

Restoration of the Sundial at All Saints' Church in Isleworth

It is always pleasant to be able to record the restoration of a worn dial but it is especially rewarding when the worn dial had previously been incorrectly delineated and wrongly restored. Such a restoration offers the chance to put things right. This was recently the case with the sundial on All Saints' Church in Isleworth.



Figure 1: The Isleworth dial soon after its previous restoration in 1999.

History of the Dial

Shortly after the Norman Conquest, Isleworth was recorded as a well established riverside settlement on the Middlesex bank of the River Thames. Records indicate that a church has been on this site since AD695 and the present tower is thought to date from 1398. The church and its monastery have had Royal connexions since the time of Henry V but after the dissolution of the monasteries, the buildings of nearby Syon and the church itself became Crown property and the church is to this day, under the patronage of the Royal Chapel, Windsor. The building fabric had fallen into disrepair by the end of the 17thC and completion of a proposed rebuild – designed by Christopher Wren - was delayed by lack of funds until 1706.

The first ornamental sundial at All Saints was erected a year later in 1707. It was dedicated to the memory of Susannah, fourth wife of Colonel Sir Nicholas Lawes. Her father, Thomas Temple, is said to have given Lawes his Temple Hall Estate in Jamaica, as a dowry on their marriage in 1698. Sir Nicholas subsequently became Governor of Jamaica from 1718 to 1722 and is credited with introducing coffee grow-

ing (what we today know as Blue Mountain coffee) to the island in the 1720s using trees imported from Martinique. He also is credited with setting up the first printing press in Jamaica. It is presumed that he may have been responsible for the erection of the original dial.

Sadly, the church, except for the tower, was destroyed in 1943 by two boys, who had set fire to five churches in the area in the course of a few days, completely destroying All Saints' and one other. After years of indecision the desire for a full restoration was finally abandoned on cost grounds and in 1970 a smaller modern brick building was openly linked to the remaining tower. It is this church that continues in use today and the dial was mounted high on the new Lady Chapel of this building.

The problems

There have been many restorations, repaints and even complete remakes of this dial over the years, not all of them leaving it in a fully working condition. Several of these have been recorded in the church's archives by early B&W photographs, by descriptive detail and even by some tracings. After the 1970 works the dial was repositioned, so as to sit high between the angled walls of the new brick Lady Chapel; actually locally named the 'Joshua Chapel' in memory of a young boy who had died in infancy around the time of the chapel's completion. In this position the dial is actually rather too high for easy reading of its scales. Fig 1 shows it as it was in 1999 following a complete remake after the earlier dial had been regarded as irreparable and had been discarded.

The dial furniture of this replacement had been painted on a sheet of ply set within an ornate and very heavy backing of 2½ inch (63.5mm) thick ply measuring approximately 1.9m high x 1.7m wide overall. The 'Sans Retoure' arched pediment contained a seated winged Angel of Death observing a supported parchment carrying the motto *Watch and Pray* together with extensive scrolling around the dialplate. The inner dial plate measured 880mm wide by 1060mm high and contained a second motto: *Time Passeth Away Like a Shadow*.

By 2010 the dial had seriously deteriorated. The twin views of Figure 2 show that by then the gnomon was partially detached and in imminent danger of falling onto passing pedestrians, one wooden corbel had fallen away and the fabric of the dial was in an advanced state of decay. Like most Church of England churches, All Saints' is exempt from most listed building control. Alteration, restoration and change are instead regulated by the complicated and quite onerous process of licensing necessary works by means of a *Faculty Jurisdiction*. A 'Faculty' was therefore duly applied for from the Consistory Court of the Diocese. In view of the length of this procedure, this was done prior to any detailed discussions over the manner of restoration. As a consequence all subsequent restoration works had to follow the existing design and materials and longer life options using more modern materi-



Figure 2: The 1999 dial as it was in 2013 just before restoration

als were not permitted.

Royal Warrant holders Charles Perry Restorations of St Albans won the contract to perform the work. Owing to the risk that the gnomon might soon fall the dial was swiftly removed from its position, well before any consideration could be given to the matter of the work needed to remedy its many defects of delineation.

Despite the many renovations and remakes over the years, archived photographs show quite a remarkable consistency of design. All show the unusual ladder-like scale of solar altitude, something which is rare, if not unique, on vertical dials in the British Isles. All show the same three time arcs showing solar time in Jamaica, Jerusalem and Moscow. The Jamaica link is clear from the history but the linkages with Jerusalem and - more particularly - with Moscow are not understood. It was common to include the time in Jerusalem in any set of significant place or city markings on dials at that time; however why Moscow should be important to this family isn't clear. Peter the Great's 'Grand Embassy' (a Russian Diplomatic mission sent to Western Europe to search for allies - and especially advisers - in the fight against the Ottoman Empire) had visited England sometime in 1697-1698, possibly even in the year of the Lawes' marriage. Perhaps Lawes had military connexions with that? As far as the dial is concerned, one might conjecture that this would then represent a balance of the interests of husband and his lately deceased wife.

The many errors of delineation

Once in the hands of the restorers the dial was carefully examined. There were many serious errors some of which can be seen in Figure 3. Although clearly a declining dial, the hour scale was fundamentally incorrect, the hour lines did not meet at the gnomon root, the times given in the place name arcs and even the direction stated for Jamaica were all incorrect, the solar altitude scale and the gnomon itself were wrongly centred on the noon line, the altitude lines were drawn as circular arcs and only one declination line (that for the summer solstice) had been drawn but even that had not been identified.

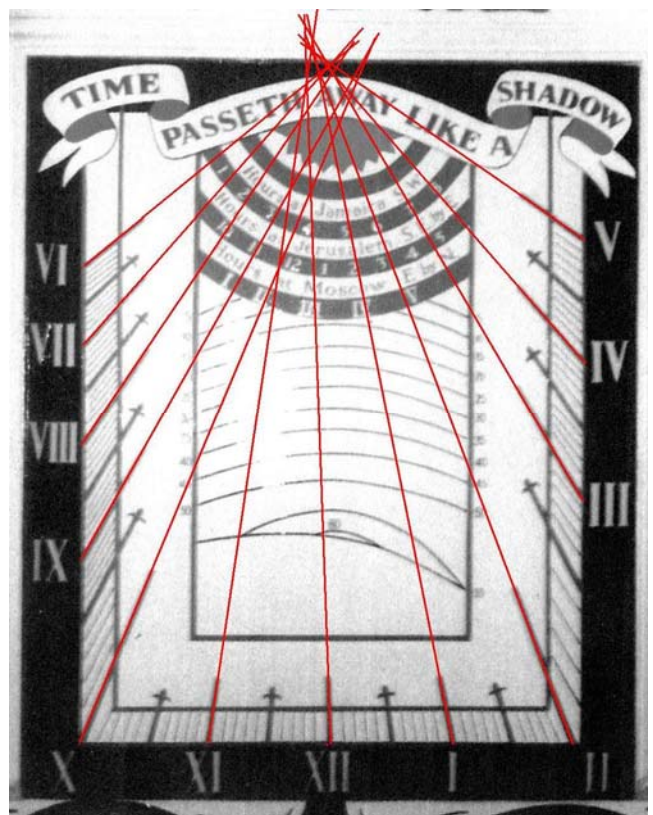


Figure 3: Problems of delineation

Additionally an examination of the gnomon showed that there didn't ever appear to have been a nodus whose shadow against the altitude and declination scales would have been needed.

The inter-hour markings (which had been painted freehand and again did not point to the dial origin) had been drawn to show intervals of six minutes - something which is thought to be present on no other similar dial in the UK and which, from the available archival evidence, had never been used on any earlier manifestations of this dial. The gnomon was itself bent and its fixing was broken. Then there was the state of the 2½ inch thick plywood backing, a partly rotten easternmost mahogany corbel, a missing westernmost corbel and the loss of the lower part of the dialplate's framing.



Figure 4: The dial as restored and installed

Problems of declination

As if all that was not enough the declination of the dial in its present place was not accurately known. With its present mounting high up between two modern, angled brick pillars, simple methods of declination measurement did not apply. Worse, the dial had been removed by the time that the declination was being considered. The incorrect hour lines did not permit more than a rudimentary reverse calculation of dial declination, there was no flat wall that could be used to measure it by ordinary means and even a 1:200 digital Ordnance Survey map of the church proved to be inconsistent. In the event an average of a series of readings taken from Google Earth was used and a figure of $5^{\circ} 47'$ East of South obtained. The gnomon for such a dial would need a style 'height' of $38^{\circ} 30'$ which reassuringly was found to be the actual angle of the gnomon after it had been straightened. Accordingly a declination of $5^{\circ} 47'$ East of South was adopted for the new design and the fixings on the tower adapted to provide some modest adjustment.

Place Name Directions

As mentioned above the arcs that show times in Jamaica, Jerusalem and Moscow also include the direction from Isleworth. These directions are the bearings which if followed

continuously would lead to the place in question. They are of course loxodromic or rhumb lines which cross all meridians in their path at the same angle. They are represented by straight lines on a Mercator projection and the directions were checked using Colton's 1855 Map of the World. On the 1999 dial the directions stated for Jerusalem and Moscow were correct but that for Jamaica was wrongly given as "S.W". rather than as the correct "S.W. by W". It is to be supposed that this was a consequence of a simple omission in the earlier restoration.

Delineation and Painting

The dial's delineation was completely reworked and checked and the final basic layout transferred to a CAD drawing package so that a full sized cartoon could be produced. A new marine ply dial plate was constructed, sealed and painted on both sides with a white gloss exterior grade paint. The design was then pricked through the cartoon onto it. In view of the extensive artwork that had to be reproduced on this dial all fonts, numeric styles and the hour line markers were left to be brought into balance by the signwriter who faithfully used the same colours, and styles that were known to have been used in past versions of the dial. The scroll work on the backplate was not copied from the 1999 design shown in Figure 1 since

all known earlier restorations were found to have much more floral scrolling. This floral scrolling was copied as far as was possible using the descriptions and the B&W images available in the church's archive..

Remaking the backing and surround

The original dial as removed had been constructed from a single backing piece of 2½ inch thick ply. Its weight had proved to be a major obstacle during removal of the dial from the tower and it was decided that the replacement should be made in two lap jointed halves of marine ply that could be simply bolted together after raising them in place. This was achieved using concealed fittings. The reduced sizes of the component parts also made it easier for the dial to be transported to the signwriter for all of this work. He had recently retired to Cornwall but had been persuaded to come out of retirement for this one further project.

As much as possible of the arched pediment and the remaining damaged corbel was retained by letting in new wood where appropriate and a completely new west corbel was carved to replace that which had been lost.

Once all of the painting had been completed, the scalloped edges of the backing together with the tops and horizontal inner surfaces of the pediment were covered in lead and the gnomon, together with its new spherical nodus was fitted.

Testing and Installation

Before being taken to site, the fully assembled dial was set in a frame and oriented and slightly tilted to allow it to be fully checked at ground level in St Albans. The test showed an excellent performance. Following this the dial was transported, assembled and installed at All Saints'. Installation to a precise alignment at such a height – and with four separate mountings each with links proved not to be easy. It was aligned as far as was possible given available sunshine. This was done against a pre-calculated table of the solar time that should be indicated for any clock time during the day. Figure 4 shows the new dial in place on the tower.

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