The British Sundial Society

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NOTES FOR DIAL RECORDERS

I am grateful for the number and quality of dial reports that members send in, whether updates to dials already recorded, or new sightings. If you have never sent me a report, please don't be reluctant to get started. The report form can be downloaded from the Society website. Log in with your user name and password, and go to Sundials / Fixed Dial Register / Report Form / Dial Recording Forms, and click on 'MS Word' in the second paragraph. Alternatively, just contact me and I will send you a form.

Emailed reports with digital photographs are welcomed and indeed preferred, though the traditional paper in the post is still used by many and is also very welcome. If using email, attach the report as an MS Word document, and photographs as jpgs. It is helpful if you put the dial location in the email Subject Line, together with the SRN if known. In more detail:

Email

- Subject Line: Include the location briefly, and the SRN if you know it.
- Content: There is no need to give any message but of course put in anything you wish to say.

Report

- Format: Attach as an MS Word doc or docx, or compatible format, NOT as a pdf, please.
- Name: Can be what you like, but it is helpful if you use the same as the email subject line.
- Addenda: Exceptionally you may wish to add a further sheet or sheets giving greater detail, using the same name as the main report plus 'b', 'c', etc. Addenda may also be jpegs (eg of text) or Excel spreadsheets, but please only use if they add significantly to your report.

Photographs

- Format: Please send as attachments to the email. Do NOT embed them in the email - they are difficult to extract for the Register structure.
- File type: Please send jpg files only, NOT jpeg, tiff, bmp, pdf or any other graphic format.
- Resolution: As it comes out of the camera. I used to ask members to reduce the file size to around 0.5 MB but this no longer applies, and high resolution photographs are often very helpful.
- Name: There is no essential format for the name, but please make the names of all the photos with one report start the same. For example, IMG_56789.jpg, IMG_1234.jpg etc is fine, as are Ruston.jpg, Ruston sig.jpg, Ruston pedestal.jpg. But please avoid choosing names that do not start with the same few letters, such as Gnomon.jpg, Plate.jpg, Pedestal.jpg.

John Foad

***Front cover**: The magnificent double horizontal dial made by Henry Wynne for Richard Maitland, Earl of Lauderdale, c. 1680. Its location had been unknown since 1966 but it was auctioned in August 2017 by Thomas N Miller Auctioneers, Newcastle. It was described as part of John Davis's talk at the Norwich Conference (see Report page 42). Picture courtesy of Alistair Scott.*

***Back cover**: This fine dial (SRN 8046) was found last summer by Maureen Harmer at East Ruston in Norfolk. It is a detailed copy of the one at Barrington Court in Ilminster (SRN 0040). The latter is believed to have come from Scotland around 1910. For further information and another view of the dial, see page 16. Photo: Maureen Harmer.*

Editorial team: John Davis, Frank King,
Christine Northeast and David Brown

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CONTENTS

EDITORIAL

The BSS Register of Fixed Dials is one of the major achievements of our Society. We are deeply indebted to our Registrar, John Foad, for maintaining this important work of reference and he, in turn, relies on the numerous members who send him reports of newly-noted dials or updates on dials which are already in the Register. On the facing page, we reproduce the guidelines to follow when writing a report. If you come across a sundial that is not in the Register or which is in the Register but seems to have been moved, repaired or vandalised, please let our Registrar know. On pages 13–17, John Foad presents outline descriptions of sundials which have recently been drawn to his attention. Perhaps one of your sightings will appear in his next report.

While the Register of Fixed Dials can be held up as a major success for the Society, the same cannot be said of the Register of Mass Dials; unfortunately it doesn't exist and, on page 9, John Lester laments this lacuna and asks for the views of the Editorial team on preparing such a Register. We have a huge amount of raw data about mass dials which is now housed in the Borthwick Institute of Archives in York. Sadly, a search of the Borthwick catalogue for mass dials leads to no results. There must be some member or members who have experience undertaking research in libraries and archives. Please could you offer your services, at least to the extent of assessing the material and preparing a strategic plan.

On a quite separate note, this issue includes a valedictory article by Tony Moss announcing his final retirement from dial-making and describing the dials which are the last products of a truly remarkable run. We all wish Tony a happy retirement. That said, I hope it will not be long before he sends us more material for typesetting.

Frank King

A SINGULAR CROSS DIAL IN MOORFIELDS

GRAHAM STAPLETON

In my earlier article[1] about the sundials of Moorfields, I closed with a partial description of a cross dial located there. At the time of writing, I had very little information about it: the precise location, and indeed much else about its commission and manufacture, called for research. This is a series of findings interspersed with silences, from which I offer some inferences until other searches unearth evidence. It appears to me that the existence of cross dials in England is tied to the dramatic history of religion and that for an extended period, it would have been regarded as idolatrous.

Initial References

My first discovery was in *The History of the Works of the Learned*,[2] a descriptive catalogue of the recently published works of natural philosophy. The author paraphrases the descriptions in Charles Leadbetter's *Mechanick Dialling*.[3]

Article XXXVIII

> To these are added plain and easy Rules for making of *Reflective*, *Refractive*, and *Globe-Dials*; as likewise another sort in form of a Cross; in respect of which last our Author has been especially full and particular, because of its Singularity; there not being (as he knows of) any of the sort in *England* beside one situate in *Moor-Fields*: He has not therefore only inform'd us after what manner a Dial of this Figure is to be made, but has moreover exhibited to the Eye several necessary Views or Positions of it.

The relevant chapter, text and footnote, in Leadbetter reads as follows:

Chapter XIX. To make a Cross Dial

> A *Cross Dial* is that which shews the *true Hour* of the Day, without a *Stile*, by the *Shadow of one Part* of the Dial itself, appearing upon *another Part thereof*. There is one of *this* sort of Dials near the *South-West* Corner of *Middle Moorfields, London**
>
> [1] In order to which, prepare a Piece of *Wood* or *Stone* of what Size you please, and shape it in the *Form* of a *Cross*, so that *ab, bc, cd, de, eh, hi, ik, kl, lm*, and *m a* may be *all equal*: *ef*, may be *more than double* to *ae*: that in *London* is 25 Inches, and 5 Tenths of an Inch *long* from *a* to *f*, and *a m* is 4 Inches and 8 Tenths, *ef* 15 inches and 8 Tenths, and the *Depth* or *Thickness* is 6 Inches, 8 Tenths. (Fig. 1)

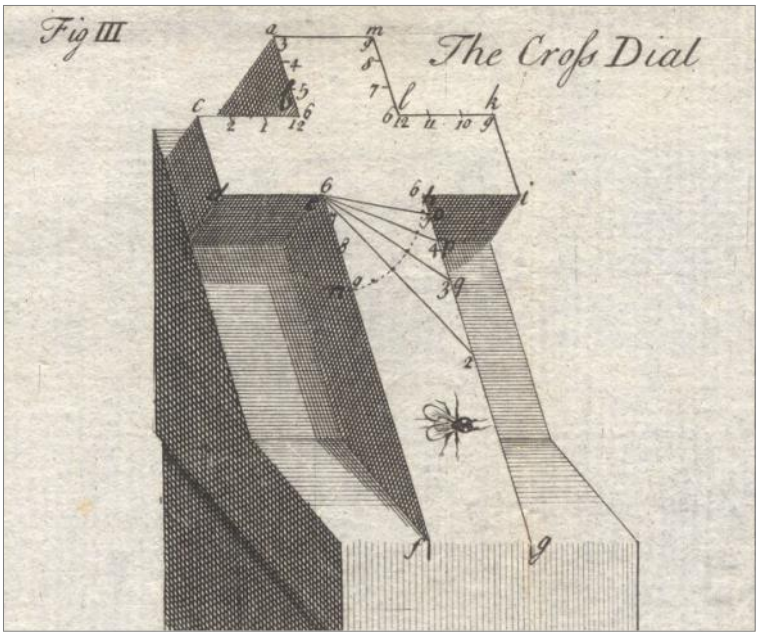

Fig. 1. Leadbetter's illustration of the cross dial viewed from the North East. The annotations are referred to in the text (image courtesy of Mike Cowham).

> *The *Inscription* upon this Dial being cut in *Iron*, and exposed to the Weather, it is so defaced, that it required much Pains and Art to render it legible, and therefore I desire the Reader's Excuse for preserving it. "*This Dial was placed here as a Boundary of the Parish of* St. Stephens, Coleman-Street, *in the memorable Year* 1706, *and in the fifth Year of the glorious Reign of our most gracious Sovereign Queen* ANNE, *whom GOD long preserve*. Robert Trevitt, Painter, Fecit."

Leadbetter's drawings of the dial as seen from East and West (Fig. 2) show a fairly plain cross dial on a low plinth without any details of its location. The artist has given it shadows to indicate its form, but they are unrepresentative of a functioning dial. Whether the actual dial had a fly on it as a visual pun is unknown, but it seems unlikely; such flies appear to be exclusively a feature of glass dials.

A trawl of the Fixed Dial Register produced not even two dozen examples, suggesting that the popularity of the cross dial has not greatly increased over the centuries despite the potential of its imagery. The oldest, dated 1667, is located at Scotscraig Mains, Tayport, Fife (SRN 0863), making it entirely possible that Leadbetter did not know of another

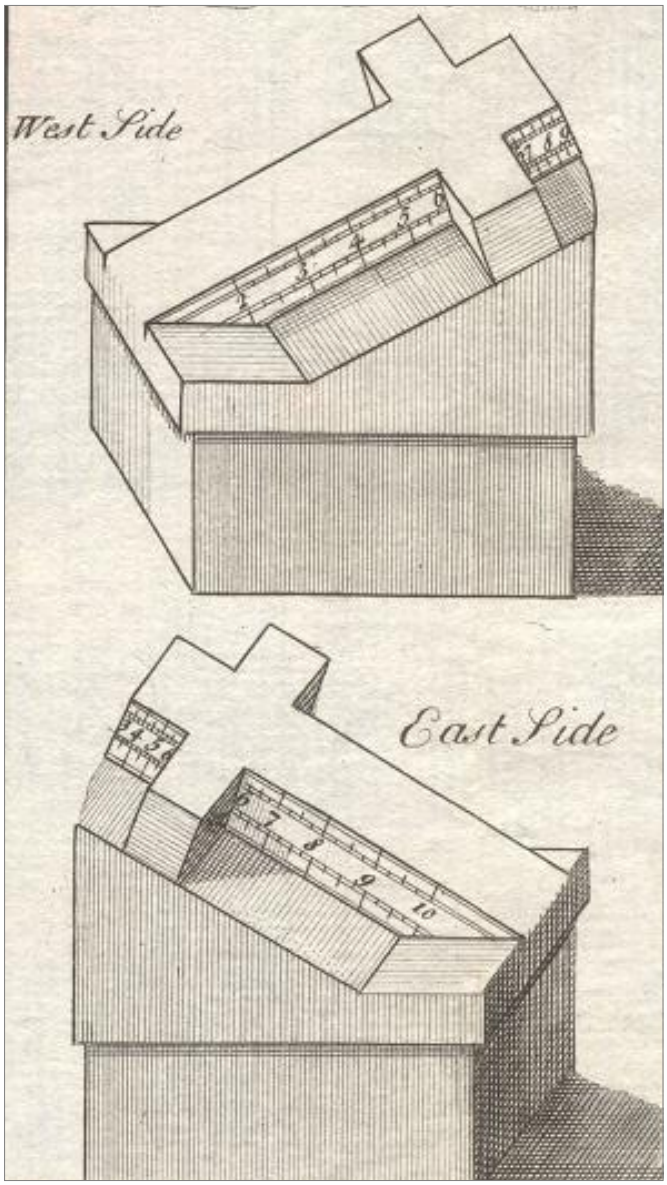

Fig. 2. Leadbetter's East and West views of the dial (image courtesy of Mike Cowham).

example in England. Nearer in time, dated broadly to the eighteenth century, are the two in the Penrith area (SRNs 1008 and 2046). Of these, the first shows the most similarity to Leadbetter's, but it is distinctly more complex, combining horizontal, cross and two scaphe dials. I have found no connection between the London and Penrith dials, but would observe that they are well worth researching in their own right and recommend Mike Cowham's *Bulletin* article as a starting point.[4]

The Making of the Moorfields Dial

Archives contain treasures; without undue effort I had in front of me the churchwardens' account book for the parish church.[5] On the disbursements page for 1706, under Robert Trevitt's name, there appears:

Octob:' 2 Carriage of the Dial into Moorfields brickwork
- / 2 / 6

12 Pd Cooper the Mason for the Stone Diall
2 / 18 / -

From these accounts, Cooper appears to have been the church's regular mason, being paid for various works around the church; but as his name does not appear in the vestry minutes, he was probably not of the parish.

Incidentally, this and Leadbetter's transcribed inscription suggest that the reference in Gatty[6] was taken from a corrupted source, since it was neither "an iron sun-dial 'fixed on a stone fastened in the ground'", nor "in the ninth year of the glorious reign", as Queen Anne's accession was in March 1702.

The Inscription

Looking closely at Leadbetter's drawing of the South face (Fig. 3), the middle initially appears to have been drawn with an incoherent perspective quite unlike the other views. Ignoring the fly, there are some rather indistinct rows of curved marks on the top face, which are suggestive of text. Accepting that the top of the cross is not drawn correctly as a cube to function as a dial, it appears that the artist's intention was to emphasise the location of the inscription plate attached to the cross. There are several other locations at which it could have been placed, but as the highest point on the dial, this would be the easiest to read.

But what was 1706 memorable for? The Internet pointed me to a likely answer – the Battle of Ramillies, a decisive action in the War of the Spanish Succession. Together with later battles, the Allies imposed the greatest loss of territory and resources that Louis XIV would suffer during this war. Thus, the year 1706 proved, for the Allies, to be an *annus mirabilis*.[7] If these battles do not spring to mind, the name of the British General probably will – John Churchill, First Duke of Marlborough.

This is all fine taken at face value, but I observe three things: (1) there has never been a statue of John Churchill in London, (2) the dial's inscription was on a cast iron plate and not more expensively lettercut into stone, and (3) the inscription gives almost as much importance to the parish boundary as to the great military victory. These suggest to me that the patriotic rejoicing was not particularly extended, and that the huge ongoing cost to the Treasury of building Blenheim Palace was already making John

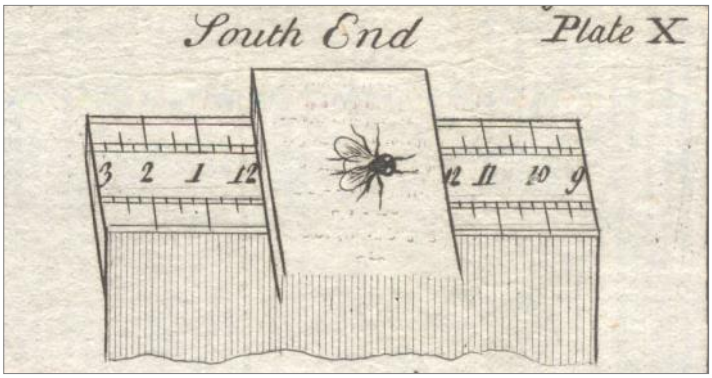

Fig. 3. Leadbetter's South view of the dial, apparently showing the inscription plate (image courtesy of Mike Cowham).

Churchill unpopular.[8] From this, I infer that Trevitt had some kind of personal affiliation to (or at least interest in) Churchill, and had been able to persuade his parish to fund a modest memorial.

The Dial's Location

Unless more evidence comes to light, it is not possible to say precisely where the dial was sited. St Stephen, Coleman Street was an unusual parish, in that it straddled the City boundary, with Moorfields distinctly on the fringe of London. Assuming that the choice to make a cross dial came first, there would have been almost nowhere in this densely built part of the city where one would work satisfactorily, hence the choice of location may have been as much practical as any other consideration.

The description "near the South-West corner of Middle Moorfields" narrows it down only slightly. It cannot be taken too literally, as Middle Moorfields belonged to the neighbouring parish. Since the dial's inscription stated it was on the parish boundary, I had hoped that some residual evidence might have survived in a later parish perambulation and boundary book.[9] If the dial's location had been of any utility as a marker, it would have appeared between the points numbered 42 and 43 in the perambulation (Fig. 4). Clearly this was not the case.

This part of Moorfields has to be understood as a 'resort', being crossed by several tree-lined 'walks' to make an area that genteel folk from the city would visit to promenade. Possible sites are near the west end of the path divided by the boundary, or (rather better in dialling terms) on the grassed area away from trees that could overshadow it. On balance, I suggest that Trevitt placed it on the path where such people would be prepared to tread, particularly if he had any thoughts to advertising himself.

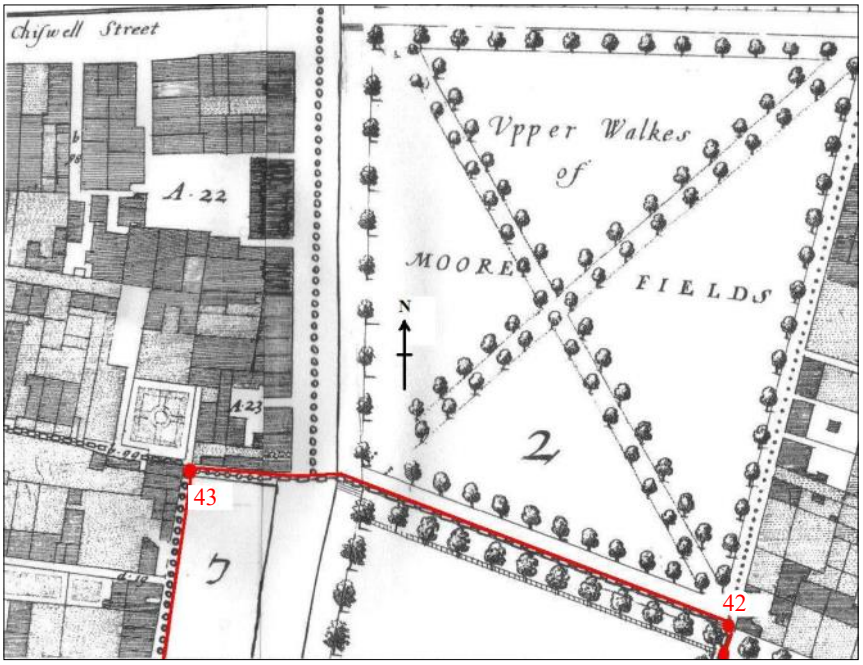

Fig. 4. 1676 map of Moorfields, showing the limit of St Stephen, Coleman Street parish and boundary markers referred to in the text.

The Fate of the Dial

It is possible that the dial was – for a time – a local landmark, since in 1722 John and Moses Fontaine established their workshop for making clocks and watches at "The Dial" in Middle Moorfields.[10] Otherwise the end is silence, and probably ignominy; when Leadbetter published in 1756, the dial had clearly received little or no maintenance, and assumedly it never did. Moorfields remained an open space until the close of the eighteenth century, but Horwood's map of 1799[11] shows streets already laid over it.

Robert Trevitt – the Maker?

Not very much has come down to us about the life of Robert Trevitt (fl. 1675–1723).[12] The apprenticeship register describes his father, James, as being a gentleman of Westminster in Middlesex. His apprenticeship to Thomas Reeves, a Painter-Stainer in 1675, suggests a birth of 1661–3. He fared well enough to rise through the offices of the Worshipful Company of Painter-Stainers, becoming its Master for 1712–13. Beyond this Trevitt appears to be known only for a series of five copperplate engravings of St Paul's Cathedral, having been engaged by its Commissioners in 1710. Assumedly this was prompted by his own series of architectural engravings produced in 1703 and sold from his house at the sign of the King's Arms, Coleman Street – opposite St Stephen's Church.

As an architectural engraver, the task of delineating a dial from instructions should have been well within his capabilities, but the question as to whether he played any practical part is unanswerable. Since there is no evidence for either him or the mason being involved with other dials, and the fact that the dial was carved by the mason generally employed by the parish, there is the important question of their source of information.

Stepping into speculation, if Trevitt had approached a diallist for a design, he would have easily been able to make enquiries. In the first decade of the eighteenth century, numerous lectures and demonstrations of natural philosophy subjects, including mathematics and navigation, were given in London coffee houses.[13] Of the London dial makers active at that time, the fact that in 1710 John Rowley supplied dials to both Blenheim and St Paul's Cathedral[14] offers the possibility of the two men moving in the same circles. Personally, it appears to me from the circumstances that Trevitt worked with little or no professional input.

Sundial Books Available to Trevitt

If Trevitt was working with his own resources, what books could he have referred to? The Old Sundial Books page of the BSS website[15] makes this quite easy to answer. It is not always easy to see absences, but in this case it quickly became apparent that the cross dial did not feature in any English publication before Leadbetter's. Here is a mystery: this was an era with no shortage of ingenuity, the books showed every other kind of dial, but somehow the particular conjunction of a polar dial with East and West direct dials eluded everyone.

Enquiring on the Internet about early sources for cross dials, I was directed to Christoph Clavius,[16] and upon reading, the penny dropped with considerable force. If Clavius was not the inventor of the cross dial, in 1581 he was the first of several writers to promote it as a symbol of Roman Catholic belief. So while there would have been several books in existence to consult, few people in Britain then would have run the strong risk of a heresy conviction for importing or possessing a Catholic text; still fewer would construct what would surely be decreed a 'Popish' dial.

It cannot be ruled out that by the seventeenth century a dialling text from overseas had found its way into a London library – for example that of St Paul's Cathedral. It might have survived if it were viewed summarily and seen for its scientific and practical content, but that is to stretch chance a long way.

Destruction of Crosses

Even if the passage of the centuries had slightly softened English attitudes, any possibility of the cross dial gaining acceptance was extinguished by the English Civil War and Commonwealth. This Puritan outlook required the destruction of images, objects and monuments reflecting royalty or the Catholic religion. Following the creation of the 'Committee for the Demolition of Monuments of Superstition and Idolatry', the House of Commons ordered in August 1643 that whether at religious or non-religious sites, plain crosses were to be demolished in 'any open place'.[17] As a result of zealous actions, there was hardly a churchyard or market cross left intact in the land, for which the only consolation is that many were replaced by dials. Hence, not only were any cross dials lost that might have existed, but even the idea of them was lost, or at very least they were thought inadvisable.

Conclusions

I had hoped to uncover more facts regarding the circumstances of this dial than has been possible; however, I have been able to draw attention to a sequence of singular occurrences that amount to something of a mystery. Much seems to turn on the unrecorded motivations of an individual: an artist-engraver, with no evident experience of dialling, prevails on his parish to put up a monument to an event of short-lived memory, connected to a General of limited popularity. The dial is of a type effectively unknown in the land at that time, information for which may have been scarce. Further, the design has religious and political connotations that could easily have brought its promoter unwelcome attention.

The cross dial continued to remain obscure in Britain until the eighteenth century, and so just possibly it is to the Evangelical Revival that we owe the recovery of this type of dial.

ACKNOWLEDGEMENTS

My thanks to Mike Cowham and to Jill Wilson for their particular help with relevant material.

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IN THE FOOTSTEPS OF THOMAS ROSS
Part 23: West Fife Sundials

DENNIS COWAN

I didn't have to step far to follow in Thomas Ross's footsteps to see these four sundials, as two of them are in my home village of Limekilns situated on the northern bank of the Firth of Forth, and the other two are just a few miles away.

However, in volume 5 of *The Castellated and Domestic Architecture of Scotland*,[1] Ross didn't have much to say about the Limekilns sundials. Of the first, he says only:

"*On the south-east corner of a house here there is a similar dial bearing the date 1682* [Fig. 1]."

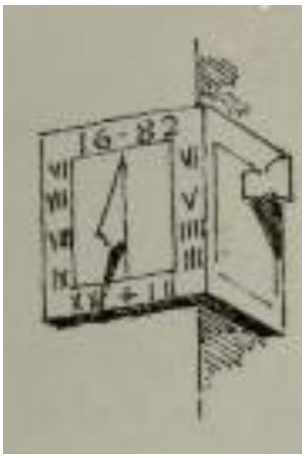

Fig. 1. Ross's sketch of the first Limekilns sundial.

Here Ross was comparing it with a dial at Prestonpans in East Lothian, which has been long lost along with several others in that village. As with the missing Prestonpans dial, it has two faces wrapped around a corner of the building. It can be seen in Fig. 2 that the dial hasn't changed much since Victorian times and it remains in good condition. The most obvious difference though is that both Ross's sketch and his text quote the date as 1682 whereas it now shows 1689. I have studied the dial closely and I believe that 1689 may be correct, but the tail of the 9 certainly doesn't appear to be as deeply cut into the stone, so maybe the painter of the numerals mistook the 2 for a 9. Or maybe Ross mistook the 9 for a 2!

The stone faces have been painted white and the hour lines, numerals and date are black. The south face has Roman numerals and a cross patty for noon, whilst the east face has Arabic numerals from 4 am to 11 am. The sheet metal gnomons are in good condition, having been replaced some years ago. The whole dial has been very slightly canted in order to face due south and east.

Fig. 2. The south face of the first Limekilns sundial today.

The building on which it is situated was originally called Hope Cottage (Fig. 3), but a few years ago its use changed from residential to commercial, and it is now known as the Sundial Café.

Fig. 3. The first Limekilns sundial on Hope Cottage, now known as the Sundial Café.

As to the second dial in Limekilns, Ross compares the dial with some of those at Newstead near Melrose in the Scottish Borders, which were described previously in the *Bulletin*,[2] by simply commenting:

"*The dial at Limekilns in Fife* [Fig. 4] *may be classed with those from the Melrose district.*"

The dial has lost its ball finial since Ross saw it, but the addition of harling (pebbledash) on the wall of the house has unfortunately also covered part of the dial's east and west faces (Figs 5 and 6). At least the south face is still in reasonable condition (Fig. 7). All three faces have Arabic numerals. Like the other Limekilns dial, its south-facing gnomon has been replaced, although it doesn't look to be at the correct angle for the latitude.

Fig. 4. Ross's sketch of the second Limekilns sundial with its ball finial.

Fig. 6. The east face of the second Limekilns sundial significantly covered by the addition of the harling.

Fig. 5. The west face of the second Limekilns sundial partly covered by the addition of the harling.

Fig. 7. The south face of the second Limekilns sundial minus the ball finial.

Ross doesn't mention the dial at Culross Palace, a National Trust for Scotland property a few miles further up the Firth of Forth from Limekilns, but the dial is shown (just) in his sketch of the palace (Fig. 8) within Volume 2.[3] As this volume was published a full five years before Volume 5 (the sundial volume), perhaps his interest in sundials had not yet developed.

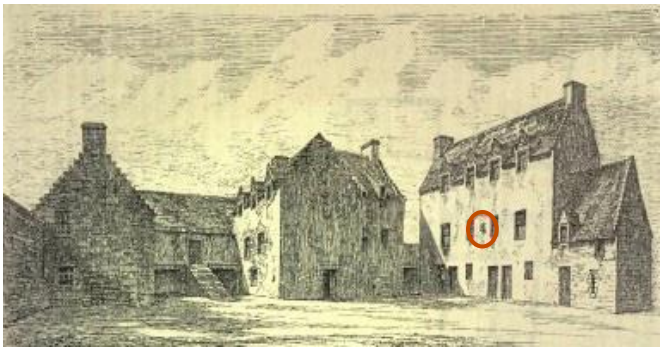

Fig. 8. Ross's sketch of Culross Palace with the sundial circled.

Fig. 9. The sundial is still in the same place on Culross Palace today.

Fig. 10. Close-up of the Culross sundial.

The part of the palace on which the dial is mounted looks just the same today with the dial still in place (Fig. 9). The single-faced stone dial, which has been canted slightly to face south, hasn't fared well. Its gnomon has gone, leaving only the packing in its mounting holes, and the carved Roman numerals and hour lines are now fading somewhat (Fig. 10).

The village of Crossford lies inland from Limekilns and Culross, and the old Pitfirrane estate originally owned by the Halkett family lies on the western edge of the village. It has, however, been the home of the Dunfermline Golf Club since 1953 with the much horribly extended castle serving as the clubhouse (Fig. 11). Of the sundial that resides here, Ross says:

"*The dialstone which rested on this fine lion-shaped pedestal* [Fig. 12] *is lost. The figure holds between his fore-paws a shield, containing a lion passant regardant, over three piles, the cognisance of the Halketts of Pitfirrane. The date on the castle is 1580, but there is nothing to connect this date with the dial.*

"*This dial disappeared, and all knowledge of its ever having been at Pitfirrane was lost, till the late Mr. Paton of Dunfermline found it lying in a garden in the neighbourhood, and on Sir Arthur Halkett recognising the arms as his own it was restored to Pitfirrane. The height of the lion is 2 feet 6 inches, and including the base 3 feet 3½ inches; breadth of base 12½ inches; breadth across shield, 9½ inches.*"

Local belief suggests that the event described above by Ross took place around 1850. Today the pedestal stands

Fig. 11. The Pitfirrane sundial in front of the golf clubhouse.

Fig. 12. Ross's sketch of the Pitfirrane pedestal.

Fig. 13. The replacement Pitfirrane sundial.

Fig. 14. The rather fine "H" for Halkett supporting the gnomon.

outside the clubhouse, on a different stepped base, but still probably in its original position as shown on a contemporary map in the National Library of Scotland. A replacement table and circular dial are now in place on the pedestal (Fig. 13).

In keeping with its history, the dial has the Clan Halkett motto "Fides Sufficit" meaning "Faith is Sufficient" inscribed upon it. It also has the old Scots sundial motto "Tak tent o' time ere time be tint" which can be loosely translated as "Make use of time while you have it". Rays of the sun take the place of hour lines. However, it does have a ten-minute scale, but no noon gap. Additionally it has a rather fine "H" for Halkett supporting the slightly bent gnomon (Fig. 14).

Ross saw another dial nearby in Crossford, but there is some mystery surrounding it. This will be the subject of a future article.

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READER'S LETTER

Should We Produce a Mass Dial Register?

One of the great achievements of the British Sundial Society is the publication of the Fixed Dial Register, maintained and updated by a succession of meticulous Registrars.

What we lack is a similar publication relating to mass dials. "Mass Dial Records" was produced in 1996 with later updates by Edward Martin. It was an idiosyncratic compilation and contained a number of instances where mass dials were assigned to the wrong counties. It is no longer available and may well be incomplete owing to later records having been received. Today we have one or two illustrated publications relating to mass dials in specific counties but nothing which covers the entire country.

The ideal solution would be to produce a Mass Dial Register comparable with the Fixed Dial Register. It would be of value not only to ourselves but would provide a unique resource for anyone interested in church history or architecture. If this is not considered feasible, a less satisfactory option might be to create something akin to the Abridged version of the Fixed Dial Register. This would contain no pictures but in each county would list towns and villages in alphabetical order, giving the dedication of the church and the number of mass dials found on it. Users might then enjoy locating them.

I would be interested to hear the views of the editorial team and of other members about this proposal.

John Lester
johnws1@btinternet.com

SOME EARLY FRENCH DIALS

MIKE COWHAM

France is a very interesting country with many fine dials to be found. My wife Val and I have travelled to most parts and have spent much of our time looking at churches and many old buildings. In doing this we have been particularly attracted to the early dials, most of which are quite different from those found in England.

Mass dials are to be found in many parts. We found that they were particularly common in the areas that had been connected to Britain during early times. Some of the ones most similar to ours are in Départements Charente and Charente-Maritime. However, many more dials are to be found that are divided into four or six equal segments. The dials shown in this article are generally much larger than our standard mass dials, frequently measuring about 30 cm across.

Fig. 1. Mass dial with four equal segments at Beaumont-de-Pertuis in Vaucluse.

Fig. 2. Mass dial with twelve equal segments at Louzac-Saint-André, in Charente.

Fig. 3. Mass dial with six equal segments at Saint-Yrieix-la-Perche in Haut Vienne.

The first is a very simple dial with four equal segments at Beaumont-de-Pertuis (Fig. 1). It is high on the eastern end of the nave, above the roof of an extension.

Another simple dial at Louzac-Saint-André, high on the south wall of the church (Fig. 2), has twelve equal segments, filling the full 360°.

The dial at Saint-Yrieix-la-Perche, half way up a pillar to the right of the main doorway (Fig. 3), has six equal segments, and each of the lines is marked with letters for the canonical hours. These are “PR” for Prime or the first hour, “TE” for Terce or the third hour, “ME” for Meridies or noon and “NO” for Nones or the ninth hour. The last line, probably for Vespers, appears to be unmarked.

Fig. 4. Mass dial with six segments at Mérindol-les-Oliviers in Drôme.

Fig. 5. Mass dial with ten and two half segments at Saint-Gaultier in Indre.

A similar dial is to be found at Mérindol-les-Oliviers (Fig. 4), around 6 metres high on the south side of the church. Its diameter is approximately 0.35 metres. The dial is marked above with "OROLOGII" and letters below that for the lines, "·P·T·M·N·". However, the segments on this dial are not equal, suggesting that the dial could have been calibrated with eight segments.

A rather different dial is at Saint-Gaultier (Fig. 5), again quite high on the south side of the church. It has ten segments but the top lines of these are not level, so there appear to be half segments above, on each side.

The dial at Uzeste (Fig. 6) is placed quite high on a chancel buttress. This dial and the following few are carved in relief. At Uzeste a more recent and simple rectangular stone dial is placed upon the south wall of the church, to the left of the first dial.

The dial shown in Fig. 7 was found in a local garden and since 1990 has been kept safely inside the church at Cruis. Its width is about 85 cm, height 88 cm and its stone is about 9 cm thick. Apart from the dial, it has various creatures displayed around it and some inscriptions. The main one appears to read "hoRILOGIO†". The dial, like the one at Saint-Gaultier, seems to have ten segments and two half ones. Note that the church is kept locked but its key is available at the local Mairie. On the south wall outside the church is a fairly standard vertical dial, but in rather poor condition.

We found the dial at Gigondas (Fig. 8) when we were staying at a hotel nearby. It is not on the main church (which does have a later vertical dial) but is on a small 10th- to 11th-century chapel, Chapelle St Cosme, at the edge of the village. This dial is about 7 metres above the ground and about 30 cm diameter. Although it is high on the building it is certainly of interest. It is difficult to decide how the 'hours' are divided as there is no obvious noon line. The dial has twelve lines. Below the dial there appear to be a sun and moon with the inscription:

SOL LVNA
OROLOGIVM

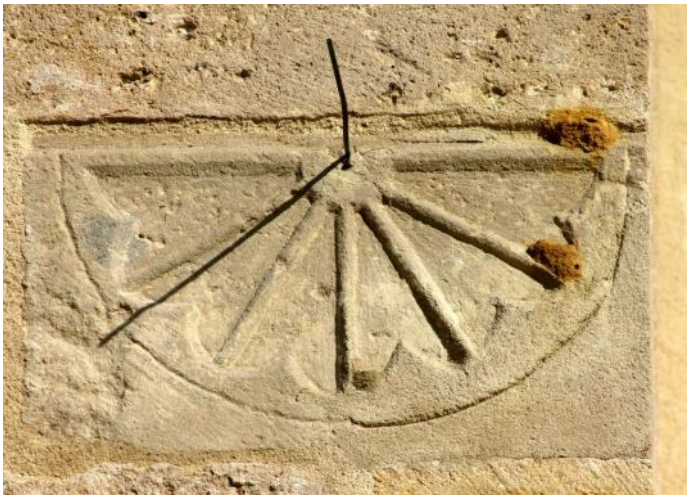


Fig. 6. Early dial with six segments at Uzeste in Gironde.

Fig. 7. Early dial with ten and two half segments, now stored inside the church at Cruis, in Alpes-de-Haut-Provence.

Fig. 8. Dial on a chapel in Gigondas, Vaucluse.

Fig. 9. Dial with ten segments at Meung-sur-Loire, Loiret.

The dial at Meung-sur-Loire (Fig. 9) is placed about 11 metres up on a chancel buttress and has eleven hour lines. Three of them have a cross line on them. Naturally, its gnomon is a modern replacement. The dial is about 42 cm wide.

Another carved dial is shown from Boulbon (Fig. 10). This has twelve equally spaced hour lines. It is placed above the south doorway. There are also traces of further mass dials on this church.

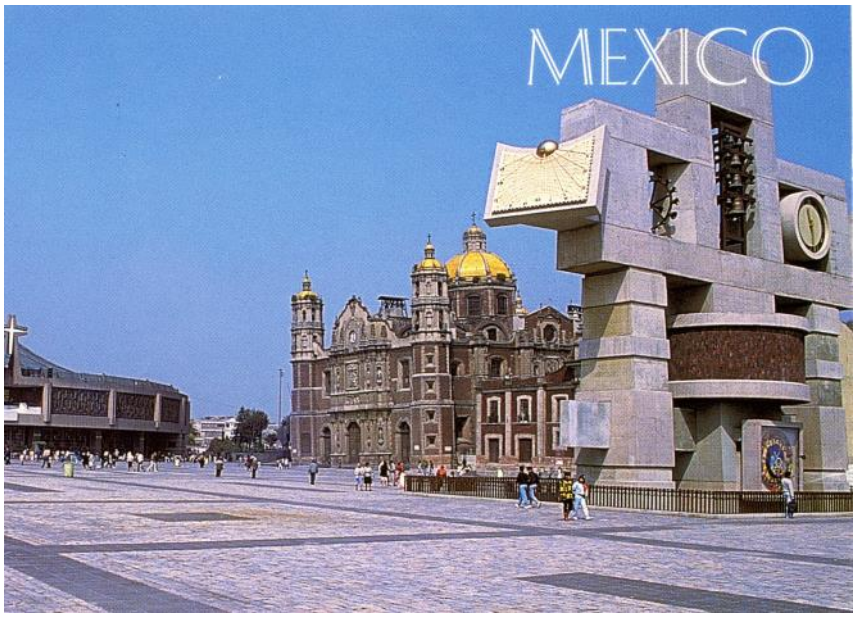
Fig. 10. Dial at Boulbon, Bouches-du-Rhône.

mandvcowham@gmail.com

Postcard Potpourri 43

Basilica de Guadalupe, Mexico City

Peter Ransom



The last Postcard Potpourri was the belfry at Amiens and now we move over the Atlantic to the bell tower next to the Basilica de Guadalupe in Mexico City. This is the second most visited Roman Catholic shrine after the Vatican.

The bell tower, which reminds one of a pre-Hispanic god, shows many of the ways that people have used to reckon time. The dominant feature in the postcard is the sundial which appears to be a direct south-facing instrument but reclining a few degrees. There is a short gnomon whose tip also serves as a nodus. The hour lines run from VII in the morning to V in the afternoon.

At the same level as the sundial, there is a small rectangular space which houses a wheel with bells round its rim and then a much larger rectangular space for a substantial carillon. There is an analogue clock beyond this. Close to ground level, under the carillon, there is a large representation of an Aztec calendar.

On the other side of the tower there is an astronomical clock which shows the position of the sun and the moon; it includes an ecliptic ring which is decorated with the twelve Zodiac symbols.

For more details of the Basilica de Guadalupe and the bell tower, go to *https://mexicanmuseumsandmavens.wordpress.com/2012/01/04/the-virgencita-and-the-basilica-of-guadalupe-part-ii/*

This postcard is part of the Blue Line Collection, published by Capaco and kindly sent to me by Martha Villegas.

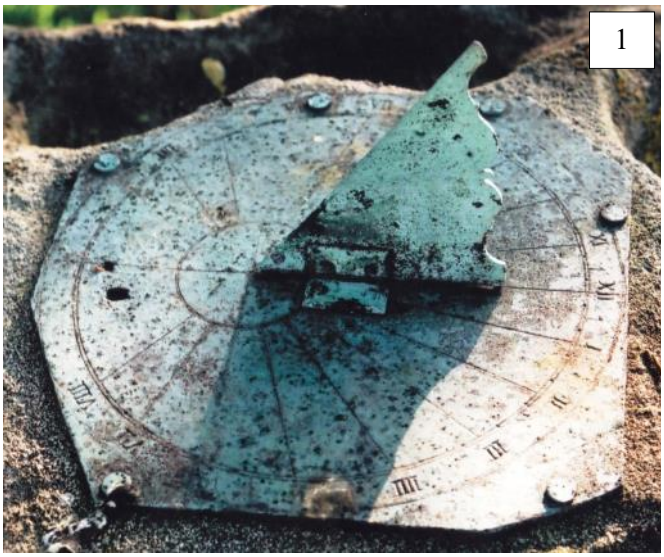
pransom@btinternet.com

NEWLY REPORTED DIALS 2017

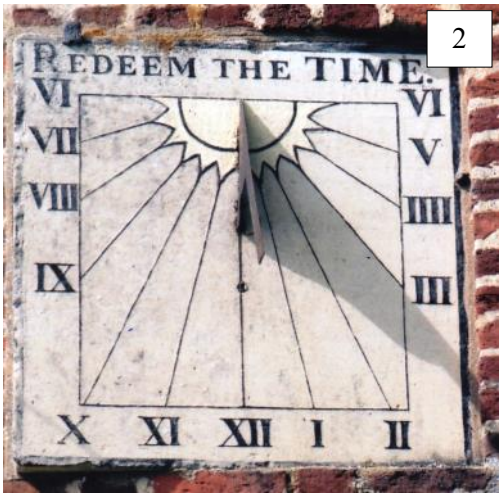
JOHN FOAD

Over a hundred dials have been added to the Register since my report a year ago, and here is a small selection. I am most grateful to Ian Butson, Maureen Harmer, Ian Maddocks, Ben Jones and John Allen for their reports and photographs, and I hope that these pages may encourage you, dear reader, to record other dials that you know of. If you are unsure whether one is already in the Register, please drop me a line, but follow-up reports of recorded dials are also very welcome, to keep track of any changes. New recorders are particularly welcome, and you may see from my notes inside the front cover of this *Bulletin* how to send me your reports.

Some dials, although technically 'Open', are at risk of theft or vandalism, and address details are withheld here, but please contact me if you would like more information, or wish to visit. Where access is noted as 'Restricted' there are usually limited opening times and a charge for entry may be made. It is best to enquire in advance if you intend to visit.


1

1. This dial stands unprotected in a country churchyard, and stylistic features suggest that it may have been there for 500 years. Note the attractive double-scrolled north edge of the gnomon. The original square plate seems to have been clipped to fit its present pedestal. SRN 7960, Leicestershire. Open.



2

2. This good stone dial is set into the brickwork of the house and canted slightly to face south. The furniture appears to be incised and painted. SRN 7961, Stonton Wyville, Leicestershire, LE16 7UQ. Visible.

3. I am not convinced by the delineation of this 1932 dial but it seems to be otherwise well designed. It makes an attractive feature set into a brick park wall housing an Edward VII post-box and the village notice board. SRN 7964, Main Street, Gaulby, Leicestershire, LE7 9BE. Open.


3a

3b


4


5


6

4. This Francis Barker cross dial is in good condition and stands in a Sussex churchyard. It carries an EOT table for each month on the upper side, and the unusual variant motto "Sic gloria transit mundi". Early Barker catalogues listed it at £10. SRN 7966, Sussex. Open.

5. John Bird, who made this dial, was a highly respected London professional instrument-maker in the eighteenth century. We have two other dials by him in the Register, in Tapeley Park, Devon (SRN 0561) and in Lincolnshire (SRN 7850). Like this one, the dial in Lincolnshire stands in a country churchyard. SRN 7970, Leicestershire. Open.

6. Made perhaps in imitation of a mass dial, this has numbered hour lines. SRN 7977, Cossington, Leicestershire, LE7 4UU. Open.

7. This nicely designed and well preserved dial was made by Thomas Woodcock, probably using the local Swithland slate. Note the aligned hour numerals and the decorative half-hour ticks. 'I K', whose initials are separated by the date, was probably the Churchwarden of the time. The very similar nearby dials SRNs 4443 and 5101, at Breedon on the Hill and at Leicester, are probably by the same maker. SRN 7982, All Saints' Church, Newtown Linford, Leicestershire, LE6 0HD. Open.

8. Leicester slate is an excellent material for dials, resisting erosion well. This second example has a double-spiral gnomon support, and shows the Rector's name, W C Cole. The date MDCCCXCVIII is inscribed (vying for the dial date length record – 1838 would be even longer but sadly we don't have a Roman example in the Register!). SRN 7985, St James's Church, Newbold Verdon, Leicestershire, LE9 9NL. Open.


7


8

11. Globe dials with a moving gnomon are not often found, and nor are moon dials. This stainless steel example can be seen from Broad Street, but closer inspection is needed to appreciate it properly. The swinging gnomon indicates the time by day, and the sphere carries extra hour bands to show the time at night for three days before and after a full moon. The dial is dedicated to all Balliol women, past, present and future. SRN 8025, Balliol College, Oxford, OX1 3AJ. Restricted.

12. This six-ring armillary sphere stands on a short pedestal in the form of a Corinthian capital. The instrument appears to be a replacement for a previous large horizontal dial of which we have no record, but it is a good dial in its own right. SRN 8029, Avebury Manor, Wiltshire, SN8 1RH. Restricted.

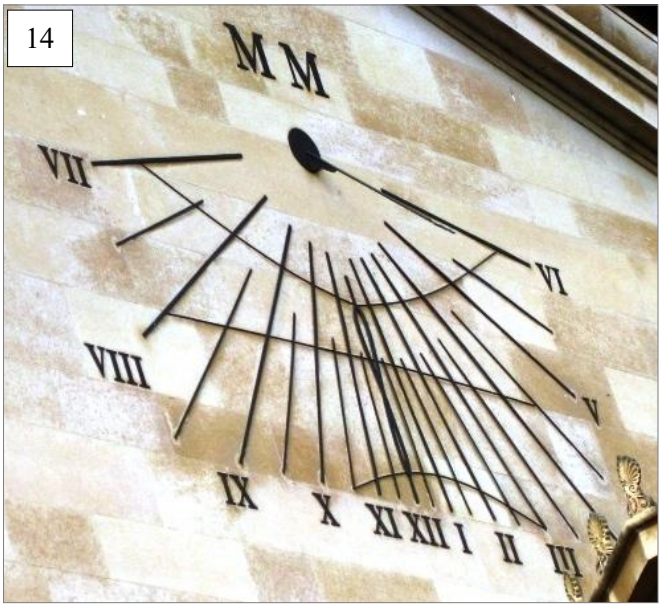
9. This simple east decliner is dated 1705. Could the tab half way along the gnomon support have had a purpose? Boldly in the bottom corners is the name 'Sam Guise' – Churchwarden, or Maker? In the stone surround at the top right 'W. S.' is inscribed more discreetly. SRN 7990, St Andrew's Church, Chippenham, Wilts, SN15 3HT. Open.

10. Here we have a well executed dial in a public park, one metre high. The sun has a solid body and the date is in strap work. The dial has been restored since 2007, when the '19' of the date was missing. SRN 7996, Ada Salter Rose Garden, Southwark, London, SE16 2ET. Restricted.

13. The motto here reads 'ΖΩΗ ΑΤΜΗ ΣΚΙΗ', provisionally translated as 'Life, Steam, Shadow', suitable for a dial on an old steam railway station (now a private house). The same motto appears on a dial in the Isle of Man (see *Bulletin* 29(i), p.41, and Gatty 1900, p.392), and Gatty translated it as

> "*Life is the Spectator* (query *Spectre?) of a Shadow*, instead of *Life (is) smoke, shadow*, which is the literal interpretation."

SRN 8041, Trinity Railway Station, Edinburgh, EH5 3RX. Private.



14. This millennium dial is formed from metal lines and characters attached to the south-facing stone wall of the Grove Auditorium. The gnomon is a thin unsupported rod springing from a small disc on the wall. The superscription recalls both the year 2000 and Mary Magdalene. SRN 8043, Magdalen College, Oxford, OX1 4AU. Restricted.

15. This very fine pillar dial (also shown on the back cover of this *Bulletin*) is a direct copy of one at Barrington Court in Somerset (SRN 0040), or conversely. The form is identical, and duplicated details include the lion atop, the embossed numerals, the scrollwork in unused areas on the ten dial faces, and even the plain pillar and capital. It is known as 'the Scottish dial', but may not originate from north of the border. SRN 8046, The Old Vicarage, East Ruston, Norfolk. NR12 9HN. Restricted.

16. This good old 11-inch dial is too corroded for any furniture to be read. The thin gnomon has unusual decoration to its northern edge, recalling No. 1 above. The pedestal does not appear to be as old as the dial, though the latter fits it well. SRN 8053, Benington Lordship, Stevenage, Hertfordshire, SG2 7BS. Restricted.

17. This circular declining dial is carved into a large limestone lintel for a door or window, and is believed to come from a house near its present location. The date, 1673, is clear, and the motto 'Ut Hora Sic Fugit Vita' can just be made out. Around the top are initials P, M, B [or possibly R]. SRN 8054, Alyth Museum, Blairgowrie, Tayside, PH11 8AF. Restricted.

18. This is a fine clear stained glass dial for the Millennium, although sadly the exterior gnomon appears to have shifted slightly, perhaps with the wind. The church also contains other beautiful modern stained glass windows. SRN 8055, St Mary's Church, Old Basing, Hampshire, RG24 7DJ. Open.

registrar@sundialsoc.org.uk

A SUNDIAL COMMISSION WITH A CIRCULAR ENOCH CALENDAR

ALASTAIR HUNTER

One or two years ago Macmillan Hunter sundials had a general enquiry about making a sundial with a calendar marked on it. Of course, sundials marked with a calendar in a graphical form like an elongated figure-of-eight are not unusual. Diallists recognise this form as the analemma, and it might have been the answer to the enquiry. In fact our own 'Solar Time' sundial (Fig. 1) includes the analemma as a feature of its design, so it might have worked well. This article explains how the enquiry progressed and describes the sundial we then designed and made as a private commission.

In 2017 we received more information. The calendar was to have exactly 364 days in the year, like an ancient description found in the writings of Enoch.[1] The arithmetic is appealing: there are exactly fifty-two weeks of seven days, making 364 days. There are exactly four seasons, each season is three months, each month is thirty days long, and there are four specific seasonal days, again making a total of 364 days. The Enoch calendar begins at the spring

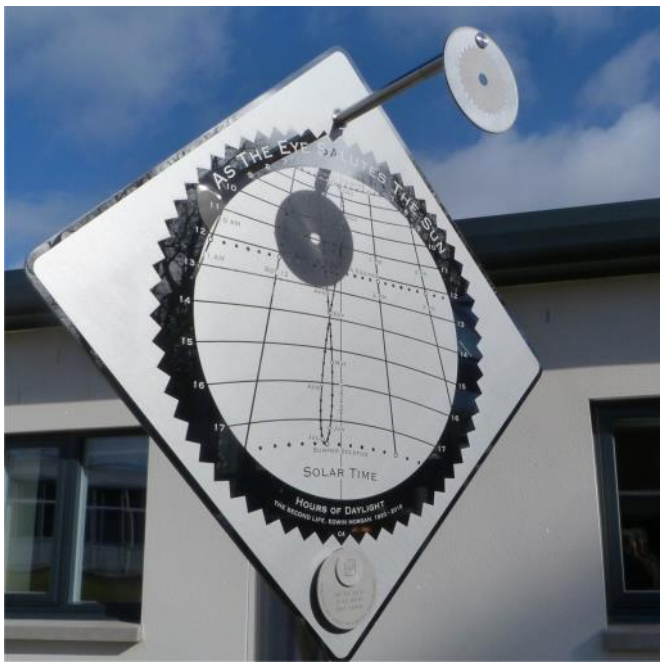


Fig. 1. The existing 'Solar Time' design of sundial has the analemma as one of its features, which can be calibrated as a form of calendar.

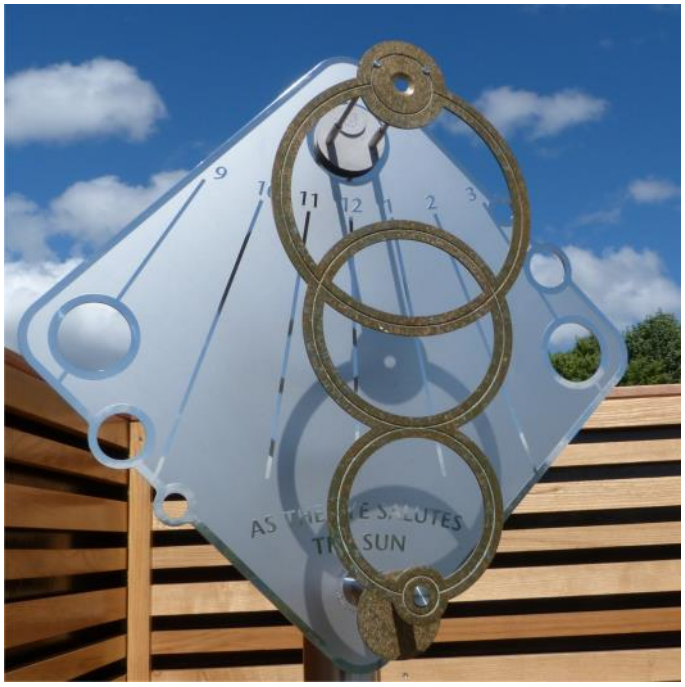


Fig. 2. The existing 'Orbit' design of sundial creates an impression of bodies in orbit with its artistic swirls of rings and circles. A calendar cycle presented in a circular form could fit in with the design.

equinox and the sequence of twelve numbered months and four season days starts from this point.

The purpose of linking the calendar to a sundial was to show the dates of a whole series of religious events in the year. In other words, the sundial was intended to mark the dates of the events directly, in the modern day, without referring to anything else such as a published diary. This would require the gnomon's shadow to pinpoint the passage of the seasons, the months, the weeks, and the individual days of the year. In general terms the idea sounds a striking one but a diallist will have reservations.

To mention a few points: the solar year of just over 365 days is not equal to 364 days so the years will soon drift apart; the spring, summer, autumn, and winter seasons of the solar year, which are separated by the times of equinox and solstice, have unequal lengths so the seasons will not be well aligned; the analemma on a plane dial face is not a linear scale of months, weeks, or days so particular dates will be hard to discriminate. What first sounded like a positive idea now started to sound less promising, and at this point discussions about the commission were necessary.

The main question was to recognise that a sundial indicating the position of the sun in the sky, and a calendar indexing the days of the year, perform in different ways. The sundial is able to act as a type of calendar, in a general way, but it does not have a fixed number of days in a year, and its scope for showing calendar detail is restricted. On the other hand a sundial is excellent as a form of visual calendar that gives a real impression of the passage of the year through the seasons. It shows the declination of the sun by the height of the shadow on a vertical dial. Watching the height of this shadow as it follows the course of the seasons is fascinating. These points were accepted and the discussion developed further.

Rather than keeping the original idea of showing the analemma, a new idea of creating a design with the Enoch calendar superimposed on the sundial delineation was considered. This could be done in a graphical form. The resulting dial would provide information and reference, rather like a look-up table, and be complementary to the sundial readings. Our own 'Orbit' design of sundial already has a swirling cyclical appearance that could fit in with what was required (Fig. 2). This approach was agreed and work on the new design began.

To take the sundial first (Fig. 3), the hour lines were laid out from 9 am to 3 pm, which was the full span for the relevant parameters of latitude, dial proportions, and nodus height and position. The spacing of the winter solstice, equinox, and summer solstice lines made good use of the dial area. There is a lot of pleasure in watching the declination of the sun and the progress of the seasons of the year shown by the day-to-day position of the shadow measured against these lines.

Second, a detailed graphic representing the Enoch calendar was created. The fifty-two weeks and the twelve months were placed in concentric rings, within a circular border.

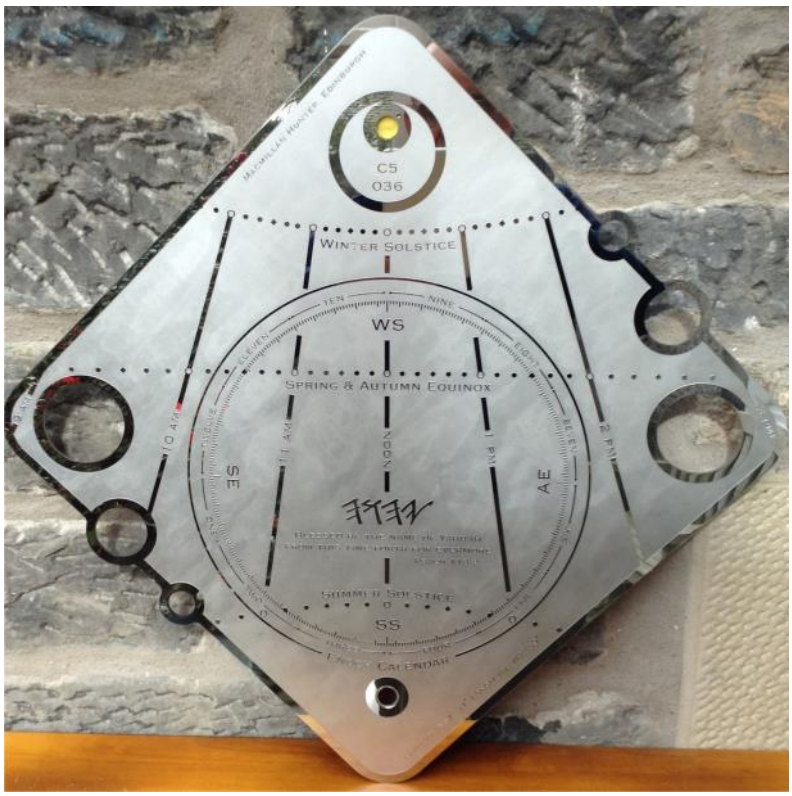


Fig. 3. The new design uses an existing Orbit dial plate. The Enoch calendar graphic is superimposed on the delineation of the vertical sundial.

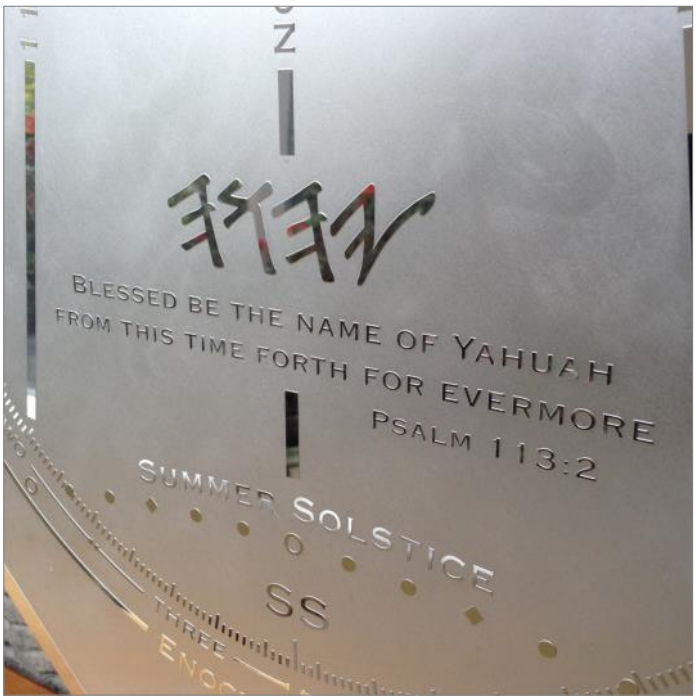


Fig. 4. A close-up of the lower part of the finished dial showing the inscriptions, the summer solstice declination line, and a short section of circular Enoch calendar lines. These calendar lines are intended as informative; they do not interact with the solstice line. The day marks are too close for practical enumeration, which has been omitted.

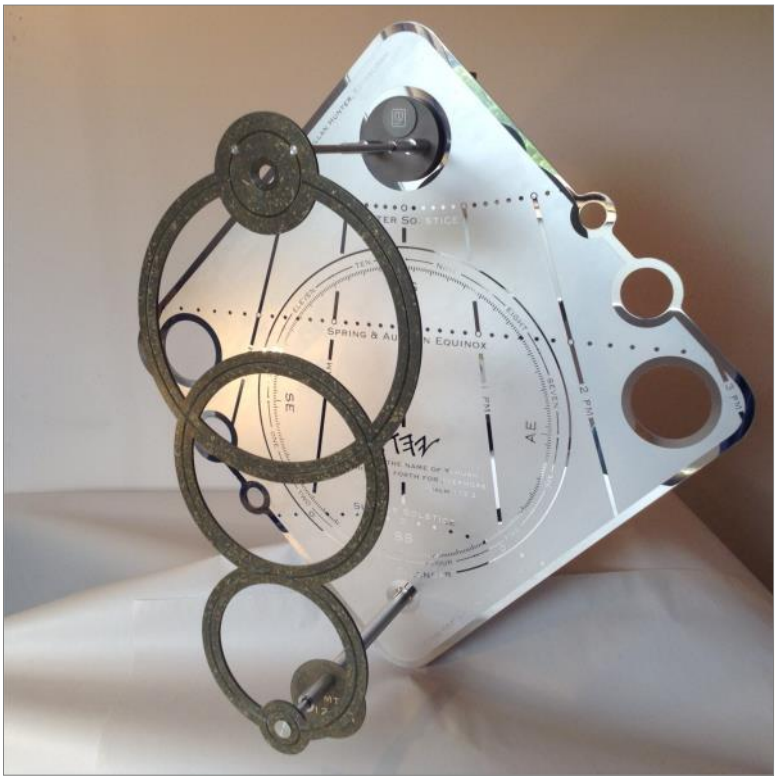


Fig. 5. The completed sundial has a span of hour lines from 9 am to 3 pm. The equinox and solstice declination lines are shown by hour, half-hour, and ten-minute points. The delineation is exact for latitude 57° 31′ N, and the longitude correction disc reads GMT +12 min. The Enoch calendar is a circular graphic graduated by 364 day marks with equal spacing. The circle of twelve months is concentric with the circle of days.

This was superimposed on the dial in such a way that it did not obscure or interfere with the sundial delineation. Lettering, a text in ancient script, and a biblical inscription, were added. All of the 364 days were marked, including the 52 seventh days, but enumeration of the days had to be omitted to avoid clutter in the design. A close-up of part of the layout is shown in Fig 4. Although the sundial and the calendar perform independently, and there is no solar interaction between them, it was now possible to keep a personal track of calendar days.

The finished piece of work in polished and photoetched stainless steel, and patinated brass, is shown in Fig. 5. This new sundial commission was installed at its home in the county of Moray in the north of Scotland in July 2017.

NOTE

1. Little is known about the Enoch calendar or the ancient religious group who are said to have used it, although it is not hard to find mention of it online. They may have had procedures for keeping the calendar in step with a real solar cycle, or perhaps this was not very important to them. Its tidy mathematical nature would certainly have made the calendar very convenient for administration and planning. For the present article, the design of a suitable sundial so we could satisfy the commission we were given is the important matter.

sundials@macmillanhunter.co.uk

LIVERY SCHOOLS LINK SHOWCASE EVENT 2018

JOANNA MIGDAL

It was with grateful thanks that the Clockmakers' Company received from David Brown the design of a paper sundial, delineated for the City of London, and showing the logo of the British Sundial Society (see Fig. 1 and the design on the facing page).

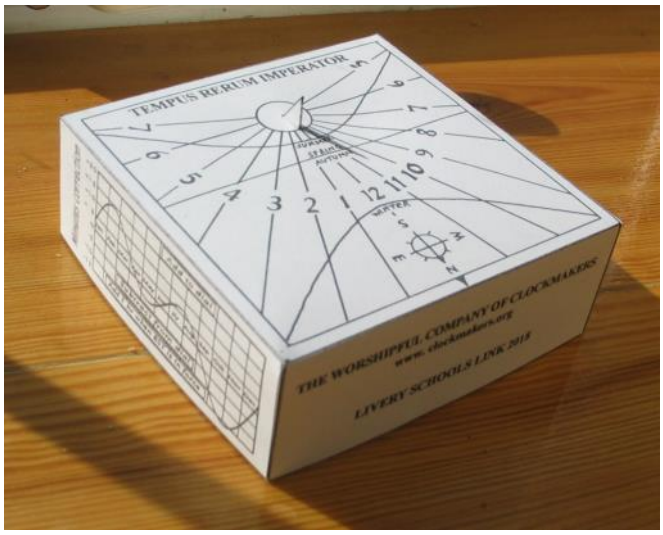


Fig. 1. Paper sundial designed by David Brown for the 2018 Livery Schools Link event. Photo: David Brown.

The Clockmakers' Company had been invited to the Livery Schools Link Showcase on 6 February, an annual exhibition at Guildhall, to show teachers and young people of London what possible careers were available to them and how much help the Livery Companies could give.

Fig. 2. The Clockmakers' Company stand. Photo: David Hodgkinson.

Fig. 3. Left to right: Phyllida James (Master's Consort), holding an assembled version of the dial; Andrew James (Master), holding the unassembled version; Joanna Migdal (Renter Warden). Photo: Oliver Bartrum/Ben Gough.

This year we wanted to exhibit all forms of horology named in the Royal Charter of 1631 (Fig. 2). We displayed information about educational possibilities throughout the U.K., including Birmingham City University, The British Horological Institute, The British School of Watchmaking, West Dean College, and the help available through the George Daniels' Educational Trust, the Antiquarian Horological Society and, of course, the British Sundial Society.

This year, 2018, is special as Andrew James and Joanna Migdal, both members of the BSS and practising sundial makers are, respectively, Master and Renter Warden of the Worshipful Company of Clockmakers (Fig. 3). Where would the Clockmakers be without a sundial to set their clocks by?

Nine hundred and fifty children attended the day and many should, by now, have made up their paper sundials at home. They were mostly amazed that a sundial could work!

The event was a great success and we thank David Brown particularly for producing such a creative design.

jam@sundialsomething.com

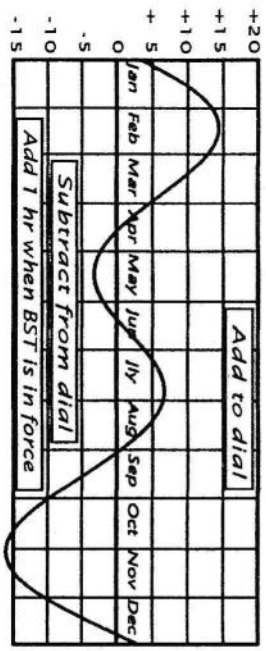
TAB

www.sundialsoc.org.uk

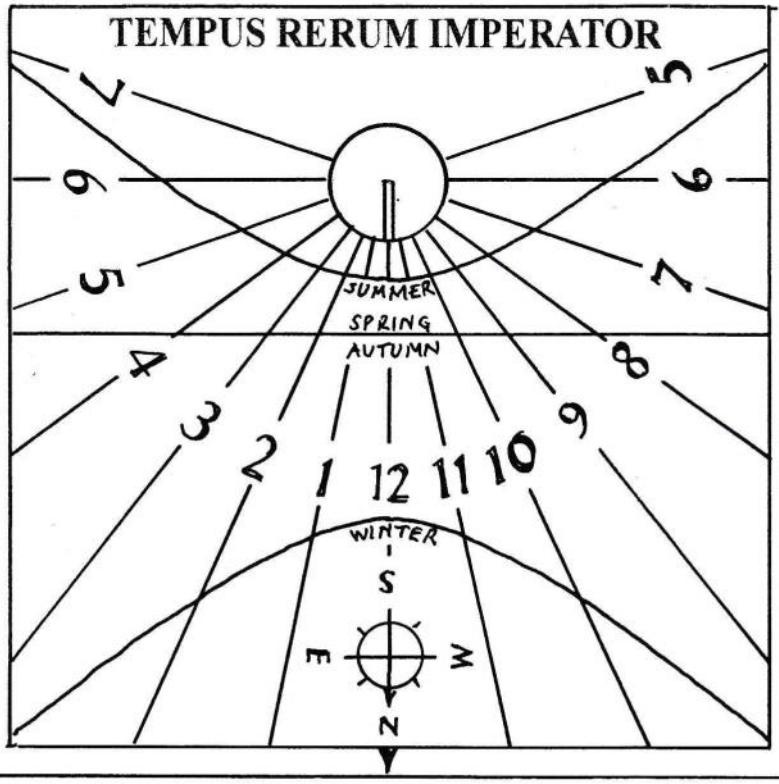
The British Sundial Society

TAB

Minutes correction



TEMPUS RERUM IMPERATOR



Stand the sundial on a sunny window sill.
Use the compass drawing to help you set it in the right direction.
Read the time that is shown by the tip (nodus) of the gnomon.
Find the minutes correction from the graph.
Add an extra hour during summer time.
The result should be clock time.
If not, turn the sundial until right clock time is found.
Keep the dial in that position.
The nodus shadow will also move along the seasonal date curves.

TAB

THE WORSHIPFUL COMPANY OF CLOCKMAKERS
www. clockmakers.org

LIVERY SCHOOLS LINK 2018

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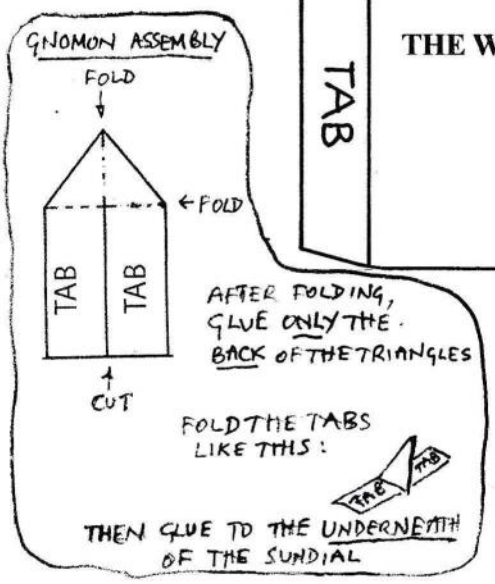

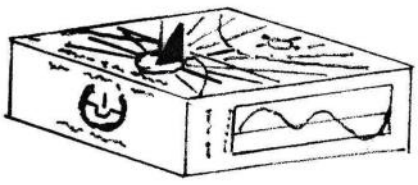

HOW TO MAKE YOUR SUNDIAL

1. Cut carefully round the outside edges of the whole model.
2. With a sharp knife, carefully out the slot for the gnomon in the sunburst.
3. Score along the four sides of the sundial square as well as the tabs, then fold along the lines to make an open box shape, with all the features on the outside.
4. Glue the TABS to make the box.
5. Cut out and assemble the gnomon. Make sure that it fits from **underneath** the sundial into the slot that has alreadybeen cut. The **sloping edge** of the gnomon must be nearest to the **outside** of the sundial.
6. Glue the TABS of the gnomon and fix it in place from **underneath** the box.
   The gnomon should stand straight up. The tip of the gnomon acts as a nodus to indicate dates.
7. Follow the instructions on the side of the sundial to see how to set it up and to use it.

SUNDIAL AT HOTEL CASINO RIDOLA, MATERA SOUTH EASTERN ITALY

MARTIN JENKINS

As part of our holiday touring in June 2017, my wife Janet and I visited the famous city of Matera in south eastern Italy, which is built onto the side of a steep gorge. It is famous for ancient cave dwellings cut into the rock, many of which have been incorporated into more recent houses. The area is known as the Sassi di Matera and is a UNESCO World Heritage site.

Situated some 800 metres from the old city is the Hotel Casino Ridola, which we can highly recommend if you are visiting Matera (Fig. 1). The hotel is quite striking to any sundial enthusiast because, not only is there a lovely painted dial on the front façade (Fig. 2), but the dial schematic is also depicted on the glass entrance door (Fig. 3), on the reception desk (Fig. 4), and on hotel paperwork. In addition, the wall behind the reception desk has a gallery of several old photographs of the hotel.

Fig. 1. Hotel Casino Ridola from the garden showing the dial just below the upper balconies and equidistant between them.

Fig. 2. Close-up of the dial.

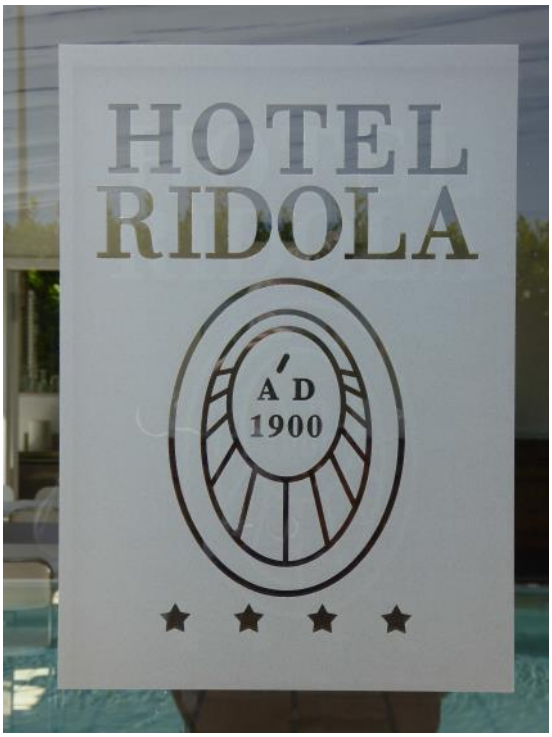

Fig. 3. Dial used as the hotel logo etched into the glass reception door.

Fig. 4. Reception desk detail and wall-mounted photographs.

Fig. 5. Casino Ridola as Studio Tecnico Elettro-Industriale G. Ridola. Photo courtesy Hotel Casino Ridola.

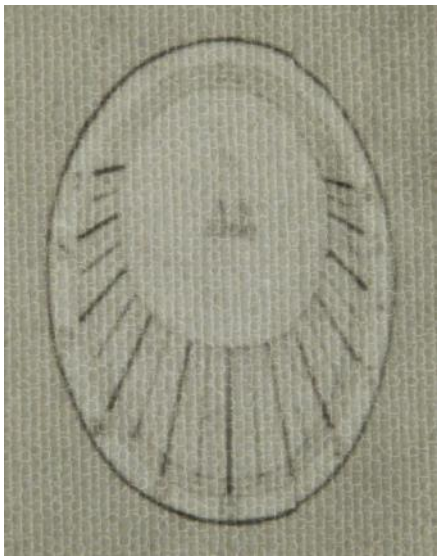

Fig. 6. Enlarged view of the dial, taken from Fig. 5.

Enquiries revealed that the hotel has a very interesting history.

A Brief History of the Hotel

Between the unification of Italy in the late 19th century and the beginning of the 20th century, some noble families of Matera, the Ridola family being one of them, used to build residences (called 'casini') on their country estates in the southern Regione Poliero area of Matera because of the healthy air currents from the Ionian Sea.

The period residence known as Hotel Casino Ridola was built in 1872. It was designed by a famous local architect Leonardo Ridola, brother of Senator Domenico Ridola, who was a doctor and archaeology enthusiast. The National Archaeological Museum in Matera was named after him. The hotel still has its original vaults and pavements, and the sundial on its front façade dates from 1900.

Leonardo Ridola was a skilful architect and when he planned his country residence he oversaw construction to ensure that the building was in good taste for the area and perfectly fitted his living needs. In 1900 Leonardo assigned the residence to his son Gregorio, who, being keen on street lighting, decided to establish his 'Studio Tecnico Elettro-Industriale G. Ridola' at the residence (Fig. 5).

Interestingly, in the photograph of Studio Tecnico Elettro-Industriale G. Ridola (Fig. 6), the dial does not have a clearly marked date or a gnomon. This leads me to conclude that the photograph was taken while the Studio was still being established.

In 1952, the Ridola family entrusted the residence to a caretaking family, reserving for themselves the use of Casino Ridola for the summer months only. In 2003, the residence was sold to the present owners, Signor Cosimo dell'Acqua, an architect from Matera, and his wife Lucia, who have spent two years lovingly restoring it to its original grandeur. They have even purchased and restored some of the original furniture and restored the 1900 sundial.[1]

I have been unable to obtain any information about who painted the original dial or who painted the refurbished version.

Without doubt, this is a beautiful hotel with an interesting history and sundial.

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1. *www.localidautore.com/schede/hotel-ridola-relais-matera-9148*, accessed January 2018.

For a portrait and CV of the author, see *Bulletin* 27(i), March 2015. He can be contacted at *sundialduo@gmail.com*

"THE *VERY* LAST SCRATCHINGS OF AN OLD BIRD"

TONY MOSS

The title is a quotation from *The Horse's Mouth* by Joyce Cary.

After twenty intensive years, discontinuing the production of metal sundials proved to be much harder than I initially anticipated, even after closing the company bank account and being signed off from income tax declaration forms. Whoopee! What a wonderful day that was! The main weakness in my planned departure was the 'please just one more' factor. The last of my brass dial projects used up remaining stock for relatives, friends and neighbours so not really a commercial operation. The real end came with the realisation that I had only two large offcuts from a previous contract remaining. With my local granddaughter Freya attending Newcastle High School for Girls, two sundials seemed appropriate for their mix of historic and brand-new buildings. Possible design sketches were submitted to the heads of the junior and senior schools where they were received with great enthusiasm.

Design work called upon my extensive store of dialling ideas including a favourite compass rose derived from a Cook, Troughton and Simms original. I could never myself aspire to the quality of their master hand engraver's work so I make no excuses for *borrowing* that. The school icon is a stylised seahorse which has appeared in the Newcastle City coat of arms since 1575. A pierced and engraved gnomon with its sub-plate extension deeply embedded in the supporting masonry was chosen for security. The rest of the layout with Roman numerals and local dedication was surrounded by all the names of the 28 establishments nationwide in the Girls' Day School Trust. The main profiles and deep engraving of the gnomon were completed

Fig. 1. Water jet cutting the 9 mm thick gnomon.

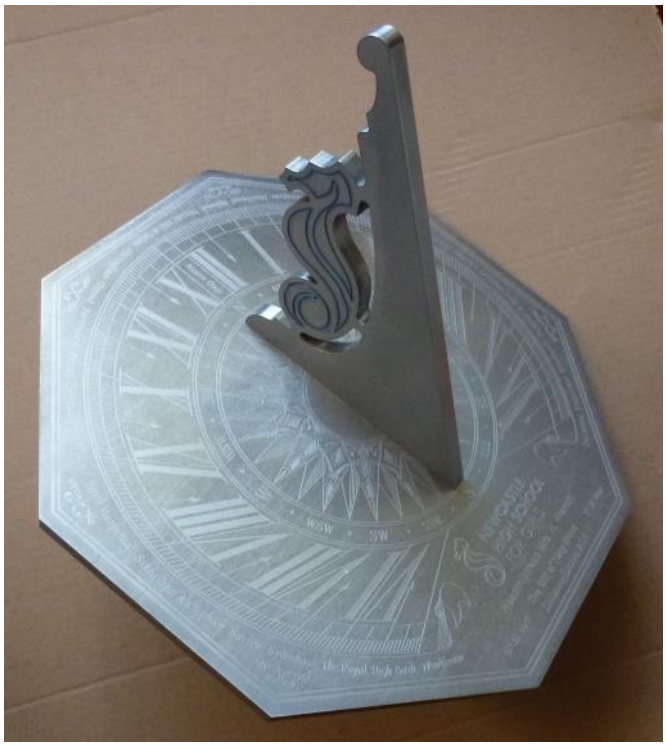


Fig. 2. £XXX worth of stainless-steel 'scrap'.

by a local water-jet cutting company to relieve my stiffening fingers (Fig. 1).

Realizing the designs in metal presented no problems at all for the junior school dial which was to be set among old stone buildings designed by local architect John Dobson. This instrument was tackled first as a lead-up to the senior school dial in its brand new setting on an extensive roof terrace outside their state-of-the-art science laboratories. The result was one of the best plates I have ever made with deeply etched numerals and clear line work filled in the teal blue of the school uniform colour. Etching time was five hours face-down with occasional hand agitation. A rude shock then awaited me as the senior school dial was ready for etching. My usual source of the etching agent said that the distributors were no longer able to supply it for safety reasons in transit. Using old stock gave an unsuitable result even after 30 hours in the tank. With no more brass available it was to be a 'palimpsest' dial etched on the reverse side using an alternative etchant obtained from France. Again there was a sub-standard result and no more brass to use.

The above blind alley led me to consider a stainless steel dial etched by a local commercial company. The result looked good but the etching was pathetically shallow in

places and could not be induced to retain a blue paint 'fill': a costly experiment leading nowhere (Fig. 2).

Final production had now stretched to several months so the school was mollified with full-size, framed 'ano-prints' on 4 mm aluminium as I considered the next stage. The notion of two replacement dials in stainless steel was rejected as the first attempt was below expectations. The brass items fitted the school so well that I decided to upgrade the defective etching laboriously by hand and I still have the partially deadened fingers to prove it. A steel straightedge (clear plastic in Fig. 3) was clamped to the plate rotating about fixed points at the dial origins to ensure accurate alignment and the lines were made deeper with first a scriber then a 'pull burin' of my own devising (Fig. 3). A normal 'pushed' burin could wander or over-shoot in my ageing hands. The result was a very useable dial with a few minor details perhaps not as deep as I would have preferred to match its junior school 'twin' but good for several hundred years, I think.

Haddonstone pedestals were ordered and were unexpectedly received in three separate pieces over the summer holiday. Freya's Dad arranged for a deep and solid foundation in a flower bed at the junior school and the pedestal was assembled and filled with a concrete core within a soft polystyrene lining per the detailed instructions from the suppliers to protect from frost expansion and cracking. This trial run ensured easier assembly three storeys up at the senior school on a solid slate roof decking.

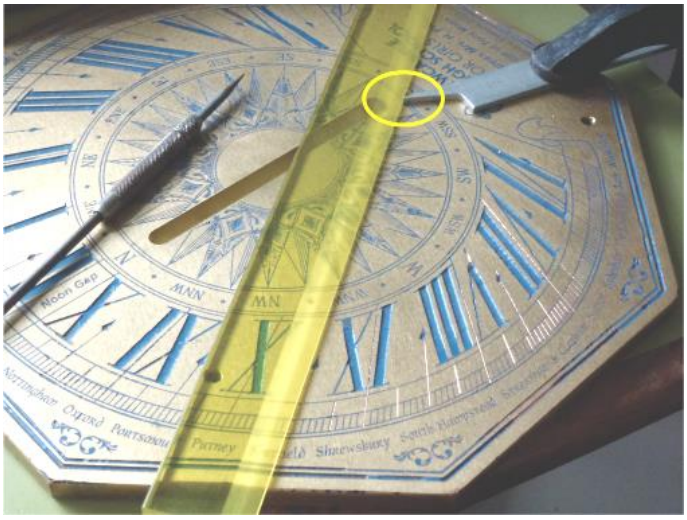


Fig. 3. Re-cutting the hour lines on the senior school dial. A sharp vertical edge clamped over a dial origin aligns the straightedge perfectly.

After a few days for settlement the very last clear sunny days of autumn 2017 allowed for pre-levelling, alignment and final installation of both plates (Figs 4 and 5). This was quite an unexpected late-year bonus in a north-eastern November.

Both dials were inaugurated on the same day with the junior event first, followed by lunch and the senior ceremony (Figs 6 and 7). A short PowerPoint presentation including 'Reading Roman Numerals' was followed by interpreting various shadow examples illustrated by

Figs 4 and 5. The junior school (above) and senior school (right) dials installed.

Fig. 6. The junior school dial unveiled. The adults (L–R) are Miss Angela Charlton (Head of Junior School), Tony Moss, Ms Claire Williams (Deputy Head). Photo courtesy of Newcastle High School for Girls.

Fig. 7. The senior school dial unveiled, with girls from a senior physics class. Photo courtesy of Newcastle High School for Girls.

photographs of the maquette dials in operation. 'How Sundials Work' included dealing with Longitudinal Correction and the Equation of Time.

Fig. 8. Junior girls waiting with curious excitement to see what is under the cover.

The school ethos seeks to prepare girls to be equally employable in hitherto male careers so pictures and explanations of some of the manufacturing processes such as the water-jet cutting process were included to catch the attention of any budding engineers. One 'old girl' of my acquaintance has recently been awarded her Fellowship of the Institute of Mechanical Engineers. As a student on industrial placement she was never afraid to be 'up to the elbows in grease' but is now a scientist in the nuclear industry. During my presentation only one senior girl from a physics group was seen to yawn!

The earlier junior event was sheer delight. On turning a corner with the headmistress and her deputy, expecting a small knot of adults and parents, we were met by a sea of delightful young faces patiently waiting and clearly excited by this mysterious shape under its concealing covering (Fig. 8). This was a happy conclusion to a lengthy and frequently anxious process and the last-ever metal sundials to be made by my own hands.

The Next Dial

Creative instincts never die, I believe, so the next year may see a large stainless steel horizontal dial in my home town of Bedlington with its famous terrier 'rampant' as the support for an overhung gnomon. With any luck I will never lay a finger on any part of it while it is being made and assembled by a local engineering company. The 1-metre diameter stainless steel plate, supported on six colliery winding gear frames, celebrates local historical events and people while the hour lines suggest *black diamonds* being raised from the coal mines of yesteryear. The surrounding 'contrate' gearwheel (crown) should discourage climbers and edge sitters (Figs 9 and 10).

Fig. 9. A scale model of the proposed Bedlington sundial.

Fig. 10. An approximate view of the sundial in place for visual scale. The wireframe of the dial shows only two of the six panels. It is an elevation and lacks perspective depth which would show the top face in this view, reducing the apparent height.

Goodbye to 'Bridget'

There could be no more final act than removing my production machinery (Figs 11 and 12). This industrial-scale equipment in a small domestic garage/workshop I had long foreseen as a future burden for my eventual executors.

Fig. 11. Bridget craned for transport.

Fig. 12. Farewell, old friend!

'Bridget', my beloved Bridgeport milling machine, with all its associated tooling and specialist power supply, was freely gifted to the Tyneside Society of Model and Experimental Engineers where she is showing every sign of a busy future in enthusiastic hands. Farewell dear friend!

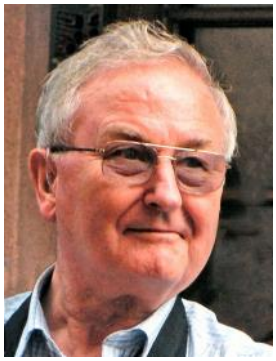
The VERY End.

ACKNOWLEDGEMENTS

Grateful thanks are due to the following for their enthusiastic support of this project:

Mrs Hilary French, Head of Senior School
Miss Angela Charlton, Head of Junior School
Mrs P. De Giorgi, Development Manager

Tony Moss is Jack of all trades... and master of a few. The following scratches the surface.



Professional training: Loughborough College teaching diploma with first class honours: top of his year. Woodwork and cabinet making, engineering workshop practice, silversmithing, blacksmithing, welding and foundry work. Associated art & design work 2D and 3D.

Lifetime interests: Electronics but never got beyond transistors: music and musical instrument making: recorders, flutes, a shawm, small pipe organ, clavichord, octavina virginal all designed and made from scratch. Anything electro-mechanical.

Schoolmaster for six years followed by thirty years running various teacher education courses in H.E. 'Applied Science & Technology'. Retired early as Course Leader of a PGCE course. Co-ordinator Newcastle Science & Technology Education Centre.

Spare time interest as sailplane pilot qualified as Senior Airframes Inspector for the BGA which led to establishment of Lindisfarne Aviation Ltd as M.D. Certificates of airworthiness and repairs.

…and then there was sundialling to fill his declining years!

He can be contacted at *lindisun189@gmail.com*

MINIATURE SUNDIALS FOR SOME WONDERFUL PEOPLE

VALERY DMITRIEV

I made my first sundial ten years ago and have continued making sundials until the present time. It changed my life. I have met many interesting people, most of whom are far from sundials. But they helped me in a lot of my sundials and in my life. That is why I made some little sundials for them to remember. I should like to write about some of these dials.

Gundega Linaare is a landscape architect, many of whose projects are implemented in Riga and other cities of Latvia, and she passes on her skills to students of the Latvia University of Agriculture. In winter she lives in Riga, and in summer she lives in a village on the Baltic Sea; her house is sheltered from onshore wind by sand dunes, but the breath of the sea is felt, because it is just three minutes' walk away. There I invented the small sundial for her – 'Baltic Sea, Seagulls' (Fig. 1).

Fig. 1. 'Baltic Sea, Seagulls'.

Averin Boris Valentinovich (Аверин Борис Валентинович) is a professor of St Petersburg State University, a philologist, and a great expert on the history and culture of St Petersburg. His favourite writer is Vladimir Nabokov, and his favourite place is Peterhof, not far from where he lives. At school his nickname was 'Alphabet', because А, Б and В are not only the first letters of the Russian alphabet, but also the first letters of his full name. Thus was born the idea of the sundial for him – 'Alphabet' (Fig. 2).

Fig. 2. 'Alphabet'.

Vil Yakubovich Yumangulov has been an art historian since 1970, and is chief keeper of sculpture at Peterhof State Museum. The Palace and Park complex of Peterhof is famous not only for its fountains, but also for its sculptures, of which there are more than 600. Vil Yakubovich is not only the keeper, but is also a wonderful researcher of artistic monuments. The emblem of Peterhof is a monogram of Peter I, which served as the basis for the dial dedicated to this wonderful person – 'Peterhof' (Fig. 3).

Elena Eskelinen is an artist, and a teacher at the Siversky Children's Art School. She and I together held the first Russian children's competition for the best sundial project, which resulted in the appearance of the sundial 'Pushkins', described in the June 2012 issue of the *Bulletin*.[1] Her watercolours are gentle and touching; her little daughter is almost an angel. Her sundial is called 'Flower' (Fig. 4).

Fig. 3. 'Peterhof'.

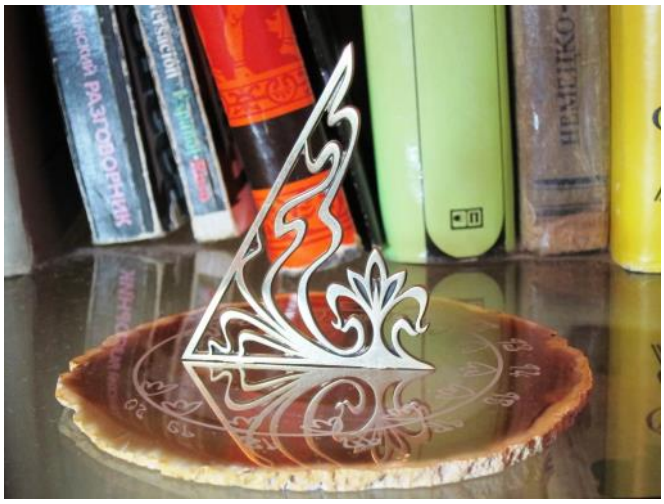


Fig. 4. 'Flower'.

Irina Eduardovna Rizhenko is a historian, and curator of the archive of the Gatchina Museum. Without her help in providing historical photographs and other material, I would not have been able to reconstruct the history of the sundial at Gatchina Palace, and thus recreate this ancient sundial of the 18th century (see the *Bulletin* of December 2011 for details).[2] 'Two Butterflies' was made for her as a token of gratitude to this charming woman (Fig. 5).

Fig. 5. 'Two Butterflies'.

My experience of communicating with officials of different ranks about recreating historical sundials said that the eyes of the interlocutor should open within five to ten minutes, otherwise the conversation will not last more than fifteen minutes, the case is bad and nothing good will happen later.

The conversation with Yulia Evgenievna Kiseleva, the Head of the administration of the Vasilevsky district of St Petersburg, lasted almost an hour. As a result, in half a year it was possible to make and install the sundial of the Siege of Leningrad, described in the *Bulletin* of March 2017.[3] A small sundial for this clever and persistent woman was called 'The Swallow' (Fig. 6).

Fig. 6. 'The Swallow'.

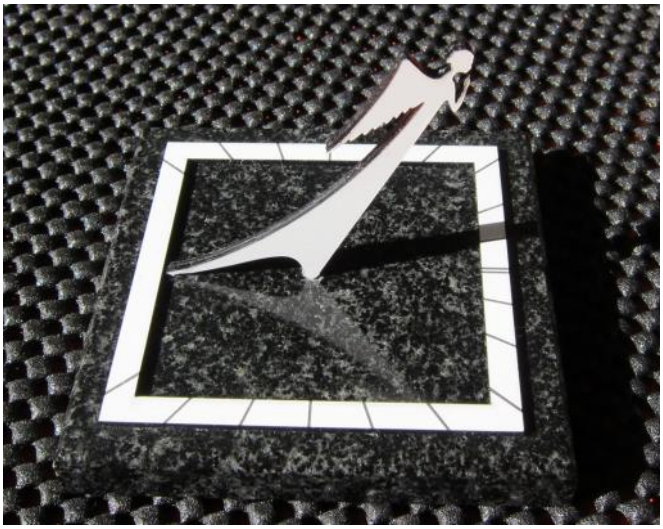


Fig. 7. 'White Angel'.

The seventh, and final, miniature sundial 'White Angel' is a small copy of the sundial at the grave of my parents. Probably, one day, this angel will guard and pray for my soul, too (Fig. 6).

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2. V. Dmitriev: 'Sundial Festival at the Gatchina Palace, St Petersburg', *BSS Bulletin* 23(iv), 14–15 (December 2011).
3. V. Dmitriev: 'Two new dials of St Petersburg', *BSS Bulletin* 29(i), 10–11 (March 2017).

For a portrait and CV of the author, see *Bulletin* 27(iii), September 2015. He can be contacted at *sundials_spb@mail.ru*

A SUNDIAL THAT UNITES: TEDDY PARK SUNDIAL, JERUSALEM, ISRAEL

LUPE FERIA

A version of this article has previously been published in Catalan and Spanish in *La Busca de Paper*, no. 88 (Winter 2017).

In this article I should like to introduce you to an example of a sundial that denotes union for a variety of reasons. It represents not only a personal friendship, but also a union of teamwork in spite of cultural, political and religious differences between Arabs and Jews.

This all began thanks to a link through my friends, Noaa and Juanlu, in the small town of Neot'Hakikar, in Israel. Through my friendship with the couple, I was able to visit Noaa's country. After a great night of celebration in the desert, surrounded by their relatives and friends from around the world, and involving dinner and dancing under the local date plantations, it was decided that we should continue by visiting the city of Jerusalem, the cradle of cultures on the following day.

What was it that caught my attention on arrival? It was neither the Wailing Wall, nor the skyline of the old city of Jerusalem with the golden Dome of the Rock. No! Then what was it? What could attract the attention of a fan of gnomonic projections? What I saw in the distance, in the corner of my eye, was a small sculpture of extraordinary human ingenuity, the sundial of Teddy Park (Fig. 1).

Fig. 1. Plaque at the entrance of Teddy Park, with text in Hebrew, English and Arabic.

Fig. 2. Teodor Kollek. Photo: Government Press Office (Israel). Wikimedia Commons.

Teddy Park is named in honour of Teodor Kollek (1911–2007), Mayor of Jerusalem from 1965 until his retirement from service in 1993 at the age of 82 (Fig. 2).

Many consider Kollek to be the man who transformed Jerusalem into a modern city following the reunification of 1967. He was a founder of the National Museum of Israel, the Municipal Theatre and the Jerusalem Foundation, and the financier of the construction of Teddy Park. In 1980, he was one of those opposed to the declaration of Jerusalem as the eternal and indivisible city of the state of Israel, owing to the risk it presented to the harmony and coexistence of the different religions in this historic city.

Fig. 3. Location of Teddy Park (from Google Maps).

Fig. 4. The sundial of Teddy Park, with the Tower of David and the old city walls in the background.

Teddy Park is situated in the centre of Jerusalem, but outside the Old City, just within the area of the Tower of David, Jaffa Gate, the old walls and Mamilla Mall. It is one of a series of parks and open areas: Mitchell Garden, Ha'atsmaut Park, Ha'emek Park, Teddy Park, The Sultan's Pool, Gei Ben Hinom, Zurich Garden, Blumfield Garden, etc. (Figs 3 and 4).

The Teddy Park sundial is at latitude 31° 46′ 32″ N, and longitude 35° 13′ 34″ E. Its typology is a polar plane with hour lines and half-hour lines, shown as dotted lines and continuous lines respectively, apart from the first and last hours, which do not have lines (Fig. 5).

The stone dial plate is inclined at an angle equal to its geographical location, this being the main characteristic of all polar sundials.

Fig. 5. The Teddy Park sundial.

It contains another element that makes it unique: the N–S axis of the dial plate has an aperture whose diameter exactly matches that of an open ring on the gnomon. At solar noon a spot of light falls on a noon line underneath the dial plate.

Four points on the noon line are labelled with five numbers in circles (Figs 6a and 6b):

- The Summer solstice of 21 June is marked by the number 1.
- The numbers 2 and 3 mark the Spring Equinox on 20/21 March and the Autumn Equinox on 22/23 September respectively.

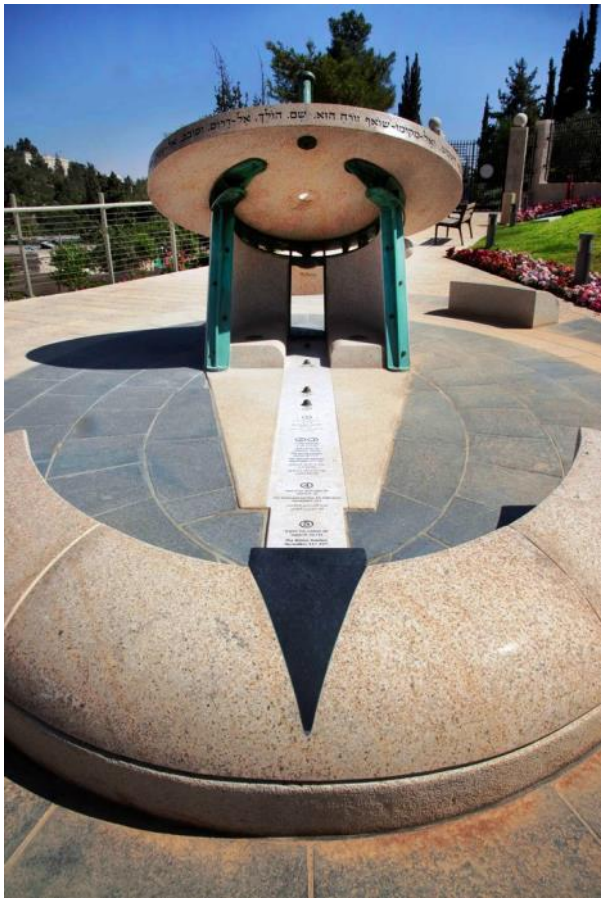

Fig. 6a. The noon line.

Fig. 6b. Close-up of part of the noon line, with explanatory labels.

Figs 7a and b. Information panels.

- Next is the number 4, which marks 17 November, the International Day of Tolerance, in honour of the work of Mr Kollek and the sundial's location.
- Finally, the most distant mark from the quadrant is number 5, and indicates the day of the winter solstice, on 21 or 22 December.

Information about the sundial and how it functions is provided on explanatory panels in three languages – Hebrew, English and Arabic – thus reaching a large number of people, and making the sundial accessible to the general public (Figs 7a and b).

Despite its dimensions, 1.62 metres high, with a major axis of 2.25 metres, minor axis of 1.60 metres, and weight of 2.4 tonnes, the sculptor, Maty Grünberg, wanted to transmit to the spectator the sensation of buoyancy during the observation of this wonderful sundial, supporting it by only three points connected to the ground.

Inscribed on the edge of the sundial is Hebrew text (Fig. 8) that comes from the book of Ecclesiastes, also known as the Book of the Predicator, and one of 24 books that constitute the Hebrew Bible. The text consists of verses 4–6 of the first chapter, as follows:

ד דּוֹר הֹלֵךְ וְדוֹר בָּא וְהָאָרֶץ לְעוֹלָם עֹמָדֶת׃
ה וְזָרַח הַשֶּׁמֶשׁ וּבָא הַשֶּׁמֶשׁ וְאֶל-מְקוֹמוֹ שׁוֹאֵף זוֹרֵחַ הוּא, שָׁם׃
ו הוֹלֵךְ אֶל-דָּרוֹם וְסוֹבֵב אֶל-צָפוֹן סוֹבֵב סֹבֵב הוֹלֵךְ הָרוּחַ וְעַל-סְבִיבֹתָיו שָׁב הָרוּחַ׃

This can be translated into English as:

> A generation passes, and another generation appears,
> but the earth remains forever.
> The sun rises, and the sun goes down,
> and hastens to the place where it rises.
> The wind blows to the south,
> and goes around to the north;
> around and around goes the wind,
> and on its circuits the wind returns.

Maty Grünberg is an Israeli artist who was born in Skopje, Macedonia (the former Yugoslavia) in 1943. Grünberg (Fig. 9) is one of a group of Yugoslavian Jews who emigrated to the new state of Israel in 1948. He studied at the Bezalel Academy of Arts and Design in Jerusalem and completed his studies with honours. For more than 40 years he lived and worked in London, where his interest in, and studies of, sundials were born.

Grünberg explains that once in the neighbourhood of the Greenwich Meridian, that line divided his study. This division made him imagine that he could have one foot in the East and the other in the West of the planet. Here, his interest in time and sundials was born. Another curiosity that Grünberg comments on is that England has the largest collection of sundials despite the fact that the sun shines only 60 days per year on average.

Fig. 8. Part of the Hebrew text on the rim of the dial.

Fig. 9. Maty Grünberg and his sundial.

The sundial in Teddy Park is not the only one designed by Grünberg. In 1999, he created a sundial in a private garden in Ascot, England, and, in 2000, another located in the entrance of the New York Hall of Science, the unique interactive centre of science and technology of New York City (Fig. 10). Both sundials are made of bronze and are of considerable dimensions.

In 2013, he created the sundial in Teddy Park.

The initial plan for "Teddy Park's Sundial" was to build it of bronze, but this was discarded because of the high cost and because of the amount of vandalism from which the city suffers. Grünberg considered Hevron, a popular stone in Jerusalem, but Yaakov Murdoch, owner of Jerusalem Gardens Stone Works Ltd, recommended granite, for its durability. In the end, black granite from Mongolia was used, carved in China and transported to Israel by ship.

The sundial in Teddy Park relied on collaboration with Ilan Manulis, a recognized Israeli astronomer, the director of the Weizmann Institute of Science's Observatory in Rehovot, Israel. On the day that the last measurements were taken, Manulis was joking with Grünberg, that there was a possible deviation of 2 seconds in his calculations, resulting in 2 millimetres of deviation a year.

Fig. 10. Sundial by Maty Grünberg at New York Hall of Science. Photo: CaptainJohn (mapio.net/pic/p-24863564).

The cooperation in the construction of the sundial in Teddy Park is the aspect that makes this dial so special. In spite of cultural, political and religious differences, it represents the cooperation between Arabs and Jews.

The people involved in the project – Maty Grünberg, Illan Manulis, Yaakov Murdoch, Yitzhak Halfon (architect of Teddy Park) and Uri Shitrit (architect of Jerusalem) – as well as all the fans of the sundial, can be proud of this teamwork, and how two religions and two cultures are united by gnomonics.

Grünberg's passion for sundials continues, and he is now working on a new sundial in Macedonia, his native land. His gnomonic works are deserving of another article.

For my part, I would like to add only that, while I do not know when I will return to Jerusalem, I am sure that I will see my new friend again, the sundial of the Teddy Park.

ACKNOWLEDGEMENTS

I am grateful to Maty Grünberg and Illan Manulis for their hospitality in Israel. I always remember the days we spent together. Thank you very much, friends, Shalom.

The Editors of the *Bulletin* are grateful to the Editors of *La Busca de Paper* for permission to publish this English version of the article, and to Conxita Bou for her help.

Lupe Feria lives in Barcelona. She is a Textile Engineer and holds an MSc in Occupational Health and Safety.

She likes travelling, local history and science. She has collaborated with the Societat Catalana de Gnomònica (Catalan Gnomonics Society) since 2015; her work related to sundials includes exhibitions, workshops, several articles and guided tours. She considers gnomonics to be a full science, combining the various disciplines of mathematics, geometry, architecture, history and art, among others.

Currently, Lupe is working on new articles about the sundials she saw recently in Sydney, Australia and Auckland (New Zealand).

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The BSS Gavel

This gavel, made for the Society by John Lester, was used by Chairman Frank King to call the AGM to order at the recent BSS Conference. Photo: Mike Shaw.

NORTH AMERICAN SUNDIAL CONFERENCE ST LOUIS, AUGUST 2017

GEOFF PARSONS

This article is based on a talk given at the 2018 BSS Conference in Norwich.

The 23rd Annual North American Sundial Society (NASS) Conference was held in Clayton, St Louis, Missouri between 19 and 22 August 2017. The conference was arranged to coincide with the full eclipse of the sun. I normally join NASS conferences a few days early to explore the local area. This time my visit included a ride to the top of the St Louis Gateway Arch (Fig. 1), a weighted catenary stainless steel arch and the highest arch in the world at 630 feet; a paddle steamer ride on the Mississippi; and visits to the Old Court House and the Western Expansion Museum. The Louisiana Purchase in 1803 enabled the United States to expand west, and the explorers Lewis and Clark to map and establish routes to the Pacific. I also visited Forest Park, the site of the 1904 World's Fair, and the St Louis Science Centre, which comprises a Science Museum and Planetarium: this provided a special eclipse exhibition.

The NASS and BSS conference programmes are quite similar with presentations and sundial tours. Registration took place on Saturday afternoon and included an auction and presentations. Sunday provided a full day of presentations followed by a book auction and conference dinner.

On the day of the eclipse, Monday 21 August 2017, the delegates boarded a coach for the sundial tour and visited Forest Park to view the Korean War Memorial sundial

Fig. 1. The St Louis Gateway Arch.

Fig. 2. Korean War Memorial sundial, Forest Park.

designed by Mel Meyer and installed in 1989 (Fig. 2). The sundial is a south-facing vertical dial, 10 feet high, and made of stainless steel, which replaces an earlier floral clock. The second dial in front of the Park's Jewel Box, a conference centre, is a standard cast bronze horizontal sundial on a pedestal dedicated to Mary Harrison Leighton Shields by the Missouri Society Colonial Dames of America. There is a symbol of a winged sand hourglass on the dial signifying the flight of time.

The delegates then departed to the Jefferson Barracks 10 miles south of St Louis to view the eclipse. NASS had obtained special permission to enter this restricted and active military training base for uninterrupted views of the eclipse. Lunch was provided, and a Murder Mystery play, 'Murder by Gnomon', specially written for the occasion using astronomical characters, was presented to the great amusement of the audience. After lunch the delegates moved outside to view the Jefferson Barracks sundial (Fig. 3). This is a replacement for an earlier dial, which disappeared around 1964. It is a standard cast bronze horizontal dial very similar to the Leighton dial referred to earlier. It has the same winged hourglass symbol, and both dials might have been cast at the St Louis military Arsenal.

Fig. 3. The Jefferson Barracks sundial.

Fig. 4. Bill Gottesman with his sun spotter.

As the eclipse approached (Fig. 4), the delegates turned their attention to the sky and prepared to view and record the first solar eclipse in St Louis since 1445. The solar eclipse totality occurred just after 1 pm and lasted for approximately 1 minute (Fig. 5). As predicted, the sky darkened, everything fell quiet, and the insects came out to bite. The light gaps through the trees acted as pinhole cameras and projected multiple images of the partially eclipsed sun on the ground. The moment the sun was

Fig. 5. Totality.

uncovered, and a thin crescent appeared, the full strength of the sun was immediately apparent as light levels and temperature were quickly restored.

The sundial tour recommenced with a visit to Missouri Botanical Gardens created by Henry Shaw, an Englishman from Sheffield. The garden is fortunate to have several interesting sundials.

A Richard Schmoyer Sunquest sundial (Fig. 6) was installed close to the start of the gardens by NASS in August 2008, and made by NASS member Bill Gottesman. The sundial has a two-sided gnomon with edges in the shape of an analemma. The Equation of Time is applied by

Fig. 6. Schmoyer dial in the Missouri Botanical Gardens.

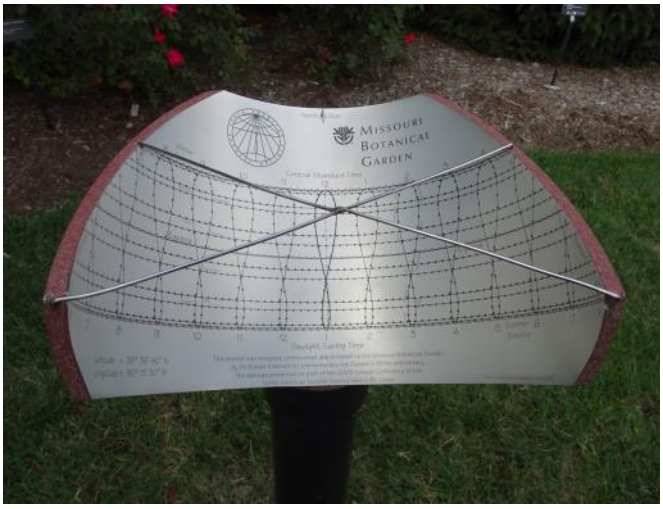

Fig. 7. So-called 'bifilar' sundial.

selecting the appropriate gnomon side. The time can be read by turning the gnomon until a thin line of light from the shaped gnomon slot is projected onto the equatorial scale.

The second dial is described as a 'bifilar' but uses two crossing wires that are physically joined at the centre to cast a shadow (Fig. 7). However, a bifilar is traditionally considered to have two wires that are physically separate and cast independent shadows that intersect. The dial uses multiple analemmata on the hour lines to display standard and daylight saving time. The dial was designed, constructed, and donated by Dr Ronald Rinehart to commemorate the 150th anniversary of the gardens.

Fig. 8. Roger Bailey by his Ottoman sundial.

Fig. 9. Long Elementary School sundial.

A particularly interesting dial is a horizontal sundial on a marble pedestal located in the Ottoman Garden (Fig. 8). It is modelled after a sundial in the Topkapi Palace in Istanbul, Turkey. The dial is unusual in that it displays not only normal hour lines but also Italian and Babylonian hours. Roger Bailey, a NASS member who designed the dial, was able to explain the design features in person.

After leaving the gardens, the delegates visited Long Elementary School to view an analemmatic sundial (Fig. 9). It is an attractive dial of 18 feet diameter constructed in coloured cement surrounded by raised box flowerbeds. It shows the cardinal points and phases of the moon. The dial was dedicated to the long-serving Principal Nancy L. Ferguson on her retirement in 2003.

Fig. 10. Dial at the Beth Hamedrosh Hagodol Jewish Cemetery.

The last dial visited was at the Beth Hamedrosh Hagodol Jewish cemetery (Fig. 10). It is a standard horizontal dial that dates from 1938.

On the final day of the conference there was a brief NASS AGM followed by several more presentations, including one by me on 'Two War Memorial Sundials (Bosworth Field and Darwin)', and another on 'The 3D Printed Sunquest Dial', which several BSS members have purchased.

NASS conferences provide excellent opportunities to visit and explore different parts of the USA and Canada, and to meet friendly, like-minded individuals who share a common interest.

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BSS PHOTOGRAPHIC COMPETITION 2017–18

DAVID HAWKER

The Photographic Competition held at the Annual Conference this year in Norwich comprised an entry of 26 photographs from eleven Society members. It was pleasing to receive overseas entries from Valery Dmitriev of St Petersburg, Donald Petrie in Ontario and David Le Conte from Guernsey. All the photographs entered made an excellent display for members to look at as well as to consider for voting.

For the competition, there was a good return of 39 voting slips from delegates, each vote selecting a first, second and third choice. Three points were awarded for the first selection, two for the second and one for the third. The results were quite close as can be seen from the first three places. The final results were:

Announcements of the winning photographs were made during the Conference and, in the absence of the winning photographer, David Le Conte, and the third place, Ian Butson, Mike Shaw was presented with his second place certificate by our Chairman, Frank King. The certificates for David Le Conte and Ian Butson were later sent to them by post.

Thank you to all who provided photographs and many congratulations to the winning photographers. Thanks too to all those delegates who voted in the competition.

david@hawkerdials.co.uk

First place	(23 points)	*Feeding Time*	David Le Conte
Second place	(20 points)	*Out In All Weathers*	Mike Shaw
Third place	(20 points)	*Just In Time For The Post*	Ian Butson

Out In All Weathers was placed second, having a greater number of 'first' selections.

The remaining photographs making up the top ten places had points ranging from 18 down to 10 and were as follows:

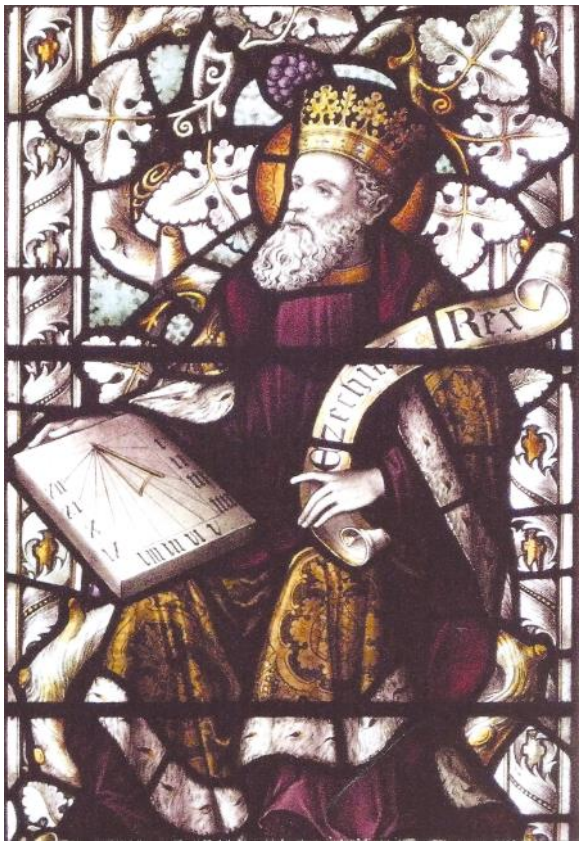
I Can't Quite Put My Finger On This Strange Delineation	Ian Butson
Show Time	John Allen
Gutt(er)ed	John Allen
Time and Tools Wait for This Man	David Le Conte
Baker's Shop Dial	Mike Cowham
Sit-In for Sunshine	Jenny Brown
Take 5	David Payne

First Place
Feeding Time
David Le Conte

Second Place
Out In All Weathers
Mike Shaw

Third Place
Just In Time For The Post
Ian Butson

Top Ten
Take 5
David Payne



Top Ten
I Can't Quite Put My Finger On This Strange Delineation
Ian Butson

Top Ten
Gutt(er)ed
John Allen

Top Ten
Sit-In for Sunshine
Jenny Brown

Top Ten
Time and Tools Wait for This Man
David Le Conte

Top Ten
Show Time
John Allen

Top Ten
Baker's Shop Dial
Mike Cowham

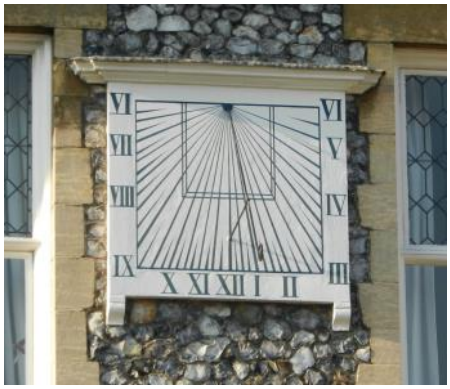
BSS ANNUAL CONFERENCE

Norwich, 20–22 April 2018

The Conference Team of Chris & Liz Williams, Doug Bateman and Bill Visick, augmented this year by David Payne as the local expert, had arranged for this year's Conference to be held at the 4-star Maid's Head Hotel, close to Norwich Cathedral. It is reputed to be one of the oldest hotels in the country, formed from an amalgamation of several buildings. In addition, they had organised a weekend of superb warm and sunny weather.

Friday 20 April

After Registration and tea, we assembled in the cosy Oak Room, where **David Payne** introduced his walking tour of Norwich, to include some of the main sights, and most of the city's sundials. He showed photo-graphs, both old and new, of two dials that were a little too far for the evening's walk, and of one that no longer existed, having been sited on a house that had collapsed! Two groups then set off in the lovely evening sunshine, exploring the Cathedral Close, some most attractive Medieval streets, and some sundials on the way, guided by David Payne (the '60-minute' group) and his friend Rodney Ferguson (the '30-minute group'), who supplied fascinating commentaries.



Friday evening's tour and three of the sundials visited: SRN 2574 in The Close, SRN 2575 on St Andrew's Church, and SRN 8056 on The Old Meeting House.

After an informal buffet dinner, we reassembled in the Oak Room, where BSS Chairman Frank King formally welcomed us to the most easterly Conference so far, at 1° 18′ E.

He then handed over to Chris Williams, who introduced the first speaker of the 2018 Conference…

Geoff Parsons: *An Overview of the 2017 NASS Conference and the Solar Eclipse*

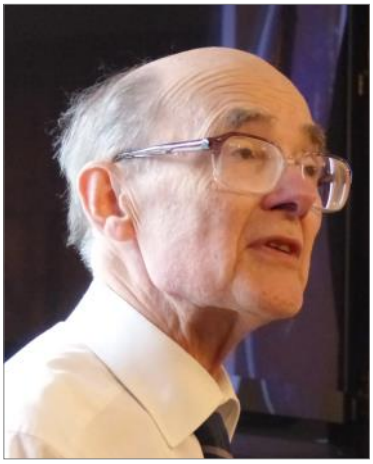
Geoff described his visit to the 23rd Annual North American Sundial Society (NASS) Conference held in Clayton, St Louis, Missouri between 19 and 22 August 2017. A full account appears on pages 34–37 of this issue of the *Bulletin*.

Saturday 21 April

As usual, the formal proceedings of the first full day of the Conference began with the AGM, and this was followed by the morning's presentations.

Frank King: *Modelling the Terminator, the Greatest Shadow on Earth*

One of Frank's friends had sent him a photograph of a granite sphere and had asked how it could be exploited as a sundial. Shortly afterwards, our Webmaster, Bill Visick, mentioned that he had bought a smart watch and wanted to program it to display both the time and the position of the Earth's terminator. These unrelated events prompted Frank to draw an orthogonal projection of the Earth. His mathematical model incorporated 24 lines of longitude and five lines of latitude. The drawing was partitioned into two regions, one light and one dark. The border between the two is the terminator.



Frank showed how the owner of a sphere could determine not only ordinary sun time and solar declination but also Babylonian hours, Italian hours and unequal hours. On his model, Babylonian hours and Italian hours run from the Antarctic to the Arctic and not just between the tropics. This is because he was plotting hour angle against latitude for a fixed solar declination rather than hour angle against declination for a fixed latitude.

As a finale, Frank showed how the time lines for Islamic prayers could be drawn on the sphere. He noted that, in general, none of the five lines extends from pole to pole but added that Islamic scholars have ways of modifying the rules to deal with special cases.

John Davis and Michael Lowne: *The Double Horizontal Dial: An Update*

This talk (presented by John) was an extension of John and Michael's 2009 BSS Monograph on the subject, describing the developments in the intervening period. The catalogue section of the monograph had listed all of the 66 historical double horizontal (DH) dials from the 17th and 18th centuries known at that time: another 11 have since come to light. In addition, a few of the known dials have been resold at auction allowing further studies to be made. The list of makers of DH dials starts with the great Elias Allen (starting in the 1620s) and his apprentices and their apprentices in turn. Two unrecorded Elias Allen DH dials were auctioned in London on consecutive days in 2012 though the authenticity of one of them was shown to be dubious. An unsigned and undated dial was auctioned and identified by a European member: it is in the very early Allen style and has been confidently attributed to John Allen, previously with only one DH dial to his name. The most productive DH dial maker of all was Henry Wynne at the end of the 17th century and evidence for two previously unknown examples of his work, of very high quality, was found by David Bryden in the Warwickshire Record Office in the form of paper proofs pulled directly from the engraved brass dial plates as an intermediate step in producing paper dials by the 'counterproofing' method. In addition, the Wynne dials for Lord Cornwallis and the Earl of Lauderdale were auctioned again allowing some errors in the catalogue to be corrected, though unfortunately the new owners are again unknown to the speaker. The finding of dials by Nathaniel Witham and Nathaniel Anderton – both London instrument makers previously without a recorded

DH dial – allowed some 'holes' in the tree of DH dial makers to be filled in, though unfortunately the prominent lack of a dial by Walter Hayes remains a glaring omission. These two examples were found 'in the wild' – on pedestals in someone's garden, so there is every incentive to keep looking. Other new names added to the list were Anthony Thompson and John Dougharty, the former again fitting neatly into a gap in the makers' tree but the latter a mathematical teacher rather than an instrument maker and thus probably the designer rather than the artisan. The talk concluded with a few modern DH dials made since 2009.

Brian Huggett: Heliochronometer Research and Development in the Garden Shed

Brian described how, just two years previously, he had known nothing about sundials. Looking at sundials when visiting open gardens with his wife, however, had inspired him to try to make one for his own garden that showed clock time in a simple manner.

The resulting heliochronometer, now called Mark I, is described in the September 2017 *Bulletin* and, in greater detail, at *http://bit.ly/huhe01*.

Contact with the BSS and experience of using Mark I had led Brian to identify the strengths and weaknesses of his first dial – both in terms of design and construction. Mark II had thus emerged which had attempted to employ the strengths and address the weaknesses of its predecessor.

Mark II is described in the March 2018 Bulletin and, in greater detail, at *http://bit.ly/huhe02*. Modifications had included greater ease of reading the timescale at equinoxes, PTFE to facilitate the rotation of moving surfaces, and a new EoT correction mechanism based on that of the Pilkington Sol Horometer.

Brian now believed that his ideal garden heliochronometer might resemble Mark II, but be adjustable for latitudes and longitudes within the British Isles and include a scale to show the date – it was back to the garden shed, therefore, to design and build Mark III.

Fred Sawyer: *E.G. Hewitt – Sundial Patentee*

Fred presented his research on the inventions and dials of Edward Gurnee Hewitt, an early 20th century member of a well-known New York and New Jersey family. Until recently, Fred did not know of any existing dials or instruments traceable to Hewitt, but he has now found a garden dial clearly attributable to the man. The dial has a list on its side of the numbers of the first four of Hewitt's seven sundial-related patents – thus allowing the dial to be dated to 1905. Interestingly, none of the four patents had anything to do with the dial itself; they appear to be simple witnesses to Hewitt's bona fides. Fred reviewed each of Hewitt's seven patents – the fifth of

which was for the dial he found. He also traced Hewitt's path to becoming a rich man by selling both paper and glue wholesale – and noted that although his wealth came from stationery sales, his obituary described him simply as a sundial-maker. Finally, Fred took on the task of dating the two monumental dials he has now been able to attribute to Hewitt; they were initially given dates of

1888 and 1991, but all of Hewitt's dials were made between 1905 and 1917. The first was given to Trinity College (Hartford, CT) as a gift from the Class of 1888 – but the date problem is easily explained if the gift was made on the class's 25th anniversary. The second problem was more difficult to resolve. The dial was erected at Columbia University (New York, NY) in 1991 in memory of a former Dean. Close examination made it clear that the gift was called the 'Camp Columbia Sundial', suggesting that it may have been moved from its original site. Investigation showed that for much of the 20th century, Camp Columbia was a rustic camp in Connecticut that all Columbia engineering students had to attend. University records and a previously unseen inscription on the dial established that it was presented to the Camp in 1933 by Hewitt Crosby – the nephew and executor of E.G. Hewitt. In 1931, Crosby had just inherited Hewitt's stock of sundials from his father who had received them in 1917 in the will of his former partner, E.G. Hewitt.

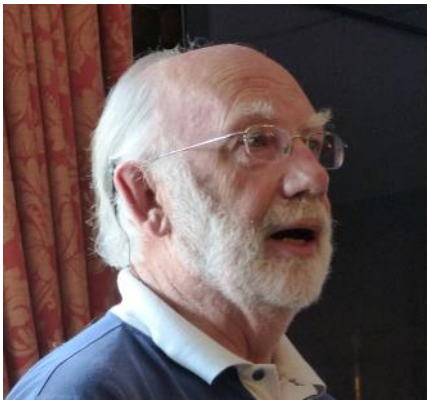
David Brown: *A Life in a Year of a Sundial Maker*

The first possible new commission of 2017 was mooted during a visit to the family at Doha, where David's daughter and son-in-law are teaching at Sherborne Qatar School. A suitable site was found, sun sights taken and preliminary discussions held with senior staff. However, like many others, this project will almost certainly be defeated by a combination of lack of funding, logistics and a national blockade. Discussions are ongoing about restoration of another analemmatic dial installed for the Millennium in Ringwood, Hampshire; it has been damaged beyond repair by the vehicles of the market traders driving over it.

David uses Helmut Sonderegger's computer programme 'Alemma' to delineate analemmatic sundials and 'Sonne', by the same author, for horizontals and verticals. These latter are more often private commissions, to mark birthdays and other anniversaries. David showed us slides of the 70th, 80th and silver wedding anniversary horizontal dials he created last year, whilst an elegant vertical dial marked the completion of a house extension in Cumbria. David also collaborated with a fellow member of the Somerset Guild of Craftsmen to produce a stained-glass sundial.

These were all one-offs, but at Cheney School in March, the BSS input was once again provided by David with Chris and Liz Williams supporting the mass production of horizontal card dials by many children and young people passing through the Iris Classics Centre taking part in the Festival of Ancient and Modern Science (opened by Sir Robert Winston!). Then a master A4 copy was hastily prepared and posted off to Joanna Migdal who printed several hundred copies for the Worshipful Company of Clockmakers at the Schools Livery Link Showcase at the London Guildhall, attended by Andrew and Phyllida James, and Joanna (see pages 20–21 of this issue of the *Bulletin*). Finally, at the end of November, all the children in year 5 at Britannia School in London's Dockland, in three class groups of 20 throughout the day, made one of these card dials as the climax of a talk and demonstration given by David; the concept really came to life for the children as a powerful torch was beamed onto each model, producing the shadow.

This trip to London also produced another highlight of the year – the surprise discovery of a Henry Moore sundial at the back of St Stephen Walbrook Church. A 'new' dial was also discovered on the church at East Harptree in Somerset, during a planned visit to view the vertical dial on the



Manor House, recently restored by Harriet James and originally investigated by David in response to a BSS Help and Advice enquiry. A planned diversion on the way home from Bristol one day also led to the sundial at Blaise Hamlet, mentioned by a friend now in Cumbria, but not before seen by David.

However, the life of a sundial maker does not consist entirely of making sundials and as the Summer term nears its end requests come from former colleagues at Kingswood School for small lettered plaques as leaving presents for the current generation of staff. Recently, David has been able to use for this purpose slices from a core of slate salvaged from the waste tip of the Wincilate slate quarry near Machynlleth (a limited source of good slate) which are a handy size for the carving of initials, dates and sometimes an image or the school badge. Larger scale lettering is needed for house names, memorials or refurbishment jobs. Last year's jobs included refurbishment of a large roundel marking the centenary of the Mendip Golf Club and a gazebo plaque at Kingswood School on Lansdown, Bath. His work is usually in slate or limestone, but occasionally in wood as was a platter for the Falklands HMS Sheffield veterans. Letter cutting per se has also been the subject of workshops David has run during the year.

David's talk with ended with a couple of slides showing work continuing into another year: the completion of a large

An attentive audience.

Photo: Bill Visick

stainless steel vertical dial at in Tetbury: and the early stages of new dial for St Peter in the East, Oxford, which houses the Library of St Edmund Hall.

In introducing the afternoon's coach tour, **David Payne** showed three delightful archive films: the formation over the millennia of 'The Great Estuary', the herring season at Yarmouth in full swing, and tourism in Great Yarmouth in 1950.

Saturday afternoon

After lunch we set off from the hotel in our coach, first to St James Hill with the handsome Café Britannia and Prison building, and a magnificent view over the city. We then left Norwich and headed eastwards, to a detailed commentary from David, who pointed out places of interest, including some bat bridges on the recently-opened Norwich Northern Distributor Road, which were new to many of us.

At Farrows Wood, North Burlingham, we all descended from the coach and walked the short distance to a polar dial of 2014, included in David's "Burlingham Walks and Sundial Trail". After taking our own pictures of the dial, we gathered round it to pose for the official Conference photograph.

Back on the coach, we made our way to Yarmouth along a toll road of 1830, that floated on a wood mattress of willow. On either side there were several windmills formerly used for draining the surrounding marshland.

After a rapid tour of Great Yarmouth, the coach headed back westwards, through the attractive little market town of Acle, and so to David's home village of Lingwood, making a detour to glimpse a black granite cube with five dials in Austin's Wood (SRN 7813; see "Take 5" on page 39 of this issue of the *Bulletin*). After welcome refreshments at Lingwood Village Hall, we headed back to Norwich for drinks and the Gala Dinner.

Following the Dinner, Mike Shaw conducted a mini auction: Martin Jenkins had very generously donated one of his slate dials and, not to be outdone, John Lester had found a somewhat smaller dial in a local antique shop, and placed that in the auction, too. Elspeth Hill successfully bid for the polar dial, and Sarah Schechner secured the little antique item.

At Farrows Wood polar dial.

Sunday 22 April

John Wilson: *Sundials at Two Country Houses in North Nottinghamshire*

John gave two short talks on the sundials at two houses in North Nottinghamshire, the area known locally as the Dukeries, which consists of old estates held by great land-owning families. The families were all inter-related by marriage. In his first talk, on *The Sundial at Hodsock Priory, Nottinghamshire*, John explained that the house at Hodsock had never been an actual priory. The oldest part of the house is the Tudor gateway. The original Tudor building had been replaced over the years with the present house which had passed through various owners and was currently in the hands of the Buchanan family. The grounds of the house are opened each spring for the

After the auction: Elspeth Hill with Martin Jenkins, who made and donated the dial.

Sarah Schechner and Ken Launie, happy new owners of the dial donated by John Lester.

public to view the collection of snowdrop varieties. In the garden there is a fairly standard pattern horizontal sundial which originally came from the home of an ancestor of the Buchanans and was moved to Hodsock in 1968. An examination of the sundial showed that it had never been orientated correctly and so would not give an accurate solar time. In addition, the dial plate is very

corroded. However, the sundial bore a maker's name, Jos^{h} Wilson of Stamford. Investigations revealed that Joseph Thomas Wilson was a watch and clock maker, jeweller and engraver whose family had lived and worked in Stamford for several generations. Joseph inherited his uncle's watch-making business in 1818. John suggested that the maker of the dial may have been either Joseph himself or his nephew Charles Ryan who worked with him.

In his second talk, John described *The Heliochronometers of Rufford Abbey*. Unlike Hodsock, Rufford started out as a Cistercian monastery in the 12th century. Following the dissolution of the monasteries by Henry VIII, Rufford was bought by George Talbot, earl of Shrewsbury and his wife, Bess of Hardwick. In the 17th century, Rufford passed to the Savile family with whom it remained until 1938. The second Baron Savile was a close friend of King Edward VII, and the King and Queen Alexandra were regular visitors to Rufford. When the king died in 1910, Lord Savile erected a monument in the form of a pillar with a memorial plaque, and purchased a Pilkington and Gibbs heliochronometer, reportedly at a cost of 10 guineas, and had the instrument mounted on the memorial. The memorial was placed in the Rose Garden near to the house. When the Rufford property and the house contents were sold at auction in 1938, the heliochronometer was bought but the memorial plinth was not taken. Rufford Abbey is now known as Rufford Park and is the property of Nottinghamshire County Council. It is a popular venue for families and much has been done to improve the amenities. In 2009, the council decided to restore the Rose Garden and reinstate the memorial to King Edward VII, replacing the original heliochronometer with a modern heliochronometer. The council officers stipulated that the device had to be vandal-proof as it was to be in a public park. This precluded the usual mechanism for the equation-of-time correction. The commission to produce the heliochronometer was given to Mr John Gunning, who made the new instrument from stainless steel. The back-sight bears the analemma to correct for the equation of time. So, Rufford now has a fine modern heliochronometer in the restored Rose Garden, as a fitting memorial to King Edward VII.

Fred Sawyer: *Foster Point and Homogeneous Analemmatic Dial Designs*

Fred discussed a variety of ways to modify an analemmatic sundial to indicate mean civil time. He began with a simple review of two approaches he has previously published, based on reversing the ancient technique of drawing an ellipse using two concentric circles the ratio of whose radii equal the sine of the latitude of the dial. Using horizontal or vertical lines from the ellipse to the

circles, it is possible to read the time from equispaced hour points on the circles themselves, making it very easy to adjust for mean time. Fred then showed the clever solution developed by Hendrik Hollander that employs an Archimedes trammel with one stationary shuttle to move the entire traditional declination scale on the analemmatic dial up and down in the course of a single day. The gnomon is turned on the end of the trammel's arm to the south of the ellipse and moved until its shadow falls on the current date on the constantly moving declination scale. The final position of the gnomon indicates the time on a circular scale of equispaced hour points, and the ellipse itself is not needed. Finally, Fred presented his new arrangement based on the Foster Point, a nomographic device invented in the seventeenth century by Samuel Foster. Although Foster's idea applied only to a circle, Fred established that it could be generalized to the case of an ellipse and gave a simple geometric construction to find the Foster Point on the centre line of an analemmatic sundial. If an alidade centred on this point is turned until it touches the usual intersection of the gnomon's shadow on the ellipse, the other end of the alidade will touch the ellipse in a new point. Another simple geometric construction gives the centre point of a circle; a chord of the circle through the new point and the dial's noon point indicates the mean time on the circle, once again on an equispaced scale of hours. This construction included several elements, but Fred showed how they can all be brought together efficiently to form a single instrument.

Johan Anton Wikander: *Milton Abbey, Dorset – The Understanding of the Mass Dial*

After the BSS Nottingham Conference 2015, Johan Anton Wikander visited Milton Abbey in Dorset to study this particular mass dial. Tony Wood had told him about this mass dial and had given him a copy of *The BSS Recorder,* Cambridge Edition April 2007, where the mass dial is briefly mentioned. The mass dial is a vertical dial, and it is said in *The Recorder* "that the numerals mysteriously went the wrong way". The Roman numerals are carved clockwise and not anticlockwise which would be correct.

The staff at Milton Abbey found a ladder for him, four yards high, and he stood

against the south wall in bright sun for about three hours. He identified all the numerals, radial lines etc. He taped a piece of plastic to the wall and made an exact drawing of the mass dial, scale 1:1, the way he does it in Norway and Sweden when he studies sundials and carved compass roses.

The mass dial is carved upside-down and does not have Roman numerals all way around. At the top there is a cross, not the Roman numeral XII which would be expected.

His conclusion is that this particular dial is a symbol for human life. At the 6th hour, when the sunbeam is horizontally coming from the East, you are born. Then your life is counting down until your life reaches the top of the dial and the cross next to the sky. You then reach Heaven! This dial is linked directly to the way of thinking in The Middle Ages when the mass dial was carved.

Before the next presentation, **David Hawker**, Organiser of the BSS Photographic Competition 2017–18, announced the results; these are given in full on pages 37–39 of this issue. The top three were David Le Conte (1st place), Mike Shaw (2nd) and Ian Butson (3rd). Of these, only Mike had been able to attend the Conference this year, and he was duly presented with his certificate.

John Davis: *Negative Muons and Sundials*

This was a rather unusual talk with a subtitle of 'particle physics and quantum theory for diallists' though it was promised that there would be no equations! It was designed as an introduction to some collaborative experiments scheduled to be performed on a selection of early sundials at the Rutherford Appleton Laboratories (RAL) facilities in July this year. The talk began by explaining the need to gather as much information as possible about all early scientific instruments, including their

metallurgy. An analysis method which readers of *Bulletin* articles will be familiar with is X-ray fluorescence (XRF) and John showed the advantages which led to his using it, the underlying physics behind it, and some samples of the results it can produce. But he also showed its limitations in analysing only a very shallow sub-surface region of a

Chairman Frank King presents the certificate to Mike Shaw for his Second Place in the Photographic Competition.

sundial plate which is a particular problem if it is heavily patinated or inhomogeneous. The potential use of negative muons (exotic sub-atomic particles created in high-energy neutron collisions) might be a way of profiling alloy compositions deep in a sundial plate in a totally non-destructive manner. The source of the muons (both negative and positive) is RAL's 800 MeV pulsed proton synchrotron, located on the Harwell site near Oxford and one of only five in the world. The facilities look like a slightly smaller version of the Large Hadron Collider at CERN with a large ring buried behind feet of concrete before the beam of neutrons travelling at close to the speed of light exit and are used to create the muons (which have a half-life of around two microseconds) which will impinge on the sundials. Watch this space!

The Andrew Somerville Memorial Lecture

Sara Schechner: *Sundials that Tell More than the Time*

Drawing upon the exquisite collection of sundials and time finding instruments at the Adler Planetarium in Chicago—currently being catalogued by the speaker (vol. 1 is in press!)—this talk was illustrated by sundials made between 1500 and 1900 out of silver, gilt brass, ivory, wood, and stone. Whether or not they were designed to be portable or fixed, pocket-sized or monumental, humble or princely, all told the time with an accuracy that suited their users' needs. But in studying these dials, we should not stop there. Many dials did far more than tell the time then, and they continue to do so today.

How is that? Like the "dyer's hand" in Shakespeare's Sonnet 111, a sundial's "nature is subdu'd / To what it works in." Early sundials did not exist in a cultural vacuum. By critically examining them, we can see the influence of the societies in which they were made and used. These material objects tell stories of race, empire, labour, religion, fashion, and politics.

For example, the speaker examined two sundials that evoked political power: One was made in 1547 by a Lutheran prince, Ott-Heinrich, when his castle at Neuburg an der Donau was under siege by Holy Roman troops. The dial was appropriately inscribed with his motto: *Mit der Zeit* (All in good time). The other

dial (by Schört, Paris, 1638) served as a diplomatic pass for Jacques de Stavay-Molondin, a French military commander. It carried a secret code.

Among dials that expressed the authority of religion, the speaker showed a gilt cruciform dial (from the Schniep workshop in Munich, c. 1560) that houses the bones of four saints and a wooden astronomical compendium (by Etzlaub, Nuremberg, 1513) with a road map for pilgrims en route to Rome. These were complemented by an English, 18th-century sundial made for the Turkish market; it has a qibla indicator to find the direction of Mecca.

Complex polyhedral dials of the 16th and 17th centuries were explicated as dissertations on mathematical astronomy and ostentatious shows of education. Other dials were fashion statements, announcing to friends the latest trends in Paris, Augsburg, London, or Nuremberg from *haute couture* and counterfeit luxury goods to copycat pocket dials of lesser materials for the middling sort.

Some sundials not only encouraged time discipline to those that would look upon them, but also gave evidence of labour relationships. A brass sundial mounted over a plane table compass (by Haye, Paris, c. 1690) could have helped a surveyor keep track of billable hours in the field. By contrast, a fine, gilt, window-sill dial (by Schissler, Augsburg, c. 1562) sports the figure of a black African man standing amidst hour lines and holding a staff from which stretches the string gnomon. The dial makes it clear that a slave is at his master's beck and call at all hours. And then we have the extravagantly carved limestone garden dial by Father Bovius, Eichstätt, 1719, which fawns over its noble patron as it lists the maker's academic credentials. This is not a sundial, but a job application.

The mention of slave labour brought up the topic of imperialism, and how sundials served colonial administrators and military officers in the Americas. The speaker also touched upon how sundials regulated clocks before the tables were turned by the needs of railroads, leading to clocks regulating the dials.

After lunch, the Conference was over and delegates dispersed, with next year's at Bath to look forward to, and, before then, the September one-day meeting at Newbury.

Thanks and congratulations are due to the hard-working and efficient Conference Team for another highly successful Conference, and to David Payne for providing so much local information, by way of tours and supplementary background notes.

Notes by the speakers

Photos by Mike Shaw and Christine Northeast

Anthony J. Turner Wins The 2018 Paul Bunge Prize

We are delighted to report that BSS member and *Bulletin* contributor Anthony Turner was awarded the 2018 Paul Bunge Prize at the General Assembly of the German Bunsen Society for Physical Chemistry at the University of Hannover on 10 May. The prize honours outstanding work on the history of scientific instruments and recognises Anthony's lifetime achievements (over 40 years and 200 publications) in the field, focusing on astronomical and mathematical-physical instruments.

Anthony was born in Newbury Park, UK, and studied history at Wadham College, Oxford. He has run an antiquarian shop for history of science and technology in Le Mesnil-le-Roi in France for many decades and is a freelance expert for auction houses and curator of exhibitions.

JD

MINUTES OF THE 29th BSS ANNUAL GENERAL MEETING
Norwich, 21 April 2018

The AGM was chaired by Frank King (Chairman) with Chris Williams (Secretary) and Graham Stapleton (Treasurer) in attendance.

1. Minutes of 2017 AGM

The minutes of the 28th AGM, held at Oxford on 22 April 2017, were published in the June 2017 *Bulletin.* As no comments had been received by the Secretary, they were taken as read.

2. Receive 2017 annual statement of accounts and the 2017–18 trustees' annual report

Both documents were circulated to all members in the March 2018 *Bulletin.* No comments were received before, or made at, the AGM. The Chairman confirmed that both the accounts and the trustees' report had been received by the membership.

3. Election of charity trustees

Graham Stapleton and Chris Williams retired by rotation. Both were willing to continue to serve and offered themselves for re-election.

Graham Stapleton and Chris Williams were both elected to the office of charity trustee.

The Chairman took the opportunity to thank all volunteers, in whatever capacity, for their contribution to the Society's activities.

4. Appoint examiner for 2018 annual statement of accounts

Independent Examiners Ltd was appointed.

5. AOB

No other business was raised.

Secretary
27 April 2018

A Dial Displaced by a Bridge: Dial Square, Norwich

David Payne

Fig. 1. Early postcard of "Dial Square", courtesy of the Norwich Society.

Fig. 2. SRN 6855 on the much-reduced building today.

This dial was described in a presentation to Conference delegates before their evening walkabout in Norwich, but not included in the tour.

The photograph in Fig. 1 can be dated to before 1923, for in September that year a new bridge across the River Wensum was first opened to traffic; a newly constructed approach road to the bridge encroached upon Dial Square, which was thus reduced in size to a mere "Dial Corner" (Fig. 2).

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