a strongly-suggested harvest-specific link with church alignment. Therefore a good case can be made that sunrise at this period was providing the focus for the alignment of a church. In addition, more than 70% of the churches in each of these counties are aligned within ten degrees of the local mean – a figure repeated in almost all the other counties in the survey, suggesting that perhaps harvest was an influence there as well. Unfortunately, the ultimate answer to the cause of the variation in alignment lies in the heads of those who actually undertook the tasks of setting-out the churches, and with no chance of regaining that information, we are

left only with the ability to work backwards from the results and calculate the most likely reasons. Whilst harvest thanksgiving may seem a little unlikely to the modern ear, it is currently the only explanation that comes anywhere near to explaining the spatial variation in church alignment across the country, whether physical, environmental or geophysical. The possibility that a fluid practice of religious belief was continued long after the Conversion, strengthens the prospect that the Saxons could have 'hedged their bets' when it came to applying the new religion to the process when churches were first built and could explain the use of harvest-time sunrise as a focus. In addition, the availability of medieval labour seems to be coincident: the earlier the harvest, the longer the period of labour availability. Further, if negative, support for the harvest-sunrise link is also provided by the fact that there is no alignment variation in the monastic churches built in east and west Norfolk, unlike the variation in the alignment of parish churches there, and, unlike local parish churches, monastic churches are far less likely to have had the building of their church affected, or constrained, by the interests of harvest completion or labour availability.

CHAPTER SEVEN

ANALYSIS OF THE RELATIONSHIP BETWEEN SLOPE AND CHURCH ALIGNMENT

When I see a slippery slope, my instinct is to build a terrace.
Jon McCarthy - 1857-1943
(US Congress Member for Nebraska)

INTRODUCTION

This chapter analyses the survey results in more detail in two areas where the initial analysis of the results uncovered unusual patterns in the relationship between church sites and sloping land. Firstly, it examines the relationship between church sites and the direction of the slope on which they are built, particularly the fact that this association is very different depending on whether the church was built on a levelled platform on a sloping site or built directly on the sloping land. Secondly, it explores the fact that up to two and a half times as many churches that were built directly on sloping land were built on east-facing downslopes as were built on west-facing slopes. In an attempt to find explanations for both of these situations, the topography and environment of the church yards will be compared for both sloping and platformed sites by using data about the siting of the church in relation to the current location of the settlement that it serves and that of the 'big house', as well as data about the degree and direction of the slope of the churchyard, in an attempt to determine whether particular slopes may have prompted platforms to be constructed. The ages of the church buildings on the two types of site will be compared to test whether churches on platforms are more recent than those built on to the slope, which might suggest that platforms themselves were a later feature. In order to check whether the considerable bias of the selection of church sites on east-facing slopes could be partly or fully explained by a predominance of landscape that slopes that way, an analysis of the topography of one of the counties in the survey, Norfolk, is undertaken.

The importance of a sloping site is also considered by conducting a case study in Norfolk using the significant number of abandoned churches in the county, specifically those that were located in the same parish as an extant church, assessing whether the slope of their sites played any part in the selection of one church over the other for retention, the results are summarised here and the full details are presented in Appendix 12. First of all, as part of the investigation of the first of the survey's findings – the difference between platforms and slopes – the problems of building on slopes, and the possible impact that the direction of the slope may have had physically on the building of a church, and its alignment, are considered.

BUILDING ON SLOPES

Building a church on a slope introduces an additional set of problems to those experienced by builders on flat sites, especially in areas of the country where freestone was not generally available as a building material. Mass walling in materials which do not lend themselves to coursing and bonding, particularly flint, where "even a simple wall demanded considerable skill" (Hart 2000, 5), makes dealing with the additional twisting stresses of building on a slope far more difficult to manage. "The generous quantities of mortar required … and the lack of mortar adhesion ... meant that only limited amounts of wall could be built at a time" (Hart 2000, 5). If a church is built directly on a slope, rather than on a levelled platform, aligning it directly up and down the slope, or directly across the slope, makes building for load-bearing and managing the stresses far simpler, usually requiring only the wall at the lower end of the slope to be buttressed, rather than building diagonally on the slope, where the whole building would be attempting to twist out of square.

Earlier it was shown that the mean alignment of churches built on slopes was the same as that of the whole sample. It is possible that slope has had an effect on some particular church alignments, but that this has been hidden by compensating alignments of other churches within the group, without affecting the overall mean figure. To establish whether this is the case or not, an attempt has been made to measure the impact that the direction of the slope may have had on the alignment of each individual church by measuring the difference between the church alignment and the direction of the slope. If the alignment of the church is within ± 11° of parallel to, or perpendicular

to, the direction of the slope of the land, it was considered that the church could have been built that way to allow for the direction of the slope and was thus "affected" by the slope. This group, made up of four slices of 22º each, totalling 88º (one quarter of the full circle of 360º) is shown in orange on the upper panel in Figure 7.1 below. If the alignment of the church was outside this group (of ±11º from the direction of the slope) it was considered that the church was built on its alignment *despite* the slope of the land (shown as yellow in the lower panel in Figure 7.1), the slope was therefore classed as having had "no effect" on the church alignment in table 7.1.

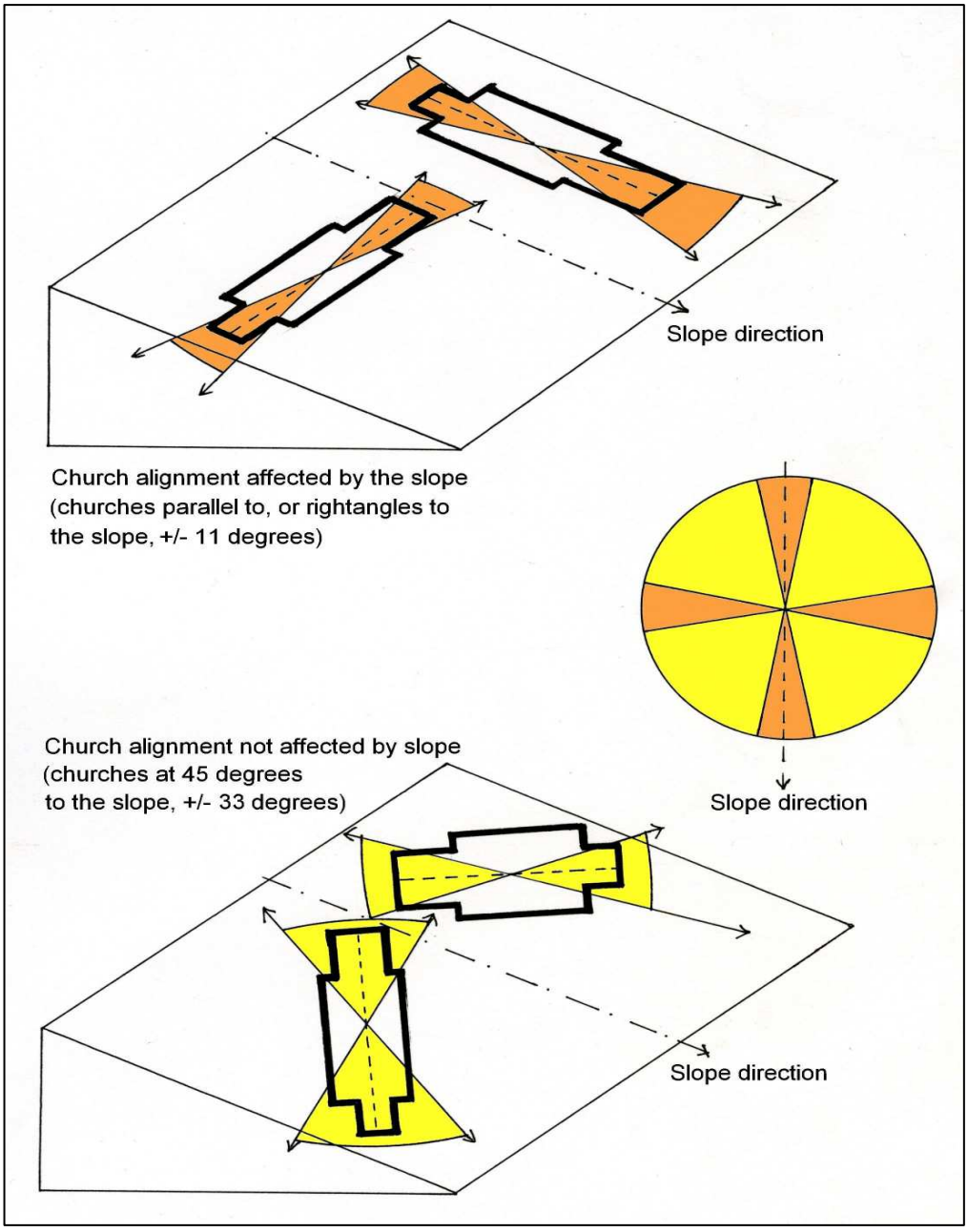


Figure 7.1 – Possible effect of the slope direction on church alignment

It can be seen from table 7.1 below that fractionally over one-quarter (**27%**) of churches on platformed sites are within this 88º segment – very close to what would be expected from a randomly distributed result (25%) – showing that the alignment of churches on platforms is definitely not affected by the slope direction. Churches on sloping land, however, are slightly biased towards this segment, with 130 (**35%**) of the churches built directly on slopes falling into this group, indicating that some slopes probably did influence the alignment of the church, causing them to be aligned closer to the direction of the slope, but, since a random distribution would result in approximately 25% (93 churches) this 'influence' is probably limited to around 10% of the churches built on slopes (30 or 40 churches of the total of 373).

Table 7.1 - Church alignment possibly affected by the direction of the slope of the site

	No	%
SLOPING SITES		
No slope effect	243	**65**
Slope affected	130	**35**
Total	373	**100**
PLATFORMED		
No slope effect	208	**73**
Slope affected	75	**27**
Total	283	**100**

Having demonstrated that a slightly larger than random group of churches is built close to parallel with, or across, the slope, it would be reasonable to expect that this might appear in the overall alignment figures when churches that were "affected" by the slope were compared with those where there was "no effect". However, the figures in table 7.2 below show this not to be the case. Of the 373 churches built directly on a slope of greater than two per cent (1 in 50), roughly one-third falls into the "slope affected" category described above; the mean alignment for this group is the same (within **0.1°**) as both the remaining churches built on slopes and the overall mean for the whole survey. The range of slope severity on both slope-affected sites and non-affected sites is the same (between 2% and 15% - 1 in 50 to 1 in 7), as is the mean slope angle (**4.7%** - 1 in 22).

Table 7.2 - Church alignments on sloping yards, by "slope effect"						
Slope Effect	No	Slope severity range (& mean)	Align. Range	Mean	95% conf	Range of mean at 95%
No effect	243	2.0-15.5% (**4.7%**)	55-121	**85.9**	±1.6	84.3 – 87.5
Slope affected	130	2.0-15.1% (**4.7%**)	48-120	**86.0**	±2.3	83.7 - 88.3
All churches on sloping sites	**373**	**(4.7%)**	**48-121**	**85.9**	±1.3	84.6 – 86.2
Platformed Yards	283	**(4.6%)**	50-128	**85.5**	±1.9	83.6 – 87.4
Other Yards	1,270		38-126	**86.0**	±0.6	85.4 – 86.6
All churches	**1,926**			**86.1**	**±0.3**	**85.8 – 864**

It is possible that the excess of churches whose alignment is close to the slope direction is merely a reflection of the greater proportion of churches that are built on east-facing slopes (a phenomenon investigated later in this chapter), where churches would be expected to face eastwards. In these cases, the coincidence of directions would mean that the slope played no real part in affecting the church alignments even though they are built down the slope, as that was probably their preferred alignment anyway. However, when the individual church alignments are taken into account, the similar mean alignments between the categories, shown in red in the summary figures in table 7.2 above, do exhibit some differences within them, shown in Figure 7.2 below, which compares the overall alignment profile of the churches in the "slope affected" category with that of all churches built directly on sloping land. The blue pecked line shows the alignment profile for all churches built on slopes, with a similarly shaped curve to that of the survey as a whole, an approximately 'bell-shaped' curve, with no major bumps, and centred fairly close to east. The curve for churches in the "slope affected" category (red) shows two distinct clusters, one at each end of the curve, with increased numbers of churches aligned at 55°- 65° and 100°- 115° (circled on Figure 7.2), which have balanced each other out when the mean value was calculated, resulting in the same mean value as the 'all churches on sloping sites' group. A case can be made for the slope having had a real influence on the alignment of these particular churches, as the slope direction was some distance from due east. Although the number of churches in these two bumps is small (approximately 20), they do constitute the majority of churches aligned at these more extreme angles.

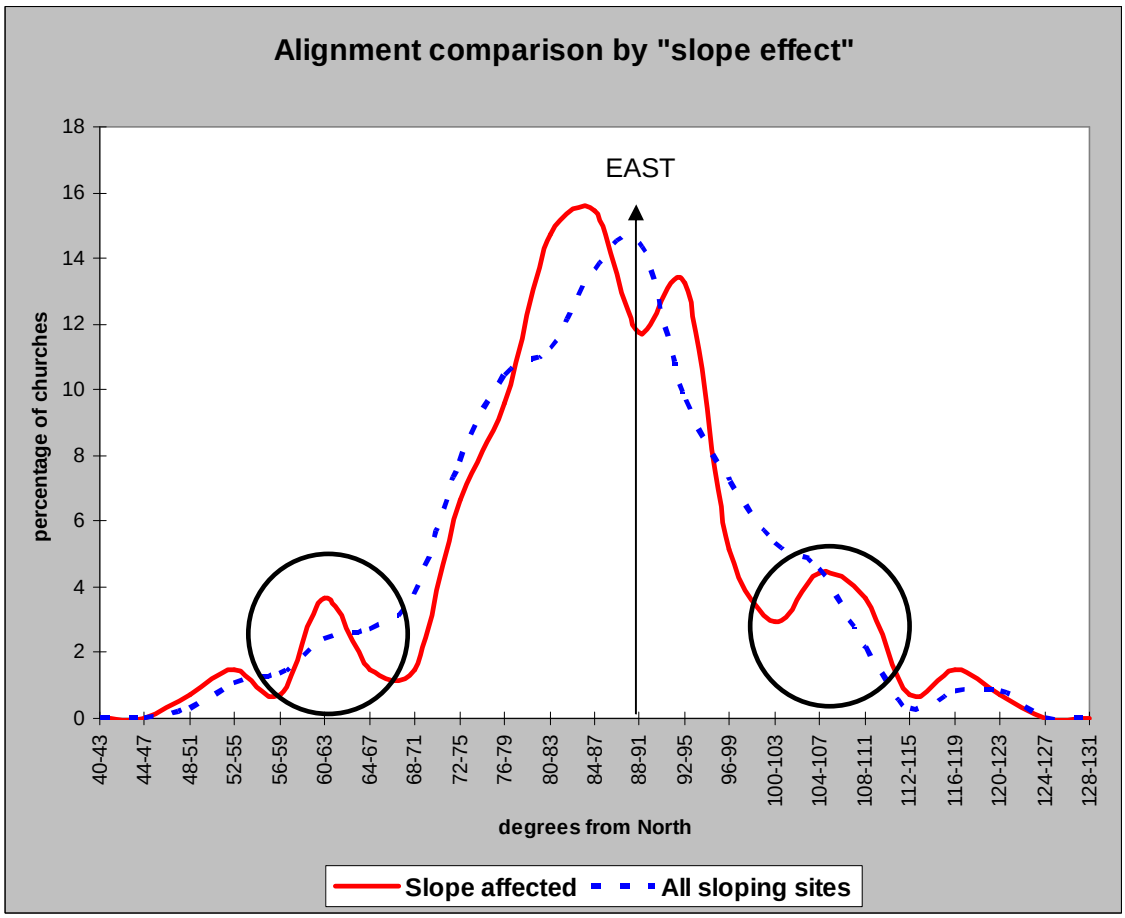


Figure 7.2 – Alignment comparison by slope effect (the black circles may highlight churches whose alignment was really affected by the slope – see text)

Churches with the most extreme alignments

Only 7% of all the churches surveyed have an alignment which is more than 20º from the mean for the county in which they are located, but they account for 13% of churches built directly on slopes, shown in table 7.3. Only a small number of churches is involved – and the difference between 13% and 7% amounts to just twenty-two churches. It is possible that only these twenty-two were truly affected by the slope of the site, and could be the same small group that was identified in Figure 7.2 above, as the two bumps in the graph. As this group of churches is only a notional excess, they cannot be identified.

Table 7.3 - Churches aligned more than 20º from their County mean alignment - by type of site and slope severity					
	No (%)	total	1 in 50 – 1 in 20	1 in 20 – 1 in 10	Over 1 in 10
Sloping sites	48 (**13%**)	373	30	17	1
Platformed sites	23 (8%)	283	9	12	2
Other sites	74 (6%)	1270	-	-	-
TOTAL	141 (**7%**)	1926			

However, 30 of the 48 churches (with extreme alignments and built on slopes) are built on shallower slopes (between 1 in 50 and 1 in 20) leaving eighteen built on steeper slopes, where any influence of the slope direction would be likely to be greater. These eighteen churches can be identified. Although their alignment is further from east than the vast majority of the whole sample, there is little to distinguish them otherwise. They are spread across the country, located in eleven different counties, and although the numbers are small, making statistical conclusions difficult, half of them fall into the group that was classed as "affected" by the slope (rather than 35% of the total on slopes noted in table 7.1) but otherwise their profile remarkably resembles the profile of all churches built on slopes. They have a similar range of planforms, and ages of earliest fabric, their sites relate to both the village location and manor house in a similar way and the village name chronology is similar. The same applies to the fourteen churches on the steeper slopes but built on platforms, both the church sites and the churches themselves are similar to the whole sample of churches built on platforms, so there appears to be nothing that sets either of the two groups apart. A detailed analysis and additional tables are shown in Appendix 12 on pages 352-356.

COMPARISON OF SLOPING AND PLATFORMED SITES

There is a fundamentally different pattern between churches that are built directly on sloping land and those built on levelled platforms on sloping sites, in the way that they relate to the compass direction of the down-slope on which they are built. If levelled platforms were used as a way of aligning a church differently, by not being forced into building in a particular way to avoid the problems of building diagonally across a slope, it does not show in the results. Churches on platforms are also aligned within a fraction of a degree of the overall mean, and with a slightly greater range of

alignments, of 78° (between extremes of 50° and 128°), compared with the range of those built directly on the slope of 73° (between 48° and 121°).

However, the way that the church relates to the direction of the slope of the land is completely different, depending on whether the church was built directly on the slope or on a levelled platform, shown below in table 7.3 below. A completely random distribution of slope directions would see 12.5% of the churches in each of the eight groups. Churches built on platforms are roughly equally distributed across sites with slopes in all directions (ranging from 7% to 19%), with the smallest proportions on slopes facing north and northwest. The distribution of churches built directly on slopes is quite different, with more than one in three churches (34%) built on an east-facing downslope, which is more than twice as many as the next largest group and almost three times more than the proportion that would result from a random distribution. Table 7.3 shows the numbers and proportions of churches built on sloping land, with the direction of the slope divided into 45º segments. The differences are shown even more clearly in Figures 7.3 and 7.4 below.

Table 7.3 - Numbers of churches on platformed and sloping sites by direction of downslope, in 45° groups

	Platformed		Sloping	
	No	%	No	%
north	21	**7**	10	**3**
northeast	35	**12**	44	**12**
east	38	**13**	128	**34**
southeast	50	**18**	59	**16**
south	53	**19**	29	**8**
southwest	33	**12**	28	**8**
west	34	**12**	56	**15**
northwest	19	**7**	19	**5**
Total	283	**100**	373	**100**

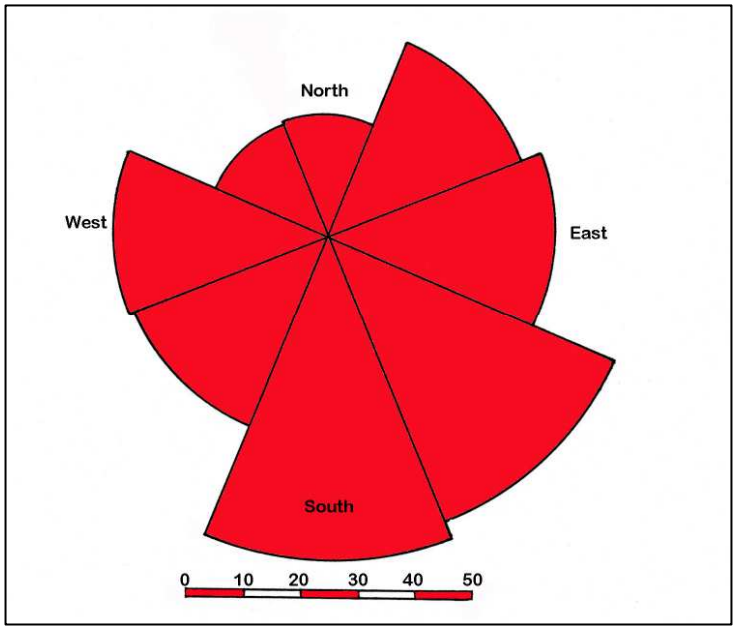


Figure 7.3 – Churches built on platformed sites, by direction of downslope

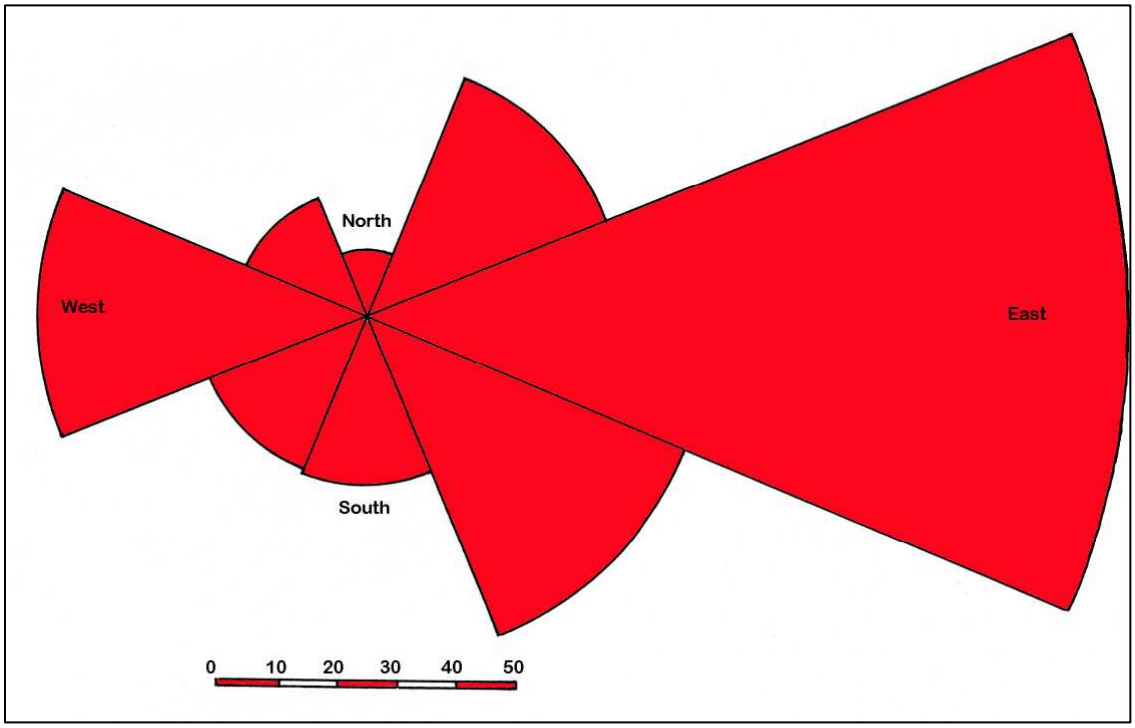


Figure 7.4 – Churches built directly on sloping sites, by direction of downslope (at the same scale as Figure 7.3 above)

Having established that the church locations on slopes and platforms are different in terms of the direction of the slope, it is important to see if there are any other distinctions between the two types of site - such as the severity of the slope, their

position in relation to the village and in relation to the manor house - which may help to explain the difference.

1. Distribution by location

Despite fundamental differences in topography between the areas included in this survey, sloping sites are used for churches across the country. Almost one in five of all churches is built directly on a sloping site. There are broadly similar proportions in every county apart from Bedfordshire, where there are fewer, and Sussex, where there are more, and in every county bar one – Cumbria – churches built on east-facing slopes form the largest group.

A slightly smaller number of churches, just over one in seven, is built on platformed sites on slopes, but a very different pattern emerges. As might be expected from the data in table 7.3, there is a more equal distribution, 'east-facing' is the largest, or equal largest, group in six counties – Bedfordshire, north Cambridgeshire, east Kent, south Lincolnshire, Norfolk and East Yorkshire. 'west-facing' is marginally the largest group in Cumbria and south Hampshire, and in eight of the remaining counties, north Cambridgeshire, west Cornwall, East Sussex, north Oxfordshire, Pembrokeshire, north Somerset, Shropshire and northeast Suffolk, 'south-facing' is the largest group. Despite all the hills and slopes mentioned, two-thirds of all the church sites in this survey are on flat or almost-flat sites, and even in the hilliest areas, the majority of the settlements are on coastal plains or near the bottom of river valleys.

2. Slope severity

It was shown earlier, in Chapter Four, that there was little variation in the overall alignment of churches built on slopes of differing steepness. There are 373 churches in this survey that are built on sites with a slope of 1 in 50 or steeper, with a mean alignment of 85.9º; 64% of them are aligned to the north of east. The 131 churches built on sites with a slope of more than 1 in 20 have a mean alignment of 84.0º, and 70% are aligned to the north of east, still only 2.1º from the overall mean, but they are disproportionately represented in the west of the country, where alignments are numerically lower.

The results in table 7.4 below show clearly that the severity of the slope did not result in the need to create a platform on which to build the church. Sloping and platformed church sites are similarly distributed across the range of slope severity in this survey, with **61%** of platformed sites on slopes of less than 1 in 20, compared with **65%** of sloping sites; **35%** of platformed sites are on slopes of between 1 in 20 and 1 in 10, compared with **31%** of sloping sites and **4%** of both sorts of site are on slopes exceeding 1 in 10, so there is virtually no difference in the distribution.

Table 7.4 - Comparison of slope severity for sloping and platformed sites

	1 in 50 – 1 in 20	1 in 20 – 1 in 10	Over 1 in 10	Total
Sloping sites	**65%**	**31%**	**4%**	373 (100%)
Platformed sites	**61%**	**35%**	**4%**	283 (100%)

In addition, the direction of slope for church sites does not appear to alter by the severity of the slope, with similar proportions of churches on slopes of each direction irrespective of the steepness of the slope, except for the very small group of fourteen churches on the steepest slopes. For example just over half of all the churches built on slopes are on east-facing slopes, irrespective of the steepness of the slope and just under a quarter are built on west-facing slopes, again irrespective of the slope's steepness (detailed figures are shown in table A7.12 in Appendix 7 on page 333).

3. Church sites in relation to current village and to the 'big house' (church/hall focus)

The siting of the church in relation to the current location of the settlement centre which it serves is very similar whether the church is built directly on the slope or on a platform; they are equally likely to be in the centre of the current village, equally likely to be at the edge of the current village or isolated from it. Although the relationship between the current sites of church and village would not necessarily have a specific meaning if it were different for the two types of sloping site, a sizeable difference in one or more of the groups may have provided a pointer towards the need for further investigation (detailed figures are shown in table A7.13 in Appendix 7 on page 333).

Similarly, the relationship between the location of the church and the manor house is also a complex one, which will also be developed in the next chapter. But, as

the results show, fairly similar proportions of churches currently close to the manor house are built on slopes (one in four) as are built on platforms (almost one in five) and consistent proportions are built on slopes facing in each direction within each group, ranging from 23% to 28% next to the hall on sloping sites and between 15% and 23% next to the hall on platformed sites. The detailed figures are shown in table A7.14 in Appendix 7 on page 334.

COMPARISON OF THE CHURCHES BUILT ON SLOPING AND PLATFORMED SITES

Having established that the sites of churches built on slopes and platforms are similar in terms of slope and location, what remains to be examined is whether there are any differences in the churches themselves on the two types of site. It is possible that the current churches built on platforms were built in a later period than those built directly on sloping sites, and that the reason that apparently drove the focus of church-builders in seeking out east-facing slopes for churches built on slopes had become less important, or that the sites that did satisfy this criterion were already in use.

Without deconstructing every church, assessing the age of the earliest fabric in a church is difficult at best, as alterations and extensions over the years frequently disguise and cover the fabric of earlier phases of building. For consistency, the assessment of the earliest phase has again been taken from the relevant volume of *Pevsner*, accepting that accuracy is difficult and relying on the hope that the assessments are at least consistent. Since the results show that there is no real difference in the age of the earliest fabric of the churches on the two types of sloping sites, it is felt that the possible problems of accuracy are less important than if the results had highlighted a large difference in the ages of the churches, which would have required further investigation.

The detailed tables for this comparison are presented in Appendix 7 (tables A7.15 – A7.17 on pages 334-335). They show that there are similar proportions of churches with their earliest fabric in each age group (11^{th}, 12^{th}, 13^{th}, 14^{th} centuries) whether they are built on platforms or slopes, and that this similarity extends to the distribution on slopes in different directions, despite the fact that some of the groups are small; about 1 in 20 of churches on slopes or platforms is of eleventh-century date,

approximately 40% are of twelfth-century date, and around one-third of them are of the thirteenth or fourteenth century.

The churches on sloping or platformed sites are also similar in terms of size and floorplan. The results are as consistent as those for the age of the fabric, around 40% of churches are of less than 190sq m, whether on slopes or platforms, a similar proportion are slightly larger and around 20% are over 300 sq metres in floor area, whether on slopes or platforms. Around one in seven churches has no tower, three-quarters have a west tower and one in twenty has a central tower, irrespective of the type of site on which they are built. So it can safely be stated that there is little difference in the churches themselves, whether they are built on platforms or directly on the sloping site, offering no assistance in differentiating between the two types of site.

COMPARISON OF CHURCH SITES ON EAST-FACING SLOPES WITH THOSE ON SLOPES FACING IN OTHER DIRECTIONS

Having concluded that there is little difference between platformed and sloping church sites that could explain the fact that there is a substantial difference in the relationship between the church alignment and the direction of the slope on which they are built, and that there is also little difference between the churches on the two types of site, it still leaves the issue that two and a half times as many churches on sloping sites are built on east-facing slopes compared with west-facing ones. Are there any other differences between sites on east-facing slopes and those on slopes in other directions?

Table 7.5 – East facing slopes compared with other sloping sites

Slope of yard	No	Range	Mean	95%	Range at 95% conf.	% N of East
East-facing slopes	203	48-120	**86.8**	±1.7	84.7 - 88.5	62
Other slopes	170	54-121	**84.9**	±2.0	82.9 – 86.9	66
All Slopes	373	48-121	**85.9**	±1.3	84.6 – 87.2	64

Again, the mean alignments of the two groups are within one degree of the overall mean, and with a 95% confidence limit of between 1.7 and 2.0, the difference is shown not to be significant as the ranges at 95% confidence substantially overlap, and

each has similar proportions aligned to the north of east. There is little difference between the sites, or their churches, on east-facing slopes and the remainder. Churches on east-facing slopes are, on average, slightly smaller than those on other slopes (45% in the smallest size group compared with 32% on other slopes); have slightly smaller yards (39% in the smallest yard group, compared with 26%); but they are located in similar positions in relation to the village and the manor house; have similar age profiles in terms of their earliest fabric; are dedicated to a similar range of saints by their season and are located in villages with a similar range of name origins. In other words there is little to distinguish the two types of sloping site, other than by the direction of their slope. The detailed tables are shown in Appendix 7 (tables A7.1 – A7.11 on pages 331-334).

In case the greater proportion of churches built on east-facing slopes is merely reflecting the fact that there is a greater proportion of land that slopes that way, a detailed digital analysis of the topography of Norfolk, is presented below.

DIGITAL ANALYSIS OF THE TOPOGRAPHY OF THE COUNTY OF NORFOLK

As there appears to be no site-based or church-based explanation for the excess of churches built on east-facing slopes, it might be thought that this imbalance is brought about by a predominance of east facing slopes in the landscape. Norfolk contains a large number of churches built on slopes, and, at 2.5:1, a typical ratio of churches built on east-facing and west-facing slopes, therefore it provides a good case to analyse in detail. This can be done relatively simply using digital data.[37] The degree of slope of the land, and the direction of that slope, has been calculated for a grid of points 100 metres apart across the whole county, resulting in 600-700 points in each of the 549 parishes in the county which has had a church surveyed for this thesis. The technical details and additional tables are set out in Appendix 13 on page 357. In order to compare the calculated landscape with the assessment of church sites already surveyed, the sampled points were separated into those which were located on land which had a slope of less than two per cent and those which had a slope of two per cent or above. In

[37] The author is grateful to Bill Wilcox, a fellow PGR student, who obtained and organized the raw topographical data

each parish, sample points on land with a slope of two per cent or more were further divided into the direction in which the land slopes downhill in 45º segments; centred on north, northeast, east, southeast, south, southwest, west and northwest.

Topography analysis details

It is most unlikely that any natural terrain would have exactly the same proportions of land sloping in each direction although, as with the church alignment results, the larger the sample becomes, the more likely it is that small variations between directions would even themselves out. Overall, the results for Norfolk show that the general perception that landscape is "random" is more or less borne out by this exercise. Just over two-thirds of the land in Norfolk (67%) is shown to be either flat, or has a slope of less than 1 in 50 (2%). The remaining 33% has a slope of greater than two per cent and an equal distribution of this sloping land in all directions would amount to 4.1% for each of the eight directions used in the analysis, shown in the table below. Table 7.6 shows that the proportions of sloping land in each of the eight directions is fairly close to being equally distributed, with slightly lower proportions than 4.1% sloping to the east, west, southwest and northwest (3.6 – 3.9%), whilst there is marginally more land than average sloping to the north, northeast, southeast and south (4.3 – 4.5%).

Table 7.6 – Results of topography analysis for the whole County of Norfolk

		Proportion of 2%+ slopes, by direction of slope							
	Proportion <2% slope	North	North East	East	South East	South	South West	West	North West
All Norfolk Sites	**67.0**	**4.5**	**4.3**	**3.9**	**4.4**	**4.3**	**3.8**	**3.8**	**3.6**

As might be expected, there is a greater proportion of sloping land in those parishes where the church is actually built on a slope (shown in table 7.7 below). Land sloping at more than two per cent rises from 33% over the whole county to 39.4% in these parishes; so the average proportion for each of the eight directions in these parishes would be 4.9%. As with county as a whole, the sloping land is roughly equally distributed, although in these parishes there is a slightly larger proportion with east-facing slopes (5.3% compared with average of 4.9%). The slightly below average proportion of land with west-facing slopes (4.3%) compared with the higher proportion of east-facing land does slightly dilute the ratio of churches on east-facing

slopes to those on west-facing slopes, from the raw figures of **33:13** (2.5:1) to the adjusted ones of **30.67:14.89** (2.1:1).

Table 7.7 - Topography of parishes with churches built on sloping sites - direction of down-slope

	<2% slope	North	North East	**East**	South East	South	South West	**West**	North West	All slopes
Landscape proportion	60.6%	4.4%	5.5%	**5.3%**	5.4%	5.3%	5.4%	**4.3%**	3.8%	39.4%
Churches		1	6	**33**	12	4	7	**13**	2	78
Number of churches standardised to 4.9%[38]		1.12	5.37	**30.67**	10.94	3.71	6.38	**14.89**	2.59	

The topography of the parishes with platformed church sites is the same as that of the sloping church site parishes (60.6% of the parish flatter than a two per cent slope in both cases) and although the detailed breakdown of the slope direction is slightly different, none of the directions is particularly above or below what would be expected for a random distribution. As was noted earlier, the distribution of churches built on platformed sites is far more equally spread so there is no topographical influence that has directed the choice of site.

Overall, the topography of the county is similar to that described by Noël Coward as "awfully flat, Norfolk", despite references to the Norfolk Mountain Rescue Service by the writer/comedian Mike Harding (Harding 1995, 123). Two-thirds of the whole county is flat or almost flat, the remaining one-third has slopes steeper than 1 in 50 and the slopes are almost equally distributed in all directions. The broad similarity between the amount of land that slopes east and the amount that slopes west demonstrates that the bias of churches built directly on the slope for east-facing slopes is not driven by a disproportionately greater area of eastern slopes, and that even when adjusted for the topography, there are still more than twice as many churches built on east-facing slopes, so another reason for this pattern has to be sought. There is no reason to assume that other counties in this survey would produce topographic results that are very different from those in Norfolk.

[38] The number of churches in each landscape sector is divided by the actual proportion of landscape in its sector and multiplied by the standard proportion of 4.925%

Norfolk case study of lost churches

Previous sections have demonstrated the apparent importance of east-facing sloping sites to the medieval church-builder. Whether or not a specific site for a church was chosen on this basis, contemporary with, or prior to, the location of the settlement there will be discussed in Chapter Eight, but the existence in Norfolk of seventy-nine settlements which had at least one church, where one has been lost, fallen into ruin or become disused, provides an additional way of examining the subject. If the slope of the site played a part in the retention of the one church over the other in these villages it might appear in the results. The full details of the analysis are shown in Appendix 14 on pages 358-361, but the slope of the site appears not to have featured in the decision of which of the two churches to retain, as very few of the churches in these parishes were located on east-facing sloping sites, whether they were abandoned or retained. The majority of the abandonments were relatively modern, many as a result of the sixteenth- and seventeenth-century upheavals of the Church (Batcock 1991, 180-184), rather than earlier when the siting on a slope may possibly have played a greater part.

SLOPE AND ALIGNMENT: CONCLUSIONS

Trying to explain why churches built on sloping sites face predominantly downhill eastwards, whereas platformed sites do not, has not proved possible from the analysis of the factors contained in this survey. Sloping and platformed church sites appear to be the same – they are on the same slopes in terms of their steepness, they also have a similar relationship with both the current location of the village and the proximity of the manor house.

Not only are the sites very similar, but the range of churches on the two types of site also appears to be indistinguishable. They are of similar age, according to the assessment in the relevant *Pevsner's Buildings of England;* they are of similar size and have similar planforms. The only aspect of the two types of site that is distinctly dissimilar is the direction of the slope. Neither can the predominance of churches built on east-facing slopes when compared to churches on slopes facing in other directions be explained by differences in the sites, or by the churches built on them. The only major difference between the sites is the direction of the slope itself.

The distinct tendency of choosing an east-facing slope when building on a slope is definitely *not* brought about by a predominance of east-facing slopes in the landscape, at least not in Norfolk. A detailed analysis has shown that here, the sloping sites are fairly evenly distributed in all directions, and even when adjusted for a slight topographical bias, there are still more than twice as many churches built on east-facing slopes as west-facing ones.

The implications of the patterns of building churches on slopes are considered in the next chapter, particularly the possibilities that these east-facing slopes were either selected by Anglo-Saxons for religious reasons as sites for their graveyards, or that they reflect elements of Christian substitution on sites which had earlier pagan significance.

CHAPTER EIGHT

LOCATION OF CHURCHES, ADOPTION OF LOCAL CHURCH SITES, DEVELOPMENT OF LOCAL BURIAL, AND CHRISTIAN SUBSTITUTION

At Castle Sowerby in Cumbria, St Kentigern plunged his staff into the hillside (*actually a west-facing slope*) at the site where he had chosen to preach and a spring issued forth. Taking this as a sign, he commanded that a church be built on the spot.

(Cumbrian legend)

INTRODUCTION

This chapter examines the relationship between the location of the church site and its settlement, in an attempt to determine whether the selection of the site had any effect on the location of the village which it served. The timing of the adoption of the church site, particularly in relation to the changing settlement patterns during Saxon times, is investigated by expanding on earlier landscape research. Locations where there is a coincidence between middle-Saxon settlement sites, identified by others, and church sites, are investigated in more detail by surveying the topography at each church and the possibility is considered that the current church site was selected early in the settlement process, perhaps just as a burial ground. It is frequently thought that many of the country's small rural churches were sited by the manorial lord on his own land, often close to the manor house; but the considerable bias of slope-located churches towards east-facing slopes, noted earlier in the results of this survey, would be an odd one if the church sites were chosen *after* the siting of villages on these slopes, as east-facing slopes are not an ideal location for an arable-based community – as the land is slower to warm, on both a daily and seasonal basis. Therefore, the possibility that the site, for at least some of these churches, was chosen first because of its suitability as an early graveyard, to be *followed* by the rest of the settlement, is examined. The development of local Christian burial, and the position in the late-Saxon church law codes of graveyards without churches, is also considered.

It is often thought that various types of earlier site, which may have been considered as having had a ritual use, have influenced the location of some churches – barrows, standing stones, springs and other features have all had churches built next to them, or even over them – with many examples listed in Chapter Two (Morris 1989, 50-91; Blair 2005, 183-195, 221-228, 374-383; Rattue 1995; Eaton 2000; Bell 2000). The incorporation of such sites was encouraged by the early church hierarchy under the broad heading of what has been called Christian substitution. The possibility that this type of site may have had a link with the east-facing slopes that have been shown here to have been so common for church sites is considered. Exactly what constitutes an easterly view in topographical terms is also discussed. In addition, an analysis is also made of other factors associated with the church or the site, in conjunction with the direction of the slope, in an attempt to establish whether a combination of elements might explain the imbalance of churches on slopes between east- and west-facing sloping sites.

It was originally intended to make a detailed comparison between the sites of churches based on their position in the hierarchy, to enable an assessment as to whether the decisions taken over the siting of a minster church were the same as those taken when siting inferior churches. However, the generally accepted difficulty of identifying minster churches on the ground, highlighted by so many writers (Blair 2005, 319; 1987; 1992; Morris 1983, 46-48; Franklin 1984; Hase 1988; Rushton 1999), and the small numbers involved, has prevented the production of any meaningful results.

LOCAL CHURCH SITES IN THE ANGLO-SAXON PERIOD

This section examines where the church site fits into the sequence of development of settlements during the Saxon era. It uses already published fieldwalking studies and settlement analysis to determine whether a site is from the middle-Saxon or late-Saxon period and analyses them in detail. It was noted in Chapter Three that the majority of the analysis of landscape changes throughout the Saxon period and early Norman period has concentrated on the changes in settlement and agricultural patterns. The rural church and its site, both in terms of when it was built and where it was built, have been very much a secondary consideration in relation to settlement change, and appear to have been viewed as part of the changes in lordship and land ownership in late-Saxon times. Richard Morris has referred to the fact that "there has been no systematic attempt to consider … village religion as part of village studies" (Morris 1985, 49); while others have referred to historical geographers' study of settlement leaving "little room for the study of burial in the landscape" (Lucy & Reynolds 2002, 5).

General studies that have considered when churches were built in villages seem to have concluded that it was usually a ninth- to eleventh-century process (Blair 2005, 368-374; Morris 1989, 140-167), although some detailed local studies (for example in Wade-Martins 1980b, 41 & 73; Newman 2005, 483; Taylor 1983, 153-157; Jones & Page 2006, 184-185), have identified situations which, the analysis here will suggest, point to a far earlier start for the selection of local religious sites, perhaps as early as the beginning of the settlement nucleation process. In general terms, if a religious site, particularly a graveyard, was chosen during the settlement nucleation process, then it seems likely that it would have been adjacent to, or within, the settlement, for two reasons; firstly for religious reasons, recognizing the importance of incorporating the dead into the community of the living (Blair 2005, 245; Morris 1989, 13; Penn 1996, 45; Thompson 2004, 170–206), and secondly for convenience of access. A location any further afield would have resulted in inconvenience, both for access to the site, and interference with any field layout, particularly if the graveyard conformed to the size of 'God's acre'. How then, was religion delivered to the residents of dispersed settlements immediately after nucleation? There was probably just one church serving an area, the minster church; with local facilities provided by a preaching site, perhaps with a cross; possibly using the local graveyard in, or close to, the settlement.

Any discussion of middle-Saxon ecclesiastical arrangements is inevitably dominated by the so-called 'minster model', in which the conversion of the population and their integration into the Church was guided by teams of clergy based at important early churches (the minsters), many on royal estates, to which large parochial territories were attached (Bassett 1992, 26-28; Blair 1985; 1988a; 1992; 1996; 2005; Foot 1992; Morris 1983; 1989). The development of the ecclesiastical system throughout the Anglo-Saxon period and its ultimate fragmentation into the parochial system of the medieval period has been discussed at length (see Everitt 1986, 196–224; Morris 1989; Cambridge and Rollason 1995; Hall 2000; Pestell 2004; Blair 2005; Hoggett 2007). Each of these writers identified the latter stages of this process as being the lordly churches built on smaller local estates in the tenth or eleventh centuries and after. However, there are several different forms of evidence that point to religious sites in settlements in the middle-Saxon period, some of them possibly containing churches, in many counties across the country, but particularly in East Anglia. East Anglia provides the strongest evidence because of the existence of two types of pottery. The first is Ipswich ware which was given its name because the only known kilns for its manufacture were in Ipswich but it was distributed throughout East Anglia. It was made between the second quarter of the seventh century until the mid-ninth century (Jennings 1981, 12), although some argue that production was not begun until the first quarter of the eighth century as it is not found in furnished burials up to *circa* 700 CE (Blinkhorn 1999, 8-10; Geake 1997, 90). The second pottery type is known as Thetford-type ware and was produced in large quantities at several town sites in East Anglia from around 850 CE (Jennings 1981, 14). The transition from one pottery type to the other provides a well-defined boundary for the change from the middle-Saxon to the late-Saxon period in the middle of the ninth century.

Anglo-Saxon sites in Norfolk

Substantial amounts of pottery from the middle-Saxon period have been found around the church in several parishes in Norfolk. In some of these cases the late-Saxon settlement site moved away from the church site, but in other cases, the spreads of middle- and late-Saxon pottery overlap, or are coterminous; and, with no ability to determine to which period the church or its site belonged, the automatic assumption has

been that the church site is related to the later of the two periods as that was the more likely timing for the building of the church.

At Heckingham in the southeast of the county, a substantial number of finds of middle-Saxon pottery, with little late-Saxon ware, was discovered in a limited area around the church by Alan Davison with substantial finds of late-Saxon pottery 100 metres away (Davison 1990, 16-17 and figs 7 & 8), but the church site remained where the middle-Saxon settlement had been, leaving the church site isolated into modern times. A similar situation was discovered at Wormegay in west Norfolk, but with a far greater separation between the settlements of the two periods. Here, a large scatter of middle-Saxon ware was discovered adjacent to the church along with a very small volume of late-Saxon pottery which was taken to indicate that the settlement had moved to a new site where a much larger amount of late-Saxon pottery was found, shortly after the end of the middle-Saxon period, over 800 metres away to the west, again leaving the site of the church isolated (Silvester 1988, 143-150), which it still is.

Peter Wade-Martins' fieldwalking study of areas around churches in the Launditch Hundred in central Norfolk also discovered several sites of middle-Saxon activity which were close to, but occasionally distinct from, the sites of late-Saxon settlement (Wade-Martins 1980b, 25-91; Williamson 2003, 97). At Mileham, the current church is sited in a scatter of solely Ipswich ware (Figure 8.1 below), with later pottery spread to the north and west along the road, away from the church site (Wade-Martins 1980b, 41).

Wellingham, close to Mileham in Launditch (shown in Figure 8.2 below), also has middle-Saxon and late-Saxon pottery scatters which are distinct. The church is located on a slight spur of land in a high position, and is in the centre of the Ipswich-ware scatter (Wade-Martins 1980b, 72-73); the late-Saxon settlement (identified by Thetford-type pottery) spread down the slope away from the church site.

In three other cases in the same study of Launditch, at Weasenham All Saints, Tittleshall and Horningtoft, the church site is located at the conjunction of overlapping middle-Saxon and late-Saxon pottery scatters (1980b, Fig 31, 62; Fig 28, 55; Fig 9, 26), therefore it is not possible to determine to which period the site relates, a similar situation to that at the DMV of Caldecote, a few kilometres to the west, where pottery of both periods was found "just to the south of the church site" (Wade-Martins 1980b, 80).

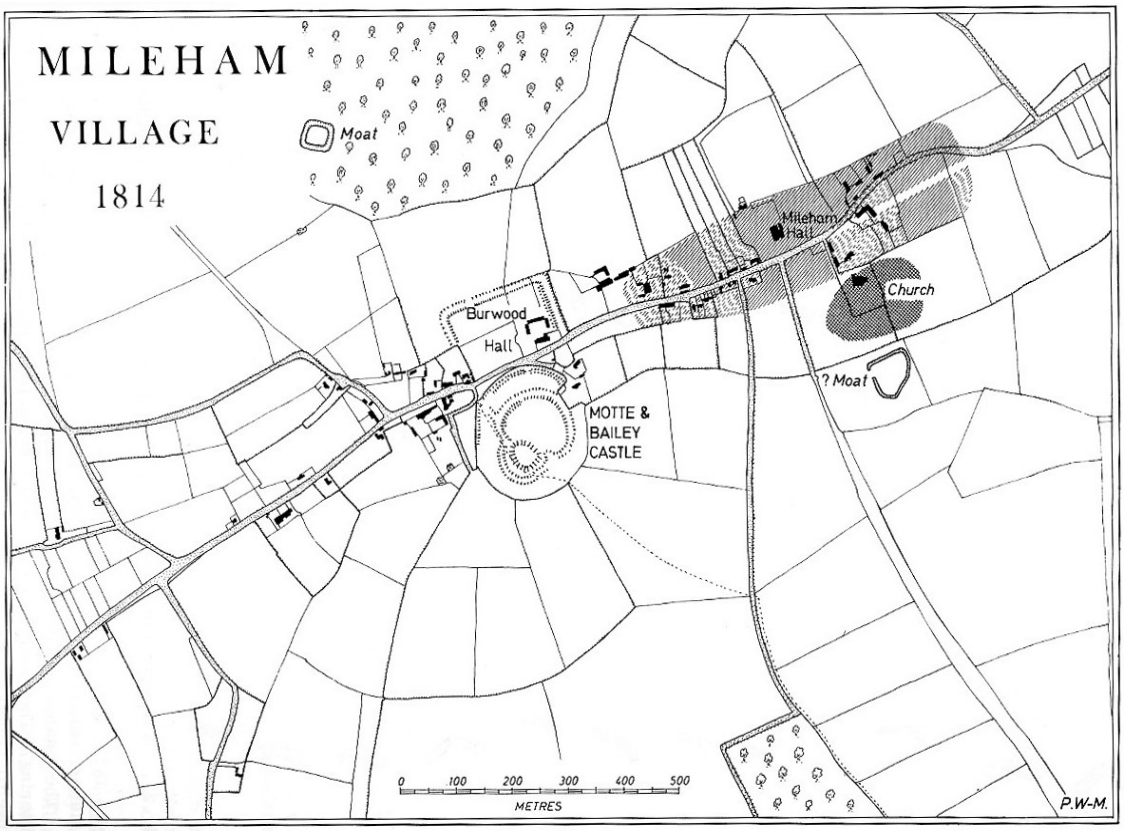


Figure 8.1 – Mileham – Saxon settlement (Wade-Martins 1980b, Figure 23)
dark shading = middle Saxon, lighter shading = late Saxon

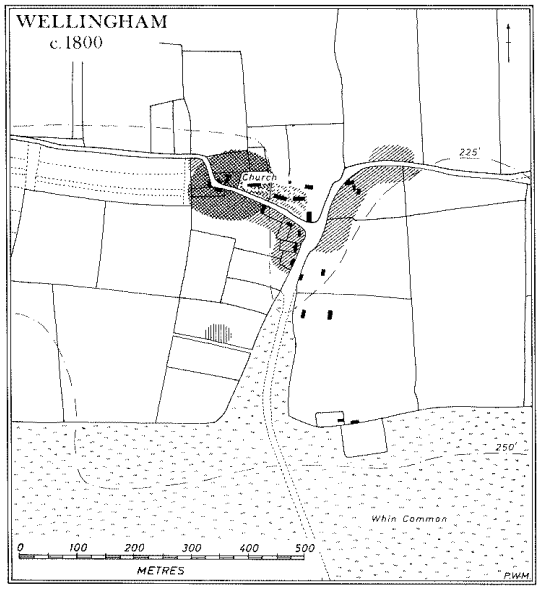


Figure 8.2 – Wellingham (at the same scale as Mileham in Figure 8.1) showing the church site in the scatter of middle-Saxon pottery (Wade-Martins 1980b, Figure 39)

A combination of investigative methods has also discovered a middle-Saxon site at Bawsey in west Norfolk, where a substantial Ipswich–ware scatter shows that the settlement, or possible monastery, was located around the top of a hill (Rogerson 2003, 112-114; Taylor 1999, 67-73), where the current isolated Romanesque church ruins are located at the eastern edge of the hilltop, facing east up the Gaywood valley.

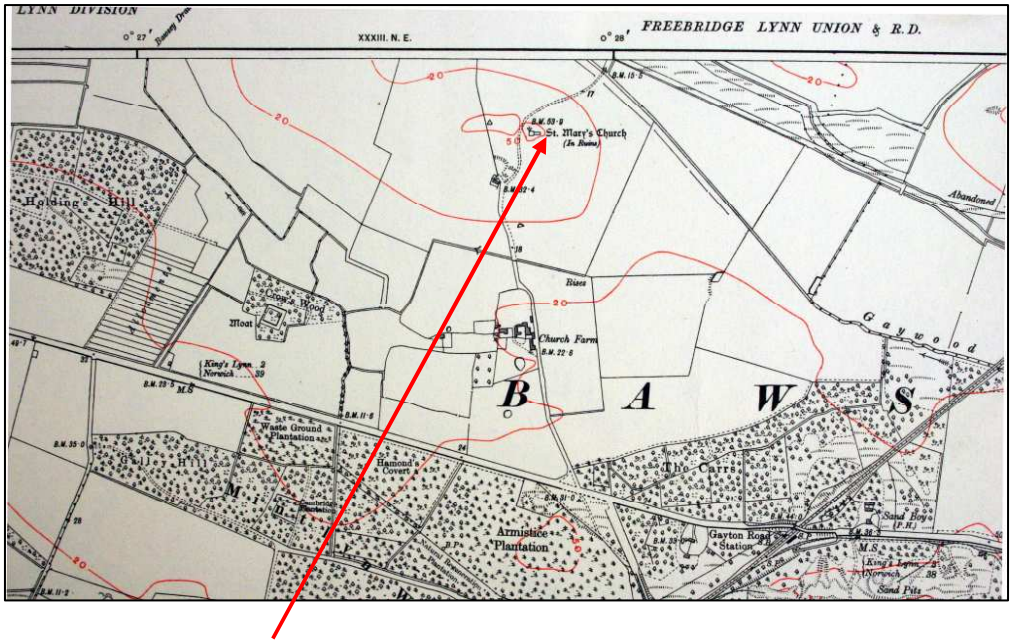


Figure 8.3 – St Mary's, Bawsey, Norfolk, at the eastern edge of the hilltop, surrounded by the 50′ contour (revised first series OS 1:10560 map)

Figure 8.4 – St Mary's, Bawsey, at the eastern end of the hilltop, seen from the north side of the Gaywood valley.

Middle-Saxon pottery was also found near several other village churches in the Launditch Hundred, sometimes in smaller amounts, often where "local conditions prevented much fieldwork near the churches" (Wade-Martins 1980b, 84): a middle-Saxon scatter 100 metres across near the churchyard at Longham (1980b, 34); to the north and east sides of the church at Beetley (1980b, 17); adjacent to the churchyard at Kempstone (1980b, 30); and small amounts were found at Great and Little Dunham, "where fieldwork was particularly restricted" (1980b, 84). When taken together with the sites in the Hundred where greater amounts of pottery was found, this indicates that at least half of the current villages in the area were in existence as settlements in the eighth century, either including, or very close to, the current church site. Only one of the twelve scatters of middle-Saxon pottery discovered by Wade-Martins was not associated with a church site – at Sutton (1980b, 84). Sutton was one of three DMVs in what is now the parish of Tittleshall, and it was located only 400 metres to the south of the middle-Saxon scatter at Tittleshall (1980b, 53-57), which did contain a church site.

Elsewhere in Norfolk, middle-Saxon pottery has also been found on the north side of the church at West Acre in west Norfolk (Davison 2003, 212-218), and around the neighbouring church of St Mary's in Barton Bendish (Rogerson 1997, 21-22). In the far west of the county, in West Walton, a number of scatters were found close to the church (Silvester 1988, 88-96). At Wickmere and Mannington, in north Norfolk, the churches were associated with scatters of middle-Saxon pottery (Davison 1995, 166-170), and at Witton, the greatest concentration of Ipswich-ware was found in the vicinity of the church (Lawson 1983, 70-72). In south Norfolk, a concentration of Ipswich ware and bone was ploughed up, identifying the site of the church of the DMV of Middle Harling (Davison 1983, 332-334); the position of the settlement was later confirmed by an excavated discovery of a hoard of middle-Saxon coins (Rogerson 1995, 121). Also, in south Norfolk at Loddon, a single mid-Saxon item was found at the edge of the churchyard, where the area around the church is completely built up, preventing further investigation (Davison 1990, 18; Williamson 1993, 90).

At all of the sites mentioned in these paragraphs various amounts of late-Saxon pottery were also found, frequently in the same area as the middle-Saxon ware but occasionally in separate areas where the settlement moved in the late-Saxon period, such as at Heckingham, Wormegay, Mileham and Wellingham. In each case however, the church site remained where the middle-Saxon settlement had been, which seems to

point conclusively to the church site being associated with the earlier period. It seems reasonable to assume from this that the remaining church sites in settlements that did not move during the late-Saxon period are also related to the middle-Saxon period. All of the sites mentioned are shown in blue on Figure 8.5 below.

In addition to the middle-Saxon sites identified by fieldwalking, records from the Norfolk HER indicate that middle-Saxon surface finds or excavated finds have been made, either pottery or metalwork, in 23 churchyards in the county. Seven of these are in the Launditch Hundred – East Bilney, Swanton Morley, Beeston next Mileham, Great Dunham, Great Fransham, Longham and Little Fransham, the remaining sixteen are spread all over the county – the find locations are shown in red on Figure 8.5 and are listed in Appendix 17 on pages 368-369. These finds indicate one of two possibilities; either that they are from an earlier use of the site, in other words pre-church or graveyard, or that they are yet another indication of middle-Saxon settlements around the church site.

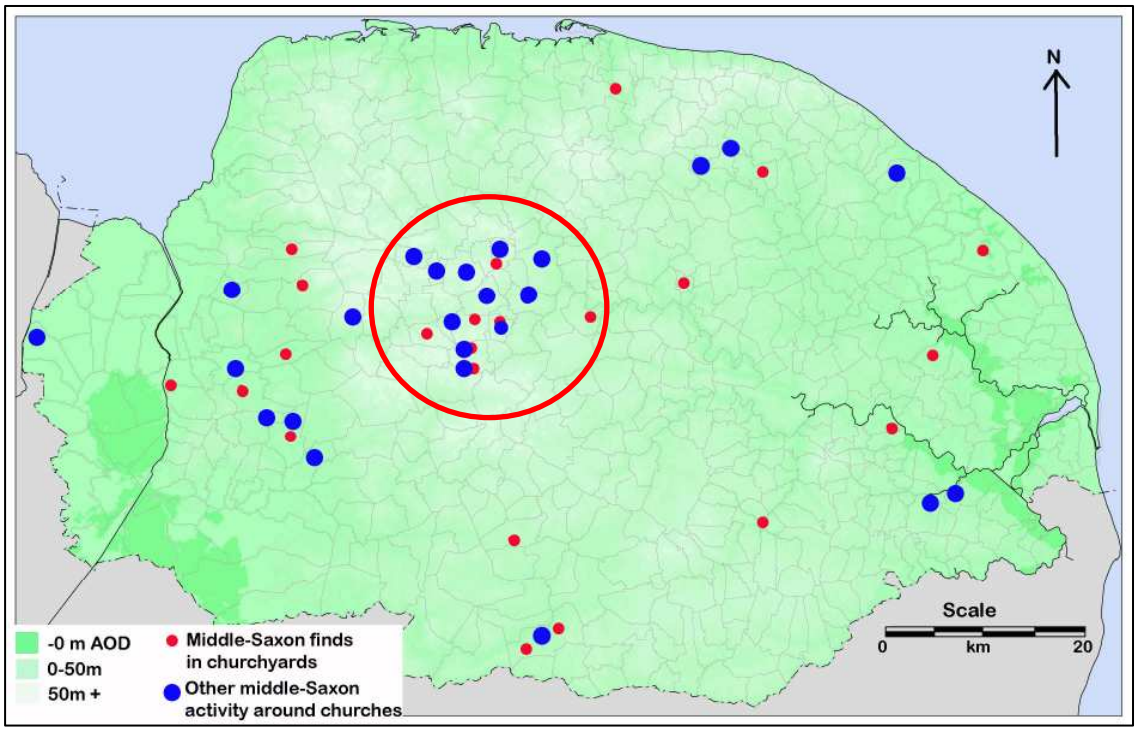


Figure 8.5 – middle-Saxon activity in and around Norfolk churchyards –sites in the Launditch Hundred are circled

In all, there are 43 distinct associations between middle-Saxon items and current church sites shown in Figure 8.5 above. It is appreciated that the pattern of

finds through fieldwalking and the churchyard finds reflect the concentration of fieldwork in particular areas, particularly in the Launditch Hundred, hence the higher than average representation there. However, the presence of finds over most of the county suggests that county-wide fieldwork at the same intensity as in Launditch, where almost one half of all the current villages were in existence in the middle-Saxon period and related to a church site, would uncover a similar concentration elsewhere and therefore a similar pattern to that in Launditch can be inferred across the county, which sees a persistent model of association between the church site and the middle-Saxon period.

Anglo-Saxon sites in Suffolk

Extensive fieldwork has also been undertaken in southeastern Suffolk by John Newman, covering many parishes either side of the Deben valley, close to Sutton Hoo. Summary results were published in 2005 (Newman 2005, 477-487) and displayed a pattern as definite as that found in Launditch in Norfolk, especially the relationship between church sites and middle-Saxon pottery finds. According to Newman, "All the major Ipswich-ware finds have been located near parish churches in the survey area … emphasizing the importance of these areas as nuclei around which later settlement grew" (2005, 483). "Of the twenty-seven parish churches in the area, twelve are associated with Ipswich-ware scatters [although thirteen are shown on his diagram including Foxhall with its lost church – Figure 8.6], and surveys around an additional six churches were not possible", leaving only nine churches where such pottery was not found (2005, 483), but this does not necessarily mean that there is none there. In addition to the middle-Saxon sites identified here, Rendlesham has to be added to the list of sites that were associated with middle-Saxon finds, as it produced pottery from all periods, and is known as the site of the Anglo-Saxon Royal palace and church identified by Bede (Warner 1996, 115; Carver 2005, 494; Newman 2005, 478). The twelve [thirteen] churches associated with middle-Saxon finds are shown on Figure 8.6 below, along with Rendlesham, showing this author's highlighting in red.

According to Newman, "the remainder of the sites close to parish churches fall into a phase of mainly ninth- or tenth-century expansion" on areas of "less attractive soil, drier heathland and heavier boulder clay", and he classes these as "daughter settlements, characterized by small quantities of middle-Saxon pottery as well as late-

Saxon pottery, a combination indicating a ninth-century origin" (2005, 483), highlighted in blue, below, although the presence of some pottery of the middle-Saxon period at these sites indicates a middle-Saxon origin for the settlement, albeit late in the period.

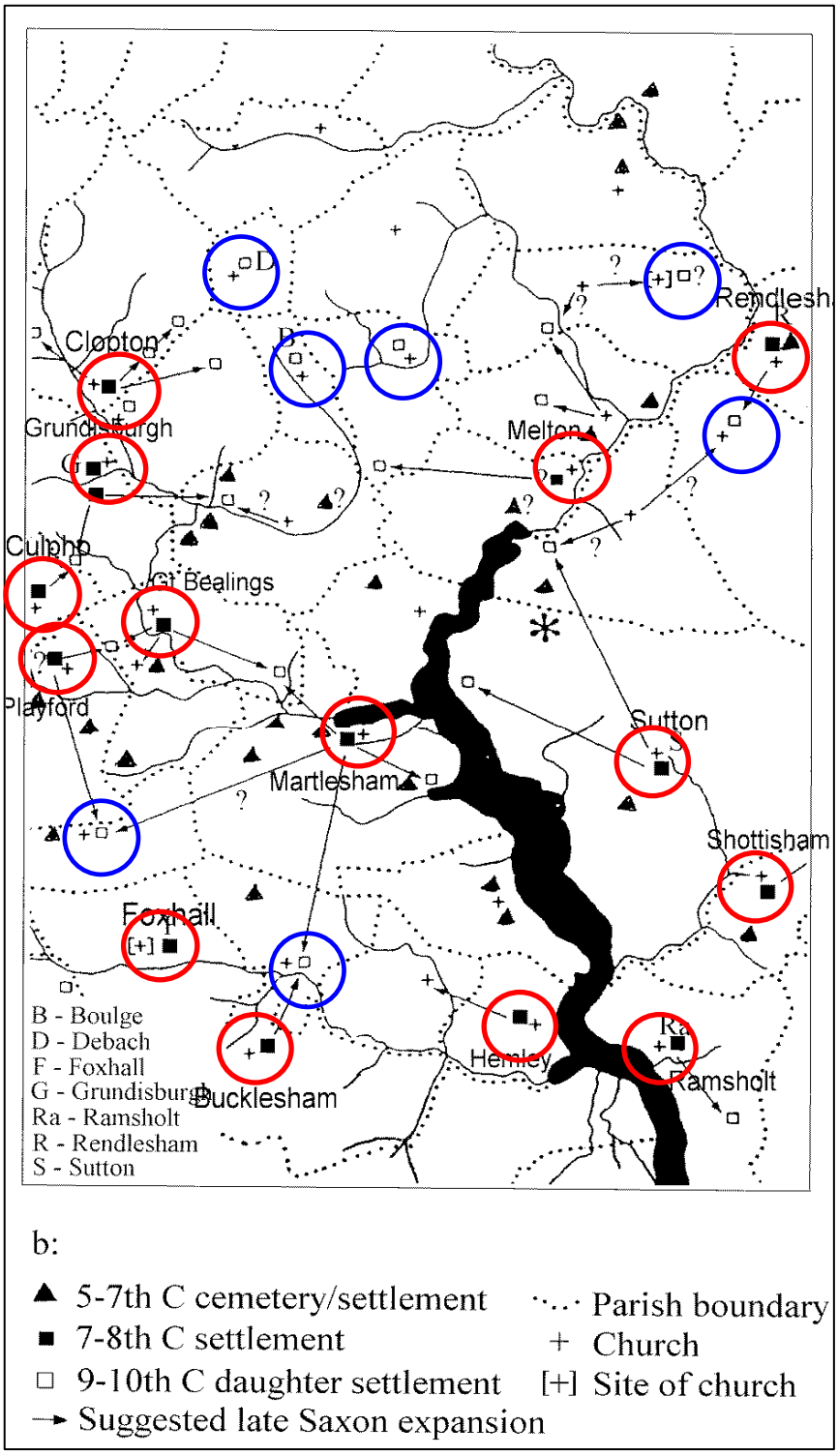


Figure 8.6 – Survey results from the Deben Valley in Suffolk (Newman 2005, Fig 216b, 481) plus this author's highlighting of identified middle-Saxon settlements adjacent to church sites in red, and late Saxon "daughter settlements" next to a church in blue

Fieldwalking evidence indicates that the population in the area "expanded through the late-Saxon period and up to the fourteenth century resulting in a dispersed settlement pattern along the lanes and footpaths in each parish, after which a large number of these small settlements were abandoned around the time of the climatic decline and the Black Death" (Newman 2005, 483). At least five of these churches are completely isolated now – Ramsholt, Melton, Grundisburgh, Great Bealings and Clopton. A settlement named Melton now exists about 1.5km to the southwest of the church and is a suburb of Woodbridge, whereas Ramsholt church has no buildings at all within the best part of a kilometre (see Figure 8.7), and the other three churches are isolated from small villages. In addition, Foxhall consists of just a single farm which incorporates part of the abandoned church as one of the outbuildings (Carver 2005, 493); Culpho church is accompanied by two cottages; Hemley is only close to Church Farm; and even at Rendlesham, the Saxon Royal seat, the church is now only close to the Old Rectory. The very fact that the current church is built where it is in all these cases confirms a continuity of religious use of the site since its middle-Saxon origin, as it would be an impossible coincidence if all of them were built on sites adopted later, but just by chance, amongst middle-Saxon pottery.

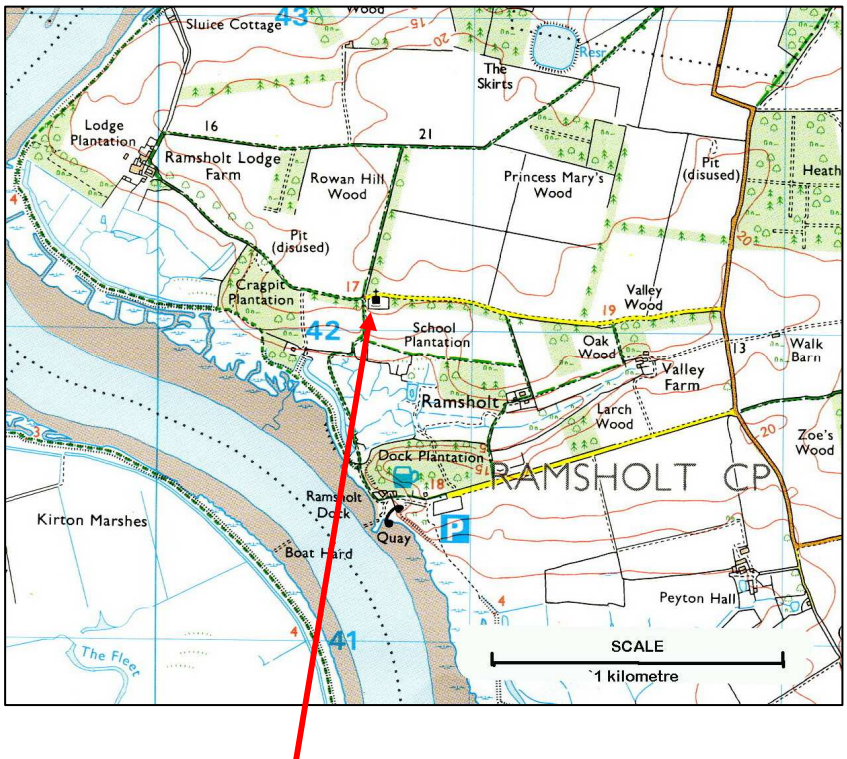


Figure 8.7 – All Saints', Ramsholt, in its isolated position.

OS Explorer sheet 197 © Ordnance Survey

Figure 8.8 – All Saints', Ramsholt, from the northeast

Figure 8.9 – All Saints', Ramsholt from the south

Further south in Suffolk, on the Shotley peninsular, “chance finds of middle-Saxon Ipswich-ware are still being made in the churchyard at Stutton”, where the walls of St Peter’s church also contain several large pieces of late-Saxon carved stone, “either from a grave-slab or a cross” (Laverton 2001, 63-64), again indicating continuity of religious use of the site. Like so many others analysed here, this church is also remote from the settlement and is located on an east-facing slope – a steep one. To complicate matters further, there is a spring in the churchyard (Laverton 2001, 106), which may also indicate that the site was selected for the purposes of Christianization.

Middle-Saxon pottery has also been found around some isolated churches in north Suffolk, although in smaller quantities than it has in Norfolk, and this suggests to Edward Martin that the churches there may only have ever been associated “with a small group of buildings – perhaps just a manorial complex” (Martin 2001, 5), although this pre-supposes that the manor and church were contemporary, and it could indicate a similar situation to the previous examples; an early local adoption of the site for religious purposes by the people of a small settlement. Whichever of these interpretations is correct in this instance, the pattern of association between middle-Saxon pottery and the church site continues in yet another part of East Anglia.

Anglo-Saxon sites elsewhere in Britain

Christopher Taylor highlights two further examples of the coincidence of middle-Saxon settlement and the church, both in Cambridgeshire. The first is Cottenham (identified by J. Ravensdale 1974, 121-123 & Fig 9; Taylor 1983, 157-159 & fig 60), where “the twelfth-century church is on the site of a sixth- to eighth-century village”, 800 metres away from the centre of the “ninth- to tenth-century planned (?) village” (Taylor’s question-mark), and not in the area of “the twelfth-century village expansion”, which stretches 1,500 metres away to the southwest. It appears here that the current church building is a replacement, built in the twelfth century (dateable from its architectural details, according to Taylor) when the village was expanded, but on the site of the original [mid-Saxon] church (although Ravensdale interpreted this as a re-siting of the church in the Norman period (Ravensdale 1974, 123)). According to Taylor, if it were to have been first built during either of the two later periods of expansion (during the ninth/tenth or twelfth centuries), the church would have been

built several hundred metres away from its current site, in either of the centres of expansion (Taylor 1983, 159). The second of Taylor's examples is at Burwell, where the church is located within the "original sixth- to eighth-century settlement area", rather than in "the ninth- to eleventh-century settlement expansion", or the later "planned medieval settlement" to the north (Taylor 1983, fig 57, 153), again pointing to the presence of a religious site, possibly a church, in the middle-Saxon period. Both of these sites appear to echo the situation at Heckingham and the other cases in Norfolk where the settlement shifted in late-Saxon times leaving the church site behind in its middle-Saxon location.

All twelve of the churches in the Whittlewood study in Buckinghamshire/ Northamptonshire "were once integral to their medieval villages, despite three of them lying semi-isolated now" (Jones & Page 2006, 184-185). The authors also feel that the chronology of "village foundation followed rapidly by church building appears to apply in all of them, except possibly at Lillingstone Lovell". Here, they postulated that the church "may have been located in a small nucleus to which the village was attracted" (Jones & Page 2006, 188). At Leckhampstead however, which they classed as "Whittlewood's oldest settlement" (Jones & Page 2006, 91), their analysis shows that this was another settlement with a church located in "the pre-village nucleus", an area of pre-850 CE settlement (Jones & Page 2006, Fig 32, 89), but they feel that the church came "after the nucleation", which according to their analysis is "post-900 CE" (Jones & Page 2006, 85-91). Since the church is built in the earlier settlement area, it appears that at least the church site is contemporary with it, as it is unlikely that the church would have been built in a later period, but in a slot in the earlier part of the settlement, unless it was already 'reserved', perhaps as a graveyard. Jones and Page also suggest that since this church has "an apparent association with the manorial site, [it] might be assumed to have begun life as a lordly foundation" (Jones & Page 2006, 186-187), although the manor is not shown on their settlement plan.

In Cornwall, at the western end of the peninsula, there are fourteen parishes, nine of which are classed as 'superior' and five as 'inferior' (Thomas 1989, 23). Figure 8.10 shows the churches associated with these parishes (in black), it also shows 26 pre-parochial chapels (highlighted in red), which were part of the early Christian landscape, either located in hamlets or as special-interest chapels, such as for sea-farers (Thomas 1989, 24). Thomas felt that these "proto-parochial" chapels and churches of the "sixth

to tenth century" (1989, 25), together with the burial grounds of the so-called *lann* model, also proposed by Thomas (1971, 49-51), formed a network of enclosed burial grounds prior to the formation of the parish structure with the noted fourteen parishes, after which many of the burial grounds and the chapels went out of use. The *lann* model has recently been called into question for the period before 800 CE by Petts (Petts 2002, 26-30; Turner 2003, 172), but it is only the date of the enclosure of the burial ground that is being questioned rather than the date or origin of early Christian burial sites separate from Monasteries (Petts 2002, 26 & 30), as Petts goes on to list several eighth-century West-Country and Welsh examples of unenclosed Christian burial grounds (Petts 2002, 30).

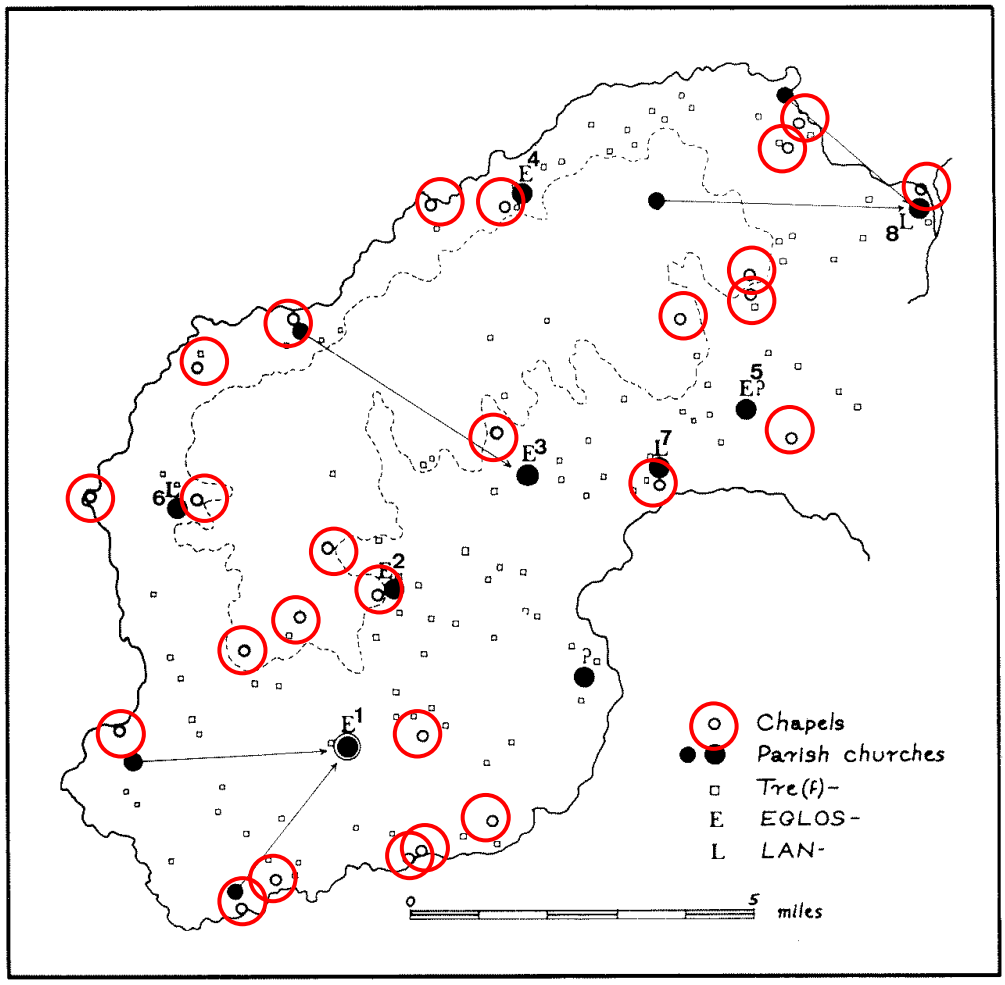


Figure 8.10 – Western-Cornwall parish churches and associated pre-parochial chapels (after Thomas 1989, 25) – this author's chapel highlights

Coin hoards from the middle-Saxon period as well as those from the cusp of the middle- and late-Saxon periods have been discovered in churchyards in many parts of

the country[39] (Morris 1985, 50). Their presence indicates that the graveyard must have been in existence well before this time in order to represent sufficient security for the deposition of valuables. What cannot be determined is whether the burial ground had become a churchyard by that time.

In each of these areas examined, Norfolk, Suffolk, Northamptonshire/ Buckinghamshire, Cambridgeshire and perhaps Cornwall, there appears to be a firm recurring association between the settlements of the middle-Saxon period - established either from pottery scatters, metalwork finds or settlement analysis - and church sites. It seems certain that these cannot all be special cases and that this is part of a much wider pattern. The lengthy period between the apparent establishment of the site in the eighth or early ninth century, and the building of the current church probably in or after the eleventh century, allows for considerable change in the specific use and importance of the site and in the importance of the settlement itself. Whether a form of church building was present on any or all of these sites at an early date is unlikely ever to be established, except in western Cornwall where they have already been identified, but the reservation of the site for religious use during the middle-Saxon period seems a distinct probability, although perhaps just as a graveyard. If some of the settlements in Norfolk and Suffolk had not shifted from their middle-Saxon origins, then much of the fieldwork research would not have been possible, and the situation of the church in the centre of the village, still on its original site, would have been completely unremarkable, and also entirely undateable. The many examples listed here, particularly those in Norfolk and Suffolk, have highlighted a situation which may be repeated in many, if not most, other villages – a religious site, established at an early stage in the development of the settlement, possibly just as a graveyard. In situations where the settlement subsequently did shift, even as early as the later ninth century as at the sites in Norfolk, the investment made by the community in the generations of burials, and possibly a church building, effectively tied it to its original site.

[39] http://fitzmuseum.cam.ac.uk/dept/coins/projects/hoards/index.list.html (accessed 9th April 2010)

DEVELOPMENT OF LOCAL CHRISTIAN BURIAL

The abandonment of large early-Saxon cemeteries has been argued to be a direct result of the conversion to Christianity (Hoggett 2007, 268-271); therefore the subsequent coincidence of cemeteries and settlements might be seen as part of the same process. The proximity of the living and the dead was Christian practice throughout medieval Europe and is seen to mean that they were still an important part of the community, and formed a focus for Christian worship (Blair 2005, 245; Morris 1989, 13; Penn 1996, 45; Thompson 2004, 170–206). Being part of the settlement, rather than separated from it, is often explained as those buried there were waiting for Judgement Day along with the living residents, whose prayers would help those who were already dead into the afterlife (Blair 2005, 228–245; Penn 1996, 45; Petts 2002, 44; Boddington 1990; Turner 2006), and that the churchyard was a safe place to await resurrection (Gittos 2002, 195). The local cemetery appears to be part of a two-tier hierarchy at this time, where larger burial grounds were located in missionary stations, often in Roman forts, such as at Caister in Norfolk, where 3000-4000 burials dating from the seventh century were found (Darling & Gurney 1993; Penn 1996, 41), but local burials in individual settlements were endorsed in certain circumstances, frequently where distance was a problem (Morris 1983, 49–62; Blair 2005, 240–245; Boddington 1990), along rather similar lines to the later establishment of chapels of ease. Helen Geake also points out that final-phase cemeteries co-existed with early churchyard burials in several places, Norfolk included (Geake 2002, 151-152).

How often did middle-Saxon cemeteries evolve into sites containing churches or chapels? The examples of cemeteries that have been discovered did not evolve any further, but that is why they are known, because they were separate from, rather than being obscured by, later churchyards and settlements. As the population grew during the middle-Saxon period, there must have been more burials than during early-Saxon times, but middle-Saxon cemeteries are rare discoveries in Norfolk. In all, 63 Saxon inhumation cemeteries have been discovered in Norfolk, of which only thirteen are from the middle-Saxon period (Myres and Green 1973, 258– 62; Hoggett 2007, 210-214).

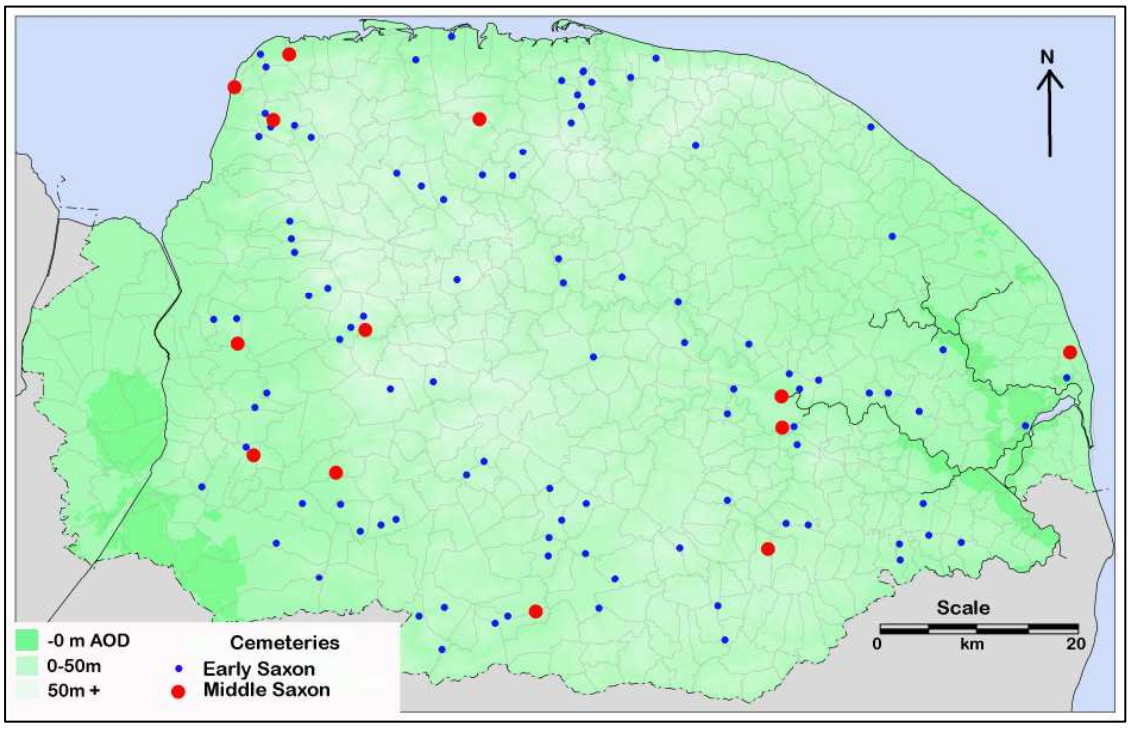


Figure 8.11 – Norfolk, early-Saxon and middle-Saxon cemeteries (data from Myers and Green 1973, 258– 62 and Hoggett 2007, 214)

As can be seen from Figure 8.11, despite the small numbers of middle-Saxon cemeteries that have been discovered, both early-Saxon and middle-Saxon types are distributed across the whole county; from west to east and north to south, the major difference being the numbers discovered. Hoggett relates part of the reason for the extra discoveries of early-Saxon cemeteries as due to their greater 'visibility' with more metal finds, helped by the fact that they were remote from settlements (Hoggett 2007, 216), similar to the early middle-Saxon cemeteries such as at Morningthorpe, where up to a quarter of the graves contained weapons (Green & Rogerson 1987, 7). There are two known, excavated, middle-Saxon cemeteries in East Anglia that were integrated into their settlements; firstly at Sedgeford in northwest Norfolk, where a slight shift in the location of the late-Saxon settlement, left the earlier phase undisturbed and has enabled excavation of some of the middle-Saxon settlement, which included an inhumation cemetery of over 200 apparently Christian burials within the settlement (Cabot *et al.* 2004). Secondly in Suffolk, where excavation at Bloodmoor Hill, Carlton Colville, near Lowestoft, has discovered 24 graves integrated into the settlement, which suggested to the writers a Conversion-period cemetery which was separate from the earlier pagan burials on the crest of the ridge close by (Mortimer & Tipper 1998, 14;

Dickens *et al*. 2006, 74-76). The remainder of the middle-Saxon Christian cemeteries in East Anglia are probably still hidden beneath later settlements or churchyards which have not moved from their original site (Geake 1992, 86–7; Newman 1992, 26; West 1998, 317; Hoggett 2007, 319), as is strongly indicated by the number of churches that are located in middle-Saxon pottery scatters identified by the field walking, particularly by Alan Davison at various sites, by Peter Wade-Martins in Launditch – where half the current villages in the area were in existence as settlements then – and by John Newman in the Deben Valley, noted earlier.

Under the minster-model, teams of monks based at the minster church would have visited local settlements to preach, and the burial rights for the area are likely to have been vested with the minster. These rights, and their income, must have been carefully observed and closely guarded. What does this say about local burials in villages close by? Such burials can hardly have gone unnoticed by the monks who preached in the area, especially if the graveyard also acted as the preaching site. Either local burial was overlooked completely, or a blind eye was turned, perhaps after payment, as these villages are hardly remote from burial facilities and therefore not able to claim justifiable relief from centralized burial in terms of distance, indicating that the tacit endorsement of local burials may have been much wider than previously thought. Archbishop Wulfstan's later law codes hint at this by commanding that soulscot was to be paid to the minster to which it belonged, even if the body was buried elsewhere (Morris 1983, 65; Blair 2005, 444), which was the codification of a practice continued since at least the ninth century, when it was mentioned in charters (Gittos 2002, 201; Hadley & Buckberry 2005, 122-123).

John Blair suggests that "lay burial in churchyards was exceptional in 650 CE", but by 850 CE (the beginning of the late-Saxon period) was "starting to become the norm" (Blair 2005, 228), although referring specifically to burial at minster churches. The excavations of middle-Saxon graveyards at Sedgeford and Bloodmoor Hill confirm that the process of local burial probably became common somewhat earlier, and this is similarly suggested by the analysis of settlements outlined in this chapter, and that by 850 CE, instead of 'starting to become the norm', local burial may actually have been the norm, although not necessarily in churchyards. This is supported by Lucy and Reynolds who suggest that in the eighth and ninth centuries "many, if not most, were buried in rural cemeteries, perhaps unenclosed, but possibly quite

substantial if the example at Chimney in the minster *parochia* of Bampton is anything to judge by." (Lucy & Reynolds 2002, 13). Hoggett goes as far as to suggest that "the vast majority of the population appears to have been buried in newly founded inhumation cemeteries situated in middle-Saxon settlements (Hoggett 2007, 322). John Blair also points out that ground used for burials does not need to have been consecrated at this time and there may have been a general belief that the actual ceremony of burial was more important than the specific location, and further, that village burial grounds in parts of Europe were often consecrated later (Blair 2005, 229). In addition, he notes that there were areas in northern Europe where village burial sites co-existed with churchyards (Blair 2005, 228-229), and points to local burials in neighbourhood or kindred cemeteries paralleling those in minster churches (2005, 180). In other parts of northern Europe however, particularly the Frankish parts, burial practices were different from those in Britain, in that furnished burials have been found in churchyards "in many cases", whereas in Britain, churchyards "almost without exception" never contain grave goods (Geake 2002, 149); an answer for this difference is still sought, but could indicate that, in this country, churches were only built over Christian cemeteries, whereas 'final-phase' cemeteries may have been overbuilt in parts of Europe.

Cuthbert, as Archbishop of Canterbury in the middle of the eighth century, authorised burials inside towns, and this "created cemeteries everywhere in England" (Morris 1983, 50; Allcroft 1930, 426-427), a situation noted in *Hamwic*, where ten separate burial sites have been discovered in the middle-Saxon settlement (Morton 1992, 68-77), but their short life suggests that they were encroached upon, "rather than remaining in use to a later period in the manner of rural cemeteries" (Lucy & Reynolds 2002, 13). Subsequently, burial in holy ground "was promoted by the Church as a privilege" (Morris 1983, 50-51), thus recognising that the majority of burials took place outside consecrated ground. This and the previous arguments support the proposition that, at an early stage in their formation, many, if not most, settlements in this country had areas within them that were reserved for burials, which were later formalized as church sites, whether soon after, or after a longer period, cannot be determined.

Churches without graveyards, graveyards without churches

The analysis here has shown that it is probable that there were a large number of small graveyards in the middle-Saxon period around the country, no mention of which appears in the national picture of religious sites as painted by the various late-Saxon law codes. However, none of the categorizations of churches contained in these codes precludes the possibility that in remote rural areas, well before the tenth and eleventh century, people in small hamlets or proto-villages had reserved and used plots of lands for burial in the same way as Blair had noted in Europe (Blair 2005, 228-229). Penn refers to these sites in East Anglia as "unchurched cemeteries" (Penn 1996, 45). If this did happen at such a local level, were these sites considered at all by the law-makers when preparing the laws and defining categories? Since they may not have been consecrated, they were outside the listed categories and appear to have slipped completely under the radar.

Once such sites were established by usage, it would be a natural progression when erecting a church, to put it on the same site, even if it was a new land owner establishing his new estate in the area. Could the building of a church there have helped legitimise the new ownership? It has been suggested that, as part of Christian substitution, the adoption of a site for a church that had had previous ritual significance could add *kudos* both to the church and to the adopter (Morris 1989, 74; Blair 2005, 382). Perhaps this *kudos* could also apply to a late-Saxon in-comer, by building a church on a site that had been used for some time by the residents for Christian burials. Of the thirty-five sites mentioned earlier with identified middle-Saxon connections in Norfolk, only one, at Saxlingham, has the hall next to the church (3% of the total), compared with one in seven (14%) of all churches in the county; this reinforces the possibility that these sites were selected for the church by the landowner because of the graveyard that was already established there, rather than build it next to his hall. As Helen Geake suggests, it is possible that in some cases burials may attract churches, rather than *vice versa* (Geake 2003, 266). In a slightly different context, another possible example of 'legitimisation' by the erection of a church could be the keeill at Speke Farm on the Isle of Man, investigated in 2007 by the *Time Team*, which was thought to be from the tenth century or after, when the Vikings adopted Christianity (Wessex Archaeology 2007, 21), but built centrally in a Christian graveyard which had

been in use since around 590 CE[40], which itself was in an area used for Bronze-Age burials.

This analysis appears to show that the delegation of burial rights was spread through practice rather than by law. The subsequent building of a church may, in some cases, have been effectively ratifying the earlier use of the site as a graveyard when both were consecrated at the same time, as has been noted when church sites have been excavated, when it has often been found that the church was preceded by unfurnished burials (Morris 1989, 152-153; Geake 1997, 267). An early adoption of local burial or the early distribution of burial rights would be likely to mean that folk religion played a much greater part in the process than if local burial was only sanctioned at a later date and imposed from above, when the reasons for, and processes of, burial would have been more focussed on the liturgy and teachings of the Church. This is discussed further when considering local religion of this period and the use of cult sites, later in this chapter.

[40] Details from http://channel4.com/history/microsites/timeteam/2007_iom_found.html (accessed 26th Oct 2009)

Village then graveyard or graveyard then village

Most of the middle-Saxon settlement sites identified by fieldwalking in Norfolk and Suffolk were found next to the church rather than surrounding it (Wade-Martins 1980b; Newman 2005). This could be explained in two different ways; firstly, that the restricted availability of land for fieldwalking prevented investigation on all sides of the church, so that other pottery around the church site might remain undiscovered. Very few churches are completely surrounded by arable land for fieldwalking, even the isolated churches in this survey have often been sited next to a building, frequently a farmyard. Secondly, it could reflect a real situation where the graveyard really was located at the edge of the original settlement.

A detailed topographical assessment of each of the sites in Norfolk and Suffolk where scatters of middle-Saxon pottery were identified is outlined in the next section, where it shows that the majority of the sites are associated with east-facing slopes. If the graveyard was located in the settlement, it seems to offer the possibility that the chosen site with its east-facing slope actually determined the position of the rest of the settlement. It is possible that, during the period when settlements were beginning to nucleate in the late eighth or early ninth century, a particular site for both settlement and graveyard was chosen from a number of alternatives as it offered the opportunity to locate on an east-facing slope, whereas a graveyard located outside the settlement could represent a situation where the settlement location had already been established, after which a suitable piece of land was sought for the location of the graveyard close by; and, with a number of available sites around the settlement, the one with the most suitable east-facing slope was selected. Particularly in the first case, this would imply that the need for a site for the graveyard was occurring very early in the process of settlement nucleation. The idea of early small graveyards in Norfolk and Suffolk fits well with the conclusions of Rik Hoggett concerning the speed of the Conversion in East Anglia, in that he postulates that it happened both more quickly and down to a lower social level than has been previously suggested (Hoggett 2007, 328-331). After the Conversion the incorporation of the dead into the community took on a new importance, rather than burial in either the remote cemeteries of the pagan period, or the remote early Christian cemeteries in the Missionary stations. Perhaps the Conversion prompted the search for a new settlement-site or a burial-site with a suitable east-facing slope. If this was the case, it could date the cemeteries to the late

seventh or early eighth century. No early-Saxon pottery was found at any of the sites in Norfolk or Suffolk where middle-Saxon pottery scatters were identified next to the church (Newman 2005, fig 216b, 481; Wade-Martins 1980b), indicating that these were all new settlement sites, rather than the fixing of a settlement on a site used in the earlier period.

Richard Morris also saw a similar pattern of local burial developing as that described above, but placed it within a later time frame (Morris 1983, 54). He suggests a sequence of remote seventh- to eighth-century graveyards developed adjacent to earlier pagan cemeteries, a process noted at Winchester by Martin Biddle (Biddle 1976, 69), followed by an eighth- to ninth-century transfer to Christian cemeteries or churchyards (Morris 1983, 54), although this second element is later referred to as an eighth- to *eleventh*-century exercise, which "usually belonged to proprietary churches attached to manorial centres" (Morris 1983, 62). Morris also suggests that graveyards were only rarely established in advance of churches (Morris 1989, 153), and adds that "If churchless burial grounds were a widespread phenomenon in the ninth or tenth century, one would expect a much larger number of incidences where the cemetery failed to evolve from graveyard to churchyard" (1989, 153). Although only two such cemeteries have been excavated in East Anglia, at Sedgeford and Bloodmoor Hill, it does indicate a considerable amount of burial activity, but where the settlement shifted or died out before the burial ground had a chance to be over-built with a church. However, the analysis here seems to point to numerous early cemeteries which became, and remained, the churchyard despite the fact that the original settlement moved, even if the shift in settlement was in the late ninth century, soon after the beginning of the late-Saxon period, as at Heckingham and Wormegay in Norfolk and Cottenham in Cambridge. What cannot be determined is whether the burial ground was still churchless at this time.

Whether the early adoption of village burial sites proposed in this thesis occurs with the same consistency elsewhere as it appears to have done in parts of East Anglia, is unclear, although Richard Morris does recognize different patterns of early Christian cemetery development between the Midlands and East Anglia when commenting that "the Midlands appear to be richer in such examples [of pagan cemeteries close to medieval churchyards] than the East Anglian counties" (Morris 1983, 59). However, the settlement analysis by others, noted earlier, in some Midland counties (Cambridge

and Northamptonshire/ Buckinghamshire) (Taylor 1983; Ravensdale, 1974; Jones & Page 2006) appears to point to some church sites located definitely within the earliest part of the settlement, which could only happen with regularity if the founding of the cemetery was contemporary with, or soon after, the establishment of the nucleated settlement, rather than later, when a church was first built, otherwise the site would be located away from the earliest settlement centre.

Circular, or sub-circular boundaries are frequently considered to be possible indicators of an early churchyard (Rowley 1972, 81; Thomas 1971, 51; Morris 1989, 455; Friar 1996, 121), although this is more likely to be an indicator that it was the first use to be established on a remote site without any neighbours, as a circular boundary is the shortest in length that can enclose a given area and is the easiest to construct if there are no other constraints, indicating perhaps a yard remote from, or on the edge of, a settlement. If an integral yard was set out as part of the establishment of a settlement, it would be most likely to have straight boundaries fitting in with the plots on either side, as did many of the churchyards analysed in Lincolnshire by Stocker and Everson (2007, 61-65). In addition, Richard Morris has identified at least three yards in Wales that have circular boundaries, but which were new in the twelfth century (Morris 1983, 58), confirming a first-use, rather than necessarily an early-use, of the site.

In dispersed settlements, perhaps the location of the church or burial ground could be selected with more freedom than as part of a nucleated settlement, since it was not "bound" by the boundaries of the village. The location of freemen-built churches, which occur in East Anglia particularly, means that their actual siting was not determined by *lordly* locational requirements, but frequently determined by accessibility, pragmatically located between the farmsteads involved (Warner 1986, 43; Williamson 2006, 89), meaning that other factors, such as previously important sites, either an early graveyard located for the same reasons, or a prehistoric ritual site, could still come into play when selecting the actual church site.

Detailed landscape assessment of Norfolk and Suffolk middle-Saxon settlement sites

The analysis in this chapter has established a strong link between middle-Saxon settlement sites and current church sites in parts of East Anglia, possibly through early graveyards. Since a number of these sites (in south Suffolk) were outside the original church survey areas, the topography at all these sites has been subsequently surveyed in more detail in order to assess whether they are located on slopes and whether the link that was established between churches and east-facing slopes in the last chapter is continued in these early religious sites.

Norfolk middle-Saxon sites

The intensively studied Launditch Hundred, with many churches located next to middle-Saxon pottery scatters, or middle-Saxon finds in churchyards, provides a compact area in which to examine the landscape more closely. It consists of 30 modern parishes, covering an area of about 20km east to west by 15km north to south, and is located firmly in the Central Norfolk Claylands which are described as "poorly-draining stagnogleys formed on Boulder Clay, forming extensive level tablelands" (Williamson 2005, 8). These 'tablelands' are approximately 80–85 metres AOD in the west of the Hundred and 65-70 metres AOD in the east of the Hundred (OS Explorer sheet 238), meaning that overall, the land loses fifteen metres in height over a distance of 20 kilometres – flat by any standard. The eastern boundary of the Hundred is formed by the River Wensum, one of the County's principal rivers, which is some 45 metres below the tableland-level at the bottom of a fairly steep slope. In all, sixteen of the parish church sites in the Hundred have an association with middle-Saxon finds, eleven sites identified by Wade-Martins (1980b) and the seven which had middle-Saxon finds in the churchyard recorded on the Norfolk HER (two of which were also identified by Wade-Martins' fieldwalking).

The topographic survey results for this area show that there is a link between east-facing slopes and these sites, although the sample is too small to be able to declare it a significant link. Half of all sixteen sites were associated with east-facing slopes, whereas only one-third of the sites had down slopes in all the other three directions added together (16 of 48 possible slope directions). Just over half of the eleven middle-Saxon settlement sites identified by Wade-Martins (1980b) are located on gentle east-

facing slopes; North Elmham, Wellingham, Mileham, Kempstone Longham and Beetley, although they are too shallow to be included within the two per cent slope category in the main survey; a further four have level land to the east (Horningtoft, Weasenham, Great and Little Dunham), and at Tittleshall the land rises slightly to the east and falls to the west. Both the current church and the Anglo-Saxon Cathedral (Wade-Martins 1980a; Rogerson 2005) at North Elmham are on the 45 metre contour looking out over the Wensum valley to the east, the cathedral site has land falling away to the north and south as well as east. At Mileham, the church is on the 60 metre contour and has a sloping easterly view along the shallow Blackwater valley, a tributary of the Wensum. At Wellingham, the church is located on a small knoll above the village, close to the 70 metre contour, the land falls very gently to both the north and east. At Weasenham All Saints, the church is on the 80 metre contour, the land is level to the east, but falls away slightly to the north and west. The church at Horningtoft is on the 65 metre contour and the land is level for some distance in every direction. At Kempstone, the church, now ruined and in parkland, lies on a spur of land which falls away to the east, north and west, but rises slightly to the south; at Longham the land falls away slightly to the south and is level in the other three directions and at Beetley, the land falls to the east and north, is level to the west and rises slightly to the south.

Of the seven sites associated with middle-Saxon finds in current churchyards noted on the Norfolk HER, two are located at the top of east-facing slopes (Swanton Morley and Beeston), Longham is on a gentle east slope and four are on land which is level to the east (East Bilney, Great Dunham, Great and Little Fransham). Swanton Morley is a particularly good example of a church and yard located in a position which maximises both the eastward view from the church and the view of the church from a distance (see Figures 8.12 and 8.13), and has almost the entire churchyard on an east-facing slope. It is located on the top of a knoll between the River Wensum and a tributary, on the 40 metre contour, with a steep slope down to the Wensum which turns east at this point allowing a view along the valley.

Figure 8.12 – All Saints', Swanton Morley church at the top of the slope, with its graveyard spread out down the east-facing slope

Figure 8.13 – All Saints', Swanton Morley from four kilometres to the east, viewed from the north side of the Wensum valley

Suffolk middle-Saxon sites

The thirteen sites where current parish churches are located adjacent to middle-Saxon settlements, identified by pottery finds by John Newman (2005), have each been visited and assessments made of any slopes in the landscape. They are located either side of the River Deben. The lower part of the valley is on the southern edge of the coastal Sandlings (Williamson 2008, 29-34), some 20 metres AOD, and those in the upper valley are located on the southern edge of the clay plateau (Williamson 2008, 33), between 30 and 40 metres AOD (OS Explorer sheets 197 & 212). There are three times as many sites sloping down in both easterly and southerly directions than those sloping to the west or north. At nine of the thirteen sites (69%), there is a slope down to the east, three of which were steep enough to have been classified as a sloping site had they been part of the main survey (steeper than 1 in 50) and three of these nine are located on the east side of the river, despite the fact that there is a general westward slope down to the river. At ten sites (76%), the land sloped down southwards, at three (23%) the land had a northward slope and three had a westward slope.

Middle-Saxon sites summary

The settlement sites, with their possible graveyards, investigated here which are associated with middle-Saxon pottery, in both Norfolk and Suffolk, are dominated by east-facing slopes, even shallow ones, despite the fact that the sites in Norfolk are on essentially level ‘tablelands’ and three of the nine in Suffolk are on the eastern side of the River Deben, where the land generally slopes to the west, down to the river. In all, of the twenty-six sites in the two counties, the land slopes down to the east in fifteen cases (58%), thirteen to the south, seven to the west and six to the north. The opposite, which seems to confirm the importance of the east slope, is that the land only rises in an easterly direction in three cases, whereas there are six rising to the west, five to the north, although none to the south. Taken together, these topographies seem to indicate strongly that an east slope, however shallow, was important when the site was first selected, whether it was for a church at this time or for a graveyard. The fact that this link between east-facing slopes and middle-Saxon settlements and their possible graveyards is extended into the pattern of churches built on sloping sites over most of the country could imply that all of the churches on east-facing slopes are built on early graveyard sites.

Unfortunately, the need to identify the shallower east-facing slopes, (of less than 1 in 50) that showed up in the closer examination of middle-Saxon sites in Suffolk and Norfolk, was not recognized until well after the general survey for this thesis was completed and the data were being analysed, so the direction of the those shallow slopes, classed as 'almost flat' in the survey – at 369 sites across the country – was not recorded, so may hide a continuing association between church sites and east-facing slopes, however shallow, that was uncovered in the analysis here.

OTHER POSSIBLE LINKS WITH EAST-FACING SLOPES

Having established in the previous chapter that a strong link exists between church sites and east-facing slopes, even some very gentle ones, which could point to a requirement for Saxon burial sites; the remainder of this chapter investigates other possible reasons why church sites might be located on easterly slopes. Firstly, the eastern view itself is discussed and how else the view might have been achieved; then Christian substitution is investigated as a possible factor in the selection of the site for the church, or whether it was only a coincidence of site requirements for both the prehistoric ritual site and a Saxon graveyard, that meant that a church was built there.

An easterly view – how can it be achieved?

The apparently disproportionate selection of east-facing slopes for middle-Saxon settlements (possibly graveyards) surveyed here, and for the churches in this survey which was identified in Chapter Seven, indicates that the direction of the slope was specifically chosen for these sites and therefore that it was important to the site's function. This raises the question of how did those without such topography available to them manage to achieve a similar advantage?

The ultimate distance of the eastern horizon can never have been the sole focus for the selector of the site at any church or graveyard, even those on east-facing slopes; otherwise all sites would be located at the top of the slope, or on the highest point possible in the parish, in order to gain the furthest view. Very few churches are built on the highest point in the parish. In Norfolk, only **58** churches (approximately 1 in 9) are sited at a height which is within 10% of the highest point in the parish (for example sited above 90 metres AOD, compared with a parish highest point of 100 metres AOD), whilst twice as many (**124**) are sited below 50% of the highest point in the parish (in other words below 50 metres AOD compared with a highest point of 100 metres AOD).

Table 8.1 – Comparison of highest point in the parish with the height of the church AOD, in Norfolk			
Number of churches:	Number	With level horizon	Horizon of 2° + elevation
Within 10% of highest point	**58**	41	17
Between 11% & 49%	343	200	143
50% of highest point, or below	**124**	64	60
Fenland churches	24	-	-
TOTAL	549	305	220

However, any church that has a level eastern horizon, even one built on flat land, will have the longest view possible, as it is the elevation of the horizon that determines the distance of the horizon from the observer. Similarly, any church built at the top of a slope of any direction will have a reasonable eastern view, as by definition, being at the top of the slope means that the ground must either be level or downhill in the other directions, so even a church built at the top of a west-facing slope will have as good an eastern view as possible. Consequently, churches at the top of any slope but with a level eastern horizon should be added to those on the east slopes as also representing the best site possible for an easterly view, along with churches built on flat or almost flat sites which also have a level horizon.

In order to calculate the number of churches in Norfolk with the best eastern view available, many churches need to be added: 47 churches on east-facing slopes; five of the 31 churches built at the top of slopes facing in other directions, 262 churches built on flat or almost flat sites with level horizons, and 34 of the 68 churches with level horizons that are built on platforms. This results in 348 churches of the total of 549 surveyed in the county (63% of the total), which might be said to have the 'best' eastern view possible. In the other counties in this survey where the elevation of the church horizon was measured, the equivalent figure of churches with the best eastern view is 65%, made up of: 68 on east-facing slopes, thirteen of the 61 built at the top of slopes in other directions, 256 churches built on flat or almost flat sites with level horizons and 46 of the 92 churches on platforms, adding a further 315 churches to those built on east-facing slopes.

With two-thirds of all the church locations having a good eastern view (63% in Norfolk and 65% elsewhere), the fact that only around one in ten of all churches (9% in

Norfolk and 12% elsewhere) are located on an east-facing slope creates something of a paradox. Throughout this analysis, the assumption has been that the east-facing slope was chosen for its view eastwards. If a long easterly view can so easily be obtained from sites with different topographies, there must have been another reason why east-facing slopes seem to have been sought out over slopes in other directions – the following sections examine some possible reasons.

Cult Sites and Christian Substitution

Various types of earlier ritual site have been thought to have influenced the location of some churches; barrows, standing stones, springs and other features have all had churches built next to them, or even over them, with many examples identified in Chapter Two. It has been argued that the incorporation of such sites was actively encouraged by the early church hierarchy, under the broad heading of Christian substitution. The possibility that this type of site may have had a link with the east-facing slopes, and that the earlier use was the sole reason for the link between churches and eastward slopes has to be considered.

Many of these sites are naturally associated with slopes. Barrows are well known for being placed near the top of a hill, on a 'false crest' presenting a prominent sightline from below; springs, although dependant on geological permeability, are usually associated with slopes; the other classes of site, such as standing stones, henges, trees or even Roman sites, can be associated with either flat or sloping sites. However, the direction of the slope for any of these sites, including barrows and springs, is not critical to their location - any slope direction will do, unless the direction of the slope was an integral part of the meaning of the site for the people who first developed it. The unanswerable question remains – did any of these sites require an east-facing slope? Sunrise at any time of year is seen in an approximately easterly direction, and the association with east has been important to most known religions, as outlined in Chapter Three, and it seems reasonable to assume that this also applied in prehistoric times, given the number of examples of eastward alignment noted earlier in prehistoric contexts in Chapter Three. Therefore, it is logical to assume that an east-facing slope would have been chosen if there was a choice of sloping sites for an early ritual site.

John Blair sees the process of exerting control over what he describes as "open-ground cult places" as part of "the whole thrust of western European seigneurialization during the tenth and eleventh centuries" (2005, 382), but this firmly refers to the building of churches on these sites. A possible example of such a site is illustrated in Figure 8.14 below:, a remote church, built on top of a hill, serving a village named Ellough in Suffolk, which is named after a pagan site - an Old Scandinavian heathen temple (Ekwall 1989, 164; Mills 1991, 120).

Figure 8.14 – All Saints', Ellough, Suffolk, located at the top of a hill, remote from the small village, which is named after an Old Scandinavian heathen temple

The results of the examination of churches known to be associated with middle-Saxon settlement in Suffolk and Norfolk, with their predominance on east-facing slopes, appear to suggest that the process of 'exerting control over old sites', suggested by John Blair for the tenth- or eleventh-century development of churches (Blair 2005, 382), may have been pushed further back in time for the selection of early graveyard sites in the eighth or ninth centuries, well before the late-Saxon church-building phase. It is impossible to determine, after 1,300 years, whether it was the requirements of an Anglo-Saxon Christian, or a prehistoric pagan, that meant that the

east-facing slope was selected. It is just possible that some of these slopes were once populated by sacred groves which have died out or have been cleared; or by springs which have dried up as groundwater levels have changed, neither of which would leave much of an archaeological record still visible. It also has to be appreciated that many prehistoric sites could still have had identifiable remains in the eighth or ninth century when establishing an early graveyard site, as the seven hundred years or so between the end of the Iron Age and 700 CE are within the lifespan of some hardwood trees, particularly the oak and yew. Additionally, 700 CE is almost as close to the end of the Bronze Age as it is to the present time. So from this point of view, it is impossible to tell whether transient prehistoric ritual sites determined the locations of some graveyards or churches, as any earlier features, which may have been more obvious then, are no longer visible.

Looking at the issue from the other side, even if the church is built next to obvious remains, it is not possible to state with certainty that the church was built on the site *because* of the remains, rather than because both uses had similar site-selection requirements - an east-facing slope. So, despite the calls from the Pope at the beginning of the seventh century to incorporate local cult sites, proximity of a church and a prehistoric feature cannot necessarily be taken as proof of this process, and this situation is supported by the conclusions of James Rattue and John Blair, mentioned in Chapter Two, when for various reasons they feel that the extent of Christianization has been overstated. This applies particularly to the fact that pre-eleventh-century minster churches appear to have been sited with little interest in Christianizing sites (Blair 2005, 376), and that so many sacred wells or healing wells had been ignored by the church (Rattue 1995, 42; Harte 2008, 93). Richard Morris also suggests that despite paganism still being a force to be reckoned with [in the period up to the Conquest], the issue of churches commonly being built on pagan neighbourhood sanctuaries “is an open question” (Morris 1989, 92).

Although Christianization may not have been high on the agenda for the upper levels of the late-Saxon church hierarchy, it does not mean that it was not a factor during the earlier stages of Christianity and at a lower level. The fact that there are a considerably larger number of churches built on east-facing slopes than would be expected by chance cannot be without explanation. On the face of it, the idea that this may have been part of the view that the dead were awaiting the Second Coming from

the east seems plausible, except for the fact that an extended eastern horizon is available from many different types of site, including flat ones, apparently making the specific selection of an east-facing slope unnecessary. However, the majority of the church sites based in middle-Saxon settlements in Norfolk and Suffolk, surveyed here, *are* located on east-facing slopes, which seems to leave the balance of probability pointing to some form of *local* Christian substitution as one of the reasons for the selection of east-facing slopes over others for the many sites that later contained village churches. The preaching of monks from minster churches at an early stage after the Conversion could have influenced the choice of site and fits in well with Hoggett's conclusions about the strength, depth and speed of the Conversion in East Anglia mentioned earlier, when the Pope's calls for the incorporation of earlier religious sites were still relatively recent. The inclusion of a possible insurance element of the assistance and influence of the previous ritual site (which may well have been their fathers' place of worship) to the Judgement-Day reasons might well also have inclined the middle-Saxon villagers to pick such a site, over one which did not have this added value, as part of the fluid practice of belief after the Conversion that was discussed in Chapter Six on pages 211 and 212.

The possibility that other factors, such as the proximity of the manor house and the proximity to the settlement, may also have had an effect on the siting of the church, and therefore on the choice of an east-facing slope over other slopes, was also investigated from the results of this survey and the detailed tables are presented in Appendix 7. The key fact from the analysis is that the numbers of churches on east-facing slopes, whether as part of a church/hall focus or not, and independent of where they are located in relation to the village, exceed the numbers of churches on all the other slope directions put together, indicating that the direction of the slope was the principal concern and that none of these other factors examined appears to have anything like the same level of connection. All of the other factors considered; the age of the church fabric, the village name origin, the position of the church in relation to both the village and the manor house, whether close to them as at Stody or Fring in Norfolk (shown in Figures 8.15 and 8.16), or isolated from them as at Mundham in Norfolk (Figure 8.17), show little variation when analysed by the direction of the slope, which firmly places the direction of the slope as the key factor when selecting the site.

Fig 8.15 – St Mary's, Stody, Norfolk, from the east - in the village at the top of the slope with its graveyard on the east-facing slope with views along the valley

Fig 8.16 – All Saints', Fring, Norfolk, located near the top of the slope above the rest of the village

Figure 8. 17 – St Peter's, Mundham, Norfolk, at the top of the hill, isolated some distance from the village

Minster church sites

It had been intended to compare the details of minster church sites with those of churches lower down the hierarchy, in terms of location and site topography etc., to see if there may have been a different pattern of influences on site selection between the different classes of church. The same problems exist for this analysis as they did earlier in Chapter Six when comparing the alignments of minster and non-minster churches, in that it is difficult to draw conclusions from the small number of identified minster churches. The details are shown in Appendix 16 on pages 366-367, but there is little difference between the sites of the minster churches and the remainder, in that they are similarly likely to be built on slopes, and equally likely to be built on east-facing slopes. They are also equally likely to be built next to the big house, but minster churches are more likely to be located in the village and less likely to be isolated from their settlement. Even though the figures in many cases are close, no real conclusions can be drawn from this analysis as the extremely small numbers in some of the categories allow no certainty, and even a small variation in the figures would alter the proportions dramatically and therefore affect the conclusions.

LOCAL CHURCH SITES AND BURIALS: CONCLUSIONS

It is widely accepted that Christian substitution is the explanation for the churches that are built on, or next to, extant prehistoric remains, and that this may illustrate a wider situation where other churches were also built on such sites, but where the evidence of the earlier use has disappeared. However, even if there are obvious remains next to a church, it is not possible to state with certainty that the church was built on the site *because* of the remains, or whether it was because the site selection requirements for both the earlier site and the church site were the same, particularly for prominent sites and east-facing slopes. Some writers have felt that the extent of Christianization has been overstated; pointing out that the Church ignored the majority of sacred wells (Rattue 1995, 42; Harte 2008, 93), so the process was anything but universal, and not even widespread. Richard Morris highlights the fact that there are few churches built close to monoliths (Morris 1989, 82), and this also suggests that, like wells, they were not considered important enough to require Christianization, or that Christianization was not as all-embracing as has been suggested. John Blair has pointed out that the process of Christianization appears to be a later one, in that the builders of the early minster churches ignored the Pope's seventh-century call to incorporate earlier pagan sites (Blair 1991, 91; 2005, 376), and that much of Christianization was a tenth- or eleventh-century programme (Morris 1989, 91-92; Blair 2005, 382), rather than a grand headline process applied as part of the early church-building phase.

The thirteen church sites in the Deben valley in Suffolk, the sixteen church sites in Launditch in Norfolk, as well as all the other sites identified as being associated with middle-Saxon pottery, seem to point conclusively to the proposition that these settlements were middle-Saxon in origin. Each of these sites indicates a recurring pattern of settlements fixing their position in the middle-Saxon period either containing, or adjacent to, the site that now contains the church. In some of these cases the settlement moved in the late-Saxon period, but in every case the church site remained where the middle-Saxon settlement had been, which seems to indicate strongly that the church site was part of the earlier settlement. It also confirms a continuity of occupation and a probable middle-Saxon religious use of the site as a graveyard, as it is not possible that all the churches currently built there had their sites chosen at a later date, but, just coincidentally, all in areas that had been occupied in the middle-Saxon period. This reinforces similar links identified in other counties across

the country that provide an excellent match between middle-Saxon settlement sites and current church sites. It seems reasonable to suggest that this situation applies to many villages in East Anglia and possibly throughout the country, where a site was reserved for religious purposes, perhaps just as a graveyard, very early in the settlement nucleation process. The identified sites cannot all be special cases, and the number in each of the areas studied implies a similar density elsewhere which has yet to be uncovered. Whilst there are records of corpse, or lych, roads being used to carry the dead to neighbouring settlements for burial until relatively recently, rather than burying them locally, these roads are confined to upland areas such as the fells in Cumbria, Northumbria and North Yorkshire where population was sparse (Hindle 1993, 57-60), rather than in the more densely-populated lowland areas.

Many of the local burial sites identified here are associated with east-facing slopes, however gentle; perhaps this is, in part, due to the contemporary view of Judgement Day which meant that the dead needed to be able to sit up and face east on Judgement Day, which would be assisted by an east-facing slope and give them a better eastern view. Local burial also took on a new importance when incorporating the dead into the community meant that the prayers of the living surrounding them could aid their progression to the afterlife, rather than burial in either the separated cemeteries of the earlier pagan period, or the remote early Christian cemeteries in the Missionary stations or at minster churches. Richard Morris suggests that the cemetery in early Christian times fulfilled some of the ritual functions that were eventually served by the church (Morris 1983, 33); so these local sites appear to have been acting as the focus for religious activities, becoming the logical place later to build the estate, or village, church. The new church continued the tradition of the ritual use of the site, as well as local burial and, incidentally, the use of the east-facing slope.

The excavated middle-Saxon burial sites in Norfolk and Suffolk which were integrated into the community, but are now completely deserted, such as at Sedgeford in Norfolk and Bloodmoor Hill in Suffolk, and the implied number of such sites where settlements have not moved to reveal them, also suggests that early local burial was taking place in many locations. Perhaps the “endorsement” of local burials “in certain circumstances” referred to by Morris and Blair (Morris 1983, 49–62; Blair 2005, 228–229), was more widespread than originally thought, and the European examples of village burial sites quoted by Blair (Blair 2005, 228-229), which operated in parallel

with central churchyard burials, also applied widely in this country. The fact that, in Norfolk and Suffolk, these burials are in settlements that are close to their minster church indicates at least a tacit approval by the church hierarchy. The local graveyard may have been purely *familial* in its early stages, but, since it was following contemporary Christian thought in being part of the community, and in the majority of cases, it appears that the selected site was later definitively Christian due to the building of the local church there; it seems to confirm a continuity of purpose.

There has to be a reason why the churches that are built directly on sloping sites and those built on levelled platforms on slopes have such a different relationship to the direction of the slope - overwhelmingly east-facing for sloping sites and almost equally distributed in all directions for those on platforms. The direction of the slope was obviously far more important for the builders of churches directly built on slopes. This could be explained if the slope and extended eastern view was important for the selection of the site as an early graveyard, and the subsequent late-Saxon or Norman church, built later on the same site, is merely coincidentally using the same slope that was selected by the middle-Saxon graveyard users; whereas churches built on platformed sites were the *first* religious use of their site. Churches built on platformed sites were perhaps part of later settlements that had had no earlier graveyard, and by this time, the middle-Saxon desire for an east-facing slope was no longer applicable. This would make the choice of, and particularly the topography of, the site considerably less important. Unfortunately, the current churches built on either sloping sites or platformed sites cannot assist with the dating of the earliest use of the site, as they are rarely earlier than the eleventh or twelfth century, and the only way to test this theory is by the complete excavation of the graveyard, as the earliest burials that may exist on the sloping sites are completely hidden beneath the church building and later interments.

The fact that a distant eastern view is available at many sites, particularly at flat ones and even those at the top of slopes in other directions, slightly confuses the issue in relation to the idea of a Judgement-Day-driven reason for the selection of east-facing slopes. If a flat site could satisfy the contemporary requirements, why was a sloping site sought out? Although it might be considered that Christianization is unlikely at such a low social level, the incorporation of additional forces to assist with the passage of the dead into the after-life could easily have been part of the consideration of

someone at a local level, perhaps using folklore that had held sway for generations to reinforce the new religion. On balance, this seems to be the most likely reason for the use of an east-facing slope - incorporating an earlier use which had been located there and which had required an eastern view.

A case can also be made that, in some situations, the often-noticed church/hall focus may have come about in the opposite way to the accepted order, in that the building of the first church could have been used to validate the lordship by utilizing the existing graveyard to achieve *cachet*, and the lord possibly further extended this advantage in some cases by building his hall next to the church, rather than *vice versa*. However, the link between manor house and church is less strong in Norfolk than in the other counties surveyed here. Whether this is due to a greater proportion of freemen-built churches in Norfolk; the greater number of small manors, many of which have been amalgamated or lost; or is due to the wider adoption of local burial where the church was built in the earlier graveyard and away from the manor house, is unclear.

The small number of identified minster churches has prevented any real conclusions being drawn about whether the reasons for locating a minster church were different from those used when locating other churches. However, it is most likely that there are multiple influences on church location, so the end result cannot be a "one size fits all" solution. The main problem appears to be establishing which of the churches in this survey fit into each of the church categories. Minster churches are notoriously difficult to identify, as are the so-called 'field churches' at the other end of the scale, so identifying any difference in the factors at each church, or even which influences applied to the majority of churches at each particular level in the hierarchy, is not possible.

PART FOUR

CONCLUSIONS

CHAPTER NINE

CONCLUSIONS

'The ultimate answer … is 42'
(Hitch-hiker's Guide to the Galaxy)

East as a focus, whether it was for monuments, burials or buildings, seems to have been with us for several thousand years. Prehistoric burials were aligned eastwards, some even as far back as 60,000 years ago; Mediterranean Bronze-age tomb entrances almost universally faced eastwards; Egyptian Pharaohs were buried facing east as well as countless millions of Christian interments, and it seems probable that Anglo-Saxon Christian cemeteries sought out slopes which faced east. The prehistoric examples can easily be explained as instances of a relationship with sunrise and aspects of light, good and rebirth, whereas Christian burials are probably related to resurrection and the supposed direction of the Second Coming. Whether facing east in Christian thought is related to sunrise intentionally as another representation of Christian substitution, or towards paradise, as shown on the medieval maps, or an age-old link to the rising sun, cannot be determined. This continuity may reflect separate but coincident *foci* on contemporary religious meaning, but it might also represent a continuation of the consistent prehistoric focus on east. Whatever the reason, it is the continuation of the use of east so widely which is important here. The focus on east is also seen in church buildings; particularly the overall general alignment of churches eastwards, and the apparent selection of east-facing slopes on which to site them, and more specifically in the rebuilding of chancels closer to east in the thirteenth and fourteenth centuries. Taken together, all these aspects of easterly focus provide an almost seamless pattern stretching back *millennia* which cannot be coincidental.

The large-scale survey of medieval rural churches undertaken for this thesis has resulted in four significant main findings. Each of them is being revealed for the first time due to the size of the sample and to its structured nature. Previous surveys have been considerably smaller in sample size, usually limited to churches in a single county or in a small typological group. Subsequent analysis of the survey results, in combination with other landscape surveys of settlements and archaeological finds, has helped to interpret part of the results for which no topographical explanation could be found.

The first finding is that many of the previously published assertions about the reasons for the differences between the alignments of individual churches have been shown to be less than accurate. Suggestions that churches are aligned with sunrise on their patronal-saint's day, or are aligned with sunrise on the specific day that building started, have both been proved to be in error, although a few individual churches will inevitably do so through chance. Some of the studies that have claimed to have proved these assertions to be true can be shown to have used suspect research logic as well as being based on small samples.

The second finding is that the results show that there is a statistically significant difference, of approximately ten degrees, in the general alignment of churches between the east and west of the country; which is the same as the difference in the alignment of the two churches shown in the photo in the frontispiece to this thesis, the closer church representing the average alignment in the west of the country and the further church representing average alignment in the east. The countrywide variation in alignment seems to be convincingly linked to the direction of sunrise after particularly early harvests. A direct link cannot be established, but analysing thousands of harvest festival dates in parts of four counties spread across the country, and also within Norfolk, shows that the position of sunrise after the earliest harvests relates very closely (within a degree or two) to the mean values for church alignment in all five of the areas, in which the church alignments are several degrees apart. Other possible influences, such as topography, magnetic effects, the chronology of church building, or even the prevalence of different saints in different areas, have each been shown to be incapable of explaining the spatial variation in medieval church alignment.

The third main discovery is the fact that a large proportion of the churches that are built on sloping land are built on slopes that face east – three times as many as

might be expected from a random distribution. The importance of this imbalance is reinforced by the fact that it does not occur amongst churches which have been built on artificially levelled platforms on the slope, where the distribution is much closer to a random one. Initially the pattern of bias towards east-facing slopes seemed to be explained best by the process known as Christian substitution – the adoption of sites for Christian worship that had been important to an earlier cult or religion. Suggested by the Pope in the early seventh century, and reinforced by later church pronouncements, substitution was designed to incorporate earlier religious sites in order to ease the transition to Christianity for the former worshipers there. These sites have, in many cases, left little archaeological evidence in the present, except perhaps for an extended eastern horizon which would have given a better eastern view, including that of sunrise. Several writers have suggested that Christian substitution was not as widely practiced as the church hierarchy may have hoped until several centuries after the Conversion; with the omission of many cult-type features, such as most wells and standing stones, and the reticence of the senior members of the Church hierarchy to locate their own churches on such sites, however, the following paragraph may offer a slightly different view of substitution.

Lastly, the fourth main finding has led to this thesis arguing for a separate process for the creation of many local religious sites. As opposed to the broadly accepted minster model, where the building of churches, and presumably the selection of their sites, came later and later in the Saxon period as lower and lower levels of the church hierarchy and lordly hierarchy are considered, here it is being suggested that many burial sites were set up during the middle-Saxon period by residents for burial in, or adjacent to, their settlements, which later became the focus for the estate or village church (and possibly the manor house). The process of building the church formalized the position of the earlier graveyard when the church itself was consecrated. The early adoption of sites could have been due to the speed of the Conversion at a lower social level in East Anglia than had previously been suspected, when the incorporation of the dead into the community took on new importance, rather than burial in the remote cemeteries of the earlier periods. It is also possible that the development of a large proportion of these local cemeteries in the mid-Saxon period on east-facing slopes is either following contemporary thought about the location of the Second Coming, or reflecting the drive by the early church hierarchy for Christian substitution by using

earlier ritual sites, but again at a far lower level than previously supposed, perhaps with the happy coincidence of using the perceived force of the earlier use on the site as an additional factor to the need to face east on Judgement Day; this takes the aspect of Christian substitution one stage further back in the process. So, rather than Christian substitution being the driver of site-selection when the church was built, it is possible that it was applied when the graveyard sites were being identified. Then the incentive to build the later church on the same site meant that in many cases the fact that the church is sited on an east-facing slope is a coincidence and provides a possible explanation for the considerably greater proportion of churches built on slopes that face east. Whether the use of the east-facing slopes was prehistoric or Saxon, or both, is not really the issue; in either case this selection has to represent a specific choice for the sites in one or both periods, otherwise the numbers of sites on slopes in all directions would balance out. Those churches that are built on levelled platforms on slopes are roughly equally distributed between slopes of all directions and do not reflect the same bias towards east-facing slopes. This could be explained if platformed sites were the first religious use of the site, with no earlier graveyard, by which time perhaps the direction of the slope was no longer important, rather than churches built directly on to the slope being a continuation of the middle-Saxon use of the site as a local graveyard which had originally sought out the east-facing slope. The fact that the churches on sloping or platformed sites are of similar build-dates merely reflects the fact that they were all built during the main period for church building (or rebuilding), rather than reflecting the sites' length of use for religious purposes.

Whether the reasons behind the choices made in earlier times about the selection of one site over another for the building of a church can ever be identified is difficult to say. The ultimate answer can only lie in the heads of the people making the choices at the time; but the early adoption of a burial site in a village, whilst the new Religion was still in its formative infancy in the minds of the peasants, could easily have Christianized a site that may have had an earlier significance. In many cases the local tradition that was engendered by generations of burials on the site in the settlement later fixed the position of the village church.

Given the size and structured nature of the sample used here, it seems unlikely that extending the survey would produce results that are very different from those outlined above, or indicate very different conclusions. It is possible that there is another

reason, which has not been considered here, explaining why churches are aligned in certain directions and that these vary across the country, but if it is not concerned with sunrise, magnetic changes, topography or climate, then it must have been an arcane reason, and it seems unlikely that such a reason would have been so influential over so much of the country. Therefore, since climate *via* early harvest dates appears to explain the variation so closely, and provides a plausible justification for the event of building the first church on an estate, then it can reasonably be presented as the answer.

The analysis in this thesis, particularly concerning the early graveyards in villages, leaves some interesting questions, but ones which cannot be answered from the results of this survey or from further analysis of the other work discussed here. Firstly, was the local graveyard site fully Christian when it was adopted in villages, or was it merely a pragmatic approach to dealing with their dead? Secondly, if they were Christian, did the need for a local Christian graveyard site soon after the Conversion become a trigger for the change of settlement patterns of the period when nucleation of settlements began or perhaps even earlier, as the early-Saxon shifting settlements began to fix their position in the middle-Saxon period? Thirdly, did the burial ground only come after settlement nucleation? Or could nucleation have been more likely to occur around a settlement that already had a burial ground? Lastly, if the cemetery later became the focus for the building of a church (as part of the idea of the builder gaining the power of the site suggested by John Blair) in how many cases was the Manor House built next to the church as part of a similar process, in the opposite order from that normally accepted?

BIBLIOGRAPHY

Abbreviations used

(-)UP	(City) University Press
Antiq J	Antiquaries Journal
Arch J	Archaeological Journal
ASSAH	Anglo-Saxon Studies in Archaeology and History
BAR	British Archaeological Reports
CBA	Council for British Archaeology
EAA	volumes in the “East Anglian Archaeology” series
J Hist G	Journal of Historical Geography
JSAH	Journal of the Society of Architectural Historians
LALHS	Lowestoft Archaeological and Local History Society
Med Arch	Medieval Archaeology
MSRG	Medieval Settlement Research Group
NAHRG	Norfolk Archaeological and Historical Research Group
NNAS	Norfolk and Norwich Archaeological Society
OUCA	Oxford University Committee for Archaeology
OUDES	Oxford University Department for External Studies
POAS	Proceedings of the Orkney Archaeological Society
PSAS	Proceedings of the Society of Antiquaries of Scotland
PSIAH	Proceedings of the Suffolk Institute of Archaeology and History
SHARP	Sedgeford Archaeological and Historical Research Project
SMA	Society for Medieval Archaeology

Bibliography

Beverley Guardian & East Yorkshire Advertiser, Saturdays August – November, 1870-1899
Cumberland Pacquet, Tuesdays August - November, 1870-1873
Cumberland News, Tuesdays August - November, 1874-1899
East Suffolk Gazette, Saturdays August – November, 1870-1899
Lynn News & County Recorder, Saturdays August – November 1880-1899
Somerset County Gazette & Bristol News, Saturdays August – November, 1870-1878
Somerset County Gazette & Devonshire News, Saturdays August – November, 1879-1899
Somerset County Herald, Notes and Queries, April 30th 1927 & Nov 20th 1934
Yarmouth Mercury, Saturdays August – November, 1870-1899

Ecclesiologist, Volumes I – XXIX, 1841-1870, Cambridge Camden Society

Abrahamsen, N., 1992 'Evidence for Church Orientation by Magnetic Compass in Twelfth Century Denmark', *Archaeometry 34 (2)*, 293-303

Addy, S.O., 1913, Church and Manor: a study in English economic history, London: George Allen

Addyman, P. & Morris, R. (eds.), 1976, The Archaeological Study of Churches, York: CBA Research Report 13

Ali, J. & Cunich, P., 2001, 'The Orientation of Churches: Some New Evidence', *Antiq J 81*, 155-193

Ali, J. & Cunich, P., 2005, 'The Church East and West: Orienting the Queen Anne Churches 1711-34', *J SAH 64*, 56-73

Alibert, D., 1997, Chrétientés Médiévales VIIe – XIe Siècles, Neuilly: Atlande

Allcroft, A., 1927, The Circle and the Cross: A study in continuity, Part 1 The Circle, London: MacMillan

Allcroft, A., 1930, The Circle and the Cross: A study in continuity, Part 2 The Cross, London: MacMillan

Anderson, A., 1898, 'Some Hertfordshire Churches', *Bygone Hertfordshire*, W. Andrews (ed.), 152-186

Anderson, M., 1995, History and Imagery in British Churches, Cambridge: CUP

Armstrong, K., 2006, The Great Transformation: The World in the Time of Buddha, Socrates, Confucius and Jeremiah, London: Atlantic Books

Arnold, C. & Wardle, P., 1981, 'Early Medieval Settlement Patterns in England' *Med Arch 25*, 145-149

Arnold-Forster, F., 1899, Studies in Church Dedications, Three Volumes, London: Skeffington

Ashwin, T. & Davison, A. (eds.), 2005, An Historical Atlas of Norfolk, Third Edition, Chichester: Phillimore

Aston, M., 1985, Interpreting the Landscape: Landscape Archaeology and Local History, London: Batsford

Aston, M., 2000, Monasteries in the Landscape, Stroud: Tempus

Ayres, B., 2001, 'Excavations in St Martin-at-Palace Church, 1984-5', *Two Medieval Churches in Norfolk*, O. Beazley & B. Ayres (eds.), Gressenhall: EAA 96, 65-97

Baker, M., 1974, Folklore and Customs of Rural England, Newton Abbot: David & Charles

Baldwin-Brown, G., 1903, The Arts in Early England: Ecclesiastical Architecture in England, London: John Murray

Barclay, A & Harding, J. (eds.), 1999, Pathways and Ceremonies: The cursus monuments of Britain and Ireland, Oxford: Oxbow Books

Barley, M. (ed.), 1976, Plans and Topography of Medieval Towns, York: CBA

Barlow, F., 1972, The Feudal Kingdom of England 1042-1216, London: Longman

Barlow, F., 1979, The English Church 1000-1066: A history of the later Anglo-Saxon church, second edition, London: Longman

Barnes, G., 1997, 'Church Location in the Norfolk Landscape', *The Annual No 6*, Norwich: NAHRG, 23-36

Bassett, S., 1992, 'Church and Diocese in the West Midlands: the transition form British to Anglo-Saxon control', *Pastoral Care Before the Parish*, J. Blair & R. Sharpe (eds.), 13-40

Batcock, N., 1988, 'The Parish Churches in Norfolk in the 11th and 12th Centuries', *Minsters and Parish Churches: The local church in transition 950-1200*, J. Blair (ed.), 179-190

Batcock, N., 1991, The Ruined and disused churches of Norfolk, Gressenhall: EAA 51

Beazley, O., 2001, 'Excavations in St Martin-at-Palace Church, 1987', O. Beazley & B. Ayres (eds.), *Two Medieval Churches in Norfolk*, Gressenhall: EAA 96, 1–63

Bede, (trans. Sherley-Price, L.) 1955, A History of the English Church & People, London: Penguin

Bell, R. & Beresford, M., 1987, Wharram Percy Vol III: The Church of St Martin, SMA Monograph No 11

Bell, T., 1998, 'Churches on Roman Buildings: Christian Associations and Roman Masonry in Anglo-Saxon England', *Med Arch 42*, 1–18

Bennett, H., 1937, Life on an English Manor, Cambridge: CUP

Beresford, G., 1975, The Medieval Clayland Village: Excavations at Goltho and Barton Blount, London: SMA Monograph No 6

Beresford, M. & Hurst, J., 1971, Deserted Medieval Villages, revised edition 1989, Gloucester: Alan Sutton

Beresford, M. & Hurst, J., 1990, Wharram Percy: Deserted Medieval Village, London: Batsford

Bettey, L., 1987, Church and Parish: An introduction for local historians, London: Batsford

Bevan-Jones, R., 2002, The Ancient Yew: A history of *taxus baccata*, Macclesfield: Windgather Press

Bewley, R., 2003, Pre-historic Settlements, Stroud: Tempus

Biddle, M., 1976a, 'The archaeology of the church: a widening horizon', *The Archaeological Study of Churches*, P. Addyman & R. Morris (eds.), 65-71

Biddle, M., 1976b, 'The evolution of towns: Planned towns before 1066', *Plans and Topography of Medieval Towns*, M. Barley (ed.), 19-31

Binns, A., 1989, Dedications of Monastic Houses in England and Wales 1066-1216, Woodbridge: Boydell Press

Binns, A., 1995, 'Pre-Reformation Dedications to St Oswald in England and Scotland: A Gazetteer', *Oswald: Northumbrian King to European Saint*, C. Stancliffe & E. Cambridge (eds.), 241-271

Blair, J., 1985, 'Secular Minster Churches in Domesday Book', *Domesday Book: a Re-assessment*, P. Sawyer (ed.), 104-142

Blair, J., 1987, 'Local Churches in Domesday and Before', *Domesday Studies*, J. Holt (ed.), 265-278

Blair, J., 1988a, 'Minster Churches in the Landscape', *Anglo-Saxon Settlements*, D. Hooke (ed.), 35-58

Blair, J., 1988b, 'Introduction: From Minster to Parish Church', *Minsters and Parish Churches: The local church in transition 950-1200*, J. Blair (ed.), OUCA Monograph No 17, 1-19

Blair, J., 1991, Early Medieval Surrey; Landholding, Church and Settlement before 1300, Stroud: Sutton Publishing

Blair, J., 1992, 'Anglo-Saxon Minsters: A topographical review', *Pastoral Care Before the Parish*, J. Blair & R. Sharpe (eds.), 226-266

Blair, J., 1995, 'Ecclesiastical organization and pastoral care in Anglo-Saxon England', *Early Medieval Europe 4(2*), 193–212

Blair, J., 1996, 'Churches in the Early English Landscape: social and cultural contexts', *Church Archaeology: Research directions for the future*, J. Blair & C. Pyrah (eds.), 6-19

Blair, J., 2005, The Church in Anglo-Saxon Society, Oxford: OUP

Blair, J. & Pyrah, C. (eds.), 1996, Church Archaeology: Research directions for the future, York: CBA Research Report 104

Blair, J. & Sharpe, R. (eds.), 1992, Pastoral Care Before the Parish, Leicester: LUP

Blinkhorn, P., 1999, 'Of cabbages and kings: production, trade, and consumption in middle-Saxon England', *Anglo-Saxon Trading Centres*, M. Anderton (ed.), Glasgow: Cruithne Press, 4–23

Board of Agriculture, 1813, General View of the Agriculture of the County of Hertfordshire, London: Sherwood & Neely

Boddington, A., 1990, 'Models of Burial, Settlement and Worship: The Final Phase Reviewed', *Anglo-Saxon Cemeteries: A Reappraisal*, E. Southworth (ed.), Stroud: Sutton, 177–199

Boddington, A., 1996, 'Raunds Furnells: The Anglo-Saxon church and churchyard', *Archaeological Report 7*, London: English Heritage

Bond, C., 1985, 'Medieval Oxford Villages and their Topography: a Preliminary Discussion', *Medieval Villages: a review of current work*, D. Hooke (ed.), 101-122

Bond, F., 1914, Dedications & Patron Saints of English Churches, Oxford: OUP

Bond, J., 2000, 'Landscapes of Monasticism', *Landscape*, D. Hooke (ed.), 63-73

Brandwood, G., 2000, 'Appendix: A Camdenian Roll-Call', *'A Church as it should be': The Cambridge Camden Society and its influence*, C. Webster & J. Elliot (eds.), Stamford: Shaun Tyas, 359-454

Branston, B., 1957, The Lost Gods of England, London: Thames & Hudson

Braun, H., 1970, Parish Churches: Their Architectural Development in Britain, London: Faber

Brine, J., 1990/1991, 'The Religious Intentions of the Cambridge Camden Society and Their Effect on the Gothic Revival', *Fabrications 2/3*, 4-18

Brook, D., 1992, 'The early Christian Church east and west of Offa's dyke, *The Early Church in Wales and the West*, N. Edwards & A. Lane (eds.), 77-90

Brown, A., 1983, 'Grave Orientation: A further view', *Arch J 140*, 322-328

Brown, E. & Taylor, C., 1989, 'The origins of dispersed settlements: some results from fieldwork in Bedfordshire', *Landscape History 11*, 61-82

Brown, P. (ed.), 1984, Domesday Book – Norfolk (2 vols), Chichester: Phillimore

Brown, T. & Foard, G., 1998, 'The Saxon landscape: a regional perspective', *The Archaeology of Landscape: Studies presented to Christopher Taylor*, P. Everson and T. Williamson (eds.), 67-93

Burl, A., 1997, Prehistoric Astronomy and Ritual, Aylesbury: Shire Books

Burl, A., 2000, The Stone Circles of Britain, Ireland and Brittany, revised edition, New Haven: Yale UP

Butler, L., 1976, 'The evolution of towns planted after 1066', *Plans and Topography of Medieval Towns*, M. Barley (ed.), 32-47

Butler, L., 1986, 'Church Dedications and the Cult of Saints in Anglo-Saxon England' *The Anglo-Saxon Church*, L. Butler & R. Morris (eds.), 44-50

Butler, L. & Morris, R., 1986, The Anglo-Saxon Church, London: CBA Research Report 60

Cabot, S. (ed.), 2002, Sedgeford Historical and Archaeological Research Project Interim Report 2002, Sedgeford: SHARP

Cabot, S., Davies, G. & Hoggett, R., 2004, 'Sedgeford: Excavations of a Rural Settlement in Norfolk', *Land, Sea and Home*, J. Hines, A. Lane, & M. Redknap (eds.), Leeds: Maney, 313–324

Cambridge, E. & Rollason, D., 1995, 'Debate: The pastoral organisation of the Anglo-Saxon Church: A review of the 'Minster Hypothesis', *Early Medieval Europe 4(1)*, 87–104

Campbell, B., 1981, 'Commonfield origins – the regional dimension', *The Origins of Open-field Agriculture*, T. Rowley (ed.), 112-129

Campbell, J., 1986, Essays in Anglo-Saxon History, London: Hambledon

Carr, R., Tester, A. & Murphy, P., 1988, 'The Middle-Saxon settlement at Staunch Meadow, Brandon', *Antiquity* 62, 371–377

Caruth, J., 1996, 'Ipswich, Hewlett Packard plc, Whitehouse Industrial Estate (IPS247)', *PSIAH 38(4)*, 476–479

Carver, M. (ed.), 1992, The Age of Sutton Hoo, Woodbridge: Boydell Press

Carver, M. (ed.), 2003, The Cross Goes North: Processes of Conversion AD300-1300, Ipswich: Boydell & Brewer

Carver, M., 2005, 'Sutton Hoo in context', *A seventh-century princely burial ground and its context*, M. Carver (ed.), Reports of the Research Committee of the Society of Antiquaries of London 69, 489-504

Catling, C., (News ed.), 2009, 'A 'Neolithic cathedral' for the north of Scotland', *Current Archaeology 236*, 6

Cave, C., 1950, 'The Orientation of Churches**',** *Antiq J 30*, 47-51

Chadwick, O., 1970, The Victorian Church - Part Two 1860-1901, London: Adam & Charles Black

Chadwick, O., 1971, The Victorian Church - Part One 1829-1859, London: SCM Press

Chamberlain, W., 1809, General View of the Agriculture of the County of Oxfordshire, London: MacMillan

Chamberlain, A. & Parker Pearson, M., 2001, Earthly Remains: The History and Science of Preserved Human Bodies, London: British Museum Press

Chaney, W., 1960, 'Paganism to Christianity in Anglo-Saxon England', *Harvard Theological Review 153 (3)*, 197-217

Chaney, W., 1970, The Cult of Kingship in Anglo-Saxon England: The transition from Paganism to Christianity, Manchester: MUP

Chauncy, Sir H., 1700, reprinted 1826, The history and antiquities of Hertfordshire, London: J.M. Mullinger

Cheney, C. (ed.), 2000, Handbook of Dates for Students of English History, revised edition, Royal Historical Society Guides and Handbooks No. 4, Cambridge: CUP

Church, Dean R., 1892, The Oxford Movement: Twelve years 1833-1845, London: MacMillan

Clark, A., Tarling, D. & Noel, M., 1988, 'Developments in Archaeomagnetic Dating in Britain**',** *Journal of Archaeological Science 15,* 645-667

Clark, R., 1992, 'The Dedications of Medieval Churches in Derbyshire: their survival and change from the Reformation to the present day', *The Derbyshire Archaeological Journal CXII*, 49-61

Clarke B., 1969, Church Builders in the Nineteenth Century, Trowbridge: David & Charles

Cook, G., 1961, The English Medieval Parish Church, London: Phoenix House

Cooper, J., 2000, 'Church Dedications in the Colchester Archdeaconry', *Essex Archaeology and History 31*, 161-168

Corcos, N., 2001, 'Churches as Pre-Historic Ritual Monuments: A Review and Phenomenological Perspective from Somerset', *Assemblage 6,* sourced from http//:www.assemblage.group.shef.ac.uk/issue6/Corcos_web.html (accessed 4th June 2008)

Cornish, V., 1946, The Churchyard Yew and Immortality, London: Frederick Muller

Cotton, S., 1980, 'Domesday Revisited – where were the 11th century churches?' *NAHRG News 21*, 11–17

Croom, J., 1988, 'The fragmentation of the Minster *Parochiae* of South-East Shropshire' *Minsters and Parish Churches: The local church in transition 950-1200*, J. Blair (ed.), 67-82

Cruden, A., 1769, A Complete Concordance to the Holy Scriptures, 3rd edition, London

Cumbria County Council, 1998, Church of England Parishes in Cumbria, 3rd edition, Cumbria Archive Service

Curl, J., 1995, Victorian Churches, London: Batsford

Dallas, C., 1993, Excavations in Thetford by B.K. Davison between 1964 and 1970, Gressenhall: EAA 62

Darby, H., 1952, The Domesday Geography of Eastern England, Cambridge: CUP

Darby, H. (ed.), 1976 revised edition, The New Historical Geography of England before 1600, Cambridge: CUP

Darby, H., 1977, Domesday England, Cambridge: CUP

Dark, K., 2002, Britain and the end of the Roman Empire, Stroud: Tempus

Darling, M. & Gurney, D., 1993, Caister-on-Sea Excavations by Charles Green, 1951–5, Gressenhall: EAA 60.

Davey, N., 1964, 'A Pre-Conquest Church and Baptistery at Potterne', *Wiltshire Archaeological and Natural History Magazine 59*, 116–123

Davies, G. & Hoggett, R., 2001, Sedgeford Historical and Archaeological Research Project Interim Report 2001, Sedgeford: SHARP

Davies, J. (ed.), 1972, A New Dictionary of Liturgy and Worship, London: SCM Press

Davies, R., 1984, 'Church orientation in Rutland', *Rutland Record 4*, 142-143

Davis, J., 2004, BSS Sundial Glossary: A sourcebook of dialling data, Second Edition, Ipswich: British Sundial Society Publications

Davison, A., 1983, 'The Distribution of Medieval Settlement in West Harling', *Norfolk Archaeology 38*, 329–336

Davison, A., 1990, The Evolution of Settlement in Three Norfolk Parishes in South-east Norfolk, Gressenhall: EAA 49

Davison, A., 1995, 'The Field Archaeology of the Mannington and Wolterton Estates', *Norfolk Archaeology 42*, 160–184

Davison, A., 2003, 'The Archaeology of the Parish of West Acre, Part 1: Field Survey Evidence', *Norfolk Archaeology 44*, 202–221

de Selincourt, E., 1939, The Letters of William and Dorothy Wordsworth: The Later Years, Volume 1 1821-1830, Oxford: The Clarendon Press

de Selincourt, E. & Darbishire, H. (eds.), 1947, The Poetical Works of William Wordsworth – Volume 4, Oxford: The Clarendon Press

Dickens, A., Mortimer, R. & Tipper, J., 2006, 'The Early Anglo-Saxon Settlement and Cemetery at Bloodmoor Hill, Carlton Colville, Suffolk: A Preliminary Report', *ASSAH 13*, 63–79.

Dodgshon, R., 1980, The Origin of British Field Systems: An Interpretation, London: Academic Press

Doggett, N., 1988, 'Medieval Church Dedication in Hertfordshire', *Hertfordshire's Past - Issue 25*, 22-30

Doggett, N., 1989, 'Medieval Church Dedication in Hertfordshire (concluded)', *Hertfordshire's Past - Issue 26*, 9-16

Duffy, E., 1992, The Stripping of the Altars: Traditional Religion in England c1400-c1580, New Haven: Yale UP

Duffy, E., 2001, The Voices of Morebath: Reformation and Rebellion in an English Village, New Haven: Yale UP

Dumville, D., 1992, Liturgy and the Ecclesiastical History of late Anglo-Saxon England, Woodbridge: Boydell Press

Duncan, D., 1999, The Calendar: The 5000 year struggle to align the clock and the heavens, London: Fourth Estate

Durandus. W., (trans. J. Neale & B. Webb) 1906, The Symbolism of Churches and Church Ornaments, Third Edition, London: Gibbings & Co

Dyer, C., 1994, Everyday Life in Medieval England, London: Hambledon Press

Dymond, D., 1968, 'The Suffolk Landscape', *East Anglian Studies*, L. Munby (ed.), 17-47

Dymond, D., 1985, The Norfolk Landscape, London: Hodder & Stoughton

Dymond, D., 1995, 'Chapels of ease and the case of Botesdale', *East Anglian Studies: Essays presented to JC Barringer on his retirement*, A. Longcroft and R. Joby (eds.), 58-65

Dymond, D., 1999, 'Churches and Churchyards', *An Historical Atlas of Suffolk*, D. Dymond & E. Martin (eds.), 54 &197

Dymond, D., 2005, 'Medieval and Later Markets', *An Historical Atlas of Norfolk*, T. Ashwin & A. Davidson (eds.), 76-77

Dymond, D. & Martin, E. (eds.), 1999, An Historical Atlas of Suffolk, revised edition, Ipswich: Suffolk County Council

Eeles, F., 1914, 'The Orientation of Scottish Churches: Illustrated by an analysis of some examples in Aberdeenshire and Banffshire', *PSAS 48*, 169-183

Easton, T., 1999, 'Ritual Marks on House Timbers', *Weald & Downland Open Air Museum Newsletter, Spring 1999*, 22-28

Eaton, T., 2000, Plundering the Past: Roman Stonework in Medieval Britain, Stroud: Tempus

Edwards, N., 1992, 'Identifying the Archaeology of the early church in Wales and Cornwall', *Church Archaeology: Research directions for the future*, J. Blair & C. Pyrah (eds.), 49-63

Edwards, N., & Lane, A. (eds.), 1992, The Early church in Wales and the West, Oxford: Oxbow Monograph No 16

Edwards, N., & Lane, A., 1992b, 'The Archaeology of the early church in Wales: An introduction', *The Early church in Wales and the West*, N. Edwards & A. Lane (eds.), 1-12

Ekwall, E., 1989, The Concise Oxford Dictionary of English Place-names, fourth edition, Oxford: OUP

Ellison, A., 1983, Medieval Villages in South-East Somerset, Bristol: Western Archaeological Trust Survey No. 6

Evans, G., 1971, The Pattern Under the Plough, London: Faber & Faber

Everitt, A., 1986, Continuity and Colonization: The evolution of Kentish settlement, Leicester: LUP

Everson, P., Taylor, C. & Dunne, C., 1991, Change and Continuity: Rural Settlement in North West Lincolnshire, London: HMSO

Everson, P. & Williamson, T. (eds.), 1998, The Archaeology of Landscape: Studies presented to Christopher Taylor, Manchester: MUP

Faith, R., 1997, The English Peasantry and the Growth of Lordship, Leicester: LUP

Farmer, D., 1991, The Oxford Dictionary of Saints, Oxford: OUP

Faull, M., 1976, 'The location and relationship of the Sancton Anglo-Saxon cemeteries', *Antiq J 56*, 227-233

Faull, M., 1983, 'Roman and Anglo-Saxon Settlement Patterns in Yorkshire: A computer generated analysis', *Landscape History 5*, 21-40

Faull, M., 1984, 'Late Anglo-Saxon Settlement Patterns in Yorkshire', *Studies in Late Anglo-Saxon Settlement*, M. Faull (ed.), 129-142

Faull, M. (ed.), 1984, Studies in Late Anglo-Saxon Settlement, Oxford: OUDES

Fernie, E., 1980, The Architecture of the Anglo-Saxons, London: Batsford

Fischer, D., 1996, The Great Wave: Price Revolutions and the Rhythm of History, New York: Oxford University Press

Foard, G., 1978, 'Systematic fieldwalking and the investigation of Saxon settlement in Northamptonshire', *World Archaeology 9*, 357-374

Foot, S., 1992, 'Anglo-Saxon Minsters: a review of terminology', *Pastoral Care Before the Parish*, J. Blair & R. Sharpe (eds.), 212-225

Foster, S., 2006, Maes Howe and the Heart of Neolithic Orkney, Edinburgh: Historic Scotland

Franklin, M., 1984, 'The identification of Minsters in the Midlands', *Anglo-Norman Studies vii*, 69-87

Fraser, J., 1923, 'Some Antiquities in Harray Parish', *Proceedings of the Orkney Antiquarian Society 1*, 31-37

Friar, S., 1996, The Companion to the English Parish Church, Stroud: Chancellor Press

Geake, H., 1992, 'Burial Practice in seventh- and eighth-century England', *The Age of Sutton Hoo*, M. Carver (ed.), 83–94

Geake, H., 1997, The Use of Grave Goods in Conversion-Period England, c600-850, Oxford: BAR British Series 261

Geake, H., 2002, 'Persistent Problems in the Study of Conversion-Period Burials in England', *Burial in Early Medieval England and Wales*, S. Lucy and A. Reynolds (eds.), SMA Monograph 17, 144-155

Geake, H., 2003, 'The Control of Burial Practice in Middle Anglo-Saxon England', *The Cross Goes North: Processes of Conversion in Northern Europe AD300-1300*, M. Carver (ed.), 259-270

Gelling, M., 1983, Place-names in the Landscape, London: J.M. Dent

Gem, R., 1988, 'The English parish church in the 11th and early 12th centuries: a great rebuilding', *Minsters and Parish Churches: The local church in transition 950-1200*, J. Blair (ed.), 21-30

Gem, R., 1996, 'Church Buildings: cultural location and meaning' *Church Archaeology: Research directions for the future*, J. Blair & C. Pyrah (eds.), 1-6

Gerrard, C. & Aston, M., 2007, The Shapwick Project, Somerset: A Rural Landscape Explored, SMA Monograph No 25

Gilbert Scott, Sir G., 1881, A History of English Church Architecture, London: Simpkin Marshall

Gittos, H., 2002, 'Creating the Sacred: Anglo-Saxon Rites for Consecrating Cemeteries', *Burial in Early Medieval England and Wales*, S. Lucy and A. Reynolds (eds.), 195-204

Gooch C., 1813, General View of the Agriculture of the County of Cambridge, London: Sherwood & Neely

Green, B. & Rogerson, A., 1978, The Anglo-Saxon Cemetery at Bergh Apton, Norfolk, Gressenhall: EAA 7.

Green, B., Rogerson, A. & White, S., 1987, The Anglo-Saxon Cemetery at Morning Thorpe, Norfolk, Gressenhall: EAA 36.

Griffith, J., 1908, 'The origin of Advent and other three-week celebrations', *Nature* LXXIX, 36-37

Grinsell, L., 1986, 'The Christianization of pre-historic and other pagan sites', *Landscape History 8*, 7-38

Groves, N., 1995, 'Two Sisters: Two Churches', *East Anglian Studies: Essays presented to J. C. Barringer on his retirement*, R. Joby and A. Longcroft (eds.), 108-115

Hadley, D. & Buckberry, J., 2005, 'Caring for the Dead in Late Anglo-Saxon England', *Pastoral Care in Late Anglo-Saxon England*, F. Tinti (ed.), Anglo-Saxon Studies (6), Woodbridge: Boydell, 121-147

Hall, D., 1981, 'The origin of open-field agriculture: the archaeological fieldwork evidence', *The origins of open-field agriculture*, T. Rowley (ed.), 22-38

Hall, T., 2000, Minster Churches in the Dorset Landscape, Oxford: BAR British Series 304

Hamerow, H. 1991, 'Settlement Mobility and the "Middle-Saxon Shift": rural settlement and settlement patterns in Anglo-Saxon England' *Anglo-Saxon England 20*, 1-17

Hamerow, H., 2002, Early Medieval Settlements: the archaeology of rural communities in Northwest Europe 400-900, Oxford: OUP

Harding, J., 1999, 'Pathways to new realms: cursus monuments and symbolic territories', *Pathways and Ceremonies: The cursus monuments of Britain and Ireland*, A. Barclay & J. Harding (eds.), 30-38

Harding, J., 2003, Henge Monuments of the British Isles, Stroud: Tempus

Harding, M., 1995, Hypnotising the cat, London: Robson Books

Harte, J., 2008, English Holy Wells: a sourcebook, 3 volumes, Loughborough: Heart of Albion Press

Harvey, J., 1974, Cathedrals of England & Wales, London: Batsford

Harvey, P., 1996, Mappa Mundi: The Hereford World Map, Hereford: Hereford Cathedral

Hase, P., 1988, 'The Mother Churches of Hampshire', *Minsters and Parish Churches: The local church in transition 950-1200*, J. Blair (ed.), 45-66

Hawkes, J., 1967, 'God in the Machine', *Antiquity 41*, 174-180

Hawkes, S., 1976 'Sunrise dating of death and burial in an Anglo-Saxon cemetery in East Kent', *Archaeologia Cantiana 92*, 33-51

Hawkins, G., 1970, Stonehenge Decoded, London: Fontana/Collins

Hayfield, C., 1986, 'Wawne, East Riding of Yorkshire: a case study in settlement morphology', *Landscape History 8*, 41-68

Hayslett, H., 1973, Statistics Made Simple, second (revised) edition, London: W H Allen

Heilbron, J., 2001, The Sun in the Church: Cathedrals as Solar Observatories, London: Harvard UP

Henshall, A. & Ritchie, J., 2001, The Chambered Cairns of the Central Highlands, Edinburgh: EUP

Hesse, M., 2003, 'Domesday settlement in Suffolk', *Landscape History 25*, 45-57

Heywood, S., 2005, 'Round-Towered Churches', *An Historical Atlas of Norfolk*, T. Ashwin & A. Davison (eds.), 60-61

Hill, R., 2008, Stonehenge, London: Profile Books

Hills, C., 1979, 'The archaeology of Anglo-Saxon England in the pagan period: a review', *Anglo-Saxon England 8*, 297–329

Hills, C., Penn, K. & Rickett, R., 1984, The Anglo-Saxon Cemetery at Spong Hill, North Elmham. Part III: Catalogue of Inhumations, Gressenhall: EAA 21

Hindle, B., 1993, Roads, Tracks and their Interpretation, London: Batsford

Hinton, I., 2001, 'The alignment of churches in the Waveney Valley', *The Annual No. 10*, Norwich: NAHRG, 3-16

Hinton, I., 2003, A regional study of the alignment of medieval rural churches, unpublished MA dissertation, University of East Anglia

Hinton, I., 2004, 'Do Chancels Weep: Does the often noticed difference between the alignments of nave and chancel actually mean anything?', *Church Archaeology 5&6*, 42-54

Hinton, I., 2006, 'The Rural Church in the Landscape: further considerations of aspects of alignment and location', *Antiq J 86***,** 206-226

Hoare, P. & Sweet, C., 2000, 'The Orientation of Early Medieval Churches in England', *J Hist G 26 (2)*, 162-173

Hodges, R., 1989, The Anglo-Saxon Achievement: archaeology and the beginnings of society, London: Duckworth

Hoggett, R., 2001, The Origin and Early Development of Sedgeford, Norfolk, unpublished M.A. dissertation, University of Bristol

Hoggett, R., 2007, Changing Beliefs: An Archaeology of the East Anglian Conversion, unpublished PhD thesis, University of East Anglia

Holt J., 1813, reprinted 1969, General View of the Agriculture of the County of Lancaster, Newton Abbot: David & Charles

Holt, J. (ed.), 1987, Domesday Studies, Woodbridge: Boydell

Homans, C., 1970, English Villagers of the Thirteenth Century, New York: Harper & Row

Hooke, D. (ed.), 1985, Medieval Villages: a review of current work, OUCA Monograph No 5

Hooke, D. (ed.), 1987, Anglo-Saxon Settlements, Oxford: Basil Blackwell

Hooke, D. (ed.), 2000, Landscape: the richest historical record, Society for Landscape Studies supplementary series 1

Hoskin, M., 2001, Tombs, Temples and their Orientations: A new perspective on Mediterranean pre-history, Bognor Regis: Oscarina Books

Hoskins, W., 1955, The making of the English Landscape, revised edition 1974, London: Book Club Associates

Insoll, T., 2004, Archaeology, Ritual, Religion, London: Routledge

Jay, E., 1993, The Literary Associations of Rydal Church, Rydal: Armitt Trust

Jennings, S., 1981, Eighteen Centuries of Pottery from Norwich, Norwich: EAA 13

John, C., 2001, The Saints of Cornwall: 1500 Years of a Christian Landscape, Padstow: Tab House

Johnson, A., 2008, Solving Stonehenge: the new key to an ancient enigma, London: Thames & Hudson

Johnson, M., 2007, Ideas of Landscape, Oxford: Blackwell

Johnson, S., 1983, Burgh Castle, Excavations by Charles Green 1958–61, Gressenhall: EAA 20.

Johnson, W., 1912, Byways in British Archaeology, Cambridge: CUP

Jones, A., 2002, A Thousand Years of the English Parish: medieval patterns and modern interpretations, London: Cassell Paperbacks

Jones, F., 1998, Holy Wells in Wales, University of Wales Press

Jones, G., 1986, 'Holy wells and the cult of St Helen', *Landscape History 8*, 59-76

Jones, G., 2003, Saints of Europe: studies towards a survey of cults and culture, Donnington: Shaun Tyas

Jones, G., 2006 'TASC' website at http://www.le.ac.uk/elh/grj1/database/data.html, last accessed 23rd Aug 2008

Jones, G., 2007, Saints in the Landscape, Stroud: Tempus

Jones, G. J., 1961, 'Settlement patterns in Anglo-Saxon England', *Antiquity XXXV*, 221-232

Jones, G. J., 1989, 'Multiple Estates and early Settlement', *English Medieval Settlement*, P. Sawyer (ed.), 9-34

Jones, R. & Page M., 2006, Medieval Villages in an English landscape: Beginnings and Ends, Macclesfield: Windgather Press

Kaler, J., 1996, The Ever-Changing Sky: A Guide to the Celestial Sphere, Cambridge: CUP

Keble, J., 1888, The works of that Learned and Judicious Divine Mr. Richard Hooker, seventh edition, Oxford: OUP

Kershaw, I., 1973, 'The Great Famine and Agrarian Crisis in England 1315-1322', *Past & Present 59*, 3-50

Kett, J., 1973, Tha's a Rum'un Bor: Norfolk Verse, Norwich: Bertram Books

Knox, E., 1933, The Tractarian Movement 1833-1845: A study of the Oxford Movement, London: Putnam

Kosminsky, E., 1956, Studies in the Agrarian History of England in the Thirteenth Century, translated R. Kisch, Oxford: Basil Blackwell

Kussmaul, A., 1981, Servants in husbandry in early modern England, Cambridge: CUP

Laing, L., 1977, The Archaeology of Late Celtic Britain and Ireland, London: Book Club Associates

Lamb, H., 1977, Climate, Present, Past and Future: Volume 2 Climatic history and the future, London: Methuen

Lancaster-Brown, P., 1976, Megaliths, Myths and Men: An introduction to astro-archaeology, Poole: Blandford Press

Laverton, S., 2001, Shotley Peninsular: The making of a unique Suffolk landscape, Stroud: Tempus

Lawrie, W., 1859, History of Free Masonry and The Grand Lodge of Scotland, Edinburgh

Lawson, A., 1983, The Archaeology of Witton, Gressenhall: EAA 18

Levison, W., 1956, England and the Continent in the Eighth Century, Oxford: OUP

Lewis, C., Mitchell-Fox, P. & Dyer, C., 2001, Village, Hamlet and Field: Changing Medieval Settlements in Medieval England, revised edition, Macclesfield: Windgather Press

Linnel, Rev. C., 1962, Norfolk church dedications, York: St Anthony's Hall

Lloyd, T., Orbach, J. & Scourfield, R., 2004, The Buildings of Wales: Pembrokeshire, New Haven: Yale UP

Lockyer, Sir N., 1909, Stonehenge and Other British Stone Monuments: Astronomically Considered, London: MacMillan

Longcroft, A. & Joby, R. (eds.), 1995, East Anglian Studies: Essays presented to JC Barringer on his retirement, Norwich: University of East Anglia

Loveday, R., 1999, 'Dorchester on Thames – ritual complex or ritual landscape', *Pathways and Ceremonies: The cursus monuments of Britain and Ireland*, A. Barclay & J. Harding (eds.), 39-48

Loveday, R., 2006, Inscribed across the Landscape: The Cursus Enigma, Stroud: Tempus

Lucas, H., 1930, 'The Great European Famine of 1315-1317', *Speculum 15*, 57-66

Lucy, S., 2000, The Anglo-Saxon Way of Death, Stroud: Tempus

Lucy, S. & Reynolds, A. (eds.), 2002, Burial in Early Medieval England and Wales, SMA Monograph No 17

Lucy, S. & Reynolds, A., 2002, 'Burial in Early Medieval England and Wales: Past, Present and Future', S. Lucy & A. Reynolds (eds.), *Burial in Early Medieval England and Wales*, 1-23

Margeson, S, Ayres, B, & Heywood, S., 1996, A Festival of Norfolk Archaeology, Norwich: NNAS

Martin, E., 2001, 'Rural settlement patterns in medieval Suffolk', *MSRG: Annual Report 15*, 5-7

Mayr-Harting, H., 1977, The Coming of Christianity to Anglo-Saxon England, London: Batsford

Meaney, A., 1964, A Gazetteer of Early Anglo-Saxon Burial Sites, London: Allen and Unwin.

Meaney, A., 2003, 'Anglo-Saxon Pagan and Christian Attitudes to the Dead', *The Cross Goes North: Processes of Conversion in Northern Europe AD300-1300*, M. Carver (ed.), 229-242

Merrill, R., McElhinny, W. & McFadden, P., 1996, The Magnetic Field of the Earth: Paleomagnetism, the Core and the Deep Mantle, San Diego: Academic Press

Messent, C., 1934, The Monastic Remains of Norfolk & Suffolk, Norwich: H W Hunt

Michel, J., 1969, The View Over Atlantis, London: Sago Press

Mills, A., 1991, A Dictionary of English Place-names, Oxford: OUP

Morris, R., 1979, Cathedrals and Abbeys of England & Wales, London: J M Dent

Morris, R., 1983, The Church in British Archaeology, York: CBA Research Report 47

Morris, R., 1985, 'The church in the countryside', *Medieval Villages: A review of current work*, D. Hooke (ed.), 48-60

Morris, R., 1989, Churches in the Landscape, London: Phoenix Press

Mortimer, R. & Tipper, J., 1998, 'Excavation of early/middle Saxon settlement at Bloodmoor Hill, Carlton Colville, Suffolk', *Annual Report 31*, LALHS, 14-16

Morton, A., 1992, 'Burial in middle Saxon Southampton', *Death in Towns: Urban Responses to the Dying and the Dead 100-1600*, S. Bassett (ed.), Leicester: LUP, 68-77

Moshenska, G. (ed.), 2004, Annual Report, Sedgeford Historical and Archaeological Research Project

Muir, R., 2007, How to Read a Village, London: Ebury Press

Muirden J., 2003-2005 (published 2005), 'Crooked Churches and Saintly Sunrises', *Church Archaeology vols 7-9*, 33-43

Muncey, R., 1930, A History of the Consecration of Churches and Churchyards, Cambridge: W. Heffer

Myres, J. & Green, B., 1973, The Anglo-Saxon Cemeteries of Caistor-by-Norwich and Markshall, Norfolk, London: Society of Antiquaries.

Mytum, H., 2000, Recording and Analysing Graveyards, York: CBA

Neale, J., 1841a, A Few Words to Church Builders, Cambridge Camden Society

Neale, J., 1841b, A Few Words to Churchwardens on Churches and Church Ornaments: No. 1, Suited to Country Parishes, eighth edition, Cambridge Camden Society

Neale, J. & Webb, B., 1906, 'Introductory Essay: Sacramentality - A Principle of Ecclesiastical Design', *The Symbolism of Churches and Church Ornaments*, William Durand, third edition, London: Gibbings & Co

Newman, J., 1908, Apologia Pro Vita Sua: Being a History of His Religious Opinions, London: Longmans

Newman, J., 1969, The Buildings of England: North East & East Kent, London: Penguin

Newman, J., 1992, 'The Late Roman and Anglo-Saxon Settlement Pattern in the Sandlings of Suffolk', *The Age of Sutton Hoo*, M. Carver (ed.), 25-38

Newman, J., 2001, 'The landscape of dispersed settlement – change and growth in south-east Suffolk', *MSRG Annual Report 15 - 2000*, 7-8

Newman, J., 2005, 'Survey in the Deben Valley', *A seventh-century princely burial ground and its context*, M. Carver (ed.), 477-488

Newman, R., 1984, 'The Problems of Rural Settlement in Northern Cumbria in the Pre-Conquest Period', *Studies in Late Anglo-Saxon Settlement*, M. Faull (ed.), 155-175

Northeast, P., 'Moving the Signposts: Changes in the Dedication of Suffolk Churches after the Reformation', *East Anglian Studies: Essays presented to J.C. Barringer on his retirement*, R. Joby and A. Longcroft (eds.), 201-205

Nuttall, A., 1974, Common Sky: Philosophy and the Literary Imagination, Berkeley: University of California Press

O'Carragain, T., 2003, 'A Landscape Converted: Archaeology and Early Church Organisation on Iveragh and Dingle, Ireland', *The Cross Goes North: Processes of Conversion in Northern Europe AD300-1300*, M. Carver (ed.), 127-152

O'Sullivan, D., 1984, 'Pre-Conquest Settlement Patterns in Cumbria', *Studies in Late Anglo-Saxon Settlement*, M. Faull (ed.), 143-154

Orme, N., 1996, English Church Dedications: with a survey of Cornwall and Devon, Exeter: EUP

Oswin, J., 2009, 'Stones and Solstices on Scotland's Remotest Island', *Current Archaeology* 227, 30-37

Oosthuizen, S., 2002, 'Medieval Greens and Moats in the Central Province: Evidence from the Bourne Valley, Cambridgeshire', *Landscape History 24*, 73-88

Owen, D., 1971, Church and Society in Medieval Lincolnshire, Lincoln: History of Lincolnshire Committee

Owen, G., 1981, Rites and Religions of the Anglo-Saxons, Newton Abbott: David & Charles

Park, R., 1988, Geological Structures and Moving Plates, London: Blackie & Son

Parker Pearson, M., 1993a, 'The Powerful Dead: Archaeological Relationships between the Living and the Dead', *Cambridge Archaeological Journal 3*, 203–229

Parker Pearson, M., 1993b, Bronze-Age Britain, London: Batsford/English Heritage

Parker Pearson, M., 1999, The Archaeology of Death and Burial, Stroud: Sutton Publishing

Parker Pearson, M. & Richards, C., 1994, Architecture and Order: Approaches to social space, London: Routledge

Parsons, D., 1986, Liturgy and Architecture in the Middle Ages, Leicester: LUP

Patton, M., Nash, G., Finch, O. & Rodwell, W., 2002, 'La Hogue Bie', *Current Archaeology 183*, 125-129

Pearce, S., 1985, 'The early church in the landscape: the evidence from North Devon', *Arch J 142*, 255-275

Pearce, S., 2003, 'Saintly Cults in South-Western Britain: A Review' *Saints of Europe: Studies Towards a Survey of Cults and Culture*, G. Jones (ed.), 261-279

Penn, K., 1996, 'The Early Church in Norfolk: Some Aspects' *A Festival of Norfolk Archaeology*, S. Margeson, B Ayres & S. Heywood (eds.), 40–46.

Penn, K., 2000, Excavations on the Norwich Southern Bypass, 1989–91. Part II: The Anglo-Saxon Cemetery at Harford Farm, Caistor St Edmund, Norfolk. Gressenhall: EAA 92.

Pestell, T., 2004, Landscapes of Monastic Foundation: the establishment of religious houses in East Anglia c.650-1200, Woodbridge: Boydell Press

Petrie, G., 1890, 'Notice of Brochs and Large Round Towers of Orkney', *Archaeologia Scotica*, 71-94

Petts, D., 2002, 'Cemeteries and boundaries in western Britain', *Burial in Early Medieval England and Wales*, S. Lucy and A. Reynolds (eds.), 24-46

Pevsner, N., 1951, The Buildings of England: Cornwall, London: Penguin

Pevsner, N., 1958a, The Buildings of England: North Somerset, London: Penguin

Pevsner, N., 1958b, The Buildings of England: Shropshire, London: Penguin

Pevsner, N., 1967, The Buildings of England: Cumberland and Westmorland, London: Penguin

Pevsner, N., 1969, The Buildings of England: North Lancashire, London: Penguin

Pevsner, N., 1970, The Buildings of England: Cambridgeshire, London: Penguin

Pevsner, N., 1988, The Buildings of England: Bedfordshire Huntingdon and Peterborough, London: Penguin

Pevsner, N., 1991, The Buildings of England: Suffolk, London: Penguin

Pevsner, N. & Harris J., (2nd edition revised by N Antrim), 1998, The Buildings of England: Lincolnshire, London: Penguin

Pevsner, N. & Lloyd D., 1967, The Buildings of England: Hampshire and the Isle of Wight, London: Penguin

Pevsner, N. & Nairn, I., 1999, The Buildings of England: Sussex, London: Penguin

Pevsner, N. & Neave, D., 1999, Buildings of England: York and the East Riding of Yorkshire, London: Penguin

Pevsner, N. & Wilson W., 2002a, The Buildings of England: Norfolk, Northwest & South, New Haven: Yale UP

Pevsner, N. & Wilson, W., 2002b, The Buildings of England: N.E. Norfolk & Norwich, New Haven: Yale UP

Pickford, C., 1994, Bedfordshire Churches in the Nineteenth Century: Part I Parishes A-G, Bedfordshire Historical Records Society Vol 73

Pickford, C., 1998, Bedfordshire Churches in the Nineteenth Century: Part II Parishes H-R, Bedfordshire Historical Records Society Vol 77

Pickford, C., 2000, Bedfordshire Churches in the Nineteenth Century: Part III Parishes S-Z, Bedfordshire Historical Records Society Vol 79

Pickford, C., 2001, Bedfordshire Churches in the Nineteenth Century: Part IV Appendices and Index, Bedfordshire Historical Records Society Vol 80

Pitts, M., 2000, Hengeworld, London: Arrow Books

Plymley, J., 1813, General View of the Agriculture of the County of Shropshire, London: Sherwood & Neely

Pollard, J. & Reynolds A., 2002, Avebury: The biography of a landscape, Stroud: Tempus

Pope, R., 2008, 'Roundhouses: 3,000 years of prehistoric design', *Current Archaeology* 222, 14-21

Pounds, N., 1994, 'The Churches of Canterbury', *Proceedings of the 140th Summer Meeting of the Royal Archaeological Institute (Supplement to the Archaeological Journal Vol 151*, N. Pounds (ed.), 27-30

Prescott, A., 2008, 'Masonic Papers', *Pietre-Stones Review of Freemasonry*, sourced from http://www.freemasons-freemasonry.com/ prescott10 .html (accessed 28th April 2008)

Preston-Jones, A., 1992, 'Decoding Cornish Churchyards', *The Early Church in Wales and the West*, N. Edwards & A. Lane (eds.), 105-124

Prout, D., 1989, ''The Oxford Society for Promoting the Study of Gothic Architecture' and 'The Oxford Architectural Society', 1839-1850', *Oxoniensia liv*, 379-391

Pryor, F., French, C., Crowther, D., Gurney, D., Simpson, G. & Taylor, M., 1985, The Fenland Project 1: Archaeology and Environment in the Lower Welland Valley, Cambridge: EAA 27

Pugin, A. W., 1853, The True Principles of Pointed or Christian Architecture, London: Henry Bohn

Rackham, O., 1986, The History of the Countryside, London; J M Dent

Rahtz, P., 1978, 'Grave Orientation', *Arch J 135*, 1-14

Rattue, J., 1995, The Living Stream: Holy wells in historical context, Woodbridge: Boydell

Ravensdale, J., 1974, Liable to Floods: Village Landscape on the edge of the Fens, AD 450 - 1850, Cambridge: CUP

Rees, E., 2001, Celtic Saints in their Landscape, Stroud: Sutton Publishing

Reynolds, A., 1999, Later Anglo-Saxon England: Life and landscape, Stroud: Tempus

Reynolds, A., 2002, 'Burials, boundaries and charters in Anglo-Saxon England: a reassessment', *Burial in Early Medieval England and Wales*, S. Lucy and A. Reynolds (eds.), 171-194

Reynolds, A., 2003, 'Boundaries and settlements in later sixth- to eleventh-century England', *Anglo-Saxon Studies in Archaeology and History* 12, 98-136

Ridgard, J., 1999, 'The structure of a Medieval Manor', *An Historical Atlas of Suffolk*, D. Dymond & E. Martin (eds.), 86-87

Rigold, S., 1962, 'The Anglian Cathedral of North Elmham, Norfolk', *Medieval Archaeology 6*, 67–108

Roberts, B., 1977, Rural Settlement in Britain, London: Hutchinson

Roberts, B., 1982, 'The Anatomy of a Village: Observation and Extrapolation', *Landscape History 4*, 11-20

Roberts, B., 1992, 'Dating villages: theory and practice', *Landscape History 14*, 19-30

Roberts, B. & Wrathmell S., 1998, 'Dispersed settlement in England: A national view', *The Archaeology of Landscape: Studies Presented to Christopher Taylor*, P. Everson & T. Williamson (eds.), 95-116

Roberts, B. & Wrathmell, S., 2002, Region and Place: An Atlas of Rural Settlement in England, London: English Heritage

Rodwell, W., 1981, Archaeology of the English Church, London: Batsford

Rodwell, W., 1984 'Churches in the Landscape: Some Aspects of Topography and Planning', *Studies in Late Anglo-Saxon Settlement*, M. Faull (ed.), 1-23

Rodwell, W., 1986, 'Anglo-Saxon Church Building: Aspects of design and construction', *The Anglo-Saxon Church*, L. Butler & R. Morris (eds.), 156-175

Rodwell, W., 1989, Archaeology of Religious Places: Churches and Cemeteries in Britain, revised edition, Philadelphia: UPP

Rodwell, W., 2001, The Archaeology of Wells Cathedral: excavations and structural studies 1978-1993, London: English Heritage

Rodwell, W. & Rodwell, K., 1973, 'Excavations at Rivenhall Church, Essex: An interim report', *Antiq Jl LIII (2)*, 219-231

Rodwell, W. & Rodwell, K., 1985, Rivenhall: investigations of a villa, church and village, 1950-1977, York: CBA Research Report No 55

Rogerson, A., 1995, A Late Neolithic, Saxon and Medieval Site at Middle Harling, Norfolk, Gressenhall: EAA 74

Rogerson, A., 2003, 'Six Middle Anglo-Saxon Sites in West Norfolk', *Markets in Early Medieval Europe: Trade and 'Productive' Sites 650-850*, T. Pestell & K. Ulmschneider (eds.), Macclesfield: Windgather Press, 110-121

Rogerson, A., 2005, 'Middle Saxon Norfolk (*c*.AD650–850)', *An Historical Atlas of Norfolk*, T. Ashwin & A. Davison (eds.), 32–33

Rogerson, A., Ashley, S., Williams, P. & Harris, A., 1987, Three Norman Churches in Norfolk, Gressenhall: EAA 32

Rogerson, A., Davison, A., Pritchard, D. & Silvester, R., 1997, Barton Bendish and Caldecote: fieldwork in south-west Norfolk, Gressenhall: EAA 80

Ross, A., 1974, Pagan Celtic Britain: Studies in Iconography and Tradition, London: Sphere

Rowley, T., 1972, The Shropshire Landscape, London: Hodder & Stoughton

Rowley, T., 1978, Villages in the Landscape, 1994 edition, London: Orion Books

Rowley, T. (ed.), 1981, The Origins of Open-field Agriculture, London: Croom Helm

Ruggles, C., 1999, Astronomy in Prehistoric Britain and Ireland, New Haven: Yale UP

Rumble, A. (ed.), 1986, Domesday Book: Suffolk, 2 volumes, London: Phillimore

Rushton, N., 1999, 'Parochialization and patterns of patronage in 11th-century Sussex', *Sussex Archaeological Collections 137*, 133-152

Ryder, P., 1993, Medieval Churches of West Yorkshire, West Yorkshire Archaeology

Salmon, J., 1981, Saints in Suffolk Churches, Ipswich: Suffolk Historic Churches Trust

Salmon, M., 1991, A History of St John's Church, Newton Arlosh, privately published

Salzman, L., 1992, Building in England down to 1540: A documentary history, revised edition, Oxford: Clarendon Press

Sawyer, P., 1976, Medieval Settlement: Continuity and Change, London: Edward Arnold

Sawyer, P. (ed.), 1985, Domesday Book: a Re-assessment, London: Edward Arnold

Scarfe, N., 1986, Suffolk in the Middle Ages, Woodbridge: Boydell

Scarfe, N., 1987, The Suffolk Landscape, Bury St Edmunds: Alastair Press.

Schlesinger, A., Walls C., Kissock, J., Lovegrove, C., Pollard, K. & Wright, N., 1996, 'An Early Church and Medieval Farmstead Site: Excavations at Llanelen, Gower', *Arch J 153*, 104-147

Scott, Sir G.G., 1881, An Essay on the History of English Church Architecture, London: Simpkin Marshall & Co

Searle, S., 1974, 'The church points the way', *New Scientist*, Jan 3rd 1974 and subsequent correspondence

Shepherd Popescu, E., 2009, Norwich Castle: Excavations and Historical Survey 1987–1998, Gressenhall: EAA 132

Sherwood, S. & Pevsner, N., 1974, The Buildings of England: Oxfordshire, London: Penguin

Shore, T., 1886, 'Orientation of Churches in Hampshire', *Walford's Antiquarian 10*, 95-98

Short, E., 1955, The House of God – A History of Religious Architecture, London: Eyre & Spottiswood

Silvester, R., 1988, The Fenland Project Number 3: Marshland and the Nar Valley, Norfolk, Gressenhall: EAA 45

Somerville, H.B., 1923, 'Instances of Orientation in pre-historic monuments of the British Isles', *Archaeologia 73*, 193-224

Somerville, H.B., 1927, 'Orientation', *Antiquity 1*, 31-41

Stamp, G. (ed.), 1995, Personal and Professional Recollections: The autobiography of the Victorian architect Sir George Gilbert Scott, Stamford: Paul Watkins

Stancliffe, C. & Cambridge, E. (eds.), 1995, Oswald: Northumbrian King to European Saint, Stamford: Paul Watkins

Stenton, Sir F., 1971, Anglo-Saxon England, 3rd edition, Oxford: Clarendon Press

Stocker, D., 1990, 'Rubbish recycled: a study of the reuse of stone in Lincolnshire', *Stone: Quarrying and Building in England, AD43-1525*, D. Parsons (ed.), Chichester: Phillimore, 83-101

Stocker, D. & Everson, P., 2006, Summoning St Michael: Early Romanesque Towers in Lincolnshire, Oxford: Oxbow Books

Stratton J. & Houghton-Brown J., 1978, Agricultural Records: AD 220 -1977, London: John Baker

Strzygowski, J., 1928, Early Church Art in Northern Europe: With special reference to timber construction and decoration, London: Batsford

Surman, R., 2008, Secret Churches: Ecclesiastical Gems from Britain & Ireland, London: HarperCollins

Tatton-Brown, T., 1987, 'The Anglo-Saxon Towns of Kent', *Anglo-Saxon Settlements*, D. Hooke (ed.), 213-232

Tatton-Brown, T., 1988, 'The Churches of the Canterbury Diocese in the 11th Century', *Minsters and Parish Churches: The local church in transition 950-1200*, J. Blair (ed.), 105-118

Taylor, A., 2001, Burial Practice in Early England, Stroud: Tempus

Taylor, C., 1977, 'Polyfocal Settlement and the English Village', *Medieval Archaeology 21*, 189-193

Taylor, C., 1983, Village and Farmstead: A History of Rural settlement in England, London: Book Club Associates

Taylor, C., 1992, 'Medieval rural settlement: changing perceptions', *Landscape History 14*, 5-18

Taylor, C., 2002, 'Nucleated settlement: a view from the frontier', *Landscape History 24*, 53-72

Taylor, H.M., 1978, Anglo-Saxon Architecture- Vol 3, Cambridge: CUP

Taylor, H.M. & Taylor, J., 1965, Anglo-Saxon Architecture - Vols 1 & 2, Cambridge: CUP

Taylor, T., 1999, Time Team 1999: The site reports, London: Channel Four Television

Thacker, A. & Sharpe, R. (eds.), 2002, Local Saints and Local Churches in the Early Medieval West, Oxford: OUP

Thirsk, J., 1964, 'The Common Fields', *Past & Present 29*, 3-39

Thom, A., 1967, Megalithic Sites in Britain, Oxford: OUP

Thom, A. & Thom, A.S., 1971, 'The astronomical significance of the large Carnac menhirs', *Journal for the History of Astronomy 2*, 147-160

Thomas, A., 1971, The early Christian architecture of north Britain, Oxford: OUP

Thomas, C., 1986, 'Recognizing Christian Origins: an archaeological and historical dilemma', *The Anglo-Saxon Church* L. Butler & R. Morris (eds.), York: CBA Research Report 60, 121-125

Thomas, C., 1989, 'Christians, Chapels, Churches and Charters: Proto-parochial provisions for the pious in a peninsular (Lands End)', *Landscape History 11*, 19-26

Thomas, G., 2005, 'Bishopstone: in the shadow of Rookery Hill', *Current Archaeology 196*, 184-190

Thompson, A., 1913, The Ground Plan of the English Parish Church, Cambridge: CUP

Thompson, V., 2004, Dying and Death in Later Anglo-Saxon England, Woodbridge: Boydell.

Tilley, C., 1994, A Phenomenology of Landscape: Places, Paths and Monuments, London: Berg

Tooley, B., 2002, North Cove & Barnby: A History of Two Villages, privately published

Trubshaw, B., 1989 'Church Orientation', *Mercian Mysteries No 5*, 17-31

Turner, S., 2003, 'Making a Christian Landscape: Early Medieval Cornwall', *The Cross Goes North: Processes of Conversion in Northern Europe AD300-1300*, M. Carver (ed.), 171-194

Turner, S., 2006, Making a Christian Landscape: The countryside in early medieval Cornwall, Devon and Wessex, Exeter UP

Tyrell-Green, E., 1929, 'The Ecclesiology of Anglesey', *Y Cymmrodor XL*, 43-118

Valk, H., 2003, 'Christianisation in Estonia: A Process of Dual-Faith and Syncretism', *The Cross Goes North: Processes of Conversion in Northern Europe AD300-1300*, M. Carver (ed.), 571-580

Vancouver C., 1813, Reprinted 1969, General View of the Agriculture of the County of Devon, Newton Abbot: David & Charles

Veasey, S., 1986, 'Discussions: church orientation in Rutland', *Rutland Record 6*, 215-216

Verey, D., 1970a, The Buildings of England: Gloucestershire 1: The Cotswolds, London: Penguin

Verey, D., 1970b, The Buildings of England: Gloucestershire 2: The Vale and the Forest of Dean, London: Penguin

Vinogradof, Sir P., 1932, The Growth of the Manor, London: George Allen

Wall J., 2006, 'Church Orientation', *Bulletin of the British Sundial Society 18 (i)*, 16-17

Wade-Martins, P., 1980a, Excavations in North Elmham Park 1967-72, Gressenhall: EAA 9

Wade-Martins, P., 1980b, Fieldwork and Excavations on Village Sites in Launditch Hundred, Norfolk, Gressenhall: EAA 10

Warner, P., 1986, 'Shared churchyards, freemen church builders and development of parishes in eleventh century East Anglia', *Landscape History 8*, 39-54

Warner, P., 1991, Greens, Commons and Clayland Colonization: The Origins and Development of Green-side Settlement in East Suffolk, Leicester: LUP

Warner, P., 1996, The Origins of Suffolk, Manchester: MUP

Watkins, A., 1925, reprinted 1974, The Old Straight Track: Its Mounds, Beacons, Moats, Sites and Mark Stones, London: Abacus

Webb, S., 2006, Suffolk Church Dedications and the Landscape, unpublished Diploma dissertation, University of East Anglia

Webster, C. (ed.), 2003, 'Temples … worthy of His presence': the early publications of the Cambridge Camden Society: the complete texts of eight important pamphlets published between 1839 and 1843 with a critical analysis, Reading: Spire Books

Webster, C. & Elliot, J. (eds.), 2000, 'A Church as it Should be': The Cambridge Camden Society and its influence, Stamford: Shaun Tyas

Welch, M., 1985, 'Rural settlement in early and middle Anglo-Saxon periods', *Landscape History 7*, 13-26

Welch, M., 1992, Anglo-Saxon England, London: Batsford/English Heritage

Wessex Archaeology, 2007, 'Speke Keeill, Mount Murray Hotel, Isle of Man: Archaeological Evaluation and Assessment of Results', sourced from: http://scribd.com/doc/12247576/speke-keeill-isle-of-man/ (accessed 26th Oct 2009)

West, S., 1998, A Corpus of Anglo-Saxon Material From Suffolk, Ipswich: EAA 84.

West, S., Scarfe, N. and Cramp, R., 1984, 'Iken, St Botolph, and the Coming of East Anglian Christianity', *PSIAH 35(4)*, 279–301

Whiffen, M., 1947, Stuart and Georgian Churches: The Architecture of the Church of England outside London 1603-1837, London: Batsford

White, J., 1962, The Cambridge Movement: The ecclesiologists and the gothic revival, Cambridge: CUP

White, W., 1845, reprinted 1969, History, Gazetteer and Directory of Norfolk, Newton Abbot: David & Charles

Wilcox, W., 2002, 'Grave Alignment at Sedgeford', *SHARP Interim Report 2002*, S. Cabot (ed.), 36-39

Williams, H., 1998, 'Monuments and the past in early Anglo-Saxon England', *World Archaeology 30*, 90-108

Williamson, T., 1988, 'Explaining Regional Landscapes: Woodland and Champion in Southern and Eastern England', *Landscape History 10*, 5-14

Williamson, T., 1993, The Origins of Norfolk, Manchester: MUP

Williamson, T., 2003, Shaping Medieval Landscapes: Settlement, Society, Environment, Macclesfield: Windgather Press

Williamson, T., 2005a, 'Soil Landscapes', *An Historical Atlas of Norfolk*, T. Ashwin & A. Davison (eds.), 8-9

Williamson, T., 2005b, 'Place-name Patterns', *An Historical Atlas of Norfolk*, T. Ashwin & A. Davison (eds.), 34-35

Williamson, T., 2006, England's Landscape: East Anglia, London: English Heritage

Williamson, T., 2008, Sutton Hoo and its Landscape: The context of monuments, Oxford: Oxbow Books

Williamson, T. & Bellamy, L., 1983, Ley Lines in Question, Kingswood: World's Work

Williamson, T. & Skipper, K., 2005, 'Late Saxon Population Densities', *An Historical Atlas of Norfolk*, T. Ashwin & A. Davison (eds.), 38-39

Wilson, D., 1992, Anglo-Saxon Paganism, London: Routledge

Worgan G., 1815, General View of the Agriculture of the County of Cornwall, London: Sherwood & Neely

Wrathmell, S. and Roberts, B., 2002, Region and Place: A study of English Settlement, London: English Heritage

Young, A., 1804, reprinted 1969, General View of the Agriculture of the County of Norfolk, Newton Abbot: David & Charles

Young, A., 1813a, reprinted 1970, General View of the Agriculture of the County of Lincolnshire, Newton Abbot: David & Charles

Young, A., 1813b, reprinted 1969, General View of the Agriculture of the County of Suffolk, New York: Augustus Kelley

Young, A., 1813c, reprinted 1970, General View of the Agriculture of the County of Sussex, Newton Abbot: David & Charles

APPENDICES

APPENDIX 1 – Eighteenth- and Nineteenth-Century new-build Churches: Ecclesiologists, Survey Results and Analysis.

This appendix presents the results of a parallel survey of the alignment of 400 new-build eighteenth- and nineteenth-century churches in the same areas as the medieval church sample. It examines the writings of the various nineteenth-century ecclesiological and architectural groups to see if they had any influence over church alignment during the period, and tests this using the results of the survey. It also assesses the impact of the eighteenth- and nineteenth-century survey results on the possible explanations for the alignment variations amongst medieval churches presented in the body of this thesis, and attempts to establish whether the same influences were still in force, or whether there were different influences in the two periods.

Nineteenth-Century Church builders

The nineteenth century saw a considerable church-building- and church-restoration-programme for several reasons; rapid population growth and the creation of new parishes, mostly through urban expansion; the degradation of medieval churches, especially chancels, since they were disused after the Reformation and particularly during the Commonwealth period; and an upsurge in high-church feelings. Accepted wisdom is that churches were neglected during the Georgian period, although this is probably influenced by Victorian propaganda; Steven Curl put it most strongly, "Anglican churches had been shamefully neglected" since the time of the Reformation (Curl 1995, 47). However, despite the suggested Georgian 'neglect', new churches were being built at least 30 years before the start of Victoria's reign. An Act of Parliament was passed in 1803 to "Promote the building, repairing and otherwise providing churches and chapels", and amended in 1811. It was followed in 1818 by an Act for promoting the building of additional churches in populous parishes (Chadwick 1971, 84-85; Curl 1995, 21). The Church Building Society was formed in the same year and incorporated in 1828. The Act allowed for state funding to be made available for church building, resulting in buildings known as Commissioner's Churches. In all, 214 large churches were built, often known as "preaching-boxes" (Curl 1995, 21) – a theme often used by Pugin. In full flight in his lectures about church architecture, he said that "A room full of seats at the least possible cost is the present idea of a church". He went on to refer to "Government preaching-houses, called Churches" which he likened to "Bethel Houses and Socialist Halls" (Pugin, 1853, 48). There are very few of these churches in this survey as the vast majority of them were town or city churches, rather than rural ones. This was also a time of growing Dissent and Catholicism, and attendance at the established church, especially in cities, was falling rapidly; in Birmingham, 75% abstained from worship (Curl 1995, 22).

The Oxford and Cambridge Ecclesiastic Societies and their writings

In the early Victorian period, two groups were set up to influence the building and restoration of churches, with the aims of reintroducing churches in the High-church mould, rather than the Evangelical mould. The Oxford Society for Promoting the Study of Gothic Architecture (OSPSGA) was formed in 1839, two months before the

Cambridge Camden Society (CCS) (White 1962, 38). The CCS was setup to study "Gothic Architecture and Ecclesiastic Antiquities" and gave rise to the term Ecclesiology, whereas the remit of the OSPSGA also included secular buildings (White 1962, 43). The OSPSGA has to be distinguished from the Oxford Movement, which was predominantly about liturgy and belief, rather than church buildings. In his book on the Oxford Movement, the Dean of St Paul's, R. W. Church, wrote a 24 page chapter entitled 'The ideal of the Christian Church' where church buildings are not mentioned at all (Church 1892, 360-384). It has been suggested that the Oxford Movement was interested in orientation of churches, as Johnson wrote in 1912, quoting Victorian authors, that the "practice of orientation had grown lax in the years preceding the founding of the Oxford Movement in 1833" (Johnson 1912, 206 citing Murray in 1895), although the results here will show this not to be true, as alignment towards east in Victorian times was rather less rigorous than during the medieval period, indeed the only examples of alignments towards north or south are from the Victorian period. Although the OSPSGA has been seen as less influential than the CCS, and was described in an article in the *Eclectic Review* in 1849 (quoted in White 1962, 24) as "more academic and antiquarian rather than religious crusaders", the OSPSGA was the first of the two societies to produce concrete advice on church building. After requests for advice, the OSPSGA published a set of working drawings in 1840 for the building of a church which was "a monument to ecclesiological principles" and "a great example of how to build in a 'correct' Gothic style", preceding any comparable advice by the CCS (Prout 1989, 381/2).

One of the aims of the CCS was the recording of existing churches and it published a "blank form for the description of a church" (White 1962, 54). This 'form' grew to 260 items by its 4th edition in 1843 and measurements of the building were considered particularly important. It was published as *A Few hints in the practical study of Ecclesiastic Antiquities for the use of the CCS* between 1839 and 1843, culminating in the Handbook of English Ecclesiology in 1847,which consisted of 266 pages of text and an additional 118 pages of Appendices (White 1962, 58). The fourth edition of *A Few hints in the practical study …* contained two completed examples of church surveys - St Mary & St Michael, Trumpington and St Andrew, Cherry Hinton, both in Cambridgeshire. Interestingly, neither has any details entered for the orientation of the church, despite the remainder of the form being comprehensively completed (reprinted in full in Webster 2003, 115-126). In 1844, the Society published 'The Orientator' (*The Orientator: A simple contrivance for ascertaining of the orientation of churches*) possibly to assist church recorders in obtaining the information lacking in the examples published a year earlier. It consisted of a rectangular card with an attached disc showing the position of sunrise on particular saints' days, to determine "the point of the compass to which a church is directed, and more particularly whether that point be the suns place of rising at the festival of the saint in whose honour the church is dedicated" (*Orientator*, 1 - cited in White 1962, 59). It also included a table of saint's days to establish "whether the supposed rule of orientation was adhered to" (White 1962, 60). The instructions for use were "to place the card parallel to the wall of the church, establishing north with a compass placed on it, then to observe the spot where the sun appeared at daybreak". The Society seems to have lost interest in the subject without establishing any conclusive results (White 1962, 60), presumably because of the lack of data due to the difficulty in its collection, which requires the observer to be at the church at the time of sunrise on the feastday of the Patron saint (soon after 3:30 a.m. GMT for saints such as John the Baptist, with a close to midsummer feastday),

and in addition, for there to be a clear sky in order to observe the actual azimuth of sunrise.

The first CCS document to give advice on building was *A few words to church-builders*, written by John Neale and first published in 1841 (Neale 1841a). It contained 58 paragraphs aimed at church-building committees rather than architects directly (Webster 2003, 128), presumably with the aim of persuading the clients to specify the desired forms of building to the architect. George Gilbert Scott noted that prior to his "conversion" by the CCS and Pugin in 1841 (Stamp 1995, 87), he built at least six churches in 1839, when "he had no idea about ecclesiastical arrangement" (Stamp 1995, 86). Paragraph sixteen of *A few words to church-builders* contains the only mention of orientation, but it is more descriptive than prescriptive, accepting that churches were not aligned east-west in the past; and apparently accepting that some modern churches were built north-south. It appears to have identified the foundation date of the church (consecration day) with the patronal-saint's festival, rather than as separate dates in most cases, and its only criticism on the subject of alignment was reserved for churches that have their altar at the west end. Paragraph sixteen says:

> The orientation, that is the precise degree of inclination of the church towards the East, is the next point. It is well known that the direction to the *due* East was not thought necessary by our ancestors: they used to make the church point to that part of the horizon in which the sun rose on the day of the foundation of the church, the day also, it should be remembered of the Patron saint. But many modern churches are built directly north and south, in total defiance of the universal custom of the Church in all ages: and some, as if out of pure perverseness, though they stand east and west, have the Altar at the west (Neale 1841a, 10).

It did not suggest that the modern churches should be built accurately east-west, except to say that north-south is "in defiance of the universal custom", but without specifically criticising it. Given that a major proportion of the new churches of this period were being built in towns and cities, perhaps a prescriptive statement that churches 'must' be aligned east-west was seen as difficult to comply with on restricted urban sites.

In another pamphlet written by Neale in 1841, this one to Churchwardens (Neale 1841b), he encouraged them to maintain churches in the highest order, with practical suggestions for removing mould and damp, and requested them "to resist every kind of change if you would not have your church spoilt" (Neale 1841b, 6-9). In the middle of all his suggestions is the isolated line "There is no one but knows that every old church is built east and west" (Neale 1841b, 7). It is part of his description of churches generally, which defined nave, chancel and aisles, but does not bear at all on what he went on to say about maintenance of the building.

The CCS published a magazine entitled the *Ecclesiologist*, which commenced publication in November 1841, and ran for 29 years in all (White 1962, 49/50). By 1843, Benjamin Webb, "the driving force behind the CCS" (Brandwood 2000, 447), said that the CCS had had a great influence on church building - "the calm and steady diffusion of the views and principles advocated by the society, and especially the growing adoption of them by professional architects, are highly satisfactory (*Ecclesiologist II*, 88; White 1962; 183). Almost a quarter of a century later, Hope stated "we have turned minds upside down as to the outside and general fabric of the church , … and so have given new life … to the worship in the Church of England"

(*Ecclesiologist XXV*, 209; White 1962, 183). The CCS' concern seems to have been almost entirely to do with particular aspects of church architecture, such as which form of pointed architecture was the most suitable, and mostly concentrated on specific parts of the building, particularly the chancel. Colour and music also featured strongly (White 1962, 187). The redundancy of chancels during the Puritan period was seen as a problem to be redressed in both new and restored buildings, and restrictions by the Church authorities on the numbers of steps into the chancel and the elevation of the altar were seen as arbitrary by the Ecclesiologists (White 1962, 184). Conversely, the archdeacons of Middlesex and London described the effects of Ecclesiology as "under happier circumstances would have been safe and harmless" and that it had "a tendency to heighten Romanizing fever" (White 1962, 184).

The ideal church, as originally conceived by the CCS, should take the form of "an exquisite village church" (White 1962, 186), but various churches in London were criticised for being "too like a town church", or had "too much of a country-church look". Writing in 1850 (*Ecclesiologist XI*, 229-231), G.E. Street set out "six points of essential importance for a town church, but not all equally necessary in the country", among these were "avoid rusticity", shallow roofs, clerestories, "regularity of parts", "height was of immense importance", but not necessarily a spire – again no mention was made of orientation.

The main focus of the two groups was to increase the number of churches in which Tractarian services, which bordered on the Anglo-Catholic, could be performed. Tractarians encouraged the building of "fortress-like" churches (Curl 1995, 66), such as St Peter Kirkgate in Leeds (1839-41 by Chantrell), enabling a high-church return of processions and generally awe-inspiring services. All Saints', Margaret Street, Westminster, built by Butterfield between 1849 and 1859, was also designed on Ecclesiological lines to provide Tractarian services and is generally seen as the beginning of the High-Victorian phase of the Gothic Revival (Chadwick 1971, 168-172; Curl 1995, 66). This type of architecture was seen as the High Church desire to express confidence in the future of Anglicanism after the defections to the Catholic Church, of John, later Cardinal, Newman from the OSPSGA, and Augustus Pugin from the CCS, the most prominent examples (Curl 1995, 65).

Between 1840 and 1900, 6,000 churches were built in England (Morris 1989; Curl 1995, 50), mostly in towns where the growing population required them, and many thousands were "restored" with greater or lesser sympathy, as Curl put it, "The tyranny exercised by The *Ecclesiologist* in criticism of architects, must not be underestimated, as it was a Journal of immense power and influence" (Curl 1995, 50). The *Ecclesiologist* fully embraced Pugin's ideas about architecture – that Decorated Gothic was "the true Christian Style", and this so called "second- or middle-pointed" form of gothic architecture took over (Scott 1881, 87-89; *Ecclesiologist X*, 204) and "was often brutally imposed on real medieval churches, whether Early English or Perpendicular" (Curl 1995, 49).

At the same time, there was also a rise in the Evangelical Party, which saw symbolism, imagery and decoration as "idolatrous gewgaws" and "superstitious practices" (Curl 1995, 48). They were referring to chancels with piscinae, aumbries, credence tables and Easter sepulchres as survivals from the dark ages and a threat to Protestantism. On the other side, the Ecclesiologists argued that the Evangelists had allowed churches to fall into disrepair, allowed liturgy and sacraments to fall into disuse and the young to grow up ill-informed. They concluded that "the High Church

required a decorated church with a chancel, and architects and builders had to learn Gothic" (Curl 1995, 49).

At the start of his *History of English Church Architecture,* written in 1881 after he had "left" the Ecclesiologists, Sir George Gilbert Scott wrote that "We have broken the tradition which maintained the continuity of art history and made each successive style the natural outcome of its predecessor. Everywhere we meet with reproductions of ancient styles and the attempted revivals of lost traditions" (Scott 1881, 2). These church "traditions" which the ecclesiologists were trying to uphold, or re-create, did not apparently stretch to the subject of church alignment, merely to the form and decoration of the buildings themselves.

The main analysis of the results of the post-medieval church survey follows in later paragraphs, but an initial examination is made here to test whether the extensive influence that the Ecclesiological Societies had, also extended to the issue of the alignment of churches, despite the lack of its direct mention.

Initial survey results analysis – possible influence of the Ecclesiological Groups

Although the CCS and OSPSGA wrote nothing that referred directly to alignment, any indirect influence in the alignment of churches built after the two groups became well established has to be checked. In other words, was the upsurge in the support for "true principles" that formed the central tenet of their writings reflected in a change in the alignment of newly built churches closer to East? Allowing for the lead-time for the commissioning, planning and building of a church, and time for the two societies, particularly the CCS, to grow in size after their inception in 1839, any influence that they may have had on church alignment is not likely to have manifested itself until the late 1840s. The table below shows the relative alignments of churches built before and after 1850.

Table A1.1 New build Post-medieval church alignment summary by date of building

	No.	Range	Mean	95% conf	95% Range	% N of East
Pre 1850	144	43º-122º	**80.2º**	±2.4º	77.8º-82.6º	**73**
Post 1850	251	36º-126º	**83.3º**	±2.3º	81.0º-85.5º	**64**
TOTAL	395		**82.2º**			**67**

Although alignments are 3° closer to east after 1850, it is not a function of the influence of the CCS, as table A1.2 below, and its analysis will show. The variation in alignment is very close to being a statistically significant one, as the 95% confidence ranges of two mean alignments only just overlap. This time, the difference cannot be explained by an imbalance of new builds between the west and the east of the country, in the "high" and "low" alignment areas. There is almost exactly the same balance of locations for pre- and post-1850 churches - around 30% in Cumbria, around 23% in Norfolk, Sussex, Lincolnshire and Kent and exactly 48% in the other counties, in both groups. The movement of magnetic north during this period may have had an influence and will be discussed in later paragraphs.

Analysis by architect

A list of the 1243 known members of the Cambridge Camden Society, and their professions, was provided as an appendix in *A Church as it Should be* … (Brandwood 2000, 359-452). It identified 82 architects, many of them of international repute, such as William Butterfield, R.C. Carpenter, Benjamin Ferrey, Anthony Salvin, George Gilbert Scott, G.E. Street and S.S. Teulon. For new-build churches in this survey (as opposed to restorations), where the relevant volume of *Buildings of England* identified the architect, churches have been divided into members and non-members of the Society in the table below. Although some of these designs from the better-known names probably did not come from the named architect themselves, Gavin Stamp wrote that Gilbert Scott "was responsible … for pioneering the modern architectural office, producing work in a characteristic 'house style' which is not always from the hand of the nominal senior partner" (Stamp 1995, c), so any influence that the Cambridge Camden Society may have had on the principal might reasonably be assumed to have filtered down to the hand that actually drew the plans.

Table A1.2 - New-build post-1850 church alignment, summary by architect

	No.	Range	Mean	95% conf	95% Range	% N of East
C.C.S. members	61	44º-115º	**83.7º**	±4.5º	79.2º-88.2º	**64**
not C.C.S. members	155	36º-126º	**83.2º**	±3.1º	80.1º-86.3º	**63**
Architect unknown	35	50º-110º	**82.9º**	±4.8º	78.1º-87.7º	**66**
TOTAL	251		**83.3º**			**64**

There is no meaningful difference between the alignments of churches designed by identified architects, whether they were members of the Cambridge Camden Society, shown in the first row, or those who were not, shown in the second row, with no more than a 0.4° difference between any of the groups and the overall mean value. Similarly, churches where the architect was not identified in *Buildings of England* vary little from the mean alignment of the whole sample. The proportion of churches that are aligned to the north of east hardly varies at all between the three groups. As might be expected, the churches designed by unidentified, presumably local, architects tend to be located in areas far away from London. This applies particularly in Cumbria, where almost 50% of the 'architect unknown' churches in the table above are located, and also where church alignments are generally more northerly. It seems fair to say that, from both the similar mean alignments of the churches in each of the groups, and the similar wide range of alignments between individual churches in each of the groups, the alignment of the churches built during this period was not influenced at all by the writings of the various religious and architectural organisations of the period.

Nineteen of the 25 post-medieval churches which were excluded from the analysis because of their extreme alignments, were built by known architects, according to the relevant *Buildings of England.* Only one of them was designed by a CCS member - Benjamin Ferrey designed St Barnabas', Swanmore in Hampshire in 1846, but did not become a member until 1858 (aged 48), although he was listed as a member of the Oxford Architectural Society (the successor to the OSPSGA) in 1845 (Brandwood 2000, 391 & 361). The church is aligned almost due south-east. The photograph below was taken at 9.10 a.m. GMT (the church clock is showing 10.10 BST), when the sun is almost due south-east, but the sun still just shining on the 'north'

wall. The church was built on a large flat site, at least ten metres from any of its yard boundaries and nowhere near parallel with any of them, so the alignment appears to have been chosen specifically. Twelve of the remainder of the 25 are built within two metres of a churchyard boundary in restricted yards where the alignment of the church does seem to have been influenced, if not determined, by the site itself.

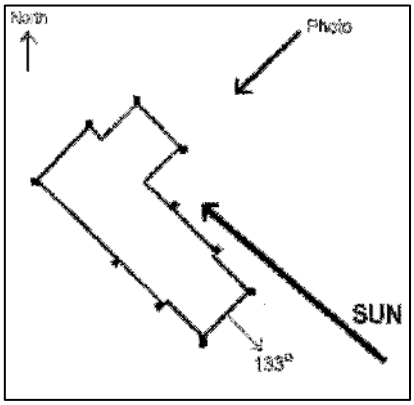


Figure A1.1 –

St Barnabas', Swanmore (Hampshire), aligned to the south-east.

Possible influences on alignment, by someone other than the architect

The possibility that the architect was not the only determinant of the alignment of some Victorian churches has to be considered. In certain circumstances the 'owner/sponsor' of a new church, to put it in medieval terms, may have had, or wanted to have, an influence on the siting of the new church - for example when the church was to be built close to the 'big house', affecting the way that the church was to be seen from the house. Thirty-eight of the post-medieval churches in this survey are built next to a manor house/hall, or in adjacent parkland, where they might have been built in such a way as to maximise the beneficial view of the church for the occupants of the house. If the church is aligned close to east, it is not possible to separate any possible 'visual' factors from the general practice of eastward alignment. However, eight of the thirty-eight churches are aligned more than 30° from east – five of these can be shown to have been influenced by other factors, such as down the slope of the land or built parallel with the closely adjacent road or boundary, so they were not necessarily rotated away from east for the benefit of the view from the house, but three probably were – Kirkandrews in Cumbria, Leaton in Shropshire and Eastville in Lincolnshire.

At Kirkandrews in Cumbria, the current church was built in 1776, but with older plate and vessels (Pevsner 1967, 147), so is not the first church on the site. The current church is aligned almost due south-north at 357°, and is therefore at right-angles to the view from the house some 400 metres to the west, rather than presenting an end-on view of the nave if the church was aligned east-west.

Figure A1.2 – Kirkandrews church, in its large yard, aligned south-north for the improved view from the modern house, close to the pele tower seen in the background. Compare the church alignment with the east-facing gravestones.

The 'big house' at Eastville however, is the Vicarage, where Pevsner noted "the [Vicarage] doorway with Gothic detail is in axis with that of the church tower" (Pevsner & Harris 1998, 267), which contains the entrance to the church *via* the west door, so the Vicarage door and church entrance are opposite each other. Pevsner did not comment on the building date of the Vicarage, but since the church was built soon after the drainage in this part of the fens was completed (Pevsner & Harris 1998, 65), it must be assumed to be contemporary with the church. The church was built in 1840, and is the most extremely aligned church in this survey, at 200º, the chancel is twenty degrees west of due north-south, but is built roughly parallel with the adjacent road, although at least ten metres away, so nowhere near close enough to have been forced to do so, leaving only the presence of the Vicarage as the unlikely determinant of the alignment.

At Leaton in Shropshire, the church is aligned at 46° (within a degree of due north-east) and is built at right-angles to the house which is close-by, thereby giving a better view of the church from the house. It is built on a flat site at least ten metres from the closest boundary, so neither slope nor a small site can be used to explain an alignment which is shared by less than 0.5% of the post-medieval churches in this survey, some 36° north of the county mean value.

There are a further five churches built close to a manor house or Hall which are aligned between 15° and 30° from east. Two of them, at Child Ercall and Fodesley, both in Shropshire, would have been seen better from the house if they were built east-west, rather than as they were at 69° and 115° respectively. The alignment of the remaining three can be shown to have been influenced by factors other than sightlines, where each of them is built close to a road, and the relationship between the church and

house has not been improved by the alignment of the church – at Fauls and Peplow in Shropshire and at Sewerby in East Yorkshire.

It seems safe to say that only two, possibly three, out of a total of over 400 post-medieval churches in this survey, were set out with the intention of providing a specific view of the church from the house, but on the other hand, there are at least two churches where the view from the big house would have been better if the church was aligned closer to east-west, rather than with their actual alignments. There may have been other examples where the siting and alignment of the church contributed to the house occupant's view but cannot be separated from other influences, but overall, it seems an insignificant factor on alignment as far as the overall sample is concerned.

As well as the church at Eastville, there were several other Anglican chapels built in the Lincolnshire fens between 1816 and 1821, soon after the land was drained (Pevsner & Harris 1998, 213). Five of these were built by a local architect - Jeptha Pacey, under the sanction of the Fen Churches Act 1812 (Pevsner & Harris 1998, 65). Three of them, at Carrington (1816), Langrick (1818) and Whaplode Drove (1821) are built specifically not parallel to the churchyard boundaries, so their alignments were presumably set out on purpose, rather than just conforming to the site. The other two, Midville (1819) and Frithville (1821) are roughly parallel to the adjacent road. All five were built on flat sites (on drained fenland) and are obviously aimed eastwards, but without specific accuracy – **94º, 83º, 90º**, 96º and 97º, which seems odd given that the alignment of at least the first three of them (in bold) was apparently 'chosen', in that there were no other obvious influences such as a boundary to align with. This variation seems to argue against the same method of setting out being used at each site, or at least the use of accurate equipment such as a compass (unless the setter-out was not competent).

The five churches built by Pacey are a good example of small village churches that are remote from any possible influence of the Lord of the Manor, or indeed anyone else, who might have tried to influence alignments to improve the view of the building from the village or a specific house, and are part of the great majority of post-medieval churches which are aligned close to east.

Ironically, the last of the six Fen Act chapels was at Eastville, mentioned earlier, and was built by Pacey's pupil, J.C. Carter (Pevsner & Harris 1998, 267), some 20 years later and 110° different in alignment.

Post-medieval church alignment

Despite there being several surveys of the alignment of medieval churches, discussed in Chapter One, there are no published surveys of churches of the Victorian era – a period of much new church building. There is one published study of Queen Anne period churches (early eighteenth-century), but its sample was too small to be statistically useful and only included urban sites; the details are listed below, followed by the results of the survey for this thesis.

Queen Anne churches

A small group of eighteen churches on the eastern edge of London was surveyed by Ali & Cunich in 2005 and showed a similar range of alignments to the larger medieval set analysed here. In all, even for this small sample, the variation in alignment was 58º, between 57º and 115º. Since many of these churches were built on urban sites, it is

impossible to draw any conclusions about alignment intentions, despite Ali & Cunich's assertion that when Sir Edmond Halley joined the Church Commissioners, he "must have affected alignment with his scientific knowledge" (2005, 67). There are no rural churches of this period in the survey for this thesis.

Survey results for eighteenth- and nineteenth-century new-build churches

In all, 420 new-build churches, as opposed to a rebuilding on a medieval church site, built between 1721 and 1902 were surveyed in ten of the counties used for the survey of medieval churches. Ninety-three percent of them were built after 1800, and they are all hereafter referred to as 'post-medieval' for simplicity. The results seem broadly to confirm medieval alignment aims, focusing generally eastwards. Medieval church alignments exhibit a range of exactly 90º between the most northerly and southerly aligned churches (between 38º and 128º). Post-medieval churches exhibit an even wider range of alignments – in excess of 220º. One church chancel, mentioned earlier, at Eastville in Lincolnshire is aligned 20º west of south, Forest Row (East Sussex) faces due south, whilst two others are approximately 20º east of south; (Madeley, Shropshire and Nenthead, Cumbria). Two chancels (Wendy, Cambridgeshire and Brathay, Cumbria) face due north, with five others aligned even further from east, actually to the west of north (Kirkandrews (mentioned earlier), Frizington and Ainstable in Cumbria, Tilstock in Shropshire and Ellerby in East Yorkshire). In these cases the actual compass reading is in the region of 350º, which causes problems when mean values are being calculated as they are 'only' 100º away from east, rather than the 260º implied by the numerical difference between 350 and 90º. In the calculations of means and other statistical analyses, the alignment of these churches has been taken as -10º, which better reflects their actual alignment in relation to east.

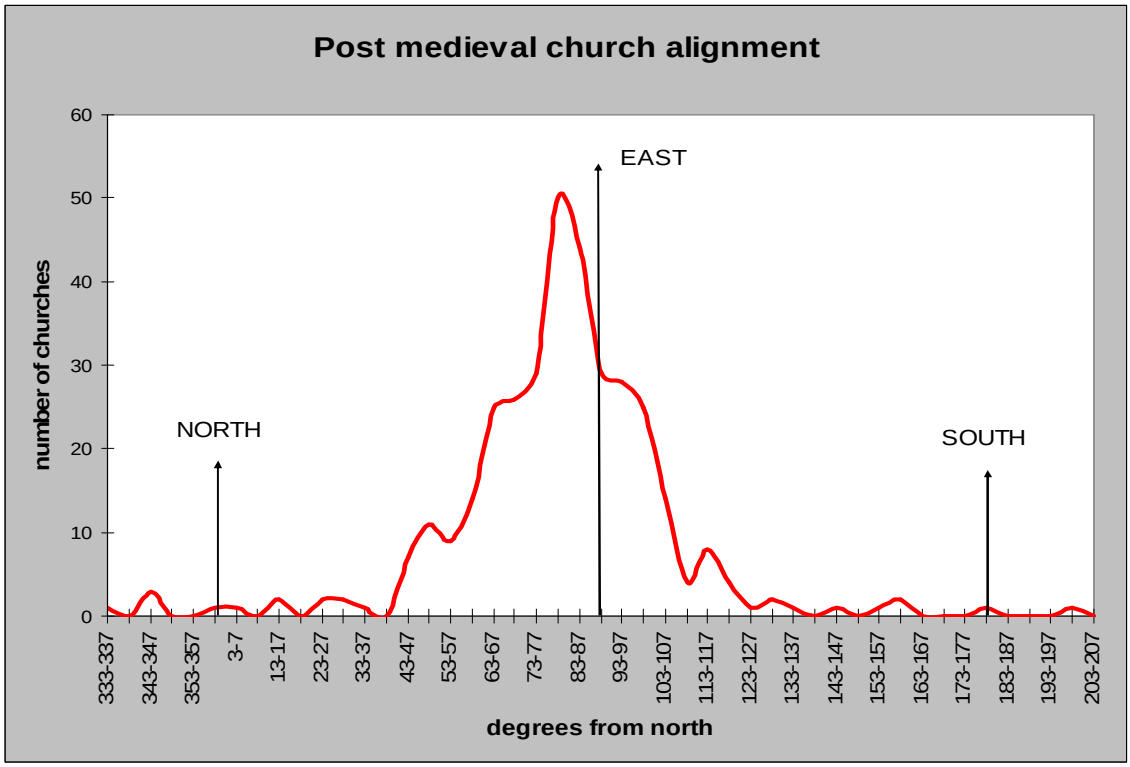


Figure A1.3 – Alignment of Post-medieval Churches

However, as can be seen from Figure A1.3, the vast majority of these churches, like their medieval counterparts, are aligned close to east. Overall, there are twenty-five churches with alignments that are so far from east that they appear to be pragmatic solutions to site specific problems (or site-specific influences), in most cases these are narrow sites that would have prevented alignments closer to east-west. In order to compare the Post-medieval results with the medieval set, these twenty-five churches have been excluded from the majority of the analyses below, using only the remainder under the heading "less extreme churches". Since the twenty-five churches are spread at both extremes, close to north and south, their removal from the analysis hardly alters the overall picture. As table A1.1 shows, the overall mean alignment is reduced by 0.6º, but the proportion of churches aligned to the north of east remains the same, at **67%**, and the overall statistical confidence in the mean results is improved as measured by the 95% confidence level, which reduces the range from **±2.4º** to **±1.7º.**

Table A1.3 - Post-medieval churches built on new sites

ALL	**No.**	**Range**	**Mean**	**95% conf**	**Mean range at 95%**	**% N of East**
Cumbria	115	-24 - 162°	**77.4°**	±4.5°	72.9-81.9°	84
Shropshire	66	-14 – 160°	**82.2°**	±6.6°	75.6-88.8°	70
North Somerset	24	43 - 120°	**82.6°**	±7.6°	75.0-90.2°	67
East Yorkshire	42	-14 - 117°	**78.7°**	±6.6º	72.1-85.3°	79
North Cambridge	17	1 - 106°	**76.1°**	±12.5º	63.6-88.6°	65
South Hants	50	36 – 144º	**87.9º**	±7.0º	80.9-94.9°	48
East Sussex	33	24 - 181°	**88.2°**	±10.8º	78.0-98.0°	52
Norfolk/East Suffolk	33	55 - 117°	**87.2°**	±5.0º	82.2-92.2°	59
South Lincolnshire	28	50 – 202º	**94.3º**	±8.8º	85.5-102.5°	36
East Kent	7	58 - 102°	**90.1°**	±9.7º	80.4-99.8°	43
OVERALL	**420**	**-24 – 202º**	**82.8°**	**±2.4°**	**80.4 – 85.2°**	**67**
Less extreme*	395	36-126º	82.2°	**±1.7°**	80.5-83.9°	67

* excluding the 25 churches mentioned in the text above

Overall, the number of post-medieval churches in each county is smaller than the number of medieval churches, except in Cumbria, where a large-scale post-medieval church-building programme followed industrialization and the creation of new parishes by the division of the large medieval ones (Cumbria C.C. 1998), but the east-west pattern of difference noticed in the medieval Figures is still exhibited in the mean alignment Figures for the post-medieval churches; lower in the west (Cumbria, Shropshire and Somerset), whilst higher in the east (Suffolk, Norfolk, Lincolnshire and Kent). Overall, there is an eight degree mean alignment difference between churches in the east and in the west, shown in table A1.5, with a difference of **2º** between the closest ends of the mean ranges at 95% confidence level. The results are still significant even at a 99% confidence level, as the range of variation in the mean values for alignment in east and west still do not overlap. As with the medieval churches, the difference is caused by the alignment curve being displaced to one side of the mean – **77%** of churches aligned to the north of east in the west of the country and **58%** in the east (compared with **75%** and **54%** respectively, for their medieval counterparts).

Why does this east-west difference still exist? The presence of churches that are aligned north-south or south-north clearly demonstrates that post-medieval builders were obviously less constrained than their medieval forebears, on occasion taking a practical view of the site constraints and working within them. In these cases the Victorian builders were obviously not obligated to align as close to east as possible, so either the focus on alignment was no longer so rigorously applicable, or the situation never arose in medieval times. None of the 1,926 medieval sites in this survey was as small, in other words as narrow in an east-west direction, as some of the post-medieval ones, so the issue of being forced to align north-south did not arise in the medieval period.

Whether or not it was the same reason that caused medieval church-builders and post-medieval church-builders to align more churches to the north of east in the west of the country, and fewer to the north of east in the east of the country, the pattern clearly continued. In all, slightly more than two-thirds of post-medieval church-builders aligned their churches to the north of east, varying from 84% in Cumbria to 43% in Kent. The same patterns in alignment east-west across the country in post-medieval times are shown in Figure A1.4 on page 320, as were shown in the medieval alignments in Figure 6.1 in the main text. The smaller sample means that the curves are less smooth, but they patently shows the same variation.

Table A1.4 - "Less Extreme" Post-medieval churches built on new sites

	Number	**Range**	**Mean**	**95% conf**		**% N of E**
Cumbria	111	44 - 118°	**76.8°**	±2.8°	74.0-**79.6°**	84
Shropshire	62	46 – 126°	**81.9°**	±4.6°	77.3-86.5°	69
North Somerset	24	43 - 120°	**82.6°**	±7.6°	75.0-90.2°	67
East Yorkshire	41	43 - 117°	**80.6°**	±4.3°	76.3-84.9°	76
North Cambridge	16	45 - 106°	**80.8°**	±9.2°	71.6-90.0°	63
South Hants	47	36 – 126°	**84.6°**	±6.3°	78.3-90.9°	51
East Sussex	27	37 - 115°	**87.9°**	±6.2°	81.7-94.1°	48
South Lincolnshire	27	50 - 108°	**90.3°**	±4.4°	85.9-94.7°	38
Norfolk/East Suffolk	33	55 - 117°	**87.2°**	±5.0°	82.2-92.2°	64
East Kent	7	58 - 102°	**90.1°**	±9.7°	**80.4**-99.8°	43
OVERALL	**395**	**36 -126°**	**82.2°**	**±1.7°**	**80.5-83.9°**	**67**

Table A1.5 - 'Less extreme' Post-medieval Church alignment summary by longitude

	No.	Range	Mean	95% conf.	Range at 95%	Range at 99%	% N of East	Medieval Mean	95%	%N of E
West (2° W+)	197	43-126	**79.1**	±2.3	76.8-**81.4**	76.0 - **82.2**	**77**	**82.2**	**±1.6**	**75**
Central (0.01° – 1.99° w)	114	36-126	**84.2**	±3.4	80.8-87.6	79.8 - 88.6	**64**	**85.0**	**±1.0**	**70**
East (0° - 1.70° E)	84	37-117	**86.8**	±3.4	**83.4**-90.2	**82.3** - 91.3	**58**	**88.8**	**±0.7**	**54**
TOTAL	395		**82.2**				**67**	**86.1**		**63**

Impact of the post-medieval church alignment results

Alignment variation by longitude

Since the spatial variation in the alignment results of medieval and post-medieval churches is similar, there are two possibilities – firstly that the same influences were in force in both periods, or secondly that two different influences were in play that happened to have similar effects on the results.

If the same influence was in force in both periods, then it removes the possibility that either the short medieval annual building programme, or sunrise at the start of building, had an effect on the alignment of medieval churches, since the same factors cannot apply to the post-medieval builders. Technology, building materials and building methods had altered and improved, with a far greater use of brick which requires considerably less mortar, thereby removing the need for very short annual building campaigns, particularly in the areas of predominantly flint construction in the south-east of England. Similarly, if there was a single influence, then it cuts out the possibility of magnetic determination of alignment in both periods – since magnetic north in the eighteenth and nineteenth centuries was at least 40º away from where it was in the eleventh and twelfth centuries. The positioning of eighteenth-century sun-dials either on contemporary, or medieval, churches shows that the issue of variation from east was both understood and capable of being corrected fairly accurately by this time. To allow for the fact that the south wall of a church did not face due south, either the face of the sundial was set at an angle to the church wall, or the gnomon was offset from vertical (for a more detailed explanation, see Wall 2006, 16-17). Similarly, labour availability in post-medieval times would be unlikely to place the same restrictions on building as it had in medieval times; particularly from the mid-Victorian period onwards when full-time labourers were available, and probably employed directly by the builders, rather than the medieval method of using feudal labour during slack periods in the farming year. Therefore labour was likely to be available at any time, and the only thing likely to determine when foundation digging could not happen would be when the ground was too wet or too frozen to dig, otherwise it could be undertaken at any time of the year.

The similarity between medieval and post-medieval results could increase the possibility that the spatial difference is brought about unconsciously. Medieval builders might have been influenced by any number of factors, either liturgical or craft-based, but this is less likely in post-medieval times, especially for the Victorians, as they seem to have taken a pragmatic approach to alignment on many sites, so why would they have consciously followed some other influence on alignment elsewhere?, thus increasing the possibility of an unconscious influence. Earlier in this chapter it was shown that the writings of the members of the CCS and the OSPSGA had a major influence over the architecture of the churches of the time, but they wrote nothing about the reasons for, or necessity of, aligning churches in specific directions. The only reference to alignment in this period being that in Wordsworth's poem, mentioned earlier in Chapter One. As there was no influence by the CCS on the alignment of individual churches towards east, it cannot have had any influence on the differences in alignment in churches between those in the east and west of the country. Neither have there been any apparent medieval written instructions on alignment, perhaps indicating that it was so widely appreciated that it did not require committing to paper, or that it was a craft- or trade-secret so closely guarded that nothing has been revealed to outsiders. By its very nature, such a 'craft secret' is difficult to investigate. However,

the *History of Masonry* explained that Freemasonry, as it is known now, was effectively re-invented in Edinburgh in the eighteenth century (Lawrie 1859, 12-14), although Prescott placed the re-invention in London by the formation of the first Grand Lodge in 1717, from which 450 Lodges across the country were authorised by 1757 (Prescott 2008, 2), so continuous links with medieval masons, when there may have been a genuine craft element to the building process, are very unlikely.

The position of sunrise still has to be considered as the possible cause of the variation in the alignment of churches in both periods. For the position of sunrise to reflect the fact that the mean post-medieval church alignments are numerically a little lower than medieval ones, area for area, sunrise would need to be a little further north on the horizon, in other words either a little later in the spring or a little earlier in the late summer, than the medieval equivalent. In an earlier chapter, Victorian harvest festival dates between 1870 and 1900 were used as a proxy for medieval harvest times. They showed that an apparent underlying climatic difference across the country closely reflected the actual difference in mean church alignment. Is it possible that the same influence played a part in the planning of post-medieval churches and that a particularly early harvest could still influence church-builders in Victorian times? Perhaps the use of large-scale mechanization meant that harvest was gathered in more quickly in later Victorian times[41], and therefore was finished earlier, shifting the date forwards a little and making sunrise a little further north. However, the possibility that all post-medieval builders were equally influenced by harvest completion seems unlikely. Despite the fact that there was still a strong link between the harvest and rural people, even continuing into the early twentieth century when school records in (very) rural Suffolk reflected this intimate connection, recording children absent from school as "they were helping to bring in the harvest" (Tooley 2002, 70), the previously close link between harvest and church-building was lost. Even in the most rural of areas, those who commissioned the building of a church in post-medieval times had to go through a lengthy period of Episcopal approvals and committees, which removes the close timing between the individuals' decision to build a church and the start of its building, which could have applied in medieval times. It also firmly divorces the date of the inception of the idea to build a church from the day that the plans were drawn up as part of the building contract, which is the point at which the alignment of the post-medieval church was effectively fixed, rather than the more direct medieval action of the marking out and digging of foundation trenches, post holes or ground-beam slots.

Taken together, all these arguments seem to remove completely the possibility that the same influence existed on church-builders over a period of several hundred years between medieval and Victorian times, whether it was a magnetic one; dictated by the building programme; prompted by an early harvest; a craft-based tradition or even merely an unconscious influence. Therefore it seems that there had to be two influences on alignment, one in medieval times and another in post-medieval times, but which happened to have similar effects. Whilst early harvest seems to provide a strong guide to church alignment in medieval times, it is less supportable for the post-medieval building process. The possibility of magnetic influence for the alignment of medieval churches was dismissed earlier, as the variation in magnetic declination was in the opposite direction from the church alignment differences. In the nineteenth century however, the variation in magnetic declination was in the same direction as the difference in church alignment between the east and the west of the country.

[41] The *Beverley Guardian* reported several large scale tests of self-binding harvesters on farms in the area in the early 1880s, which left the farmers "much impressed"

The United States' Government Geomagnetic Service website (USGS) can calculate magnetic declination for any point on the globe back to the year 1900, but can go no further into the past as there are insufficient contemporary measurements on which to base the calculations[42]. The following calculations from the website were made for Cornwall in 1900 (18.5° west of true north) and East Norfolk (15.5° west of true north) – a similar range to that measured in 2002 and listed in Chapter Eight (5° west in Cornwall, and 2.5° west in East Norfolk) and likely to have been a similar range for periods before 1900, although each end of the range would have higher values.

These declination values would mean that if a compass was used to set out the churches, there would be a 3° difference between the churches in the extreme east and the extreme west of the country, those in the west being aligned further north of east. The actual mean alignment of post-medieval churches measured in this survey was 79.1° in the west of the country, which is 10.9° north of east, and 86.8° in the east of the country, which is 3.2° north of east, a difference of 7.7°, which is greater than the 3° difference in declination, but the variation at this period is in the same direction.

Table A1.6 – Variation in Magnetic north and church alignment by longitude

	Magnetic east: degrees north of true east at 1900	Mean Church alignment ± 95% confidence	Church alignment: degrees north of true east
West	**18.5°** (Cornwall)	79.1° ± 2.3	**10.9°** (8.6 – 13.2)
East	**15.5°** (E Norfolk)	86.8° ± 3.4	**3.2°** (0 – 6.6)

If correct adjustments were made for declination then all churches would face due east, which obviously did not happen as the east-west difference in alignment is still evident. Declination was part of public knowledge, at least to the educated public (as evidenced by the adjusted sun-dials, mentioned earlier), but it is possible that Victorian architects assumed that the degree of magnetic declination was consistent across the whole country, at the level in London where it was first measured, rather than having a variable value which depended on location. This is supported by the "scarcity of contemporary declination measurements before 1900", that the USGS website mentioned. If the value for London (approximately 16° in 1900[43]) was applied to all the compass readings across the country, then the result for true east, in the west of the country would be 2.5° north of where it should be (18.5° – 16°); whilst in the east, the result would be 0.5° south of where it should be (15.5° - 16°), so there would be a 3° difference in the results between those in the east and those in the west. So, if magnetic declination was ignored, or was used but applied incorrectly, the alignment of churches in the west of the country would be 3° more northerly than those in the east, in both cases.

Alignment variation throughout the nineteenth century

In addition to the spatial variation across the country for the whole sample, the post-medieval results also display a change in mean alignments as the nineteenth century progressed, irrespective of longitude. The dates for the groups for this analysis were chosen in order to give similar sized groups, unfortunately, the dataset is far smaller than the medieval set, and cannot be expanded, so the statistical confidence that can be expressed in the results is not quite as forceful. However, at 90% confidence levels,

[42] http//:www.ngdc.noaa.gov/geomagmodels/struts/calcGRFWMM (24th March 2009)
[43] http//:www.ngdc.noaa.gov/geomagmodels/struts/calcGRFWMM (2nd April 2009)

churches built before 1850 have a significantly different mean alignment from those built towards the end of the century – 80° rising to almost 85°, shown in table 8 and Figure 9 below. As with the medieval results, the proportion of churches aligned to the north of east confirms the pattern, reducing from 73% to 59% over the same period, demonstrating that the change in alignment is not merely a statistical sleight of hand. Despite the significant difference in the mean alignments, the actual range of observed alignments is similar in each of the three periods, 43°-122° for churches built before 1850, 44°-126° for those built between 1850 and 1869, and 36°-126° for churches built after 1870.

Table A1.7 New-build post-medieval church alignment summary by date of building

	No.	Range	Mean	90% conf	90% Range	% N of East
Pre 1850	141	43º-122º	**80.2º**	±2.0º	78.2º-**82.2º**	**73**
1850-1869	130	44º-126º	**82.2º**	±2.6°	79.6°-84.8°	**70**
1870 & after	124	36°-126°	**84.8°**	±2.8°	**82.0°**-87.6°	**59**
TOTAL	395		**82.2º**			**67**

As was discussed in an earlier chapter, the movement of the magnetic north pole reached its maximum position to the west of true north at around the turn of the nineteenth century, after which the position of magnetic north, and therefore east, moved closer to their true positions at a fairly constant rate of approximately 1° per decade. The post-medieval church alignments appear to show a close link to the changes in magnetic directions as time progressed. There is a much closer match between the values involved here than with the spatial variation results, as, over the period of post-medieval church building, magnetic east shifted 6° southwards, whilst the mean church alignment shifted 4.6° southwards. This is a pattern which did not appear at all in the medieval dataset, when it was shown that church alignment did not vary by date of building, whereas the position of magnetic north moved a similar amount to that in the nineteenth century, albeit in the opposite direction.

Table A1.8 – Change in Magnetic north and church alignment in the Nineteenth century

Date	Magnetic east: degrees north of true east	Mean Church alignment ± 90% confidence	Church alignment: degrees north of true east
Pre 1850 (avge date 1825)	**24°**	80.2° ± 2.0	**9.8°** (7.8 – 11.8)
1850-1869 (1860)	**20°**	82.2° ± 2.6	**7.8°** (5.2 – 10.4)
After 1870 (1885)	**18°**	84.8° ± 2.8	**5.2°** (2.4 – 8.0)

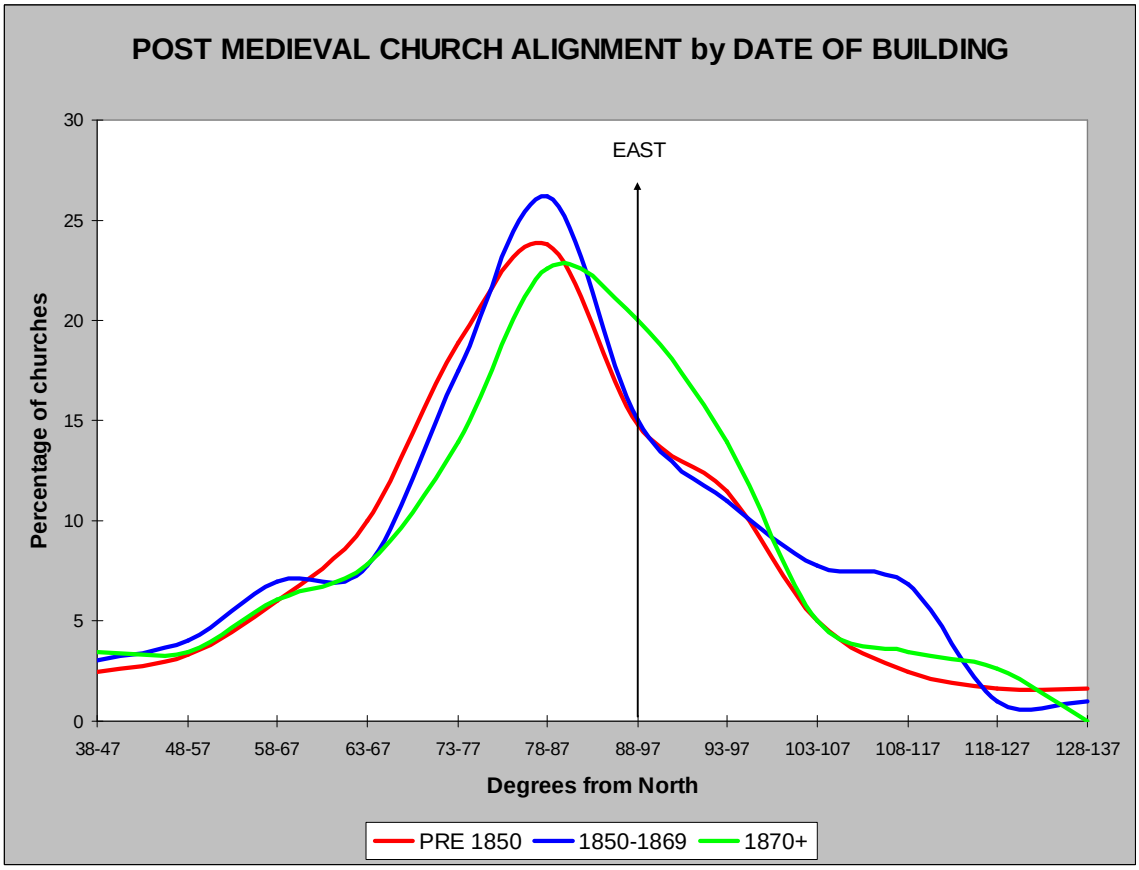


Figure A1.4 – Post-medieval church alignment by date of building

The alignments of the churches built in the early 1800s by Jeptha Pacey, the local man who designed and built the five Fen-Churches-Act chapels, mentioned earlier, confuse the issue, because although his churches were all built close together, both in location and in time, his results vary either side of true east, apparently at random - 94º, 83º, 90º, 96º and 97º - (mean value 92°). Although Pacey's alignments appear to be aimed towards true east, they give no indication of the method he was using to achieve them. If he was making consistent errors, either with the compass itself, or the subsequent calculations of declination, one would expect a consistent numerical error in the alignment of his churches. But his variations pale into insignificance when compared to the range of alignments of churches built by every single one of the named architects who built five or more churches in this survey during the period, for example Blomfield 60-117°, Butterfield 79-106°, Cory 69-112° (+ another at 162°), Ferguson 44-98°, Ferrey 69-115° (+ another at 133°), Gilbert Scott 47-85°, Haycock 56-107° (+ two others at 16° & 157°), Paley & Austin 58-105°, Salvin 55-106° and Street 64-109°. When all is said and done, it is this random variation that apparently causes the wide overall range of alignments, either side of the mean value, in the whole church sample.

It is not easy to see how the movement of magnetic north should have had an effect on the alignment of post-medieval churches. Whilst the difference in alignment is numerically similar to the difference in the apparent position of east, the actual values are different, and could not have been achieved by using a compass. If a compass had been used to align the churches and no adjustment made for the declination, then the church alignments should share the actual values of magnetic east.

If a compass was used and declination adjustment was incorrectly applied, then there would be a 3° difference in alignment, but if a compass had been used and correct adjustments made for declination, then each of the churches should face true east. The results on the ground appear to show elements of all these cases – a shift in mean alignment that mirrors the change in magnetic east over the same period, but with values that are far closer to true east than magnetic east.

Unlike all the other analyses of variations of alignments in both the medieval and post-medieval elements of this survey, the variation of post-medieval church alignment by date of building *cannot* be explained by the predominance of churches located in either the east or west of the country, in other words in the areas of 'low' or 'high' alignment values. In this instance, churches in the west (the 'low' area) form the majority of the cases in all three of the building periods shown in table 8 and Figure 4 above, thereby cancelling out any specific influence of longitude.

Rebuilt chancels

Another example of Post-medieval church alignment can be illustrated by the rebuilding of ruined medieval chancels. As mentioned in Chapter Five, when considering churches with naves and chancels aligned differently, it appears to have been equally important to realign a chancel during its rebuilding in the eighteenth or nineteenth centuries as it had been to do so during the medieval period. However, there is a good chance that some of the chancels rebuilt in the eighteenth and nineteenth centuries had already been rebuilt in thirteenth century. It cannot be determined whether these later rebuilds followed the earlier foundations or whether they were newly re-aligned as the result of the same desire to point closer to east. Post-medieval rebuilt chancels are usually much shorter and often with thinner walls built in brick, which would have made realignment on the original wider foundations much easier.

Of the 730 churches surveyed in Norfolk, Lincolnshire and Hampshire, *Pevsner* assesses the age of both chancel and nave in 389 cases. Of these 389, 150 have a later chancel, of which 113 are medieval rebuilds and 37 are eighteenth- or nineteenth-century rebuilds. Of the 113 medieval rebuilds, 33 chancels (29%) are aligned differently from the nave, two-thirds of them (22) were aligned closer to East and one-third (11) further away. The chancel alignments ranged between 67º and 111º - all bar one of the most extremely aligned were realigned (one at 111º was not). Of the 37 eighteenth- and nineteenth-century rebuilds, eleven (30%) were realigned, ten of these were aligned closer to east and one was not. Interestingly, when rebuilding offered the chance to realign the chancel closer to east, the opportunity was not always taken, even when the alignment was far from east. Seven of the 26 chancels which retained the same alignment as the nave on rebuilding had more extreme alignments than the eleven that were realigned. Those that were realigned were between 82 and 106º, whereas the whole group was aligned between 56 and 108º. This seems to be counter to the greater desire to re-align the chancel when the original alignment was further from East, which was highlighted in Chapter Six. Without written records at each site, it is not possible to say why realignment wasn't effected, but at the two most extreme sites, Thwaite and Surlingham (both Norfolk) and also East Bilney (Norfolk) the churches were built facing directly down slopes; two others, Frettenham and Great Plumstead (both Norfolk) were built on flat sites but within two metres of the closest churchyard boundary, so considerations of slope and site restriction could have made realignment

more difficult and may have outweighed the benefits of realigning closer to east. At the remaining two sites, however, at Needham and Burston (both Norfolk) the sites are large and flat so there were no restraints to realigning the chancel when it was rebuilt.

Conclusions

Almost 400 eighteenth- and nineteenth-century churches built across the country appear to have been aligned in a similar pattern to their medieval counterparts. Apart from a few churches, most of which are a pragmatic solution to the problems of difficult sites, they are aligned basically eastwards, but with wide variations. Two significant results in the alignment of post-medieval churches are apparent; firstly a similar spatial variation across the country to that of the medieval church set, and secondly a difference in alignment depending on when the church was built, which varies apparently in parallel with the change in the position of magnetic north over the same period. What caused the second pattern is unclear, as the extensive writings of the time by the Cambridge Camden Society and others, despite being forceful on other aspects of 'true' church construction, hardly mentioned orientation. The CCS produced the *Orientator* as part of their church recording exercise, but apart from the brief mentions in the pamphlets to church-builders and church-wardens, had not only little to say about the subject of orientation but even less influence over it. There is no difference in alignment between the churches designed by architects who were members of the CCS and those who were not, which clearly confirms the absence of any direction in this matter from the Society.

Why then, do eighteenth- and nineteenth-century churches apparently follow the same spatial pattern of variation in alignment as the medieval examples? This analysis has proved that the same influence cannot have been in action across so long a period, causing both early medieval, and post-medieval, church builders to build their churches with similar alignment variation between the east and west of the country. This strongly suggests that there were two different influences in the two periods that resulted in similar patterns of alignment. As far as the medieval period is concerned, early harvests seem to point to an auspicious time to build a church which was aligned towards sunrise then. The close link between decision to build a church and its actual building was broken during the post-medieval period, both from the point of view of the extended intervening time and the number of extra intermediate processes, such as committees, parochial church councils, architects, plans, building contracts etc., thereby removing the possibility of a post-medieval link between harvest and the date of building of the church. Magnetic influences cannot explain the variation by longitude over both periods, as magnetic north was rapidly shifting in opposite directions, but during the nineteenth century the movement in magnetic north and the east-west variation in church alignment were changing in the same direction. The absolute values are different, but the trend is the same, and appears to be the only realistic explanation for the variation in alignment across the country. It is difficult to see what other specific influence could have affected post-medieval builders, since nothing has apparently been written down, or reached modern times through 'folk-lore'. Unlike the medieval church sample, which was shown not to vary in alignment by date of building, post-medieval church alignment did alter over time, with mean alignments shifting closer to east as the nineteenth century progressed. Like the post-

medieval variation in alignment across the country, this change also reflects the rapid changes in magnetic declination over the same period. However, unlike all the other elements of this survey, an unequal balance in the sample between the east and west of the country, the 'low' and 'high' areas of alignment, cannot be used to explain this difference, as churches in the west of the country dominated each of the three post-medieval periods analysed – pre-Victorian, early Victorian and late Victorian. The fact that both of the observed elements of post-medieval church alignment variation - across the country, and across the period, parallel the changes in the position of the magnetic north pole during the period, emphasises the probability that magnetic variation was at the root of both of the differences, despite the fact that the actual values of the compass bearings of the position of magnetic east are not copied in either the east-west differences across the country, or the early- and late-Victorian mean alignment Figures, but the trends in the movement of magnetic east are closely mirrored in both cases. Although the concept of magnetic declination had been understood since it was first measured in the sixteenth century, it was still misunderstood three centuries later, as is demonstrated in the survey of churches in Scotland by Eeles in 1913 (outlined in Chapter One), where his interpretation of magnetic changes was erroneous (Eeles 1913, 180), indicating that this may have been at the root of the Victorian errors.

APPENDIX 2 - Sunrise azimuth by latitude

Assumes a level horizon, and is shown in degrees from North. Calculated from the formulae shown in Appendix 6

50 deg	51deg	52 deg	53 deg	54 deg	55 deg	LATITUDE/ DATE
89.4	89.4	89.4	89.3	89.3	89.3	21st March
85.1	85.0	84.9	84.8	84.7	84.5	28th March
80.9	80.7	80.5	80.3	80.1	79.8	4th April
76.9	76.6	76.3	76.0	75.6	75.3	11th April
73.0	72.6	72.2	71.8	71.4	70.9	18th April
69.4	68.9	68.5	68.0	67.4	66.9	25th April
66.0	65.5	65.0	64.4	63.8	63.1	2nd May
63.1	62.5	61.9	61.2	60.5	59.8	9th May
60.5	59.8	59.2	58.5	57.7	56.9	16th May
58.3	57.6	56.9	56.1	55.3	54.5	23rd May
56.6	55.9	55.1	54.3	53.5	52.4	30th May
55.4	54.6	53.9	53.0	52.1	50.9	6th June
54.7	53.9	53.1	52.3	51.4	50.0	13th June
54.5	53.7	52.9	52.0	51.0	49.8	20th June
54.8	54.0	53.2	52.4	51.5	50.1	27th June
55.6	54.9	54.1	53.2	52.4	51.0	4th July
56.9	56.2	55.4	54.7	53.8	52.5	11th July
58.7	58.0	57.3	56.6	55.8	54.9	18th July
61.0	60.3	59.7	59.0	58.2	57.5	25th July
63.6	63.1	62.5	61.8	61.2	60.4	1st August
66.7	66.2	65.7	65.1	64.5	63.9	8th August
70.1	69.6	69.2	68.7	68.2	67.7	15th August
73.8	73.4	73.0	72.6	72.2	71.8	22nd August
77.7	77.4	77.1	76.8	76.5	76.2	29th August
81.8	81.6	81.4	81.2	81.0	80.8	5th September
86.0	85.9	85.8	85.7	85.6	85.5	12th September
90.2	90.3	90.3	90.3	90.3	90.3	19th September
94.5	94.6	94.7	94.8	94.9	95.1	26th September
98.7	98.9	99.1	99.3	99.5	99.8	3rd October
102.8	103.1	103.4	103.7	104.0	104.3	10th October
106.7	107.0	107.4	107.8	108.3	108.7	17th October
110.3	110.8	111.2	111.7	112.2	112.8	24th October
113.7	114.2	114.7	115.3	115.9	116.6	31st October
116.7	117.3	117.9	118.5	119.2	119.9	7th November
119.3	120.0	120.6	121.3	122.1	122.9	14th November
121.5	122.2	122.9	123.7	124.5	125.3	21st November
123.3	124.0	124.7	125.5	126.4	127.5	28th November
124.5	125.3	126.1	126.9	127.8	129.2	5th December
125.3	126.0	126.8	127.7	128.6	130.1	12the December
125.5	126.3	127.1	128.0	129.1	130.6	19th December
125.3	126.0	126.8	127.7	128.6	130.1	26th December
124.5	125.2	126.0	126.8	127.7	129.2	2nd January
123.2	123.9	124.7	125.5	126.3	127.6	9th January
121.5	122.1	122.9	123.6	124.4	125.3	16th January
119.3	119.9	120.5	121.2	122.0	122.8	23rd January
116.6	117.2	117.8	118.4	119.1	119.8	30th January
113.6	114.1	114.6	115.2	115.8	116.4	6th February
110.2	110.7	111.1	111.6	112.1	112.7	13th February
106.6	106.9	107.3	107.7	108.1	108.6	20th February
102.7	102.9	103.2	103.5	103.9	104.2	27th February
98.6	98.8	99.0	99.2	99.4	99.6	5th March
94.4	94.5	94.6	94.7	94.8	94.9	12th March

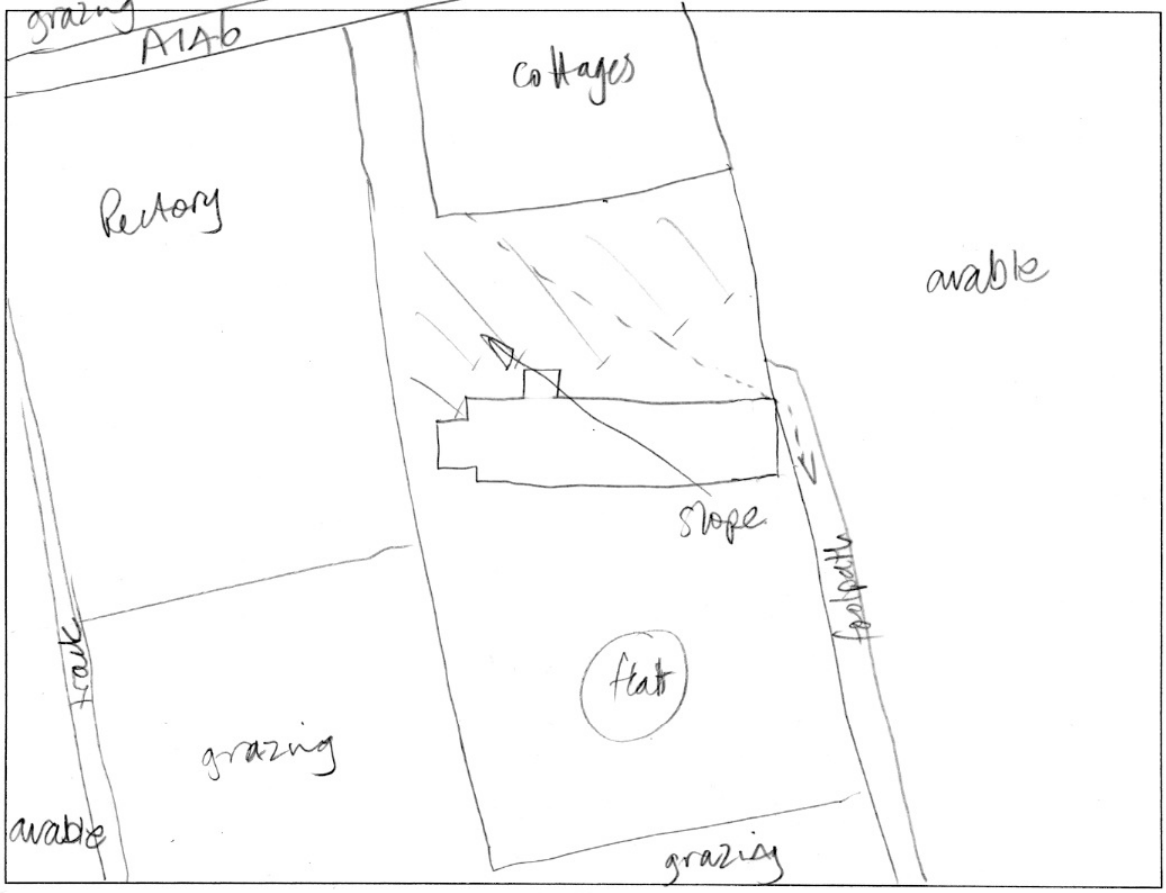
APPENDIX 3 – Survey Form

VILLAGE

County Suffolk

Village Bamby Dedication St J. Bap Date 1/7/99 Number

Sketch of Church/yard Height a.o.d 10m Declination 2·75°



Location town centre/town edge/in village / village edge / scattered village /remote/ isolated/ no village

Churchyard Size	E-W 25	N-S 65	**Slope Direction** 300 degrees
Churchyard Slope	120 cm in WIDTH / LENGTH / DIAGONAL		

Nave Alignment (Mag) 87° Chancel Alignment (Mag) 87° Tower Type sq unbuttressed

Plan Form wt - one build Nave Dimensions 14×5·0 Chancel Dimensions 7×5·0

Porches N Doors N Photos taken 1 from S, 1 from N

Slope/Platformed churches – landscape

at top of NW slope, flat to south of church.

Short slope - S edge of waveney valley.

Horizon

Elevation ..level... degrees

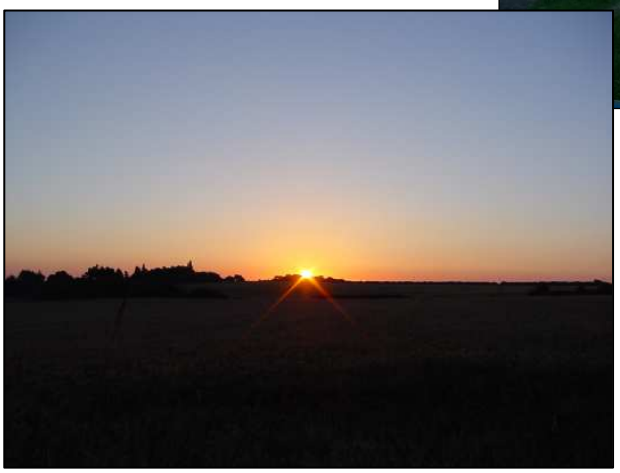
Level / Rising / Falling towards S

Horizon distance ..2·3k.....

Example survey form of the writer's local church - photos from north and south follow:

St John the Baptist's, Barnby from the south (above) and the north (below).

Figure A3.1 – St John the Baptist, Barnby, Suffolk



Sunrise over the level horizon from the church on St John the Baptist's feast day, June 24th 2002 @ 4:38 a.m. BST

APPENDIX 4 - Magnetic Declination 1999-2008

Calculated by the Canadian Geological Service website –
http://geolab.nrcan.gc.ca/geomag/e_cgrf.html
accessed April 2000, July 2001, April 2002, June 2004, Jan 2005

renamed:

http://geomag.nrcan.gc.ca/apps/mdcal_e.php/
accessed June 2006, July 2007, June 2008

now located at:
http://geomag.nrcan.gc.ca/apps/mdcal-eng.php (last accessed 18th June 2010)

Survey Areas												
	Lat.	Long.	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Waveney Valley (NE Suffolk)	52° 30'N	1° 45'E	2°48'w		2° 33'w							
East Yorkshire	53° 55'N	1° 5'W		4° 5'w	3° 56'w							
North Cambridgeshire	52° 55'N	0°		3°20'w	3° 12'w							
Cumbria	54° 30'N	3° 5'W		5° 5'w	4° 55'w	4° 46' w						
East Sussex	51° 00'N	0°		3° 5'w	2° 57'w							
North Somerset	51° 15'N	2° 30'W			3° 58'w							
Shropshire	52° 45'N	2° 45'W				4° 14'w						
East Kent	51° 25'N	1° 20'E				2° 22'w						
West Cornwall	50° 15'N	5° 25'W				4° 48'w	4° 39'w					
E Norfolk	52° 45'N	1° 20'E				2° 25'w	2° 16'w	2°07'w			1° 40'w	
W Norfolk	52°45' N	0° 45'E				2° 40'w	2° 31'w	2° 23'w			1° 57'w	
N Oxfordshire	51° 50'N	1° 30'W						3° 24'w	3° 15'w			
Bedfordshire	52° 30'N	0° 30'W							2° 47'w			
Pembrokeshire	51° 45'N	4° 50'W								4° 10'w		
S Hampshire	50° 45'N	1° 30'W								2° 38'w	2° 26'w	
S Lincolnshire	52° 50'N	0° 05'W									2° 17'w	2° 08'w

A deduction for declination was made from each measured church alignment for the relevant year and area above, to the nearest whole degree

Details of Magnetic declination calculations for realignment of chancels

As table A4.1 shows, fewer churches (**43%**) are realigned closer to Magnetic East (at an average of approximately 100° True during the medieval period (see Clark et al. 1988, 649), than are aligning closer to True East (**65%**), strongly indicating that east was the focus and that a magnetic compass was not used.

Table A4.1 – All Misaligned chancels – closer to true east or magnetic east? (excluding naves of 88-92º for true east, and 98-102º for magnetic east)					
	Improving No.	%	Not improving No.	%	Total
Chancels realignment to magnetic east	135	**43**	180	**57**	315
Chancels realignment to True east	206	**65**	109	**35**	315

The same analysis for churches where the chancel was rebuilt in the medieval period, shows an even greater bias towards True East, with **71%** aligned closer to True East and 29% further away, compared with **47%** realigning closer to Magnetic East at the time and 53% further away.

Table A4.2 – Medieval rebuilt chancels – closer to true east or magnetic east? (excluding naves of 88-92º for true east, and 98-102º for magnetic east)					
	Improving No.	%	Not improving No.	%	Total
Chancels realignment to magnetic east	35	**47**	40	**53**	75
Chancels realignment to True east	53	**71**	22	**29**	75

The post-medieval rebuilding of chancels, often a Georgian exercise, would have taken place in a period when magnetic north was west of true north. In 1800, magnetic north was approximately 24° west of north (Clark *et al*. 1988, 649; Merrill *et al*. 1996, 46), meaning that magnetic east at that time was at 66°True. If a compass was used without adjustment for declination, it would result in alignments for east of 66°T. Of the 33 churches in this survey with chancels rebuilt in the post medieval period (7 of which were excluded in the earlier analysis, with naves aligned between 88 and 92º), fifteen were realigned closer to Magnetic East (**45%**) and eighteen were aligned further away. Since it was shown earlier (table 5.7 above) that nineteen of the 26 churches (**73%**) were aligned closer to True East (90°) and only seven further away, either a compass was not used for the realignment, or appropriate adjustments were made to the readings to take declination into account.

Table A4.3 – post-medieval rebuilt chancels – closer to true east or magnetic east? (excluding naves of 88-92º for true east, and 78-82º for magnetic east)					
	Improving No.	%	Not improving No.	%	Total
Chancels realignment to magnetic east	15	**45**	18	**55**	33
Chancels realignment to True east	19	**73**	7	**27**	26

APPENDIX 5 – Additional church alignment tables

These results are presented here for completeness, rather than in the main text, as they show clearly that these particular factors have not affected the alignment of the churches themselves.

Church planform

There is little variation in alignment apparent between churches with different floorplans - the mean alignment of churches with either no aisle or two aisles is within half a degree of the overall Figure. Churches with a single aisle have a lower mean alignment, mainly because they are over-represented in Cornwall and Somerset, where alignments are generally lower. For some reason, these are the two counties that have a preponderance of single south aisles. In all the other counties in the survey, single-aisled churches are roughly equally split between a single north aisle and a single south aisle, but in Somerset, the split is 64:36 and in Cornwall it is even more marked at 68:32.

The overwhelming majority of churches in this survey have a west tower, the other groups are considerably smaller which means that the 95% confidence limits in the results are wider, but even so, there is little difference in the alignment of churches in each of the tower groups. Churches with a central tower are over-represented in Oxfordshire and Somerset, whilst churches with no tower are particularly over-represented in Cumbria, Pembrokeshire and Shropshire. Each of these counties has a lower mean alignment, contributing to the lower means for churches with either no tower or a central tower. More than one in five of all the churches in the survey with an 'other tower' are located in Kent, contributing to the higher mean alignment for this group, reconfirming the apparent effect of longitude.

Table A5.1– Overall medieval results by church planform

Plan Form	No	Range	Mean	95% conf.	% N of East
Central tower	76	57-121	85.1	±2.7	68
West tower	1,508	38-126	86.4	±0.6	62
Other tower	115	45-116	87.0	±2.2	61
No tower	227	48-128	83.7	±1.6	70
	1,926		**86.1**	**±0.5**	**63.8**

Type of church tower

Round-towered churches have a higher mean alignment because they are found almost exclusively in Norfolk and Suffolk, where mean alignment is higher, whereas square unbuttressed towers are over-represented in Cornwall and Shropshire where alignments are lower.

Table A5.2 – Overall medieval results by type of tower

Tower type	No	Range	Mean	95% conf.	% N of East
None	227	48-128	83.7	±1.6	70
Round	140	56-109	87.9	±1.7	60
Square buttressed	1,036	38-126	86.9	±0.7	62
Square unbuttressed	523	50-121	84.9	±1.0	65
	1,926		**86.1**	**±0.5**	**63.8**

APPENDIX 6 – Sunrise Position Calculation Formulae

Azimuth of Sunrise on Saint's Day (position on horizon in degrees from True North) – assuming a level horizon

Step 1

W= 2*PI()*SAINTS DAY NUMBER/365
(Saints Day number in year, Jan 1st = 1 etc.)

Step 2

Suns Declination = DEGREES(0.006918-(0.399912*COS(**W**))+ (0.070257*SIN(**W**)) -(0.006758*COS(2***W**))-(0.000907*SIN(2***W**)))

Step 3

Azimuth of sunrise on Saints day = 180-DEGREES(ACOS(-SIN(RADIANS(**SUNS DECLINATION**))/ COS(RADIANS(**LATITUDE**))))
(Latitude in decimal degrees)

Azimuth of Sunrise on Saint's Day (position on horizon in degrees from True North) – taking horizon elevation into account

(AZ = Azimuth)

Steps 1, 2 & 3 as above

Step 4

Hour Angle of Sunrise = DEGREES(ACOS((SIN(RADIANS(**HORIZON ELEVATION**))-SIN(RADIANS(**SUNS DECLINATION**)) *SIN(RADIANS (**LATITUDE**)))COS(RADIANS(**LATITUDE**))/COS (RADIANS (**SUNS DECLINATION**))))
(Measured Horizon Elevation in degrees)

Step 5

COS AZ = (COS(RADIANS(**SUNS DECLINATION**))*SIN(RADIANS(**LATITUDE**)) *COS(RADIANS(**HOUR ANGLE OF SUNRISE**))-SIN(RADIANS(**SUNS DECLINATION**))*COS(RADIANS(**LATITUDE**))) /COS(RADIANS(**HORIZON ELEVATION**))

Step 6

SIN AZ=COS(RADIANS(**SUNS DECLINATION**))*SIN(RADIANS(**HOUR ANGLE OF SUNRISE**))/ COS(RADIANS(**HORIZON ELEVATION**))

Step 7

Horizon adjusted sunrise azimuth on Saint's Day=180-DEGREES(ATAN2 (**COS AZ**, **SIN AZ**))

Sources: Davis, J., 2002 pers. comm.

Davis, J., 2004, BSS Sundial Glossary: A sourcebook of dialling data, Second Edition, Ipswich: British Sundial Society Publications

APPENDIX 7 - Detailed tables of church alignment and slope

Detailed tables of churches built on slopes, referred to in Chapter Seven

Table A7.1 – Churches on slopes by size and direction of slope					
Church floorspace		<190 sqm	190-299sqm	300+ sqm	Total
East facing slopes	No.	90	70	40	200
	%	**45**	**35**	**20**	**100**
Other slopes	No.	56	71	46	173
	%	**32**	**41**	**27**	**100**
All sloping sites		146	141	86	373

Table A7.2 – Churches on slopes by churchyard size and direction of slope					
Church/yard ratio		<7	7-10.99	11+	Total
East facing slopes	No.	26	77	97	200
	%	**13**	**28**	**49**	**100**
Other slopes	No.	17	51	105	173
	%	**10**	**29**	**61**	**100**
All sloping sites		43	128	202	373

Table A7.3 – Churches on slopes by location and direction of slope					
location		In village	Isolated	Vill edge	Total
East facing slopes	No.	107	42	51	200
	%	**54**	**21**	**25**	**100**
Other slopes	No.	74	50	49	173
	%	**43**	**29**	**28**	**100**
All sloping sites		181	92	100	373

Table A7.4 – Churches on slopes by age of fabric and direction of slope					
Earliest nave fabric		Not known	11 or 12th C	13th C +	Total
East facing slopes	No.	37	98	65	200
	%	**18**	**49**	**33**	**100**
Other slopes	No.	33	87	53	173
	%	**19**	**50**	**31**	**100**
All sloping sites		70	185	118	373

Table A7.5 – Churches on slopes by church/hall focus and direction of slope				
		No focus	Church/hall focus	Total
East facing slopes	No.	150	50	200
	%	**75**	**25**	**100**
Other slopes	No.	130	43	173
	%	**75**	**25**	**100**
All sloping sites		280	93	373

Table A7.6 – Churches on slopes by patronal-saint's season and direction of slope							
Saints season		Winter	Equinox	Summer	No date	St. Mary	Total
East facing slopes	No.	42	69	45	7	37	200
	%	**21**	**35**	**23**	**3**	**18**	**100**
Other slopes	No.	41	42	54	5	31	173
	%	**24**	**24**	**31**	**3**	**18**	**100**
All sloping sites		83	111	99	12	68	373

Table A7.7 – Churches on slopes by village name origin and direction of slope					
		O.E. name	O.N. name	Other	Total
East facing slopes	No.	160	14	26	200
	%	**80**	**7**	**13**	**100**
Other slopes	No.	131	16	26	173
	%	**76**	**9**	**15**	**100**
All sloping sites		291	30	52	373

Table A7.8 - Church/Hall focus on sloping sites by direction of slope, age of fabric by area										
		Non- Norfolk			Norfolk			All Survey areas		
Sloping sites/ age of fabric		Focus	Not focus	% with focus	Focus	Not focus	% with focus	Focus	Not focus	% with focus
Slope East	11/12th C	21	59	**26%**	6	13	**32%**	27	72	**27%**
	13-15th C	13	29	**31%**	5	18	**22%**	18	47	**27%**
	Not known	6	26	**19%**	-	5	-	6	31	**16%**
Slope other	11/12th C	26	48	**35%**	1	11	**8%**	27	59	**31%**
	13-15th C	10	28	**26%**	1	14	**7%**	11	42	**21%**
	Not known	4	25	**14%**	-	4	-	4	29	**12%**
Total all sloping sites		80	215	**27%**	13	65	**17%**	93	280	**25%**

Table A7.9 - Church/Hall focus on platformed sites by direction of slope, age of fabric by area										
		Non- Norfolk			Norfolk			All Survey areas		
Platformed sites/ age of fabric		Focus	Not focus	% with focus	Focus	Not focus	% with focus	Focus	Not focus	% with focus
Slope East	11/12th C	9	22	**29%**	-	6	-	9	28	**24%**
	13-15th C	2	21	**9%**	1	14	**7%**	3	35	**8%**
	Not known	3	9	**25%**	-	3	-	3	12	**20%**
Slope other	11/12th C	17	55	**24%**	1	14	**7%**	18	69	**21%**
	13-15th C	10	39	**20%**	3	19	**14%**	13	58	**18%**
	Not known	5	23	**18%**	-	7	-	5	30	**14%**
Total all platformed sites		46	169	**21%**	5	63	**7%**	51	232	**18%**

Table A7.10 - Church/Hall focus on sloping sites by direction of slope, village name origin by area										
		Non- Norfolk			Norfolk			All Survey areas		
Sloping sites/ name origin		Focus	Not focus	% with focus	Focus	Not focus	% with focus	Focus	Not focus	% with focus
Slope East	OE origin	34	85	**29%**	7	31	**18%**	41	116	**26%**
	ON origin	1	7	**13%**	3	5	**38%**	4	12	**25%**
	Other	5	22	**19%**	1	-	-	6	22	**21%**
Slope other	OE origin	31	66	**32%**	2	24	**8%**	33	90	**26%**
	ON origin	4	13	**24%**	-	4	-	4	17	**19%**
	Other	5	22	**19%**	-	1	-	5	23	**18%**
Total all sloping sites		80	215	**27%**	13	65	**17%**	93	280	**25%**

Table A7.11 - Church/Hall focus on platformed sites by direction of slope, village name origin by area										
		Non- Norfolk			Norfolk			All Survey areas		
Platformed sites/ name origin		Focus	Not focus	% with focus	Focus	Not focus	% with focus	Focus	Not focus	% with focus
Slope East	OE origin	12	36	**25%**	1	22	**4%**	13	58	**18%**
	ON origin	-	4	-	-	1	-	-	5	-
	Other	2	12	**14%**	-	-	-	2	12	**14%**
Slope other	OE origin	20	69	**22%**	3	37	**8%**	23	106	**18%**
	ON origin	4	6	**40%**	1	3	**25%**	5	9	**36%**
	Other	8	42	**16%**	-	-	-	8	42	**16%**
Total all platformed sites		46	169	**21%**	5	63	**7%**	51	232	**18%**

Table A7.12 - Comparison of slope severity and slope direction for sloping and platformed sites in 90° groups				
Slope severity	1 in 50 – 1 in 20	1 in 20 – 1 in 10	Over 1 in 10	Total
Sloping sites				
East	58%	50%	29%	**54%**
South	15%	18%	36%	**17%**
West	21%	23%	36%	**22%**
North	6%	9%	-	**7%**
ALL SLOPING SITES	242 (100%)	117 (100%)	14 (100%)	373 (100%)
Platformed sites				
East	39%	23%	20%	**33%**
South	28%	45%	60%	**35%**
West	22%	17%	20%	**20%**
North	11%	15%	-	**12%**
ALL PLATFORMS	173 (100%)	100 (100%)	10 (100%)	283 (100%)

Table A7.13 - Sloping church sites by location of church										
	In vill		isolated		Vill edge		other		Total	
	No	%	No	%	No	%	No	%	No	%
SLOPING SITES	**177**	**47**	**92**	**25**	**100**	**27**	**4**	**1**	**373**	**100**
East facing	104	51	45	23	51	25	3	1	203	100
South	32	51	16	26	13	21	1	1	62	100
West	35	42	21	25	27	33	0	0	83	100
North	6	24	10	40	9	36	0	0	25	100
PLATFORMED	**146**	**51**	**66**	**23**	**70**	**25**	**1**	**1**	**283**	**100**
East facing	52	57	16	17	24	26	0	0	92	100
South	48	48	22	22	30	30	1	1	100	100
West	29	51	17	30	10	18	0	0	57	100
North	17	50	11	33	6	17	0	0	34	100

Table A7.14 - Sloping church sites by church/hall focus					
	Church/hall together		No church/ hall focus		Total
	No	%	No	%	No
SLOPING SITES	**93**	**25**	**280**	**75**	**373**
East facing	51	**25**	152	**75**	203
South	16	**26**	46	**74**	62
West	19	**23**	64	**77**	83
North	7	**28**	18	**72**	25
PLATFORMED	**51**	**18**	**232**	**82**	**283**
East facing	15	**16**	77	**84**	92
South	15	**15**	85	**85**	100
West	13	**23**	44	**77**	57
North	8	**23**	26	**77**	34

Table A7.15 - Sloping church sites by Age of earliest fabric in current church (Pevsner)												
	Age N/K		11th C		12th C		13th C		14th C		TOTAL	
	No	%	No	%	No	%	No	%	No	%	No	%
SLOPING SITES	69	**18**	16	**4**	170	**46**	67	**18**	51	**13**	373	**100**
East facing	38	**55**	10	**63**	90	**53**	33	**49**	32	**63**	203	**54**
South	17	**25**	2	**13**	27	**16**	9	**13**	7	**14**	62	**17**
West	9	**13**	2	**13**	40	**24**	21	**31**	11	**22**	83	**22**
North	5	**7**	2	**13**	13	**8**	4	**6**	1	**2**	25	**7**
PLATFORMED	50	**18**	13	**5**	111	**39**	61	**22**	48	**17**	283	**100**
East facing	16	**32**	6	**46**	30	**27**	20	**33**	20	**42**	92	**33**
South	19	**38**	3	**23**	42	**38**	22	**36**	14	**29**	100	**35**
West	11	**22**	1	**8**	24	**22**	11	**18**	10	**21**	57	**20**
North	4	**8**	3	**23**	15	**14**	8	**13**	4	**8**	34	**12**

Table A7.16 - Sloping church sites by Size of church								
	<190 sq m		190-299 sq m		300+ sq m		TOTAL	
	No	%	No	%	No	%	No	%
SLOPING SITES	146	**39**	141	**38**	86	**23**	373	**100**
East facing	92	**63**	71	**50**	40	**47**	203	**54**
South	25	**17**	24	**17**	13	**15**	62	**17**
West	19	**13**	38	**27**	26	**30**	83	**22**
North	10	**7**	8	**6**	7	**8**	25	**7**
PLATFORMED	124	**44**	103	**36**	56	**20**	283	**100**
East facing	38	**31**	37	**36**	17	**30**	92	**33**
South	42	**34**	40	**39**	18	**32**	100	**35**
West	28	**23**	18	**17**	11	**20**	57	**20**
North	16	**13**	8	**8**	10	**18**	34	**12**

Table A7.17 - Sloping church sites by planform										
	Central tower		No tower		West tower		Other tower		TOTAL	
	No	%	No	%	No	%	No	%	No	%
SLOPING SITES	16	**4**	48	**13**	292	**78**	17	**5**	373	**100**
East facing	11	**69**	25	**52**	163	**56**	4	**21**	203	**54**
South	3	**19**	8	**17**	48	**16**	3	**18**	62	**17**
West	2	**13**	10	**21**	65	**22**	6	**35**	83	**22**
North	-		5	**10**	16	**5**	4	**21**	25	**7**
PLATFORMED	14	**5**	43	**15**	202	**71**	24	**8**	283	**100**
East facing	3	**21**	11	**26**	69	**34**	9	**38**	92	**33**
South	5	**36**	15	**35**	72	**36**	8	**33**	100	**35**
West	4	**29**	9	**21**	38	**19**	6	**25**	57	**20**
North	2	**14**	8	**19**	23	**11**	1	**4**	34	**12**

Table A7.18 - Nave/chancel misalignment by alignment of nave									
	total	Improving		Not improving		Aligned left		Aligned right	
		No	%	No	%	No	%	No	%
Nave <62º	13	9	69	4	31	4	31	9	69
63-72º	28	19	68	9	32	9	32	19	68
All < 73º	**41**	**28**	**68**	**13**	**32**	**13**	**32**	**28**	**68**
73-77º	33	23	70	10	30	10	30	23	70
78-82º	60	36	60	24	40	24	40	36	60
83-87º	67	34	51	33	49	33	49	34	51
All 73-87º	**160**	**93**	**58**	**67**	**42**	**67**	**42**	**93**	**58**
All <88º (north)	**201**	**121**	**62**	**80**	**38**	**80**	**40**	**121**	**60**
All >92º (south)	**114**	**85**	**74**	**29**	**26**	**85**	**75**	**29**	**25**
All 93-102º	**77**	**56**	**72**	**21**	**28**	**56**	**72**	**21**	**28**
93-97º	51	39	77	12	24	39	77	12	23
98-102º	26	17	65	9	35	17	65	9	35
103º+	**37**	**29**	**78**	**8**	**22**	**29**	**78**	**8**	**22**
Total exc 88-92º	**315**	**206**	**65**	**109**	**35**	**165**	**52**	**150**	**48**
88-92º see main text – page 144	62					49	79	13	21

APPENDIX 8 – Calculation of Easter

Standard Easter calculation algorithm (Cheney 2000, 5)

Also listed on various websites – for example

http://webexhibits.org/calendars/calendar-christian-easter.html (accessed 23rd April 2007)

Step	Action	Example for 902AD	result
1	Remainder (Year/19)	902/19	47, remainder **9**
2	Remainder (Year/4)	902/4	225, remainder **2**
3	Remainder (Year/7)	902/7	128, remainder **6**
4	(19 * (step 1)) + 24	(19 * **9**)+ 24	**195**
5	Remainder ((Step 4)/30)	**195**/30	6, remainder **15**
6	(2*step2)+(4*step3)+(6*step5)+5	(2***2**)+(4***6**)+(6***15**)+5	**123**
7	Remainder ((step 6)/7)	(**123**/7)	17, remainder **4**
8	(step 5)+(step 7)	(**15**)+(**4**)	**19**
9	IF((step 8) > 9) then ((step8)-9) = APRIL easter date		(**19**) – 9 **=APRIL 10th**
10	IF ((step 8) <10) then ((step 8)+22) = MARCH easter date		

Western and Roman Easter dates

Differences in the methods of calculation of Easter between the Western church and the Roman church both before and after the consolidation by the Synod of Whitby of 664 CE, meant that in a period of almost 400 years, the date of Easter only coincided on 154 occasions (Cheney 2000, 47-54). In 150 years Celtic Easter was earlier than Roman Easter and was only later in 63 years.

Table A8.1 – Comparison of Celtic and Roman Easter dates between 400 and 779 A.D.

	Celtic Easter earlier by 7 days	Easter on same date	Celtic Easter later by:- 7days	14 days	21 days	28 days
Pre Whitby synod	81	147			20	16
Post Whitby synod	69	7			25	2
TOTAL	150	154	0	0	45	18

APPENDIX 9 – Calculations to establish possible Norfolk Minster-church sites

Method of calculating overall ranking

Twenty-six of the 549 Norfolk parishes where medieval churches were surveyed for this thesis were not mentioned in Domesday. The ranked position for the remaining 523 parishes (1 – 523) was calculated for each of the factors for each parish. In some calculations, where several parishes had the same score, they were each given the same rank and the following parish in the sequence was given the rank score that it would have been given if each of the parishes in the group above it had been given sequential rankings. The rankings for each of the factors for each parish were then added together, resulting in an overall "score", which provides a direct comparison with all the other parishes in the analysis, and leads to a list of parishes that, on these criteria, are the most likely to have had minster churches.

Since measuring the absolute value for a factor might lead to erroneous conclusions, for example, the size of one of the many large fen-edge parishes would appear to have the same importance as a large parish elsewhere in the county where parishes are generally smaller, an alternative measure was developed whereby the size of the subject parish was compared with the sizes of all the parishes that surround it. In this case, the areas of all the parishes surrounding the subject were added together and an average size for them was calculated. This was then compared with the size of the principal parish. If the principal is larger than its contacts, the resulting score is greater than 1, and below 1 if the average size of the contact parishes is higher than the principal. The rankings for each parish were then assessed based on these scores
This method was used for the majority of the factors considered.

Finally, each factor was assigned a weighting to take into account the fact that some of the factors are more important than others in assessing the medieval importance of the parish – for example, whether the parish bears the same name as the Hundred that it is in, or the village name suffix, compared with whether a Domesday church was mentioned or the earliest recorded fabric in the present church building.

Factors Used

1 Parish named after a Hundred – indicating most important parish in Saxon times
2 Parish name suffix – indicating relative name chronology
3 Relative soil quality between parish and surrounding parishes – indicating possible preferred area for primary settlement
4 Area of glebe land at Domesday – indicating wealth of church endowment/ endowers
5 Relative Domesday total population – indicating relative importance compared with neighbouring parishes
6 Relative Domesday feudal population
7 Relative Domesday numbers of sokemen
8 Acreage of influence over other parishes, or influence from other parishes, at Domesday (outliers, jurisdiction etc.) – indicating earlier, and continuing, importance.
9 Relative parish size in acres
10 Relative number of surrounding parishes – the number of parish 'contacts' for the principal compared with the same scores for its surrounding parishes.
11 Presence of Saxon or Norman Monasteries – perhaps indicating the best estates that were left to the richest Normans
12 Landscape assessment of the church site – the most prominent sites first
13 Relative value from the Norwich Ecclesiastical Taxation of 1254 – relative to the value of its neighbours

14 Earliest church fabric – combination of assessments by H.M. Taylor's *Anglo-Saxon Architecture* and the *Buildings of England* volumes for Norfolk by Pevsner & Wilson
15 Number of Domesday churches, or implied presence of a church
16 Floorspace of the existing church

1 Name (1) – This is based on the assumption that that the Saxon administrative Hundred was named after the most important parish in the area at the time.
Parishes with the same name as the Rural Deanery were also considered, but as they are later in date (some time after reorganization of the Diocesan structure in 1072) it was decided not to class them with those with the same name as the Hundred.
(There is a very strong argument for altering the rank attributed to the vast majority of parishes that do not bear the Hundredal name, as there is insufficient differentiation between the '1' assigned to the 10 parishes that appear in this factor and '11' assigned to the remainder. It was subsequently increased to 200.

Parish with Hundredal Name	Rank
Hundred name	1
None	11 (200)

2 Village Name - Based on the village name suffix, which is taken as an indicator of the relative age of its foundation, based on the following breakdown:-

Name	Score	Rank
ham (primary settlements- 99)	1	1
ingham, ing, ton, by, kirk and others not included in 1 or 3, including burgh or borough (secondary settlements - 389)	2	100
thorpe, toft, wick, ley, ling, thwaite (tertiary settlements - 35)	3	489

3 Soil Taken from the National Soil Survey map, the proportion that each of the soil series formed of each parish was measured. Based on the following list, the soil series information was converted to an assessment of the soil quality for each parish.

Soil Series	Quality
Sheringham (541), Freckenham (551), Burlingham (572) Gresham (711a), Blackwood (821), Hockham (552)	GOOD
Fakenham (581), Evesham (713)	OK
Others not included elsewhere	Other
Sand (110a), Newmarket (343), Beccles (711b&c)	POOR

The proportion of each soil quality in each parish (GOOD, POOR etc) was summed from the data and a single measure resulted - based on the largest single quality group. For example, in a parish where 50% of the area was soil series 541, 25% was 572, 20% was 711b and 5% was "other" – since both the first two are categorised as GOOD, the third as POOR and the last as other, the assessment for this parish would be 50% + 25% = "75% GOOD".

In order to obtain a measure of the comparative soil quality between a parish and its neighbours, the percentages of each soil quality of all the surrounding parishes was added together and divided by the number of parishes, resulting in a single measure on the same basis as the example above, which could be compared directly with the quality assessed for the principal parish. They were compared on the following basis:-

Comparison of Soil Quality between a parish and the average of its neighbours		
Category	**Assessment**	**Rank**
Much Better	Change from POOR to GOOD (29 cases)	**1**
Better	Change from POOR to OK/other, **OR** from OK/other to GOOD **OR** an increase of 50% or more in the same category– e.g. from 30-60% (50% decrease if POOR) (70 cases in all)	**30**
Same	Increase or decrease of less than 50% in the same category, e.g. from 50-70%, or vice versa (337 cases)	**100**
Worse	Change from GOOD to OK/other, **OR** from OK/other to POOR **OR** a decrease of 50% or more in the same category– e.g. from 60-30% (50% increase if POOR) (77 cases in all)	**438**
Much Worse	Change from GOOD to POOR (8 cases)	**516**

4 **Glebe Land –** John Blair uses 1 hide of glebe as an indicator of superior church status over the country as a whole (Blair 1987). This level has been reduced slightly here, since there were only five churches in Norfolk endowed with more than 120 acres.

	Rank
Churches with 120+ acres glebe	1
60-119 acres glebe	6
Less or no glebe land	100

5 **Relative total population recorded in the Domesday Survey**

The Domesday population was counted for each parish, and a comparison made with the average population in the parishes surrounding it. The resulting ratio for each parish was ranked from 1 to 497. The 24 parishes not mentioned in Domesday were all assigned rank 498.

6 **Relative total feudal population recorded in the Domesday Survey**

The Domesday population of villagers, smallholders and slaves was counted for each parish, and a comparison made with the average numbers in the parishes surrounding it. The resulting ratio for each parish was ranked from 1 to 476. The 46 parishes either not mentioned in Domesday, or had no feudal population were all assigned rank 477.

7 **Relative total sokemen (freemen) population recorded in the Domesday Survey**

The Domesday population of sokemen (freemen, as opposed to Free Men) was counted for each parish, and a comparison made with the average numbers in the parishes surrounding it. The resulting ratio for each parish was ranked from 1 to 299. The 223 parishes which were either not mentioned in Domesday, or had no sokemen, were all assigned rank 300.

8 **Domesday outliers**

The acreage of influence that each parish had over other parishes, or was affected by others, was calculated from the Domesday survey. This included estate "outliers", land "appertaining to" and land "in the jurisdiction of" another parish. Acreage was

summed, and the net Figure of influence was ranked. The 88 parishes with a net positive "ownership" elsewhere were ranked from 1 to 88, the 191 parishes with a net influence from elsewhere were ranked 331-523, and the 244 parishes with no net influence, were all ranked 89.

9 **Relative Parish size** - (in acres) taken from 1844 Whites Directory, there were no missing values. The average size of surrounding parishes was calculated and compared with the subject parish. The subsequent ratio of parish size to average surrounding parish size was ranked from 1 to 523. They ranged from Wymondham (which is 6.26 times the average size of its neighbours) to Waterden (which is 0.10 the size of its neighbours).

10 **Relative number of Surrounding Parishes -** The number of parishes whose boundaries touch the subject parish was measured and ranged from 19 to 3.
The relationships between the principal parish and the average number calculated for its neighbours were also calculated and ranged between 3.23 (Wymondham) and 0.28 (Crownthorpe) – these were ranked 1 to 522

11 **Presence of Saxon/Norman Monastery –** taken as a measure of the importance of the parish. Presumably, the best estates were left to the most important (and richest) Normans, who endowed monasteries. In addition to Pestell's classification, stylus finds and "productive" sites have been added to the Saxon list

Saxon/Norman Monastery	Rank
Saxon monastery/stylus/productive sites	1
Norman monasteries	20
None	100

12 **Landscape Assessment**
Landscape at the church was assessed from the 1:25000 OS series (in the case of "assembled parishes", the landscape at the "senior" site was used – e.g. Great Dunham, rather than Little Dunham.
The following categories were used, and ranked thus:-

Landscape	**Category**	**Rank**
Knoll/Island/Promontory (19 cases)	1	1
Valley side, upper slope (10metres + above water) (168)	2	20
Valley side, lower slope (<10metres above river/stream)	3	189
Valley floor (95 with Cat 3)	4	189
Lowland - flat/interfluve (25m or less AOD) (91)	5	284
Highland – flat/interfluve (30metres or more AOD) (147)	6	375

13 **Relative Norwich Ecclesiastical Taxation of 1254 –** Provided the value of the ecclesiastic property in each parish. Twelve parishes with missing values were assigned the Mean value of the remainder.
Relative tax values were also arrived at by calculating an average tax value for all surrounding parishes and comparing the two figures. They ranged between Wymondham (worth 16.11 times the value of the average of its neighbours) and Wrenningham (worth 0.04 times the average of its neighbours). The ratios were ranked from 1 to 523.

14 **Earliest church fabric** – data taken from the relevant volume of Pevsner, adjusted by Taylor's Saxon churches where the two volumes fail to agree.
(There may be an argument for shifting back to the "Saxon" period, those parishes where a church was mentioned in Domesday. It was almost certain that, in most cases,

it is not the current church building but even then it is does indicate an earlier church presence)

	Rank
Saxon fabric	1
Norman fabric	50
Other	189

15 Domesday churches - The presence or absence of a church in Domesday was recorded, along with some "assumed" churches, where mention was made of priests or glebe land, or land belonging to the church, but not a specific church building.

	Rank
178 Parishes with a church present (or assumed)	1
27 churches with Saxon fabric, but not mentioned in Domesday	1
No church mentioned, or no Saxon fabric	206

Since there is a well-known under-recording of churches in Domesday, this factor has been modified to take into account parishes that have churches with Saxon fabric, but no mention in Domesday, as there obviously was a church in these parishes prior to the Domesday record in 1086.

16 Floorspace of existing church.

One of John Blair's comments about minster churches is that "the church is very large for a village of this size". Whilst this is a well-known phenomenon in East Anglia with large "cloth" churches, is there also a picture of large churches in other villages too? Churches were ranked from the largest to the smallest, 1 – 523

MULTIPLIERS

Each of these sixteen categories was then assigned a multiplier to take into account the fact that some of the factors were assessed as being more important than others, in other words, the early name origin of the parish was deemed considerably more important than the current floorspace of the church. The rank scores for the factors were assigned a multiplier on the following basis:-

	Multiplier
Parish named after a Hundred	10
Parish name suffix	10
Relative soil quality between parish and surrounding parishes	8
Area of glebe land at Domesday	8
Relative Domesday total population	6
Relative Domesday feudal population	6
Relative Domesday numbers of sokemen	6
Acreage of influence over other parishes at Domesday (outliers, jurisdiction etc.)	6
Relative parish size	5
Relative number of surrounding parishes	5
Presence of Saxon or Norman Monasteries	5
Landscape assessment of the church site	4
Relative value from the Norwich Ecclesiastical Taxation of 1254	4
Earliest church fabric	2
Number of Domesday churches	2
Floorspace of the existing church	1

Ranking Results

The results of this analysis produced a ranking of the 523 parishes that were mentioned in Domesday. There was an apparent 'natural' break in the list after the first 27 parishes. The first 27 had larger gaps between the parish scores, with consistently smaller gaps from 28 onwards.

The first 27 parishes were, in order :-

Wymondham, Holt, North Walsham, Aylsham, RUDHAM, Reedham, Loddon, SOUTH WALSHAM, SHOULDHAM, RAYNHAM, Tunstead, Thetford, Happisburgh, BURNHAM, Hempnall, Earsham, Old Buckenham, Diss, Ludham, Heacham, Taverham, BARSHAM, Cawston, Foulsham, North Elmham, Dereham, ACRE (the capital letters indicate parishes which were amalgamated for this analysis as described earlier).

Generally, the top 27:-

- had churches that were more than double the size of the remainder,
- were in parishes that were 2.5 times the size of the remainder
- had twice as many neighbouring 'contact' parishes
- their churches were valued at 3 times the rate of the remainder in 1254
- had a majority of primary settlement names, with no tertiary names
- there was little difference in the church site landscape
- had four times the Domesday population of the remainder
- had 2.5 times the feudal population at Domesday
- little difference in relative soil quality with the neighbours
- had twice as much glebeland at Domesday
- had a slightly greater number of churches with early fabric
- had many times more Saxon and Norman monasteries
- 21 became Market towns (Dymond 2005, 76)

Summary Results

The following tables summarise the results based on the groups that arise from the rank order classification of all sixteen factors.
Top 27 have been separated out because the ranking data showed a natural break at this point, with larger gaps between the parish scores between 1 and 27 and generally smaller gaps from 28 onwards.

Alignment						
	Number	**Range**	**Mean**	**95%**	**Range @ 95%**	**% N of E**
Top 27	27	67-110°	**88.3°**	±4.7	83.6 – 93.0	61
Remainder	522	56-128°	**88.9°**	±0.9	88.0 – 89.8	55
Total	549		**88.9°**	±0.9	88.0 – 89.8	56

Church Floorspace											
	<150 sq ft		150-189		190-239		240-299		300+ sq ft		Average
	No	%	No	%	No	%	No	%	No	%	size
Top 27	0	-	0	-	1	**4**	3	**11**	23	**85**	473 sqf
Remainder	94	**22**	114	**21**	111	**21**	86	**16**	120	**23**	245 sqf
Total	94	**21**	114	**21**	112	**21**	89	**16**	143	**26**	264 sqf

Larger churches in top group and smaller churches in bottom group.

Latitude & Longitude			
	Average Latitude		**Average Longitude**
Top 27	52.70° N		1.02° E
Remainder	52.67° N		1.10° E
Total	52.67° N		1.09° E

Overall, top churches are located in same areas as the others

Area of Parish			
	Number	**Size Range (acres)**	**Average**
Top 27	27	2167 – 10600	**4771**
Remainder	496	353 - 12953	**1673**
Total	523		**1935**

Larger parishes in top group and smaller parishes in bottom group, although the largest parish in the county (Methwold) is in the "remainder" group.

Comparative Area of Parish			
	Number		**Average**
Top 27	27		**2.46**
Remainder	496		**0.93**
Total	523		**1.00**

The "relative area" data confirms that the parishes in the top group are on average just over twice the size of their neighbours and those in the bottom group are more or less average in size.

Parish Contacts			
	Number	**Range of contacts**	**Average**
Top 27	27	7 – 18	**9.81**
Remainder	496	3 - 11	**5.72**
Total	523		**6.00**

More contacts (neighbouring parishes) in top group and fewer contacts in bottom group

Comparative Parish Contacts			
	Number		**Average**
Top 27	27		**1.71**
Remainder	496		**0.93**
Total	523		**0.97**

Parishes in the top group have more contacts than their neighbours, and vice versa.

Church Taxation 1254			
	Number	**Tax Range (£)**	**Average**
Top 27	27	10 – 100	**31.9**
Remainder	489	0.5 – 53.3	**10.4**
Total	516		**11.53**

More valuable churches in top group and less valuable churches in remainder group.

Comparative Parish Tax Value			
	Number		**Average**
Top 27	27		**3.04**
Remainder	489		**0.97**
Total	516		**1.01**

Parishes in the top group had higher value than their neighbours.

Parish name (suffix)			
	1 (Primary) ham	**2 (Secondary) ingham, ton etc**	**5 (Terciary) thorpe, toft etc.**
Top 27	17 63%	10 37%	-
Remainder	77 16%	381 81%	16 4%
Total	94 18%	391 75%	37 7%

Primary "Hams" in top 27 and no tertiary "other/Thorpe".

Parishes with same name as Hundred		
	Hundred	**Total**
Top 27	3 (11%)	27
Remainder	9 (2%)	494
Total	12 (2%)	523

Higher proportion of "named" parishes in the top group.

Landscape						
	1 Knoll, Prom.	**2 Upper valley**	**3/4 Lower valley/ val floor**	**5 Lowlnd flat**	**6 Highlnd flat**	**total**
Top 27	2 7%	18 67%	2 7%	2 7%	3 11%	27
Remainder	73 15%	151 30%	105 22%	150 30%	17 3%	496
Total	75 14%	169 32%	107 20%	152 36%	20 4%	523

Higher proportions of the top group in "upper valley", and lower in the "lowland flat" group

Domesday Population (total)			
	Number	**Range**	**Average**
Top 27	27	51 – 974	**137**
Remainder	470	0 – 146	**39**
Total	497		**44**

More people in top parishes.

Domesday Population (feudal)			
	Number	**Range**	**Average**
Top 27	27	30 – 208	**59**
Remainder	470	0 – 97	**24**
Total	497		**28**

Higher feudal pop in top parishes

Domesday feudal pop as % of the total (parishes with >20 feudal pop)					
	Over 80%	**50-79%**	**Below 50%**	**Less than 20 feudal**	**Total**
Top 27	9 33%	16 60%	2 7%	0	27
Remainder	84 18%	119 25%	33 7%	234 50%	470
Total	93 19%	135 27%	35 7%	234 47%	497

Higher proportions of parishes with large feudal pop in top group

Soil – largest group				
	GOOD	**OK**	**other**	**POOR**
Top 27	13 48%	3 11%	4 15%	7 26%
Remainder	279 56%	25 5%	74 15%	116 23%
Total	292 56%	28 5%	78 15%	123 24%

Virtually no difference in soil quality between the groups.

Domesday churches & glebeland					
	Vills with church mentioned	**No. of churches**	**Avge no. of churches**	**Glebeland (acres)**	**Avge. glebeland**
Top 27	14 52%	24	1.71	801	33.8
Remainder	156 32%	182	1.16	3,663	20.1
Total	169 32%	206	1.22	4,464	21.7

Slightly higher mentions of churches and more churches per parish and larger areas of glebe in top category

Earliest Fabric (Pevsner/Taylor)						
	11th C	**12th C**	**13th C**	**14th C**	**15th C**	**Not known**
Top 27	6 22%	8 30%	7 26%	4 15%	2 7%	0
Remainder	43 9%	146 29%	104 21%	125 15%	29 6%	49 10%
Total	49 9%	154 29%	111 21%	129 25%	31 6%	49 9%

Very slight bias towards early buildings in the top group.

Saxon/Norman Monastery in Parish			
	Saxon	**Norman**	**Total**
Top 27	6 22%	4 15%	27
Remainder	11 2%	16 3%	496
Total	17 3%	20 4%	523

Higher proportion of early monasteries in top group

Saxon Dedication for Parish Church		
	Saxon	**Total**
Top 27	2 7%	27
Remainder	33 7%	496
Total	35 7%	523

No difference between the groups

APPENDIX 10 – Harvest Festival Details

Average Harvest date by area

Year	**Taunton** Average date	**Broads** Average date	**Difference** Taunton ~ Broads	**Cumbria** Average date	**Difference** Cumbria ~ Broads	**Hold'nss** Average date	**Difference** Hold'ness ~ Broads
1870	**13 Sep**	**17 Sep**	- 4 days	28 Sep	+ 11 days	**22 Sep**	+ 5 days
1871	22 Sep	24 Sep	-2 days	29 Sep	+ 5 days	1 Oct	+ 7 days
1872	21 Sep	**17 Sep**	+ 4 days	30 Sep	+ 13 days	1 Oct	+ 14 days
1873	21 Sep	19 Sep	+ 2 days	5 Oct	+ 16 days	5 Oct	+ 16 days
1874	18 Sep	22 Sep	- 4 days	6 Oct	+ 14 days	**23 Sep**	+ 1 day
1875	22 Sep	19 Sep	+3 days	**23 Sep**	+ 4 days	28 Sep	+ 9 days
1876	12 Sep	25 Sep	- 13 days	4 Oct	+ 9 days	29 Sep	+ 4 days
1877	22 Sep	26 Sep	- 4 days	4 Oct	+ 8 days	10 Oct	+ 14 days
1878	22 Sep	22 Sep	-	**13 Sep**	- 9 days	1 Oct	+ 8 days
1879	**8 Oct**	**8 Oct**	-	3 Oct	- 5 days	**25 Oct**	+ 17 days
1880	22 Sep	25 Sep	- 3 days	29 Sep	+ 4 days	**11 Oct**	+ 16 days
1881	20 Sep	23 Sep	- 3 days	**23 Oct**	+ 30 days	**12 Oct**	+ 19 days
1882	24 Sep	28 Sep	- 4 days	**12 Oct**	+ 14 days	**11 Oct**	+ 13 days
1883		26 Sep		**11 Oct**	+ 15 days	**11 Oct**	+ 15 days
1884	19 Sep	20 Sep	- 1 day	25 Sep	+ 5 days	**19 Sep**	- 1 day
1885	23 Sep	26 Sep	- 3 days	7 Oct	+ 11 days	8 Oct	+ 12 days
1886	22 Sep	27 Sep	- 5 days	10 Oct	+ 13 days	10 Oct	+ 13 days
1887	15 Sep	23 Sep	- 8 days	**24 Sep**	+ 1 days	**20 Sep**	- 3 days
1888	**4 Oct**	**3 Oct**	+1 day	9 Oct	+ 6 days	**16 Oct**	+ 13 days
1889	19 Sep	24 Sep	- 5 days	4 Oct	+ 10 days	4 Oct	+ 10 days
1890	23 Sep	28 Sep	- 5 days	7 Oct	+ 9 days	5 Oct	+ 7 days
1891	**1 Oct**	30 Sep	+1 day	9 Oct	+ 9 days	7 Oct	+ 7 days
1892	23 Sep	28 Sep	- 5 days	**12 Oct**	+ 14 days	**13 Oct**	+ 15 days
1893	18 Sep	26 Sep	- 8 days	**24 Sep**	- 2 days	**22 Sep**	- 4 days
1894	22 Sep	29 Sep	- 7 days	4 Oct	+ 5 days	7 Oct	+ 8 days
1895	24 Sep	25 Sep	- 1 day	1 Oct	+ 6 days	1 Oct	+ 6 days
1896	**12 Sep**	21 Sep	- 9 days	**16 Sep**	- 5 days	26 Sep	+ 5 days
1897	16 Sep	22 Sep	- 6 days	29 Sep	+ 7 days	7 Oct	+ 15 days
1898	16 Sep	23 Sep	- 7 days	1 Oct	+ 8 days	30 Sep	+ 7 days
1899	15 Sep	23 Sep	- 8 days	**22 Sep**	- 1 day	**20 Sep**	- 3 days
Avge	**21 Sep**	**25 Sep**	**- 4 days**	**2 Oct**	**+ 7 days**	**4 Oct**	**+ 9 days**

Blue more than 7 days earlier than the area average harvest festival date
Red more than 7 days later than the area average harvest festival date

Year	Local weather comments **(Taunton)**	Avge date	Local weather comments **(Cumbria)**	Avge date	Local Weather comments **(Holderness)**	Avge date	Local weather comments **(Broads)**	Avge date	National weather*
1870	Dry harvest, largely complete by 10 sept.	13 Sep		28 Sep	Dry harvest – crops on hills and valleys all ready together	22 Sep	Dry harvest, in early. Autumn tillage begun early Oct.	17 Sep	Dry year, excellent crops. Good grain harvest weather – some storms – result variable.
1871	Very wet Sept -5.6" rain	22 Sep		29 Sep		1 Oct	Dry Aug, wet Sept,	24 Sep	Wet year, average crops, somewhat damaged. Fine grain harvest, badly laid and mildewed
1872	Fourteen days good weather, followed by storms – damage, 25 days with rain	21 Sep		30 Sep		1 Oct	Wet harvest but in good condition	17 Sep	Wet summer, poor harvest. Fine grain harvest – some damage
1873	Delayed by rain More than 8" in 10 days	21 Sep	Frequent heavy rains delaying harvest	5 Oct	Severe thunderstorms east of Beverley	5 Oct	Late sowing. Good harvest	19 Sep	Showery summer, poor harvest. Poor seed time and low yields
1874	Very dry season	18 Sep	Severe wind a problem in some areas	6 Oct		23 Sep	Most in before rain	22 Sep	Year of good harvests. Wheat excellent, wet later
1875	Prolonged harvest – longest in memory. 3.8" rain in Sept	22 Sep	Disastrous cold winds and heavy rain in August	23 Sep	Heavy cold rains and fogs have had disastrous effects on the corn crops	28 Sep	Weather spoilt harvest	19 Sep	Very wet summer, crops suffered. Wheat and barley below average. (First grain from USA)
1876	Thunderstorms during harvest, disrupted due to tempests	12 Sep		4 Oct		29 Sep		25 Sep	Poor sowing weather, good at harvest time. Low yields but good grain
1877	Delayed by rain.	22 Sep	Severe thunderstorms and copious hail damaged standing crop	4 Oct	Severe thunderstorms with copious hail in some areas in early September have delayed harvest	10 Oct		26 Sep	Wet summer, poor yields. Wheat & barley below average
1878	Late completion in some areas due to heavy rain	22 Sep	Good harvest weather	13 Sep		1 Oct	Early start, heavy rain during harvest	22 Sep	Warm wet summer, Wheat crop above average – better on higher land. Poor autumn sowing for 79

Year	Local weather comments **(Taunton)**	Avge date	Local weather comments **(Cumbria)**	Avge date	Local Weather comments **(Holderness)**	Avge date	Local weather comments **(Broads)**	Avge date	National weather*
1879	Gloomy prospects, much damage to standing crops. Few cattle at Michlm. Fair, farmers still at harvest	8 Oct		3 Oct	Late start to harvest due to weather conditions	25 Oct	Marshes flooded in Aug. Some late imp. Late harvest, worst for 40 years	8 Oct	Unusually wet, bad harvests, cold winter, poor sowing, backward spring, very wet Jun-Aug. In Aug – pastures flooded like winter. Harvest very late (First refrigerated beef from Australia)
1880	Early start to harvest	22 Sep		29 Sep	Brought to standstill due to weeks of rain	11 Oct	Good progress, some mildew	25 Sep	Good weather year but yields light, backward spring. Heavy barley crop
1881	Continued rain delaying harvest. 1.9" on 22 Aug. Nine days rain in late Sept.	20 Sep	Very late harvest, weather delays throughout	23 Oct	Heavy rain. Late commencement, low lying country flooded	12 Oct	Light lands good harvest	23 Sep	Wet summer, moderate harvest. Worst snow of C19.Hard frost Jun 9th. Frost Jul 28th cut down beans. Below average crop and damaged.
1882	Late finish, large amount of corn still in ground mid Sept.	24 Sep	Gloomy prospects – a full weeks rain at end of Aug, another the following week	12 Oct	Nov 25 - still harvesting in some areas, crops being laid down	11 Oct	Wheat below average, some blight	28 Sep	Wet year, deficient harvests. Frosts mid June and September. Crops poor – little autumn sowing.
1883			Great damage by storm in north of county	11 Oct	Greatly delayed harvest since weather broke	11 Oct		26 Sep	Unsettled, crops below average. Harvest stormy bur some good harvesting days
1884	Rain at end Aug after 4 weeks good weather. Aug rain 0.9"	19 Sep		25 Sep	Very dry – only 14" rain this year to the end of August.	19 Sep		20 Sep	Warm summer, good harvests Good harvest weather, good crops and yields
1885	Later than normal start to harvest	23 Sep	Very late harvest	7 Oct	Cold North east winds in August and lack of sun have delayed ripening of all grain crops in the area, delaying harvest.	8 Oct	Very dry July (lowest temp 32º)	26 Sep	Dry year, harvests below average. Mild winter but backward spring. Worst root harvest in many years

Year	Local weather comments **(Taunton)**	Avge date	Local weather comments **(Cumbria)**	Avge date	Local Weather comments **(Holderness)**	Avge date	Local weather comments **(Broads)**	Avge date	National weather*
1886	Unusually late but catching up. Big storm 10 Sept.	22 Sep	The rain spate was unparalleled, resulting in widespread flooding on already sodden fields	10 Oct		10 Oct	Harvest progressing well, little damage to standing crop.	27 Sep	Changeable year, crops above average. Late and cold spring- much winter corn killed Average yields but some blight.
1887	End Aug rain interfered with Corn	15 Sep		24 Sep		20 Sep	Several stack fires	23 Sep	Very dry year, good harvests (only 13" rain in Fens) 16 Oct Backward spring. Heavy crops
1888	Disrupted by tempests 8.1" rain in Sept	4 Oct	Slow progress, heavy rain prevented cutting and flattened crops	9 Oct		16 Oct	Ripening at last, little mildew, exceptional year for weeds.	3 Oct	Wet cool year, poor harvests. Wet summer, reasonable harvest weather.
1889	Average harvest, good root crops.	19 Sep	Hard frosts 22/9/89	4 Oct	Most unfavourable weather, 31 days rain in last 2 months	4 Oct	Wet Sept – lowest temp 29º	24 Sep	Showery year, average harvests. Good sowing weather - showers throughout harvest
1890	Rain and wind interfered with harvest. Catching up	23 Sep	Severe thunderstorms for several days at end of August	7 Oct	Prolonged wet weather	5 Oct		28 Sep	Showery year, crops below average. Damaging frost 30th June, wet summer, good harvest weather
1891	Early start, much beaten down by incessant rain. Late finish	1 Oct	Rainfall in August 2.5 times average. Crops severely damaged and flattened	9 Oct	Storms in parts of E Yorks have severely damaged crops	7 Oct	Busy harvest when weather permits – little mildew. Later than avge	30 Sep	Wet summer but good crops. Thames frozen in Jan. Backward spring. Good but some late harvests
1892	90% crop forecast. Rain early Sept stopped harvest	23 Sep	Started under poor weather, floods in north of county. Sept wild and rough, storms and gales	12 Oct	Rain at end of August have delayed reaping	13 Oct	Late start due to rain	28 Sep	Dry year – poor disastrous harvest. Late dry spring. Heavy rain in Aug, good harvest month

Year	Local weather comments **(Taunton)**	Avge date	Local weather comments **(Cumbria)**	Avge date	Local Weather comments **(Holderness)**	Avge date	Local weather comments **(Broads)**	Avge date	National weather*
1893	Unsettled weather (end Aug) slowed harvest	18 Sep	Reasonable harvest in spite of rain	24 Sep		22 Sep	Very dry year	26 Sep	Drought year, crops below average. Fine spring very dry April (50 day drought in Weald) Poor grain crop
1894	Poor year. Needs good weather for avge crop. Some sprouting	22 Sep		4 Oct		7 Oct		29 Sep	Showery year, harvest above average. Mixed grain yields and quality
1895	Good harvest weather Wheat finished 7 Sept Thunderstorm 14 Sep damaged barley	24 Sep		1 Oct		1 Oct	Wet stormy Aug	25 Sep	Hot dry year, deficient harvest. Thames blocked by ice in Feb. Very hot, dry summer with storms. Wheat much destroyed by cold winter, late sown barley failed to ripen
1896	Early start, some delayed by rain	12 Sep	Fine through most of harvest-time. Early in many places	16 Sep		26 Sep	Very dry Aug, harvest earlier than usual	21 Sep	Dry year wet harvest, but crops good. Very dry May,Jun,Jul. Very wet Sept, but wheat good
1897	Rain, gales. Gloomy delayed harvest. Only 19.7" rain in year, longterm avge 29.6"	16 Sep	Good early harvesting, poor later	29 Sep		7 Oct	Very dry July, Aug. Early start and finish to harvest	22 Sep	Dry until harvest, then stormy. Wet spring, vegetation forward – hard frost 12th Jun. Wheat below average, but good quality
1898	Harvest never so bountiful. Over early in West –fine weather	16 Sep		1 Oct		30 Sep		23 Sep	Hot dry summer good crops. Cool and damp spring. Good harvest above avge, though some damaged in May
1899	Early finish. Articles about reduced rain – is it a permanent problem?	15 Sep		22 Sep	Only 0.7" rain in August c/w 3" average	20 Sep	Dry June, July. Early harvest finish	23 Sep	Hot dry summer, average crops. Mild winter, backward spring, hot dry harvest. One of earliest harvests on record

* from Stratton J. & Houghton-Brown J., Agricultural Records, AD 220 – 1977, 2nd edition 1978, London: John Baker

APPENDIX 11 – Norfolk Monastic sites – alignment

A total of 96 monastic sites can be identified in Norfolk – 40 Norman sites and 56 post-Norman sites, from a combination of Pestell's *Landscapes of Monastic Foundation* (2004), for the Norman period monasteries and Messent's *The Monastic Remains of Norfolk and Suffolk* (1934) for the post-Norman monasteries. The church element of the monastery could be identified in fifty-two of them, either as visible remains from the first- or second-series large-scale Ordnance Survey maps, or as sub-surface foundations through aerial photography, by parch- or crop-marks, using the 1940s "RAF" series held as part of the Norfolk HER at Gressenhall.

The alignment of the nave was measured directly from the map where visible, but the alignment was measured from the aerial photograph in every case. In those cases where comparisons of the readings were possible, the figures were, with one exception, within 2º of each other. To ensure comparability, the readings from the aerial photographs were used throughout this analysis. Two point five degrees was subtracted from the measured readings, as an average figure for the County, to adjust the figures to True north from the Grid-north based measurements that the aerial photographs used.

Overall, the alignment figures are similar to the rural parish churches in the larger parish church survey. The mean alignment is just 1.8º lower (87.1º to 88.9º); and the proportion of churches aligned to the north of east is very similar, at 54%, compared with 55.8% for the medieval parish churches. Comparing the monastic results across the county with the east-west pattern of changes in mean alignment already observed in parish churches both across the country and within Norfolk, shows that the same pattern does not exist within the monastic sample. Although the sample is small, the mean alignments west and east of the longitude-divide are very close and the ranges of alignments at the 95% confidence level overlap almost completely. Emphasising this is the fact that similar proportions of the alignments are to the north of east – 53% in the west of the county and 55% in the east (compared with 62% and 50% respectively amongst parish churches). So although the overall mean alignment figures fit well with the rural parish church results as a whole, the lack of difference in the proportions of monastic churches aligned to the north of east across the county confirms that the same spatial pattern in alignment found in parish churches does not exist within Norfolk's monastic churches.

Table A11.1 - Summary alignments of Monastic sites in Norfolk by longitude

Monastic sites	No	Range	Mean	95% conf	Range at 95%	%North of East
Norfolk – west of 1.10° East	19	63.5-99.5	**86.7**	±4.4	82.3-91.1	53
Norfolk – east of 1.11° East	33	71.5-110.5	**87.3**	±3.7	83.6-101.0	55
Total	52		**87.1**	±2.8	84.3-89.9	54

APPENDIX 12 - Using the survey results to assess other possible factors linked with sloping church sites

It was established earlier in this thesis that although there was a significant difference in the numbers of slope-built churches built on east-facing slopes, there was little difference in the alignment of the churches, whether they were built on slopes, flat sites or on platforms. The aim of this section is to see if there is a difference in other factors, in addition to the slope direction, particularly the close presence of the big house (the manor house or lordly hall), especially those built on east-facing slopes, which could be part of a form of Christian substitution outlined earlier, rather than merely a lordly foundation of a church next to the house.

As was noted earlier, there are more than twice as many churches sited on east-facing slopes than would be expected in a random sample – 201 (54% of all on sloping sites) compared with a figure of 93, which is 25% of the total of 373 which would result from an equally distributed sample – an apparent excess of 108 churches. Churches on platformed sites do not exhibit this same degree of bias – with 90 (32%) on east facing slopes, an excess of only nineteen over the 71 which an equally distributed sample (25% of 283) would produce. Are there two concurrent patterns in these figures? Does this 'excess' of 108 churches, represent churches which were built in earlier graveyards or built to incorporate earlier ritual sites which have no other obvious remnants now, whilst the remainder of the east-facing group, along with slopes in the other three directions, are lordly private foundations that follow the random pattern of landscape slope which might be expected?

Table A12.1 Churches on sloping and platformed sites

SLOPING SITES		
	No	%
East facing	201	**54**
South	61	**16**
West	85	**23**
North	26	**7**
Total sloping sites	373	**100**
PLATFORMED		
East facing	90	**32**
South	101	**36**
West	57	**20**
North	35	**12**
Total platformed	283	**100**

The similarity in the number of churches on south facing slopes with the numbers of churches on west-facing slopes might support this assertion and also serves to highlight how few churches are sited on slopes which face north. A north-facing slope would be the last choice of location for an agricultural community in a land where some growing years are marginal – shown by harvest figures earlier in Chapter Six, when harvests were not always entirely gathered in, and weather comments were made specifically referring to cold summer seasons delaying ripening and therefore harvest. From an agricultural point of view when the warmth of the land and its speed of warming up are important, if the land in an area generally sloped in a single direction, then south would be first choice, followed by West, then East then North. This pattern is almost mirrored by churches built on platformed sites, except for a small

excess on east-facing slopes, with 36% south facing, 20% west facing, 32% east facing and only 12% facing north. However, for churches built directly on sloping sites, the equivalent figures are 16% south, 23% west, 54% east and 7% north facing.

There are two possibilities – firstly, as outlined above, that churches built on platformed sites represent the norm – a fairly balanced selection of sites on slopes of all directions, and that the excess of churches built directly on east-facing sloping sites represents the use of earlier graveyard or ritual sites, previously unknown; or secondly, that all platformed sites are part of the later phase of lordly church building (late-Saxon or Norman) and are built on new sites, rather than in an earlier graveyard, and show that for later churches the east-facing slopes of mid-Saxon times were no longer considered important for a church site. As table 12.2 below shows, there is little difference between the ages of the *current* churches, whether built on slopes or platforms, and it is not possible to examine the original churches on these sites, or establish whether there is an earlier pre-church graveyard beneath a church, without thorough excavation.

Table A12.2 Churches on sloping and platformed sites by age of earliest fabric

SLOPING SITES		
	No	%
11th, 12th century	185	**50**
13th – 15th century	118	**32**
Not known	70	**19**
Total sloping sites	373	**100**
PLATFORMED		
11th, 12th century	124	**44**
13th – 15th century	109	**39**
Not known	50	**18**
Total platformed sites	283	**100**

Detailed comparison of sites where church and hall are together, with those where there is no hall

Overall, as shown in table 12.3, Norfolk has fewer churches next to the hall (at **13%**) than the rest of survey area (at **21%** of all churches) and Norfolk would need almost to double the number of church/hall focus sites (an extra 50 churches, making 120 in all) to achieve the same proportion as the rest of the survey sample, so the difference is substantial. However, the numbers become much smaller in some cases when the Norfolk results are broken down into the topographic groups, despite the fact that Norfolk provides between one quarter and one-third of all the churches in the whole survey (29%), but there is still a difference between Norfolk and the remainder (Non-Norfolk) in every category of yard topography, where the proportion of churches next to the manor house is lower in Norfolk, whether the yards are sloping, flat, on a knoll or platformed. Is this smaller number of church/hall groups in Norfolk due to a higher proportion of field churches in Norfolk, built by groups of freemen where no manor was involved (Warner 1986, 43; Williamson 2006, 89); does it reflect changes in the manor system in Norfolk, which saw many small manors amalgamated with the loss of many manor houses over the centuries (Williamson 1993, 164; Barnes 1997); or is it due to a greater number of middle-Saxon sites that predated the manor system, where the church was built later but in an existing early graveyard rather than next to manor

house? Whatever the cause, there is a slightly higher proportion of churches next to halls on sloping sites (**27%**) than in any of the other possible yard topographies.

Table A12.3 Church/Hall focus by Topography of churchyard by area									
	Non- Norfolk			Norfolk			All Survey areas		
Topography	Focus	Not focus	% with focus	Focus	Not focus	% with focus	Focus	Not focus	% with focus
Sloping yards	80	215	**27%**	13	65	**17%**	93	280	**25%**
Flat/almost flat	148	628	**19%**	51	325	**14%**	199	953	**17%**
Knoll	12	79	**13%**	2	25	**7%**	14	104	**12%**
Platformed yards	46	169	**21%**	5	63	**7%**	51	232	**18%**
Total	286	1091	**21%**	71	478	**13%**	357	1569	**18.5%**

Church/hall focus may be more likely on sloping sites, but it does seem to matter in which direction the land slopes. There is no difference between east-facing slopes (**26%**) and slopes in other directions (**28%**), when all the survey areas outside Norfolk are taken together, as shown in table 12.4. Although this is not the case in Norfolk, where the numbers become very small when subdivided - if only three churches changed from an east-facing to an 'other' slope, then both would be the same percentage. It is safe to say that there is no connection between the direction of the slope and the proximity of the church and the manor.

Table A12.4 Church/Hall focus by Direction of slope of yard by area									
	Non- Norfolk			Norfolk			All Survey areas		
Topography and slope direction	Focus	Not focus	% with focus	Focus	Not Focus	% with focus	Focus	Not focus	% with focus
Sloping Yards - East	40	114	**26%**	11	36	**23%**	51	150	**25%**
- other directions	40	101	**28%**	2	29	**6%**	42	130	**24%**
Total	80	215	**27%**	13	65	**17%**	93	280	**25%**
Platformed yards -	14	52	**21%**	1	23	**5%**	15	75	**17%**
- other directions	32	117	**21%**	4	40	**9%**	36	157	**19%**
Total	46	169	**21%**	5	63	**7%**	51	232	**18%**

Examining the church/hall location in relation to its proximity to the location of the village, shows that, again, there is little difference between the groups, except for isolated churches, which at **27%** are slightly more likely to be part of a church/hall focus in areas outside Norfolk, although Norfolk itself still has smaller proportions of churches in each of the three categories than do the Non-Norfolk sites, as shown in table 12.5.

Table A12.5 Church/Hall focus by Location of church in relation to village by area									
	Non- Norfolk			Norfolk			All Survey areas		
	Focus	Not	% with	Focus	Not	% with	Focus	Not	% with
Church in village	129	608	**18%**	25	211	**11%**	154	819	**16%**
Church isolated	76	203	**27%**	32	141	**18%**	108	344	**24%**
Church at vill edge	81	280	**22%**	14	126	**10%**	95	406	**19%**
Total	286	1091	**21%**	71	478	**13%**	357	1569	**18.5%**

Analysing the church/hall location by the age of the earliest church fabric also shows little difference between the categories, although the churches with earlier fabric (eleventh- and twelfth-century) have slightly higher proportions next to the hall at **21 - 24%**, than the later churches of the 14th and 15th centuries at around **15%**, as shown in table A12.6. Again, Norfolk has a lower proportion in every single fabric age category than the remainder of the survey, between 9% and 19%, compared with the range 15% and 24% for the churches in other areas.

Table A12.6 Church/Hall focus by Age of church fabric by area

	Non- Norfolk			Norfolk			All Survey areas		
Oldest fabric	Focus	Not	% with	Focus	Not	% with	Focus	Not	% with
11th century	11	42	**21%**	6	25	**19%**	17	67	**20%**
12th century	134	432	**24%**	23	141	**14%**	157	573	**22%**
13th century	61	242	**20%**	19	103	**16%**	80	345	**19%**
14th century	20	103	**16%**	14	127	**10%**	34	230	**13%**
15th century	8	45	**15%**	3	31	**9%**	11	76	**13%**
Not known	52	227	**19%**	6	51	**11%**	58	278	**17%**
Total	286	1091	**21%**	71	478	**13%**	357	1569	**18.5%**

There are similar proportions of churches next to the hall in each of the categories of name origin, whether the church is in Norfolk (at around 13%) or outside Norfolk, at around 21% - shown in Table 12.7.

When these last two analyses, by age of fabric and by name origin, are further split into slope direction, there is little variation between each of the categories, whether built directly on the slope or built on a platform, so the tables were shown in Appendix 8.

Table A12.7 Church/Hall focus by name origin of village by area

	Non- Norfolk			Norfolk			All Survey areas		
	Focus	Not focus	% with focus	Focus	Not focus	% with focus	Focus	Not focus	% with focus
O. E. Name	69	267	**21%**	29	165	**15%**	98	432	**18%**
O. E. Process/feature	159	519	**23%**	27	233	**11%**	186	752	**20%**
O. N. Name	13	64	**17%**	8	47	**17%**	21	111	**16%**
O. N. Process/feature	9	53	**15%**	6	27	**18%**	15	80	**16%**
Other	36	188	**16%**	1	6	**14%**	37	194	**16%**
Total	286	1091	**21%**	71	478	**13%**	357	1569	**18.5**

Churches with church/hall focus have been shown to be more likely to have been built on a slope (table 12.3) as well as being in an isolated location (table 12.5). Table 12.8 below shows that this applies whether they are built on east facing slopes or on a slope in another direction (**43%** on east-facing slopes and **37%** on other slopes). The figures are similar for other village locations too, whether on east-facing- or other slopes. At this level of disaggregation, the Norfolk figures are too small to be meaningful, as a change between categories of a single church alters the balance of the figures substantially.

Table A12.8 - Church/Hall focus on sloping sites by direction of slope, location of village by area									
	Non- Norfolk			Norfolk			All Survey areas		
Sloping sites	Focus	Not focus	% with focus	Focus	Not focus	% with focus	Focus	Not focus	% with focus
Slope East – in village	16	70	**19%**	5	16	**24%**	21	86	**20%**
- isolated	12	16	**43%**	3	11	**21%**	15	27	**36%**
- village edge	11	28	**28%**	3	9	**25%**	14	37	**27%**
Slope other – in village	16	46	**26%**	-	12	**-**	16	58	**22%**
- isolated	14	24	**37%**	1	11	**8%**	15	35	**30%**
- village edge	11	31	**31%**	1	6	**14%**	12	37	**24%**
Total all sloping sites	80	215	**27%**	13	65	**17%**	93	280	**25%**

The key fact throughout this section is that the numbers of churches on east-facing slopes, whether with church hall focus or not, and independent of where they are located in relation to the village, outnumber the churches on all the other slope directions put together, indicating that the direction of the slope was the principal concern and that none of these other factors examined here appear to have anything like the same level of connection. For example, 39 churches have church/hall focus on east facing slopes, compared with a total of 41 on the three other slope directions added together; 114 do not have church/hall focus on east slopes compared with 111 on all other slopes. All of the other factors considered - the age of the church fabric, the village name origin, the position of the church in relation to both the village and the manor house, show little variation when analysed by the direction of the slope, which firmly places the direction of the slope as the key factor when selecting the site.

APPENDIX 13 - Technical details of Norfolk Topography Analysis

Computer-based topographical assessment of Norfolk - Methodology

Digital (vector) county and parish boundary data for Norfolk, for the year 1851, were obtained from the UKBorders website via the Athens website under the Combined Higher Education Software Team (CHEST) agreement. Nineteenth century parish boundaries were used in preference to modern ones as they are more consistent with early boundaries. Digital (vector) contour data for Norfolk were obtained from the Ordnance Survey at a scale of 1: 50,000 via the Athens website – Panorama Digital Elevation Model (PDEM).

The county and parish vector data were imported into ArcGIS and converted into raster layers with a resolution of 50m. The contour (vector) data was imported into ArcGIS and rendered into a Triangular Irregular Network (TIN) – 'a wire network' - for ground slope and aspect using the 3D analysis function (create/modify TIN from features). Both the ground slope TIN and aspect TIN were subsequently converted into raster layers with a resolution of 50m using the 3D analysis function (convert TIN to raster). Land was categorized as 'flat' if the slope was below 2 degrees and hence the ground slope was divided accordingly. This was achieved using the 3D analysis function (reclassify). A regular grid of 59,743 points at 300m spacing was generated using Hawths tools within ArcGIS (sampling tools – generate regular points). For each of the 59,743 points in Norfolk, the ground slope (above or below 2 degrees), aspect and parish name were added using the sample function (spatial analysis tools – extraction – sample points over raster layers) and a Microsoft Excel data table was produced. Using basic data sort routines, simple 'sum' routines, etc, within Excel, the percentage of landscape (over 2 degrees ground slope) within each parish in Norfolk for each of the eight directional slope aspects was determined.

To check the findings in greater detail, within the restriction of 64,000 sampled data points, the Norfolk parish boundary (vector) data was reduced in number to around 50 parishes at random using the Editor (delete) function in ArcGIS. The above analysis process was then repeated but the resolution of the sampling points was 100m (to fit within the 64,000 sampling limit of the program), which produced an average of about 600 – 700 data points within each parish.

Detailed text and table omitted from the main text

Parishes where the church is built on a flat or almost flat site have a generally flatter topography; with approximately 70% of the land in the parish having a slope of less than two per cent, very slightly above the average for the whole county (shown in table 7.3). In these parishes the churches are not built on slopes, but even here what sloping land there is slopes roughly equally in all directions.

Table A13.1 – Topography of parishes which have churches built on flat sites

Parishes with churches on sites which are:-		Proportion	Proportion of 2%+ slopes by direction of slope							
	No.	<2% slope	North	N East	East	S East	South	S West	West	N West
Flat/Almost Flat	**376**	**69.9**	**4.3**	**4.1**	**3.7**	**4.2**	**3.8**	**3.4**	**3.0**	**3.6**
Knoll sites	**27**	**71.2**	**2.9**	**2.9**	**2.0**	**2.6**	**3.4**	**4.4**	**4.1**	**2.8**
All Norfolk Sites	**549**	**67.0**	**4.5**	**4.3**	**3.9**	**4.4**	**4.3**	**3.8**	**3.8**	**3.6**

APPENDIX 14 - Case study - abandoned churches in Norfolk: was the choice affected by sloping sites

In the majority of these settlements with two or more churches, one church fell into disuse, and in most cases has been abandoned completely. Was the decision as to which of the churches to retain, and which to abandon, influenced by the topography of the two sites involved? Was a church that was sited on an east facing slope favoured for retention over a church located differently? There are seventy-nine parishes in Norfolk where there were two or more medieval churches, identified by Batcock (1991, 186), at least one of which fell into disuse and either remains as ruins of varying completeness or has disappeared completely. To assess whether the church site which disappeared, particularly its slope, was different from the one that remains, each of these sites has been visited and measurements of slope and horizon elevation made.

Fourteen of the seventy-nine settlements had two churches either in the same yard or adjacent yards - at Antingham, Barnham Broome, Bedingham, Blo Norton, East Carleton, Gillingham, Great Melton**,** Little Snoring, Rockland, South Walsham**,** Snetterton, Stiffkey, West Dereham, and Wicklewood. In addition, the churchyard in Reepham, which still contains the parish churches of St Mary, Reepham and St Michael, Whitwell, used to contain All Saints, Hackford as well, prior to the fire in 1549 (Batcock 1990, 22), illustrated as Figure 5.2 earlier. Despite being built in the same (very small) churchyard, the churches were actually sited in three different parishes, and the parish boundaries still meet there. The arable lands of the two South Walsham parishes, illustrated in the frontispiece, were intermingled until quite late and the current parish boundary divides the churchyard (Williamson 1993, 158). None of these fourteen sites has been included as part of this case study as two churches built in the same, or adjacent yards will obviously experience the same topography, so in these cases there can have been no landscape-based influence on the selection of the church that is still in use over the one that was abandoned.

Fifty-eight of the remaining sixty-five settlements which had two or more churches located in different parts of the parish have been surveyed and the results presented below. The final seven, where the specific site of the lost church cannot be identified (Batcock 1991, 53-55), have not been surveyed as the site-specific landscape was not able to be assessed accurately.

In addition to these sites, there are fifteen settlements that still retain both churches in use, but the parishes that contained them have been subdivided. In many cases these are the larger parishes in the west of the county. This gives rise to the peculiarly Norfolk and Suffolk pattern of naming the parish by adding the church dedication to the settlement name, such as Terrington St Clement and St John, Weasenham All Saints and St Peter, and Walpole St Andrew and St Peter. In some cases the parish was split and renamed, such as at Wheatacre, which became Wheatacre and Burgh St Peter (Batcock 1990, 10). Since all these churches are still in use or have only recently been declared redundant, they have not been included in this analysis.

Topography

The results here indicate strongly that topography played no part in the decision as to which of the two churches to retain. The sites of those churches that disappeared are topographically very similar to the 549 churches that still exist in Norfolk and form part of the main survey. Forty-one (71%) of the lost churches were located on flat, or

almost-flat sites, compared with 68% of the existing churches in the Norfolk survey; four (7%) of the lost churches were located on east facing slopes, compared with 8% in the whole of the county and thirteen (22%) were located on other slopes, compared with 24% of those in the whole county.

Thirty-eight of the 58 settlements surveyed had both churches located on sites with the same topography. As with the cases of two churches in the same yard, topography obviously was not a factor in the decision as to which of these pairs of churches was retained. In 29 of the 38 cases, both churches were on flat sites, in five cases they were both built on almost-flat sites and in four cases they were both built on sites sloping in the same direction – one east-facing, one southeast-, one south- and one west-facing. Seven sites were on similar topography – four cases where the church on the flat site remained at the expense of the other on an almost-flat site, and three cases the other way round.

Table A14.1 - Topography Analysis – One settlement : two churches (same or similar topography at both sites)

Distance apart	50-100m	150-300	350-500	550-700	750-900	950+	total
Same topography							
Both sites flat	3	10	2	4	4	6	29
Both sites almost flat	1	-	-	1	1	2	5
Both sites sloping (in same direction	-	3	1	-	-	-	4
Similar topography							
Flat site retained – almost flat site lost	-	-	1	2	-	1	4
Almost flat site retained –flat site lost	1	-	1	-	-	1	3
	5	13	5	7	5	10	45

Lastly, there were thirteen settlements where the two churches were built on sites with very different topography. The numbers involved are small and there is no pattern of retention or abandonment of the churches built on the slope. Three involve a church on an east-facing slope; one was retained at the expense of a flat site (Fincham, lost in the eighteenth century (Batcock 1991, 158)); and two were lost, one in favour of a flat site (Burnham Thorpe, fourteenth century (Batcock 1991, 53)) and one in favour of an almost-flat site (Swainsthorpe, sixteenth century (Batcock 1991, 54)). The remaining ten sites have slopes other than east-facing; in seven cases the church on the sloping sites was retained, and in three cases the church on the sloping site was the one that was lost.

Table A14.2 - Topography Analysis – One settlement : two churches (sites with different topography, involving East facing slopes)

Distance apart	50-100m	150-300	350-500	550-700	750-900	Location (& when lost)
East facing sloping site retained						
E platform retained – flat site lost		1				Fincham (lost in 18th C)
East facing sloping site lost						
East slope LOST – almost flat site retain			1			Burnham Thorpe (lost in 14th C)
East slope LOST – flat site retained					1	Swainsthorpe (lost in 16th C)

Table A14.3 - Topography Analysis – One settlement : two churches (sites with different topography, involving OTHER slopes)							
Distance apart / Site type retained	50-100m	150-300	350-500	550-700	750-900	950+	Total
SE-facing slope retain.				1 al. flat	1 flat		2
N facing slope retained		1 S slope	1 flat				2
W-facing slope retain.		1 W plat	1 S slope			1 flat	3
Knoll retained	1 al. flat		1 al. flat, 1 flat				3
TOTAL tables 14.2 & 14.3	1	3	5	1	2	1	13

Period of /reason for disappearance

Topography apparently did not affect the decision to abandon one church in a settlement in favour of another, but the figures in table 14.4 below, show that almost half of all the lost churches were abandoned in the sixteenth century, facilitated by the Act of 1535/6 permitting the consolidation of parishes. The religious upheaval during this time contributed to either reductions in, or cessation of, maintenance of church fabric generally (Duffy 1992, 424-428). In several instances, the fabric of one of the two churches was used to repair the other; Batcock recorded such a plea to the Diocese in Norfolk for the church at Guist (Batcock 1991, 11). In addition, some churches where located in manors where the Lord was a religious institution affected by the Dissolution, such as at Kirby Bedon. Secular abandonments were also growing at this time in East Anglia as parkland was being established, for example at Wolterton and West Wretham (Batcock 1991, 12), and there was also continued growth in the development of large sheep runs, such as at Godwick (Healy 1982, 59-67), Bawsey and Leziate (Allison 1955, 136).

Table A14.4 - One settlement : two churches - Period of disappearance											
Century	Unkn	12th	13th	14th	15th	16th	17th	18th	19th	20th	total
Same Yard		-	1	3	1	5	1	2	1	-	14
Other sites - assessed		1	2	3	5	29	5	8	-	5	58
- not locatable	1	3	-	1	-	2	-	-	-	-	7
TOTAL	1	4	3	7	6	36	6	10	1	5	79

Proximity must have had an effect on church abandonments. If two churches were close, there would have been no reason to maintain both after the historic imperative of attending the church of your manor had disappeared. In addition to the fourteen churches in the same yard, 39 of these lost churches were within 650 metres of the other church in the settlement, and only eleven were more than one kilometre from the other church. Even in these days of increased car-use, these distances would not be considered too far to walk to church, in medieval times such distances would not have been considered an issue at all.

Case Study Conclusion

The slope of the site appears not to have featured in the decision of which of the two churches to retain in the cases of these Norfolk abandonments, with very few churches sited on east-facing slopes involved at all. Of the four churches on east-facing slopes, two were retained at the expense of the other church in the settlement, and two were

lost. During the period of the majority of the abandonments, it appears that pragmatic decisions relating to relative state of repair of the two buildings, and the proximity of the churches to the remaining settlement were more important. Whether this was the case for those (few) abandonments in the twelfth and thirteenth centuries, when slope may have been considered, is more difficult to determine, as half of these sites cannot be identified closely enough on the ground to be able to make an assessment of the topography at the church.

APPENDIX 15 - Site-specific landscape assessment of all churches in Norfolk built on sloping land

The landscape context of the sites of all the churches that were built directly on slopes, and those built on levelled platforms on slopes in Norfolk has been assessed with a view to establishing if it was possible to determine whether specific churches were built where they are for a particular reason or not. Norfolk is a good choice for this exercise as it exhibits similar patterns of slope-built churches to almost all the other counties, despite the fact that the topography is fairly gentle, and secondly it is close to the author's home. The reason for the selection of a specific church site could have been one or more of many - to use the slope and its extended horizon; to incorporate a site of earlier importance; the close proximity to the manor or the proximity to another feature, such as a spring or a river-crossing. Consideration was also given to whether the church was built in such a place as to ensure that it could be seen from a great distance, which also reflects the fact that there is an extended eastern view from the church.

Norfolk

In Norfolk, there were 47 churches on east-facing sloping sites, nine on south-facing slope, nineteen on west-facing slopes and three on north-facing slopes. On platformed sites, there were 24 on east-facing slopes, 23 on south-facing slopes, sixteen on west-facing slopes and five on north-facing slopes.

Norfolk churches on east-facing slopes

Of the 47 churches on east-facing sloping sites, thirteen (27%) appear to have been sited solely for the slope and the extended view it offers, in that there is no close manor now (and no evidence of one) and in these cases the site is apparently the best in the locality for its eastern view, as the remainder are either lower down the slope or have additional reasons for the chosen site, such as an adjacent Hall.

The comments on their siting are as follows:-

Table A15.1 – Norfolk church sites on sloping land

Name	Grid Ref	Comments
Hunworth	TG064355	Village currently along SW-NE valley on SW side of River Glaven. Church at top of steep hill – no sign of manor close by. Castle Hill (motte) 800m to SE.
Claxton	TG328032	Near top of slope down to R Yare marshes. 1 mile from Claxton castle and manor. Isolated, rest of village on marsh edge, next to castle
East Tuddenham	TG085115	West side of small steep-sided valley, to east of current village. Isolated, village moved to top of hill (common?) on flat site. No sign of manor.
Colton	TG104094	At top of slope above wide shallow valley. Village now to N, away from river, adjacent to common. No sign of manor.
Brandon Parva	TG070082	High on slope above village, which is located in valley bottom, opposite Barnham Broome on other side of R Yare. Manor Farm and Monk's Hall 200m lower down slope. Most of the parish slopes the same way, but church is closest to hill top.

Honingham	TG115113	On Norwich-Lynn road, 1 mile from village now located at river crossing. Church halfway up steep slope from river, Completely isolated, but visible from Honingham Hall, 1k to N across park, on other side of river valley.
Wighton	TF941399	Village split either side of crossing of N-S River Stiffkey. Not close to manor, but in best place for east view, and highly visible from the now silted up river-port and directly opposite Cley, its port and grand church, across the river estuary.
Fring	TF726348	Above village at top of steep-sided narrow valley **(Figure 8.16)**. Village at valley bottom on X roads and river crossing. Church adjacent to and above large farm, but Fring Hall is on other side of river.
Bexwell	TF632034	At edge of small hamlet, on west edge of small tributary valley. Hall located 100m to east. If church was next to it, the slope would be in the opposite direction, i.e. on a west-facing slope.
Stody	TG056352	Village located at X roads, on spur at confluence of two tributaries of R Glaven. Church at the edge of the slope, on the only site in the village that could give such a lengthy east view and visibility from a distance. Graveyard on east-facing slope **(Figure 8.15).**
Swanton Morley	TG019173	Huge church at top of valley side of R Wensum **(Figure 8.12).** Village at X roads at bottom of steep-sided tributary valley to S. Extensive east views **(Figure 8.13),** visible for miles. Morley Castle with moats, sited 1k to east on the valley floor.
Mundham	TM325980	Originally, one of two churches in vill. This one better sited for slope, although it is next to parish boundary with Seething. Church is now far closer to Seething than Mundham. Excellent east views **(Figure 8.17)**. The "Old Hall" is at bottom of slope.
Pulham St. Mary	TM197861	On west side of small N-S tributary of R Waveney. Church at E end of village, near river crossing and 1k W of Hall, which is even more remote from village and isolated. Village at top of hill, but much flatter topography

In addition there are twelve churches (25%) located on an east-facing slope, but in parkland settings close to the 'big house'. In these situations it is not possible to speculate as to which came first, the house or the church, therefore it cannot be determined whether the church was located close to the house for lordly reasons, rather than the sloping site being chosen first for other reasons.

South Pickenham	TF856042	on the edge of Pickenham Hall Park.
West Barsham	TF905337	in the parkland of West Barsham Hall.
East Raynham	TF879256	in the parkland of Raynham Hall
Runton	TG179428	adjacent to a large house, now a hotel.
Anmer	TF737296	in the parkland of Anmer Hall.
Thorpe-next-Haddiscoe,	TM437981	located 50m from Thorpe Hall.
Shelton	TM221910	close to Shelton Hall.
Spixworth	TG240148	on edge of Spixworth Hall Park.

Garboldisham	TM005816	with a 2nd church, ruined, between it and both The Old Hall and The Manor House, both with parkland and 100m to the north.
Letheringsett	TG060389	adjacent to Letheringsett Hall
Denton	TM286874	next to Denton Hall
West Lexham	TF843172	isolated, on edge of Lexham Hall Park

Apart from these churches, there were an additional fourteen (29%) built on east-facing slopes where the church could have been sited over a wide area, as all of the village, or much of the parish, sloped in a similar direction and therefore any specific selection reasons for a particular site are masked by the general availability of similar conditions – these were:-

Surlingham	TG305065	
Diss	TM118800	
Brampton	TG220245	
Caston	TL960976	
Burlingham	TG372083	
Briningham	TG038344	
Marsham	TG196237	
Hackford	TG060024	(also close to a spring)
Newton Flotman	TM213984	(also close to the river crossing)
Loddon	TM364988	(also close to middle-Saxon pottery noted earlier)
Thwaite	TM333950	
Shelfanger	TM107837	
Ovington	TF924026	
Bridgham	TL957857	

There are also eight others on east-facing slopes with no specific features to indicate why the particular site was chosen.

Norfolk churches on slopes in other directions

Of the 31 churches built on slopes other than east-facing, four are located in parishes where much of the land has an eastern slope and therefore would have been better located for the view east if built elsewhere in the parish, so the site was definitely chosen for a reason other than a lengthy east view; three are built next to the big house and are probably sited for lordly reasons; three are built at the top of their respective slopes, so have the benefit of a long east view anyway. The remaining nineteen have no obvious reasons for their location.

Table A15.2 - Summary of Norfolk sloping sites

	Slope-built churches	Platform-built churches
East-facing slope – slope main reason for site	13	8
- additional possible reason for site (hall etc)	12	6
- similar slope over larger area	14	2
no identifiable reason	8	8

Other slopes - other specific reason for location	3	5
- Rest of vill same slope	4	8
- No identifiable reason	19	24
- Sited away from vill with better east view	1	1
- Sited away from places with east slope	4	6
TOTAL	78	68

Appendix 16 - Comparison of minster church sites with other church sites

It had been intended to compare the details of minster church sites with those of churches lower down the hierarchy, in terms of location and site topography etc., to see if there may have been a different pattern of influences on site selection between the different classes of church.

Unfortunately, there are two major problems – firstly, every writer on the subject has commented on how difficult it is to establish which churches should be classed as minsters, due mainly to the lack of surviving documentary evidence of the relationship between minster- and daughter-churches (Blair 2005, 319 & 465; Blair 1987 & 1992; Morris 1983; Franklin 1984; Hase 1988; Rushton 1999), but also to the many subsequent alterations and extensions to churches over the centuries which have blurred the difference between the generally larger 'superior' churches, and the generally smaller 'inferior' churches; and lastly, even when minster churches can be established, many of them are located in towns and therefore fall outside the parameters (of rural churches) for this survey, so the data required to compare many of those sites have not been collected. The tables below compare the 67 probable minster churches identified either in general studies by Blair (1987) and Morris (1983); or in specific county based studies by Franklin 1984 (The Midlands), Hase 1988 (Hampshire) and Rushton 1999 (Sussex), and which have been surveyed for this thesis, plus the possible 27 minster churches in Norfolk identified earlier in Chapter Six, with the remaining (non-minster) churches in this survey.

Table A16.1 – Alignment of churches on probable or possible minster sites in all counties in this survey

	Number	Range	Mean	95% conf.	Range at 95%	% N of East
Probable & Possible minsters	94	57-116	**86.7**	±2.2	84.5 – 88.9	66
Non-minsters	1832	38-128	**86.0**	±0.5	85.5 – 86.5	64
	1926		**86.1**			64

There is no real difference between the alignment results for the probable/possible minster churches and the remainder of the churches in the survey. The mean alignment figures are close, the proportions aligned to the north of east are almost identical and the range of alignments at 95% confidence for the two groups overlaps completely, confirming that a significant difference in alignment is not possible, but this could still disguise the fact that their sites were chosen by a different process.

Tables analysing several factors for the two groups of churches are shown below. Overall, minster churches are slightly more likely to be built on slopes than the remainder of churches – **24%** to **19%**, but both types of churches built on slopes are equally likely to be built on an east-facing slope - **52%** of minsters and **54%** of non-minsters. They are also equally likely to be built next to the big house (at around **20%**), but minster churches are more likely to be located in the village (**68%** to **50%**) and less likely to be remote from their settlement (**11%** to **24%**). They are also equally likely to be in a village with an Old English derived name, at around **75%**. Even though the figures in many cases are close, no real conclusions can be drawn from this analysis as the extremely small numbers in some of the categories of minster churches allow no

certainty whatsoever, and even a small variation in the figures would alter the proportions dramatically and therefore affect the conclusions.

Table A16.2 - minster/non-minster churches by site topography				
	'minster' churches		Other churches	
	No.	%	No.	%
Sloping sites	23	**24**	350	**19**
Flat/almost flat	51	**54**	1101	**60**
Knoll	10	**11**	108	**6**
Platformed sites	10	**11**	273	**15**
TOTAL	94	100	1832	100

Table A16.3 minster/non-minster churches built on slopes by slope direction				
	'minster' churches		Other churches	
	No.	%	No.	%
Slope facing EAST	12	**52**	189	**54**
Slope facing WEST	8	**35**	77	**22**
Other slopes	3	**12**	84	**24**
TOTAL	23	100	350	100

Table A16.4 minster/non-minster churches by church/hall focus				
	'minster' churches		Other churches	
	No.	%	No.	%
No church/hall focus	75	**80**	1494	**82**
Church/hall focus	19	**20**	338	**18**
TOTAL	94	100	1832	100

Table A16.5 minster/non-minster churches by church location				
	'minster' churches		Other churches	
	No.	%	No.	%
In village	64	**68**	909	**50**
isolated	10	**11**	442	**24**
Village edge	20	**21**	481	**26**
TOTAL	94	100	1832	100

Table A16.6 minster/non-minster churches by village name origin				
	'minster' churches		Other churches	
	No.	%	No.	%
O.E name origin	70	**74**	1398	**76**
O.N name origin	10	**11**	217	**12**
Other	14	**15**	217	**12**
TOTAL	94	100	1832	100

APPENDIX 17 - Anglo-Saxon finds in Norfolk Churchyards

A catalogue of the Anglo-Saxon finds in churchyards discussed in Chapter Eight

FIELD DESCRIPTION
HER The record number in the Norfolk HER.
Name The name of the church.
Early Whether any Early Saxon pottery or metalwork has been discovered.
Middle Whether any Middle Saxon pottery or metalwork has been discovered.
Late Whether any Late Saxon pottery or metalwork has been discovered.
Details Details of the finds and whether they were surface or excavated finds.

HER	Name	Early	Middle	Late	Details
157	Norwich, St Benedict			Pot	Excavated find.
425	Norwich, St Michael at Plea	Pot		Pot	Excavated find.
1389	Titchwell			Pot	Surface find.
1853	Warham, St Mary			Pot	Excavated find.
1990	Barmer			Pot	Excavated find.
1991	Syderstone			Pot	Surface find.
2110	Hindringham			Pot	Excavated find.
2210	**Walton, West**		Pot	Pot	Excavated find.
2344	Massingham, Little			Pot	Surface find.
2345	Massingham, Great			Pot	Excavated find.
2432	**Runcton Holme**		Pot	Pot	Surface find.
2590	Southery			Pot	Surface find.
2628	Oxborough, St Mary			Metal	Coins - Surface find.
2828	**Bilney, East**		Pot		Excavated find.
3014	**Swanton Morley**		Pot		Surface find.
3131	Guestwick			Pot	Surface find.
3201	**Saxlingham**		Pot		Surface find.
3513	Anmer			Pot	Excavated find
3562	**Congham, All Saints**		Metal	Pot	Excavated find
3770	**Gayton**	Pot	Pot	Pot	Surface find.
3941	**Pentney**	Pot	P & M	Pot	Brooches- Excavated find.
4015	Narford	Pot			Surface find.
4019	Lexham, West			Pot	Surface find.
4053	Newton-by-Castleacre			Pot	Surface find.
4074	Lexham, East			Pot	Surface find.
4093	**Beeston-next-Mileham**		Pot	Pot	Surface find
4178	**Dunham, Great**		Pot	Pot	Surface find.
4206	**Fransham, Great**	Pot	Pot	Pot	Surface find.
4290	**Shouldham, St Marga.**	Pot	Pot	P & M	Brooch. Surface find
4453	Hilgay	P & M			Cremation urn. Exc. find.
4513	Barton Bendish, St Mary			Pot	Excavated find.
4514	**Barton Bendish, St Andrew**		Pot	Pot	Excavated find.
4625	Houghton-on-the-Hill			Pot	Surface find.
4642	Necton			Pot	Surface find.
4686	Threxton			P & M	Shears. Surface find.
4717	Pickenham, South	Pot		Metal	Coin. Surface find.
5639	Weeting			Pot	Surface find.
6033	**Harling, Middle**		Pot	Pot	Excavated find.
6049	Harling, East	Pot		Pot	Surface find.
6051	**Harling, West**		Pot		Surface find.
6167	Blakeney			Pot	Excavated find.
6720	**Erpingham**		Pot	Pot	Surface find.

Bold = parishes with middle-Saxon finds

APPENDIX 17 (cont) - Anglo-Saxon finds in Norfolk Churchyards

A catalogue of the Anglo-Saxon finds in churchyards discussed in Chapter Eight

FIELD DESCRIPTION
HER The record number in the Norfolk HER.
Name The name of the church
Early Whether any Early Saxon pottery or metalwork has been discovered.
Middle Whether any Middle Saxon pottery or metalwork has been discovered.
Late Whether any Late Saxon pottery or metalwork has been discovered.
Details Details of the finds and whether they were surface or excavated finds.

HER	Name	Early	Middle	Late	Details
7120	Hempton, St Andrew			Pot	Surface find.
7277	**Longham**		pot	Pot	Surface find.
7297	**Fransham, Little**		Pot	Pot	Surface find.
7313	Tuddenham, North			Pot	Surface find.
7471	Reedham			Pot	Surface find.
7475	**Witchingham, Little**		Pot		Surface find.
7583	Felmingham	Pot		Pot	Spindle Whorls. Exc. find.
7695	Hautbois, Little			Metal	Strapend. Surface find.
7912	Costessey	Pot			Excavated find.
8393	**Hickling**		Pot		Excavated find.
8457	Ludham			Pot	Excavated find.
8517	**Walsham, South**		Pot		Excavated find.
8523	Burlingham, North			Pot	Surface find.
8987	Rockland, St Peter			Pot	Surface find.
8989	Stow Bedon			Pot	Surface find.
9047	Hockham			Pot	Surface find.
9064	**Breccles**		Pot		Surface find.
9065	Shropham			Pot	Excavated find.
9067	Snetterton, All Saints			Pot	Surface find.
9646	Thorpe St Andrew			Pot	Excavated find.
10072	Wacton, Little			Pot	Surface find.
10104	**Tasburgh**	Pot	Pot	Pot	Excavated find.
10115	Saxlingham Thorpe			Pot	Excavated find.
10212	Bedingham, St Andrew			Pot	Excavated find.
10265	Blofield			Metal	Iron knife. Surface find.
10280	Buckenham, Old			Pot	Surface find.
10464	Sisland			Pot	Surface find.
10793	Quidenham			Pot	Surface find.
10913	Roydon			Pot	Surface find.
11118	Earsham	Pot			Cremation urn. Exc. find.

Bold = parishes with middle-Saxon finds