

FURTHER THOUGHTS ON THE SYMBOLIC ORIENTATION OF ST HELENA'S CHURCH

By

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INTRODUCTION

The publication of my first paper (Farrah 1992) elicited a prompt response and a productive correspondence from Myrtle Ternstrom (Ternstrom 1993). This highlighted a number of errors in my original paper which were subsequently corrected and presented (Farrah 1994) together with an apology to Ternstrom for assuming that her date for the consecration of the church, given in her book, *A Lundy Album*, was incorrect (Farrah 1992,82). This publication was in fact the first time the date of the consecration had been corrected to June 17th. My sources for supposing the 7th June 1897 to be correct were a newspaper cutting of an account of the dedication of the church supplied by Joy Slocombe, Curator of the Ilfracombe Museum and taken from *The Ilfracombe Chronicle*, Loyd (1925,43), and an article on the 75th Anniversary Service in Vol.9 of the *Illustrated Lundy News and Landmark Journal*. With these various sources agreeing to 7th June 1897, I had wrongly assumed Ternstrom's date to be incorrect. It seems likely, as Ternstrom suggests, that the error first occurred in the *Ilfracombe Chronicle*, 'possibly by typographic omission of a digit' (Ternstrom 1993,56) and was then subsequently duplicated. With so many of the major reference works giving the incorrect date, it is an error which is likely to occur again, as indeed it has in one recently published book (Lamplugh 1993,75).

Ternstrom has assumed that, because the date given for the consecration of the church was incorrect, the whole of the astronomical theory was based on an erroneous premise. This error however has very little affect on the fundamental thesis of my paper. I had already stated that the date of June 7th also coincided with Whitsuntide in the year of the consecration (Farrah 1992,82), and it was now apparent that it must be the day of Pentecost which was the occasion meant for the dedication. Whitsunday was on June 6th and it would appear that the horizon event to which the church was orientated was the setting sun on June 5th, the eve of Pentecost. However, as a result of this error in dates, and in the light of further research, the purpose of which was to try to resolve this discrepancy, new evidence was found in support of the solar orientation

From a reading of my first paper it is evident that my research was still in progress at the time of writing. The main proposition concerned the orientation of the church to the summer solstice sunset. I had stated that this orientation, based on Professor Hawkins' calculation of the sun's declination for the solstice, showed an error of alignment to the axis of the church aisle of 1.2/1.4 degrees (Farrah 1992,82). It was not until visual observations of the setting sun in June 1992 that the sun was discovered to set central to the aisle on the 7th June (corrected to 5th June). This information was given in a postscript to my article (Farrah 1992,90). The observation of the sun as it sets central to the aisle cannot be seen because it is obscured by the mullion of the twin lancets (fig.7 in Farrah 1992,92). Because of this hindrance, this observation was made placing myself central to the aisle of the church in front of the altar, then moving an equal pace to the right and to the left of this central position in order to estimate the sun's setting position. The accuracy of this method of observation has its limitations. To help clarify this situation I approached Prof. Hawkins with the request to calculate the exact date the sun set central to the aisle of the church using the measurements I had already supplied (Farrah 1992,82). The limitations of the visual method of observation become apparent when it is realised that the sun at this time of year moves approximately one third of its diameter along the horizon in 24hrs. Previously I had requested Prof. Hawkins to calculate the orientation specifically in relation to the summer solstice. The results of this new request were unexpected and will be discussed in the reassessment of the orientation.

Much of the evidence previously presented in support of the solar orientation dealt specifically with the interpretation of the symbolism. This is an indispensable approach requisite to an understanding of the solar orientation though it is somewhat dependent upon a sympathetic response. The Church as a House of God is an expression of the eternal and infinite which is expressed aesthetically in its symbolism. The symbolic interpretation is an important part of the whole in our understanding of the building. However because this approach is by its nature open to subjective interpretation it is my intention in this paper to submit evidence of a more tangible nature independent of the symbolism. This new evidence will show that solar orientations were indeed built into the fabric of the Church with purpose and intention.

Ternstrom does not accept the solar orientation hypothesis and suggests a number of alternative explanations she feels would be more "acceptable to conforming churchmen" (Ternstrom 1993,58) and in keeping with the Rev. Heaven's conventional disposition. The solstice orientation and the coincidence of the consecration date with the patronal feast day of St. Alban as it was then observed "was fortuitous" (Ternstrom 1993,57), even though a contemporary newspaper report in the *Ilfracombe Chronicle* states that, "the death of St. Alban the proto-martyr of England, was made the occasion of the dedication of the new church on Lundy Island by the Lord Bishop of Exeter" (Farrah 1992,87). The central orientation to June 7th (corrected to June 5th) the eve of Pentecost, she states is not relevant because Whitsun is a moveable feast dependent on the calculated date of Easter and so does not occur annually on the same date. If Ternstrom is correct in this assertion then it follows that her statement with regard to the sunlight falling on the altar is also correct. If it had been intentional, "one would expect to find some reference to the arrangement of services and the occasion of the phenomena in the diary entries for June after 1897. The services are consistently recorded, but there is no mention of such a "special event" (Ternstrom 1993,57); she concludes that the phenomenon is equally possible to be inadvertant.

This disparity results partly from a lack of any substantial documentation to corroborate either view. With no written references or oral tradition to confirm the nature of the orientation it would seem that the more rational view expressed by Ternstrom is the more feasible. If we accept the solar hypothesis as the alternative explanation then we are forced to accept what seems to be an incredible conspiracy of silence over the orientation, a secret so well kept that the symbolic purpose of the orientation was lost to posterity. A.F. Langham, who has the Heaven diaries, states that, "surprisingly there is no mention whatever in the Heaven diaries and papers of the building of St. Helena's church" (pers. comm.). However, this is not strictly true; as Ternstrom has shown, there are several entries in the diaries which, although not dealing directly with the building of the church, are certainly of some relevance to it (Ternstrom 1993,56). For example, the entry for April 29th 1895 reads: "Phi (the Rev. Heaven) and Mr Norton (the architect) doing pegging first and then cutting turf, G.T. (George Thomas) operating for the outline of Church". The importance of this undertaking to the Rev. Heaven can only be fully appreciated when we realise that he was 69 years old at the time and in delicate health; the following day he left the island to see a doctor. It seems likely that this mystery surrounding the orientation can indeed be explained as a deliberate policy which existed as a traditional covenant between these principal protagonists, the patron and the architect. Walter Johnson, after a lengthy appraisal of church orientation concludes: "Priest and architect seem to have conspired to keep any actual details of tradition to themselves, supposing, indeed, that any precise canons ever existed. This select corporation may have handed down the theory and the practice, but the rite is now shorn of much ceremonial and the custom is followed almost blindly" (Johnson 1912,489). Johnson's doubt over any precise canons existing refers to the historical evidence which shows that many different methods of church orientation have been used. The new evidence I will present in my reassessment of the orientation will it is hoped answer much of the doubt and concerns expressed by Ternstrom.

ORIENTATION AND THE CHRISTIAN TRADITION

The word orientate originates primarily from the Latin *oriri*, to rise, the reference being to the sun. Orientation meant determining position according to the east. The principle and practice of orientation applied to the Christian Church meant that it was aligned

along its axis east/west, though in practice its direction was not always defined as true east.

Ritualistic orientation had its beginnings in remote antiquity as the study of Archaeoastronomy has shown. Such eighteenth century scholars as the Rev. William Stukeley and John Wood had been influenced by the classical traditions of Vitruvian architecture as it was practiced in the Renaissance, in attributing astronomical properties to Stonehenge and other ancient monuments. "Both were familiar with the old Masonic practice of laying the axes of temples towards the sunrise or in relation to the stars so that orientation corresponded to the date of the foundation" (Mitchell 1977,43). The existence of such traditions was to influence the approach to antiquarian theory. The most significant development in the study of Archaeoastronomy came with the publication of the book "The Dawn of Astronomy" by Sir J.Norman Lockyer in 1894, two years before the foundation stone of St Helena's church was laid. Lockyer describes in the preface the inspiration behind his inquiry into the astronomy of the ancient temples of Egypt: "What I had in mind was the familiar statement that in England the eastern windows of churches face generally - if they are properly constructed - to the place of the sunrising on the festival of the patron saint; this is why, for instance, the churches of St John the Baptist face very nearly north-east". Lockyer had given a series of lectures in 1890 and these were published in *Nature* in 1891 under the title, "On some Points in the Early History of Astronomy" (Lockyer 1894,viii).

The evidence from antiquity suggests that the worship of Yahweh was very closely linked with worship of the sun. When David fled from Jerusalem he went up the slope of the Mount of Olives to the east where it was the custom to prostrate oneself to God; "It may be presumed that it was from this point that the line of sight westwards lay along the E-W axis of Solomon's temple, crossing the ancient east wall of the Temple Mount at right angles" (Hollis 1933). The light of the sun rising behind the Mount of Olives at the spring and autumn equinoxes would have fallen upon the facade of the Temple and entered into the interior. Later Judaism was explicit in its repudiation of this sun worship in the pre-Exilic Temple and stated in the Mishnah tractate Sukkah (The Feast of Tabernacles): "When they reached the gate that leads out to the east, they turned their faces to the west and said, "Our fathers when they were in this place turned with their backs toward the Temple of the Lord and their faces toward the east, and they worshipped the sun toward the east; but as for us, our eyes are turned toward the Lord" (Moreton 1982,576).

The Christian liturgy was rationalised by observance and orientation to the east for the Second Advent, adopting the pre-Exilic tradition probably in defiance of Judaic custom: "As the lightning cometh out of the east, and shineth even unto the west; so shall also the coming of the son of man be" (St.Matt.xxiv). St Clement of Alexandria was more explicit: "The east is the image of the day of birth. For as the light which there first shone out of the darkness waxed brighter, so, like the sun, the day of knowledge of truth has dawned on those immersed in the darkness" (quoted in Eeles 1914,170). Both St John Damascenus and Cassiodorus state that the symbolism of church orientation which prevailed until the Renaissance originated because Christ had faced west when on the cross, so we face east in prayer; as he appeared in the east and ascended unto heaven so would he reappear at the second advent in the east, the place of light and the direction of paradise (Ward 1889,233). St Basil further confirms this but states that few knew the reason why, except the church who built, "the most ancient basilicas to the equinoctial east, because the sun was then supposed to rise over the terrestrial paradise" (Ward 1889,234). The east stands connected with the crucifixion, the Ascension, Pentecost and the Second Advent.

The evidence of orientation as a liturgical principle can be found in the earliest Christian architectural origins. The house-church at Dura-Europos, which is attributed to the pre-Nicene period when Christianity was a minority cult in a pagan environment, is orientated to the east. Moreton states that this, "was not merely fortuitous, due to the exigencies of the site, but resulted from a deliberate decision" (Moreton 1982,578). The principle of orientation is further confirmed by Moreton who traces the architectural evidence for its widespread and continuous conformity in the east and the west, concluding that, "Only the constraints of site, with few though important exceptions,

result in deviation from this principle" (Moreton 1982,587). A more detailed assessment pertaining to orientation in the early church in this country can be found in E.P.Loftus Brock's paper, 'The Orientation of Churches'. He begins his enquiry at the cathedral at Canterbury which he suggests is orientated because it was founded on the already existing foundations of a Romano-British church, "following the analogy of the other two ancient Romano-British churches at Canturbury, St Martins and St Pancras, both of which are strictly orientated" (Brock 1886-90,218-219). After starting his enquiry on this certainty he supplements evidence from the ancient British church, concluding that, with very few exceptions, "the primitive church of these islands adopted orientation as a general rule" (Brock 1886-90,220). The same principle of orientation continues into the Middle Ages, the *Summa Theologia* of Thomas Aquinas shows that the idea of orientation is still prevalent. He makes a clearly defined principle of orientation in the title to Article 3: "Utrum adoratio requirat determinatum iocum" (Rosenau 1934,10-11). In the Gothic period after the abolition of the western choir, the radiating chapels of the 12th and 13th centuries were omitted. These chapels had excluded strict orientation, but with this reform greater emphasis is placed on the choir and parallel apses are preferred which allowed strict orientation. From about 1250-1350 ecclesiastical architecture is characterised by this.

Having given a brief historical account of orientation in the christian tradition, I will now consider the evidence for alternative practices of solar orientation, which is of particular relevance to the orientation of St Helena's church. I have shown how solar symbolism combined with christian iconography were the governing factors which lay behind the practice of ecclesiastical orientation. The same symbolism also underlies the theory of determining church orientation by the rising sun at the time their foundations were laid and to sunrise on the day of the saint to which the church is dedicated. There have been a number of studies into these aspects of church orientation, notably by the Rev. William Airey (1856), T.W.Shore (1886), F.C.Eele (1914), C.J.P.Cave (1950) and the Rev. Hugh Benson (1956). Airey, Shore, Eeles and Cave are all in agreement on finding no evidence in support of the Saints day theory, although Cave does conclude that the distribution of orientations could be accounted for, "if many churches were orientated by the rising sun at the time when their foundations were first laid out" (Cave 1950,50). Significantly in all four studies no account was made of the altitude of the local horizon and this renders their results unhelpful. As Benson states, "It is of little use just to measure the church's orientation. The local horizon is of great importance, and must always be measured too. In some cases it might make a difference of 20 degrees to the position of sunrise" (Benson 1956,206).

It will be Benson's method of enquiry which will establish the orientation of any particular church or cathedral beyond conjecture and it is the same approach I have used in ascertaining the orientation of St Helena's church. Benson used a prismatic compass to ascertain the axis of a church and an Abney spirit level to measure the local horizon. He measured 237 churches and chapels in Oxfordshire and calculated the days they faced sunrise. He found that in one instance out of twenty-five churches dedicated as St Peters, eight "faced sunrise on a festival of St Peter, to the very day" (Benson 1956,206). Of the remaining seventeen churches that did not face sunrise on a festival of St Peter, he found that ten faced sunrise on festivals of the Holy Church, the Annunciation, the Assumption and Holy Cross (Benson 1956,209). Benson found that these festivals of the Holy Church accounted for nearly half the church orientations of Oxfordshire (Benson 1956,210).

Benson also found evidence that often medieval dedications were not always the original dedication of the church. The reconsecration of a church after rebuilding was often the opportunity for a change of dedication. Oxford Cathedral, now called Christ Church, was previously called St Frideswide's in the Domesday Book; yet Frideswide's father it is said built the first church "to the Holy Trinity, the Immaculate Virgin Mary, and All Saints" (Warner 1924,4). Benson found that it faced sunrise on Lady Day, the 25th March in the eighth century Julian calendar. In another example, Lichfield Cathedral, built on the former site of St Peters church, was found to be orientated to sunrise on the 1st August (St Peter's Day) in the twelfth century. And yet a further example, Rochester Cathedral, which Bede states was originally dedicated to St Andrew, also its medieval dedication, was found to "face the exact position of local sunrise on

the 30th November (St Andrew's Day) in the Norman calendar" (Benson 1956,211). More dramatic results were obtained with the application of this approach in solving the mystery of churches with crooked chancels, which have been the subject of much speculation. There are eighty-seven crooked churches in Oxfordshire and Benson found that, "in very nearly every case the difference of orientation between the two parts of the church is simply the difference required by the change of the position of sunrise due to the Julian calendar" (Benson 1956,207).

The historical record for such practices of orientation as these are not only apparent from the monuments. As early as the thirteenth century William Durand (Durandus), the Bishop of Mende (1230-96), was concerned that strict orientation was not always being adhered to. He states that, "The foundation must be so contrived as that the head of the church may point due east - that is, to the point of the heavens wherein the sun riseth at the equinoxes - to signify that the church militant must behave herself with moderation, both in prosperity and in adversity; and not towards that point where the sun ariseth at the solstices, which is the practice of some" (Ward 1889, 238). It follows that a church orientated "with moderation" to the rising sun at the equinoxes is simultaneously orientated to the setting sun, whereas a church which deviates from this principle can only be orientated with purpose to either the rising or setting sun. One exception to the rule of strict orientation is discussed by John Mason Neale and Benjamin Webb who translated the "Symbolism of Churches" by Durandus. They refer to the tradition of English Churches facing sunrise on their Patronal Festivals as, "a practice undoubtedly prevalent in England" (Neale and Webb 1842, 14 & 17).

The account given by Silas Taylor otherwise Silas Domville has given much credence to the tradition of the Patronal orientation of churches. Domville was a captain in the Parliamentary army who later devoted himself to antiquarian pursuits. During the Commonwealth Domville ransacked the cathedral libraries of Hereford and Worcester. He died in debt in AD 1678 and his creditors sold many of his collected manuscripts. One of these documents contained the following passage: "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 rose from the East, which makes that variation, so that few stand true, except those built at the equinoxes. I have experimented with some churches and have 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" (Benson 1956,205).

The 19th-century Oxford Movement sought to restore 'catholic' thought and practice to the Church of England. The movement had considerable influence, to the extent that for a short time it seemed that the Church of England might be disestablished and lose many of its endowments. The leaders of the movement were John Henry Newman (1801-90), a clergyman who eventually converted to Roman Catholicism and became a cardinal, Richard Hurrell Froude (1803-36), a clergyman, John Keble (1792-1866), a clergyman and Edward Pusey (1800-82), a clergyman and professor at Oxford. The movement's ideas were published in ninety editions of *Tracts for the Times* (1833-41); Newman wrote twenty-four of them and edited the entire series. Considerable stress was laid upon the orientation of churches. It was widely discussed by the Tractarians and the subject was also canvassed in the press. The "Academical Ritualists promptly jumped to the conclusion that such points were determined by the place where the sun rises on the day of the particular saint to whom the church is dedicated" (Ward 1889,238). In 1845 Newman joined the Roman Catholic Church, and several other followers of the movement also joined as it moved closer to the beliefs of the Roman Catholics. Keble and Pusey remained as active leaders of the movement and its influence gradually spread throughout the Church of England.

Coe'val with the wider dissemination of Tractarianism was the influence of the English Camden Society founded in 1839 by two Cambridge undergraduates, John Mason Neale and Benjamin Webb. The society was founded in order to study Gothic architecture, ecclesiastical ornament and liturgy. "Within half a decade the Society had the patronage of two archbishops and sixteen bishops, and its influence in the revival of Gothic, its stimulus to High Church attitudes and ritual practices that accompanied it in some of the most dynamic developments, were enormous and often very exclusive" (Norman 1990,269). Neale, Webb and the Tractarians all testify to the practice of Saints Day

orientation of churches as being prevalent during the period of the Gothic Revival. As indeed does Sir J. Norman Lockyer writing some 55 years after the founding of the Camden Society: "Any church that is properly built today will have its axis pointing to the rising of the sun on the Saint's Day" (Lockyer 1894,95-96). The Gothic Revival proved to be the most potent of 19th century styles. Its earliest appearance dates to before the 1820's and although it started to lose impetus by the third quarter of the century, churches were still being built into the 20th century. The turning point in the history of the Gothic Revival came with Augustus Welby Northmore Pugin who has been described as, "the most important single person in the advocacy of Gothic" (Howell and Sutton 1989,137). Pugin believed, "that the medieval practitioners of Gothic, and especially the actual masons and craftsmen, had invested a peculiarly heightened spirituality in their undertakings" (Norman 1990,267). It was inspired by a romantic disenchantment with the material culture of industrial society. The Pre-Raphaelite school of art and design together with the writings of Ruskin were also a great inspiration and important influence on the Gothic Revival.

The Rev. Heaven attended Trinity College, Oxford from 1846 to 1852, the year he was ordained Deacon. Trinity College is one of the collegial institutes of the University of Oxford, where the Oxford Movement was centred. His time at Oxford coincided with the controversial period of the Tractarians when their ideas were developing and some of the movement's followers gradually moved closer to the Roman Catholic Church. The Tractarians had always asserted the doctrinal authority of the Catholic Church, the early and undivided church and believed the Church of England to be such a church. When the clash of ideologies occurred half way through the century between the Gothicists (the traditional "Old Catholic" party) and the Romans (the ultramontane sympathisers), Gothic gained in acceptance though not in ecclesiastical discipline. "The signs of this were Pugin's Gothic churches of St George in south London and St Chad in Birmingham (built in 1848 and 1841 respectively), both of which, on the restoration of the Catholic hierarchy in England in 1850, were to achieve the status of cathedrals" (Norman 1990,269).

The Rev. Heaven attained a BA Class 3 in Lit.Hum., in 1851 and a Class 4 in Mathematics with an MA in 1852; his studies would have involved Divinity. He must have been in close contact with these dynamic developments which were to prove such an influence within the Church of England. And the fact that he chose to commission John Norton as the architect of St Helena's church shows that he too was sympathetic towards the Gothic cause, the ideologies of the Camden Society and the Tractarians of his Oxford days. On April 29th 1895 we are given a glimpse of these two eminent men, the patron 69 years old and apparently in poor health together with the architect, his senior at 72 years, pegging out the foundations of the church. It seems to suggest that they were reluctant to entrust this important procedure of pegging out the orientation of the foundations to anyone other than themselves, and gives substance to Johnson's assertion that "Priest and architect seem to have conspired..." (1912).

THE DEFINED AXIS OF ORIENTATION

Structural evidence defining the line of orientation would be expected to be found where the axis of the altar, chancel and nave meet the NW and SE faces of the building, and the principal features here are the windows. The width of the two clear-glazed panels of the NW lancets measure 21.5" which compares to the north and south lights of the altar window which measure 21". The central light of the altar window and the brick divide of the NW lancets both measure an exact 29.75", so both windows are identical in proportion and help to define the axis. The axis of orientation is further defined by the foundation stone which is directly beneath the central light of the altar window. An unusual feature of this stone is the embossed cross (top centre) which is the only carving in relief, the dedication inscription being incised (fig.1). On the NW face the axis is further defined by a step in the chamfered plinth of dressed granite stones. The total width of the NW face measures 26ft 9" and the step occurs exactly half way at 13ft 4.5". It would have made better architectural sense to have continued the line of this plinth along the face as it does on the SE face, and then to step the plinth at the corner where the face joins the tower.

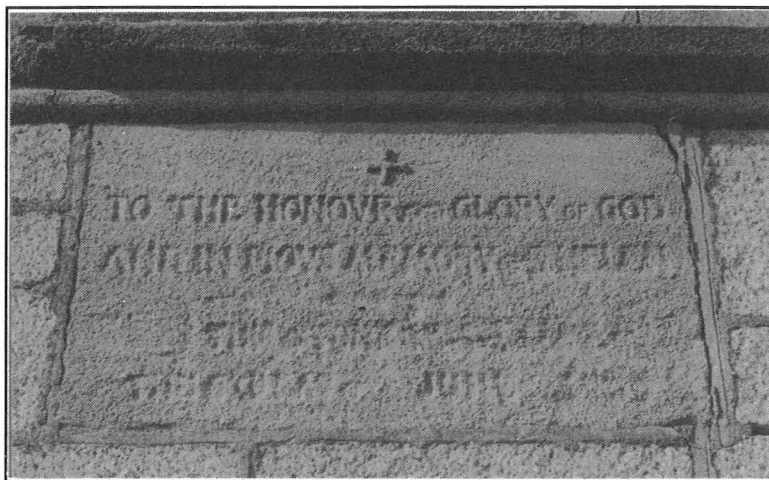


Fig 1. The Foundation Stone

To ascertain the orientation with more accuracy and the exact date on which the sun set central along the axis, it was necessary to measure the altitude of the NW horizon from behind the altar. The previous value of the horizon had been made from outside beneath the NW lancets and the observations of the setting sun on the 7th June and for the solstice had been obtained from in front of the altar rail. A comparison of the revised drawing (fig.2) with the previous one (Farrah 1992,92) shows what a difference the change of observation position has made. The new value of the NW horizon also had to

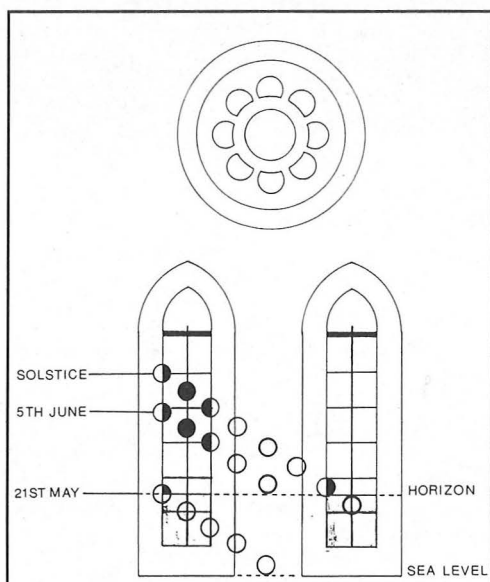


Fig 2. The Setting Sun observed from behind the Altar

be made from the level of the foundation stone, so I first had to ascertain its approximate position. The foundation stone measures 27" x 15" and is positioned approximately 12ft 5" above ground level below the altar window. I traced its position in relation to the central sculpture of the Last Supper on the altar reredos (fig.3). The top of the foundation

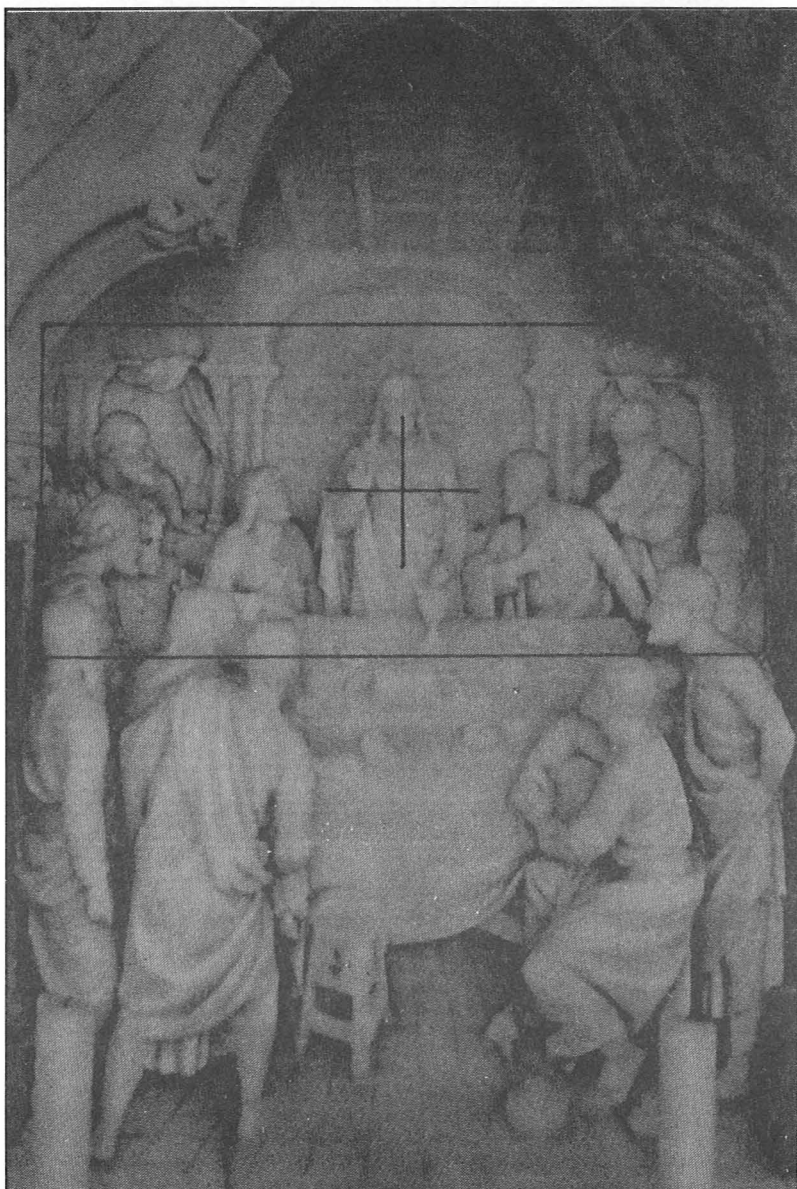


Fig. 3: The Centre Panel of Altar Reredos showing position of Foundation Stone

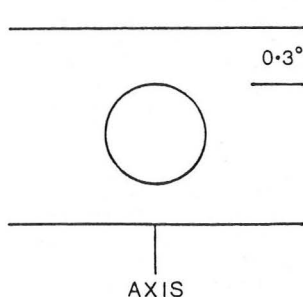
stone coincides with the top rays of the halo found behind Christ's head which the axis of the church also centres on. Significantly I found that the lower limb of this halo marks the approximate position of the centre of the foundation stone where the observation of the sun's lower limb on the horizon will be made! The halo, which is a solar symbol, is reflecting its own reality; it seemed a dramatic affirmation of the solar alignment hypothesis.

Inside the church the altar is raised approximately 2ft 6" above the floor level of the nave. The floor level is first raised by two granite steps to the chancel rising one foot; it then rises a further two steps at the altar rail rising another foot with a final rise at the altar plinth of approximately $6\frac{3}{8}$ ". From the plinth to the bottom edge of the foundation stone measures 5ft 6", very near the line of sight of a person of average height. The new horizon value was measured from the centre of the foundation stone using a Watts level positioned on the altar table. The result was a value of 2.5 degrees for the NW horizon along the axis of 309.5 degrees magnetic, 304.2 degrees E of true N.

THE SAINT'S DAY ORIENTATION

Hawkins, in response to my request to calculate the exact day the sun set along the axis wrote: "My calculations show that if the axis pointed to the sun as seen over the distant hill on June 5th 1896, and if the skyline altitude as seen from the dedication stone (the planned position for the altar) was 2.45 degrees, then the declination of the centre of the sun standing on the sea horizon viewed along the axis was 20.39 degrees. In other words, the church could be aligned to the (true) sunset on May 21st, even though the view was obscured by the nearby rise in the ground" (pers. comm.). May 21st is the Saints day of St Helen which she shares with Constantine. The setting sun however cannot be seen on the sea horizon from the altar so the alignment, if sighted, must have been marked by two stakes from Beacon Hill. More stakes would then have been used to take this alignment down to the construction site. Alternatively the orientation could have been laid out "blind", using a compass bearing as a guide according to a previous calculation of the sun's position on the horizon. The ecclesiologists of the Cambridge Camden Society did use, "an instrument called an Orientator (compass) by which to take the bearings of churches" (Clarke 1969, 100). But just how much trust the patron and the architect would have placed on the accuracy of this method over a visual sighting is uncertain. Tradition seems to suggest a preference for the sun's position on the horizon having been sighted visually and the orientation marked out with stakes.

MAY 21—1895



MAY 21—1896

HORIZON 1°

SEA LEVEL

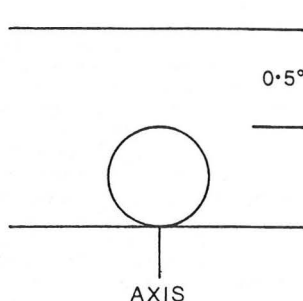


Fig. 4: The Sunset observed from the Tower

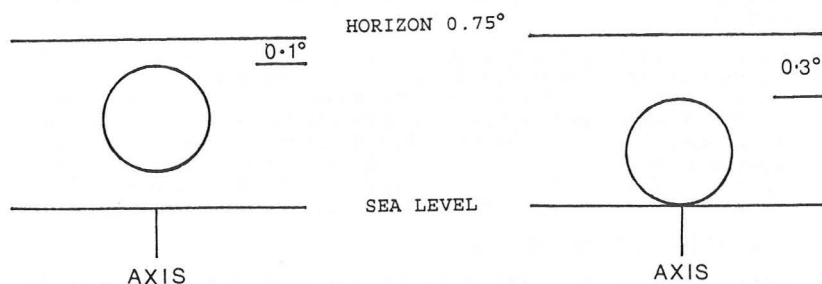


Fig 5: The Sunset observed from the Turret

The next possibility was whether the setting sun on the Saint's day could be seen from the top of the tower. This might explain the incongruous height which is often remarked upon. The answer is that it comes so close as to leave the matter in some doubt. The horizon value from the top of the tower is one degree and the calculations show that the sun's upper limb would be 0.5 degrees below the horizon, one solar diameter on May 21st 1896. But the sun's setting position is not always constant; leap years effect it too and 1896, the year the foundation stone was laid, was a leap year; in 1895, the year before, the sun was 0.3 degrees below the horizon. The horizon altitude from the turret, which is approximately 9ft higher than the tower, is 0.75 degrees. In 1896 the sun's upper limb would be 0.3 degrees below the horizon but in 1895 only 0.1 degrees below (figs 4-5). Clearly, we are dealing with very small quantities and there are a number of other variables which can effect the readings. Using a Watts level I was only able to obtain horizon values to the nearest 0.25 of a degree. The weather conditions could also effect the accuracy of the alignment. When it was marked out with stakes, how clear was the visibility? It would have required approximately another 10ft on the turret height to have seen the setting sun above the horizon. They came very close and we are left wondering if the original plan had been to view the Saint's day alignment from the tower or had the intention always been that the alignment remain hidden and purely symbolic?

The Saint's day of May 21st for St Helena was shared with Constantine and was the feast day observed by the eastern church (for a discussion of this point cf. Farrah 1992, 81 and 84-6). The choice of this Saint's day for the orientation of the church is an unusual one as the traditional Saint's day for St Helena observed in the west was August 18th. The reason why the May Saint's day was chosen I would suggest was so that the Whitsuntide and the solstice orientations could be incorporated. The 'blaze of light' event would certainly have more dramatic effect as the sun approached its standstill at the solstice. Another possibility was the preference shown by the Oxford Movement for a renewal of "catholic" thought: the Atlantic island of St Helena was named after her by the Spanish sailors who discovered it on her feast day of May 21st. (The Liturgical Commission are currently working on a proposed revision of the ASB Calendar and there is a proposal to include St. Helena on May 21st. The reason is that she is barely observed calendrically by the western churches, so it seems correct to observe her in accordance with the same date observed in eastern churches.) It would seem that there was already a precedent for the Saint's day orientation in the building of the corrugated iron church which was dedicated on Thursday 20th August 1885 by Bishop Bickersteth, two days adrift of the August Saint's Day. The site of the iron church is approached from the village through the Gothic gate behind Government House. Although the church foundations can no longer be seen, I thought it might be possible to make an

approximation of its orientation using old photographs of the building. The church was built in a fairly restricted site and the iron railings leading down to the church from the Gothic gate are still in existence. The old path along the south-eastern side of the church is still discernible even though it is now grassed over. With the aid of these visible markers, I took a bearing of its approximate orientation and obtained a bearing of 71 degrees; therefore it definitely was not the traditional east-west orientation. I then asked Hawkins to calculate for the sun's declination. His reply was that: "the sun's declination on August 17th was 13.4 degrees. For that declination and a sea horizon, the true azimuth is 68 degrees. You give 71 degrees, and presumably it was magnetic. That would correspond to 66 degrees" (pers. comm.). The azimuths are very close, suggesting that the old church too was solar orientated, this time to the rising sun on the August Saint's Day. This could be confirmed with more accuracy if a geophysical survey was able to locate the site of the church.

THE FOUNDATION STONE ORIENTATION

The Rev. Heaven laid the foundation stone which is now effaced through weathering. It reads:

TO THE HONOUR AND GLORY OF GOD
AND IN PIOUS MEMORY OF ST. HELEN
THIS STONE WAS LAID
THE 5TH DAY OF JUNE 1896

On the 5th June 1896 and each year thereafter, the sun set central to the aisle of the church with its lower limb on the island horizon, its declination being 22.7 degrees. The sun was about one day ahead in 1896, so June 5th then is nearer June 6th today, a movement along the horizon of $\frac{1}{3}$ of a solar diameter. The reason this second orientation was incorporated must almost certainly have been because on the true orientation to the May Saint's day, the setting sun could not be seen from the altar. And this date was I suggest chosen purposefully because it would coincide with Whitsuntide in the year of the consecration; the day of Pentecost, Whitsunday, was the 6th June. This could have been calculated for several years ahead using the Tables provided in the Book of Common Prayer.

Whitsun is one of the most significant dates in the Christian calendar: it marks the beginning of the Christian Church's mission to the world and commemorates the descent of the Holy Spirit on the disciples. The descent of the sun on the eve of Pentecost in the year of the consecration is clearly symbolic of this. In northern Europe, Pentecost became a more popular time for baptism than Easter. The rose window which is on the axis of the Pentecost orientation depicts Christ receiving baptism from St John the Baptist and the baptismal font is also sited beneath the NW lancets.

THE MIDSUMMER SOLSTICE ORIENTATION

The Church is not strictly orientated to the solstice, but given that two solar orientations have been incorporated, would the importance of the solstice event have been ignored? I have previously claimed that the proportions of the NW window seemed to be determined by the track of the solstice setting sun and, although the observation position has now changed and so also the track of the sun, this is still practicable. The solstice sun now sets central to the right-hand window. Reinforcing this suggestion is the fact that the bottom edge of the window sill is at zero degrees which is sea level where the sun sets on the Saint's day.

St Helen and St Alban are early christians from the 3rd century but there is no direct link between them other than having connections with the Church of the late Roman Empire. But there are several associations which suggest that St Alban's feast day was chosen as the consecration day and was not fortuitous as Ternstrom suggests (Ternstrom 1993,57); one of these was the solstice. Alban had been arrested for sheltering a priest either during the Diocletian or the Decius persecutions; he had been converted to christianity by the priest and was baptised. He was condemned to death after refusing to offer sacrifice to pagan gods during the midsummer rites. St Alban's day had been a commemoration in the Sarum missal and most other medieval English rites on the 22nd June. It was added to the 1662 Prayer Book where it appeared as the 17th June; the only

other precedent for that date is the *Preces Privatae* of 1564 (Clark 1959,227). Proctor and Frere suggest that the change of date came about from a misreading of xxii to xvii (Proctor & Frere 1965,340). So although this date appears in the Prayer Book, all other traditions back to Bede's *History of the English Church and People*, assign St Alban's martyrdom to the 22nd June, the day after the solstice.

The association of the solstice with the feast day of St. Alban is an attempt to give meaning to the choice of the consecration date. My supposition is however conjectural, unlike the orientation of the axis which can be verified by the calculated date of the sun's declination. A letter found recently by Ternstrom does seem to suggest that the choice of St. Alban's day for the consecration date was fortuitous and dependent on the sailing of steamers as Ternstrom has previously suggested (1993,56-7). The letter is from the Bishop of Exeter to the Rev. Heaven and dated April 7th 1897: "I shall be most willing to come and consecrate the church on June 17th and confirm the candidates you speak of - But of course it must depend upon the steamers...If the 17th is not convenient, I could manage to come on the 16th or the 18th, but I should prefer the 17th." The meaning of the letter is open to interpretation. It seems that the choice of St. Alban's for the consecration was the Bishop's, but he was also willing to consider a day either side of this date. However, the Bishop did get his preference and contemporary newspaper reports suggest that the Brighton was chartered specifically for the occasion of the consecration.

The design of St. Helena's conforms in many details to the recommendations of ecclesiologists of the Cambridge Camden Society for the model church, to materials used, symbolism, and even the craftsmen for the furnishings (Clarke 1969, 179-181 and 242, 243). There are also other associations which indirectly link the church with the principles of the Camden Society. Above the tower entrance is the statue of St Helena by the sculptor Harry Hems of Exeter. The face and the head-dress of the statue are modelled from a medal or coin of hers in the British Museum. The statue is a replica of Harry Hems's, "celebrated statue of this saint in the high altar screen at St Alban's Abbey" (*Ilfracombe Gazette* 27th February 1897). The altar and the polished vined alabaster reredos of St Helena's is also his work. The artisan Hems attended the consecration service of St Helena's as an acolyte (*Ilfracombe Gazette* 19th June 1897). Exeter Cathedral had been one of the principal works of restoration by the eminent Gothic architect Sir George Gilbert Scott, who was also restoring St. Alban's Abbey at the time of his death. His restoration work at Exeter had led to litigation over the reredos in which the propriety of the use of sculpture was discussed. Although the reredos is not the work of Hems, there are several monuments in the cathedral which are.

Scott's first insight into the principles of Gothic art had come from a meeting with Benjamin Webb of the Cambridge Camden Society and the writings of, and then an association with, Augustus Welby Northmore Pugin. Scott joined the Cambridge Camden Society and sent the plans of his churches to the Society for comment. Scott had travelled to Italy with Benjamin Ferrey to study Gothic architecture (Clarke 1969, 165). Ferrey, together with Augustus Welby Northmore Pugin were pupils of Pugin the elder, and John Norton, the architect of St. Helena's, was the pupil of Ferrey. The Exeter Diocesan Architectural Society was Camdenian in its views (Clarke 1969, 103) and the membership lists in the Transactions imply that whoever was Bishop at any given time was also patron of the Society. Bishop Bickersteth of Exeter had dedicated the iron church of St. Helena's in 1885 and had consecrated Norton's church in 1897. Bickersteth matriculated in 1843 at Trinity College, Cambridge, four years after the founding of the Camden Society.

Scott had written a discursus "On the Orientation of the Early Christian Churches" (Scott 1881,14-23), where he discussed how altars had been positioned in the west and were so strictly orientated "that the light fell on the altar through the eastern doors at sunrise" (Lockyer 1894,96). An article from *The Builder*, January 2nd 1892, is quoted by Lockyer in regard to St Peter's at Rome which is such an example with its altar in the west. It is so exactly orientated on the vernal equinox that, "the great doors of the porch of the quadriporticus were thrown open at sunrise, and also the eastern doors of the church itself, and as the sun rose, its rays passed through the outer doors, then through the inner doors, and, penetrating straight through the nave, illuminated the High Altar"

(Lockyer 1894,96-97). If the event of light fall on the altar of St Helena's Church was the sole symbolic purpose of the orientation then this explains why the orientation was to the setting rather than the rising sun on the Saint's Day, with the altar positioned in the south-east.

CONCLUSION

Scott, in his discursus, writes concerning the act of consecration: "In the early Church...the ceremonies connected with the consecration were even more effectually veiled from the view than in the medieval" (Scott 1881,14). The act of consecration in the early church was concealed from the laity and was gradually lessened during medieval times. Although the tradition is no longer extant it would seem that Johnson has suggested it was still the unwritten custom for Church, priest and architect to conspire to keep any details of sacred canons secret. The letter quoted by Ternstrom from the Rev. Heaven to his niece dated January 1st 1897 (Ternstrom 1993,57) suggests that the uncertainty of the consecration date is due to the completion of work: "The work will soon be completed now, except for the nave, seats and bells, which will not be ready they say for 3 or 4 months, so the consecration cannot take place very well before the early summer". I would suggest though that this is nothing other than work in progress according to a pre-planned schedule. The real reason is not given; there is no mention of the Saint's day or of the foundation stone orientations. The reason that St. Alban's day was chosen I suggest was because of its significance relative to the main orientation but serving also to distract from the true nature of the orientations, both of which in keeping with tradition are hidden from the observer.

Historically, church orientation to the sun was firmly rooted in early Christian tradition. Later variations developed incorporating solar orientation to the solstices and the Saint's days to which churches were dedicated. In this context it can be seen that St Helena's Church, far from being unusual in its orientation, conforms to these traditions and is entirely conventional. The fact that the axis of orientation coincides with the setting sun simultaneously with two significantly meaningful dates associated with the Church, the 21st May - a feast day of St Helena, and the 5th June - the date on the foundation stone, supports the orientation being purposeful. The incised inscription on the foundation stone confirms the calculated declination of the sun's position and supports the orientation hypothesis. Any attempts to search for further evidence in support of the solar orientation will be frustrated and will ultimately prove unrewarding because the secret of the orientation was concealed, true to sacred tradition, at the very beginning thus perpetuating a mystery.

The result of the orientation is that as the sun sets, its rays pass through the NW lancets, down the nave and chancel to illuminate the altar. The illuminated window images would be visible in the church from approximately two weeks before and after the date on the foundation stone, June 5th. They will only align on the altar on the 5th June when the sun's lower limb sets central to the axis of the church on the island horizon. Because of the similarity in the proportions of the altar and NW windows, the illuminated window images blaze as columns of light aligning with the altar windows, and the aesthetics of the event are the more reverential for being so. I offer this in the year of the centenary of the orientation being pegged and the foundations laid.

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