

SUNDIAL FOR A GOLDEN WEDDING

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Fig. 1. The Golden Wedding sundial window.

My wife Betty and I celebrated our Golden Wedding Anniversary on Saturday 7th August this year, 2004. (Our friends have been kind enough to remark that this is quite an achievement, given the current climate!) Well in advance we began to consider how best we might celebrate this landmark in our life together. As an enthusiastic member of the BSS, the commissioning of a sundial seemed highly appropriate. However, this special occasion clearly called for a special kind of sundial. For some years I have been keenly interested in the nature and distribution of stained glass window sundials in the United Kingdom. Our Chairman, Christopher St. J. Daniel, has identified 36 such sundials, of which four are in our native county, Yorkshire¹. These are:

1. The earliest known example, a small glass roundel 2.75" (70mm) in diameter in the Great Hall of Gilling Castle, North Yorkshire, now occupied by a Roman Catholic boarding school. It was the work of Bernard Dickinkhoff and is dated to 1585.
2. Originally in Gray's Court College, in the City of York, now on display in the entrance hall of the City Art Gallery in Exhibition Square. and dated to the 17th century.
3. Tong Hall, near Bradford, West Yorkshire, the work of Henry Gyles – "The last and only glass painter left in York in the 17th century". It is dated c.1702.
4. Nun Appleton Hall, North Yorkshire, also the work of Henry Gyles, dated 1670.

Christopher Daniel has himself added to this tally of Yorkshire stained glass dials with a splendid modern version inserted in a south-facing window of the Merchant Adventurers Hall in Piccadilly in the City of York. He was also largely responsible for the restoration of an early stained glass dial originally sited in the Hall of the Worshipful Company of Weavers in the City of London, dated c.1669. It has been relocated to the Weavers House, New Wanstead².

The site for our proposed glass sundial effectively chose itself - a window overlooking the porch of our house that sheds light on an upper staircase landing. Its horizontal shape, and its size - 16.25" x 40.5" - provided the ground on which to sketch out a preliminary design consisting of seven principal elements, (Fig. 1):

1. The dial itself, in shape not unlike the outstretched wings of a bat in flight, with conventional hour lines, except that they are in reverse order to the norm since the whole is viewed from the inside. These are bounded at the top and bottom by two curved lines that represent the dates of the winter and summer solstices respectively and a straight line midway that represents the equinox.
2. An 'equation of time' graph headed 'minutes correction' to enable the apparent solar time recorded on the dial to be converted to 'clock time'.
3. Since every self-respecting classical sundial bears a Latin motto, ours has one of my own devising: LUX ET AMOR QUEMQUE DIEM REGUNT AB ORIENTE SOLE AD SOLIS OCCASUM, which being translated reads: 'Light and Love Rule Each Day from Sunrise to Sunset'.
4. The initials of our Christian names, J for John and B for Betty, intertwined, repeated twice, copied from a similar feature on the wrought-iron gates at the entrance to our garden.
5. Four flowers at the corners, namely Wallflower (for ob-

vious reasons); Morning Glory; Evening Primrose; and lastly Globe flower, representing the earth spinning on its axis, without which there would be no day and night, sunrise and sunset, light and dark, or indeed any sundial to record them.

6. The longitude and latitude of our house, 0°56' W and 54° 16' N.

7. The Anniversary dates: 1954 – 2004.

It would have been gratifying to have been able to commission our window from the world-renowned York Glaziers Trust, heirs to the tradition of that master glazier Henry Gyles. (Their most recent achievement has been the restoration of the magnificent Rose Window severely damaged in the fire that destroyed the roof of the south transept of York Minster in 1984.) That proved to be impractical and instead we turned to a more distant professional glass engraver, David Gulland, whose studio cum workshop is hard by the Museum in Dumfries. Readers of the Bulletin will be familiar with his work from David Young's account of the George Higgs memorial window, installed in the Tollbooth Arts Centre in Kirkcudbright³. (It was George Higgs, at that time the British Sundial Society's oldest member, who, together with his friend and neighbour David Gulland, developed the concept of the engraved glass sundial.) David Gulland's welcome acceptance of our commission involved a radical change of plan regarding the nature of our sundial, as we shall see.

The creation of a glass window sundial in modern conditions poses certain problems, all of which David Gulland's technique has successfully overcome. The first is how to deal with any marked declination from due south, as is the case with our home 'Drystone's' in Kirkbymoorside, North Yorkshire. It was essential to determine the exact degree of declination, for which I called in the expertise of my friend and neighbour, sundial enthusiast and sundial maker D. Scott-Kestin. Not only did he work out the complicated mathematics that are involved in such an exercise, but he made a corresponding vertical dial that is now sited beside our front door. It invariably intrigues every visitor, since in common with the finished version in glass overhead, the combination of hour-lines and date-lines enables us to mark the precise date and time of each anniversary of our wedding - 7th August at 12:00 noon - alongside our initials J B (Figure 2).

The second problem is how to incorporate a gnomon on an unleaded single pane of glass. As Christopher Daniel has

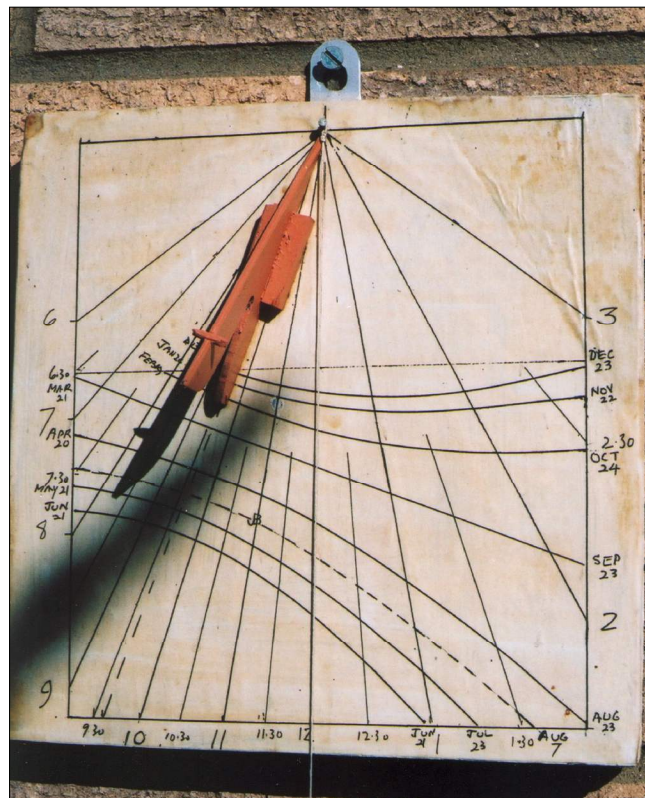


Fig. 2. Vertical dial, by D. Scott-Kestin, beside the Walls' front-door.

pointed out, the glass of all the recorded 17th century stained glass windows was normally drilled with two or more holes to allow the heavy metal outside gnomon to be fastened in place. As this was usually made of brass, or sometimes of iron or lead, the strain on the glass was considerable and has contributed to much damage and loss. David Gulland's ingenious solution is to dispense with the conventional metal gnomon altogether and to substitute one of a radically different kind. The sundial and its furniture is engraved – 'abraded' - on the light-facing surface of a second window pane positioned exactly one inch from the existing window pane which is retained *in situ* - a type of double-glazing. A small disc with a tiny pin-prick hole at its centre is precisely positioned on the inner surface of the pre-existing outer pane: it is the ray of sunlight that the pin hole projects onto the engraved glass that constitutes the 'gnomon'. (In David Gulland's phrase, this is an imaginary gnomon with the spot of light at its tip.) Indeed, it is evident that the terms we employ of a conventional gnomon are inappropriate here. The purist might object that since no shadow is cast (except the shadow of the disc), there is no gnomon. So be it!

Accomplished artist that he is, David Gulland set to work to polish and improve my primitive design and to add welcome features of his own devising. Since the distance between the two panes of glass has to be precisely one inch

throughout, in order to ensure the time-keeping accuracy of the sundial, and since the existing wooden window frame was markedly less than one inch deep, it was necessary to call in a local joiner to fashion an extension of very precise dimensions, together with fillets that keep the engraved pane in its place without exerting such pressure as might cause it to crack. It was an anxious moment when the finished pane was married up to its housing, and what relief when it sweetly fell into place with not a fraction of an inch to spare!

The reader will have noticed that the overall ‘bat’s-wing’ shape, and the delineation of the lines on the finished product, differ considerably from those on the prototype fixed alongside our front-door. This is something that in my ignorance I had not anticipated. It results from the entirely different nature of the gnomon in each case. Although David Gulland was furnished with a copy of the design on which D. Scott-Kestin based his conventional dial, this was not in itself sufficient to provide the co-ordinates that would determine the necessarily precise position of the disc with



Fig. 3. Central portion of the engraved glass dial, with EoT/longitude correction graph.

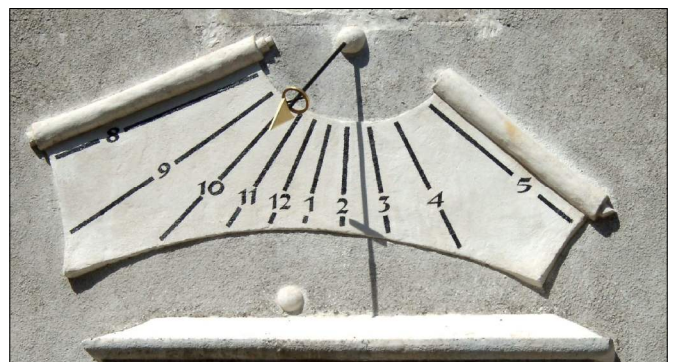
its central pin-prick. Were it to be displaced by the smallest amount, then the sunbeam thus created would not with sufficient accuracy fall upon the appropriate hour lines at different times of day. Modern science came to the rescue, like a knight in shining armour, in the form of a computer programme that generated the required matrix once it had been fed with the parameters its diet demanded. Nevertheless, David Gulland took no chances, and on the date of the dial’s installation he checked, in one of those ‘brief, bright moments (of sunshine) fading fast’ in our ‘summer’ of 2004, that the spot of light did indeed fall on the dial at its appointed place before the two panes were permanently joined in matrimony.

Of course, my wife and I are pleased that our commemorative glass window dial has added to the total of such time-tellers in God’s own county, Yorkshire. In the event, in retrospect, we are glad that our sundial is on an engraved and not a stained glass window pane. We feel that the effect of stained glass, given its location, would have been rather obtrusive. The clear engraved design is very effective - a handsome addition to our home. It has been admired by all the guests who took time to visit us during our anniversary weekend. It was a real thrill for Betty and I to recall our wedding day half a century ago when on its anniversary the spot of light did indeed fall on the exact time and date as indicated on the dial. Naturally we will encourage our sundial to tell us the time every day, but it will be a very special reminder on the day of each anniversary in the years to come.

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REFERENCES

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2. C. St. J.H. Daniel, ‘Conservation: ‘The Restoration of Sundials: Some Necessary Questions’, *BSS Bull* 98.2, 26-31, (June 1998). Text 29; Figure 6,30.
3. D. Young, ‘The George Higgs Memorial Window’, *BSS Bull* 97.2 (April 1997). Text 7; Figure 3.



St Thome, Provence, France. A neatly made dial using the edges of a ribbon scroll for the limits of the solstices. However, the equinox line has been omitted. Photo: Mike Cowham.