BSS Bulletin 27(ii)

The British Sundial Society

BULLETIN

VOLUME 27(ii)

June 2015

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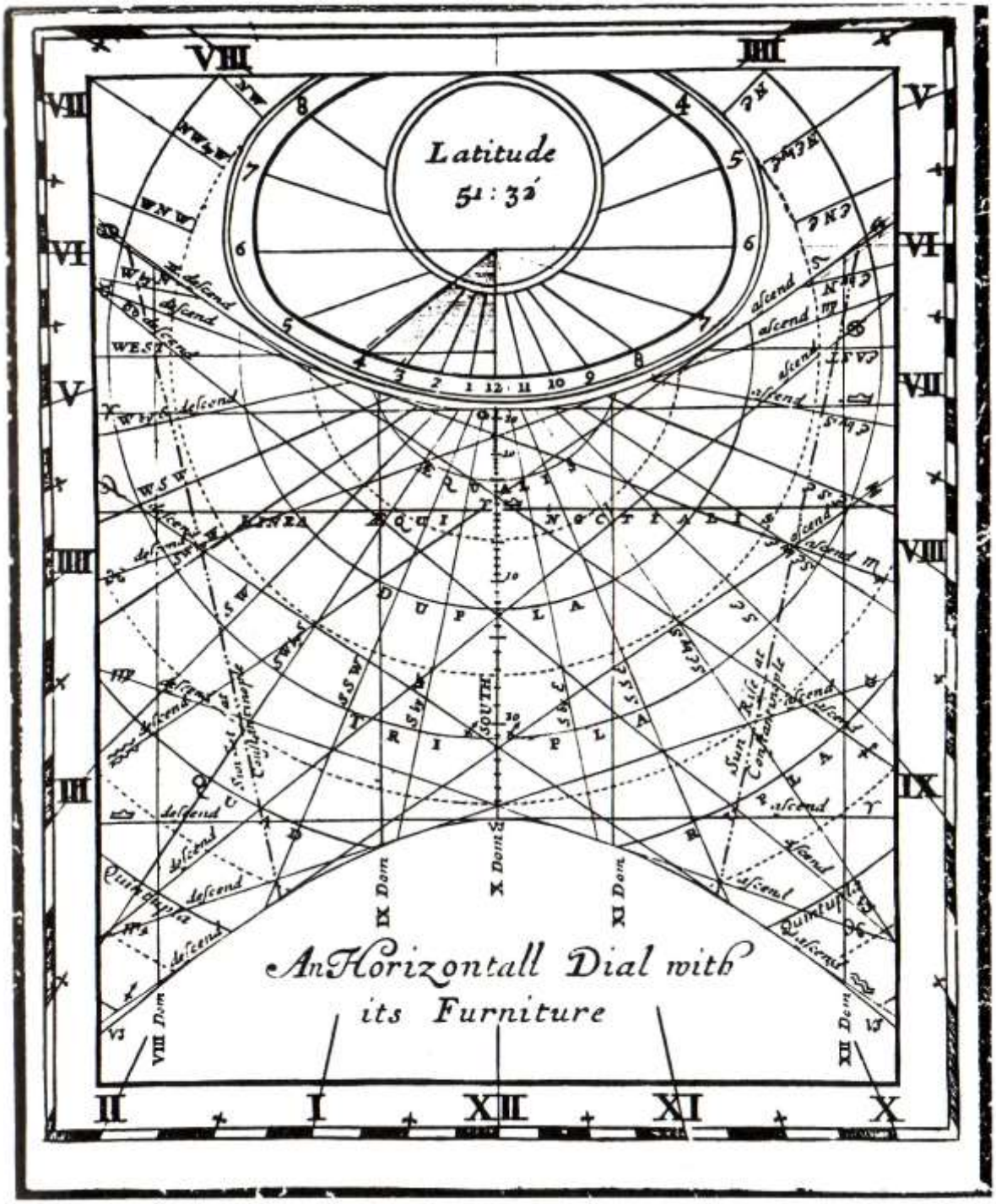

Dial furniture (Leybourn, Dialling, London 1682). Waugh (Sundials: Their Theory and Construction, Dover, 1973) endorses the original author who wrote "Though to speak my own judgement, I think these kinds of Additions rather for Ornament than use...because the multitude of lines often hinders those that are not used to them to tell the Hours of the Day, which is the chief use of Sun Dials."

Front cover: *CAPTION NEEDED*

Back cover: *Glass sundial at the Pewterers' Company Hall, a copy made by Opus Stained Glass. See the story on page 15. Photo from Geoffrey Lane.*

Editorial team: John Davis , Frank King and Christine Northeast.

Printed by The Lavenham Press Ltd., Lavenham, 01787 247436

BULLETIN
OF THE BRITISH SUNDIAL SOCIETY

ISSN 0958-4315

VOLUME 27(ii) - June 2015

CONTENTS

EDITORIAL

This issue of the *Bulletin* includes the usual wide range of articles beginning with an account by John Davis of another most interesting quadrant unearthed by a metal detectorist. Towards the other end of the *Bulletin* readers will find a report on the recent conference in Nottingham and the Minutes of the AGM. Although correctly numbered the 26th AGM, this was the first time that the new constitution applied and there are a few very slight differences. The new constitution requires two formal documents to be published each year: the Annual Statement of Accounts and the Trustees' Annual Report. From 2016, these will be published in the March *Bulletin*.

During the Conference, delegates were invited to vote on the most enjoyed article in the 2014 issues of the *Bulletin*. We are delighted to announce that the winner was Mike Shaw's article 'The Eaton Hall Sundial Pillar: A moving story of deviant orientation' which appeared in the September issue. Mike will receive the customary award.

Chris Lusby Taylor, who conducted the poll, further reports that joint second were Doug Bateman's 'John Carmichael – Sundial Maker in Arizona' and Dennis Cowan's 'In the Footsteps of Thomas Ross', with honourable mentions to John Davis and Frank King.

THE CHETWODE QUADRANT
A Medieval Unequal-Hour Instrument

JOHN DAVIS

This article is an extended version of one which was originally written for *The Searcher* (May 2015), a monthly magazine for metal detectorists. It describes a quadrant found near Chetwode, Buckinghamshire, in October 2014 by the amateur metal detectorist Simon Neal of Oxford.

Fig. 1. The Chetwode quadrant. Photo © Simon Neal.

The quadrant (Fig. 1) found by the detectorist Simon Neal might not, at first sight, look particularly exciting as it is small (radius of 51 mm and thickness of about 1 mm) and has only a simple set of lines on it. But it is this very simplicity, added to its rarity and the fact that the numerals are clearly in a late-medieval script, that are the clue to its importance as an early time-keeping instrument.

The device is of a general type known as an horary quadrant and it is delineated to indicate the time in the old 'unequal hour' (or 'seasonal hour') scheme in which the time from sunrise to sunset is divided up into twelve 'hours', which will be longer in the summer than in the winter. Noon, in the middle of the day, will be at the end of the sixth hour. The night-time was also divided up into twelve hours, counting from sunset, but only at the equinoxes were the daytime and night-time hours of equal duration. This scheme seems very strange to us today but it has many practical advantages in a society where work was ruled by the availability of daylight and thus this scheme was the one most commonly used by the general population throughout the late Middle Ages.

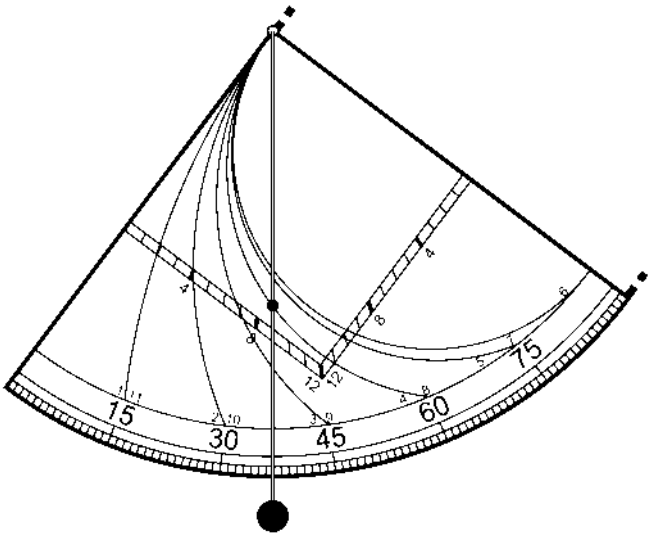

Fig. 2. Schematic drawing of a quadrant similar to the Chetwode one. The sun's altitude is 37° and the bead has been set for a noon altitude of 44°, so that the instrument shows a time of 2 hours before or after noon. Drawing courtesy of Frank King.

On the Chetwode quadrant, it is the engraved semi-circular line that indicates noon. (Fig. 2 shows a schematic of a quadrant to the same basic design in operation.) The other part-circles with increasing radii show the successive hours both before or after noon: the user had to know which part of the day it was as the hours are symmetrical about noon and, in this case, they are not numbered. Note that all the hour-lines pass through the origin of the quadrant. The same basic scheme of hour-lines is also commonly found on the backs of astrolabes. Astrolabes, though, were exceedingly expensive instruments and would have been owned only by the top levels of society. As a result, they were highly prized and several hundred of them have survived and are to be found in museums and other

collections. Simple quadrants, more affordable but still expensive, might have been owned by scholars, wealthy merchants or senior churchmen, and were probably relatively common but are today almost unknown as they would not have been valued once they were superseded and the brass would have been recycled. Thus the finding of the Chetwode example is a great benefit to the history of science.

The modern scheme of 24 hours of equal duration throughout the year and counted from noon and midnight had been known and used by astronomers since antiquity but it only started to become the normal form of everyday timekeeping with the coming of mechanical timekeepers from the end of the 13th century. The Zutphen quadrant,[1] found by the detectorist Sicco Siegers of the Netherlands in 2012 and reported in *The Searcher* of June 2014, is a very early example of an instrument delineated to show this form of time. Throughout the 14th century, both equal and unequal hours were used – it must have been most confusing!

The Chetwode quadrant, like most horary quadrants, works by measuring the altitude (height) of the sun. It was used by pointing it at the sun and tipping it so that a pinhole in the foresight cast a spot of light on the backsight. The sun's altitude was then indicated by a plumb-bob hanging from the centre from which the quadrant is drawn. On the Chetwode quadrant the sights and the plumb-bob are, not surprisingly, absent.

Because the sun has a different altitude at a given hour for different days of the year and at different latitudes, some means of incorporating this information has to be used with the quadrant. This was accomplished by placing a sliding bead on the string of the plumb-bob with its position chosen to suit the season and location. The position of the bead amongst the hour-lines then indicated the time. Different types of quadrant used various means of doing this. It is unclear how it was intended to achieve this on the Chetwode quadrant as it does not have a date scale (as the Zutphen quadrant has) and there is no table of solar altitudes on the back, as is found on a group of quadrants made at the end of the 14th century for Richard II.[2]

The very simple design of the Chetwode quadrant is sometimes known by the Latin name *quadrans vetustissimus* ('oldest quadrant') and it can be found in an Islamic manuscript from 9th-century Baghdad.[3] It is unclear when it first came to the Latin West but sometime before the middle of the 13th century seems likely.[4] By the late 13th century, a more sophisticated version of the design using the same set of lines to indicate unequal hours was described by John of Montpellier. This later became known as the *quadrans vetus* (old quadrant) or the 'quadrant with cursor' as it incorporated a large sliding cursor which moved in a curved track around the outside of the basic set of hour-lines and was used to set the position of the bead for the date and at the appropriate latitude.

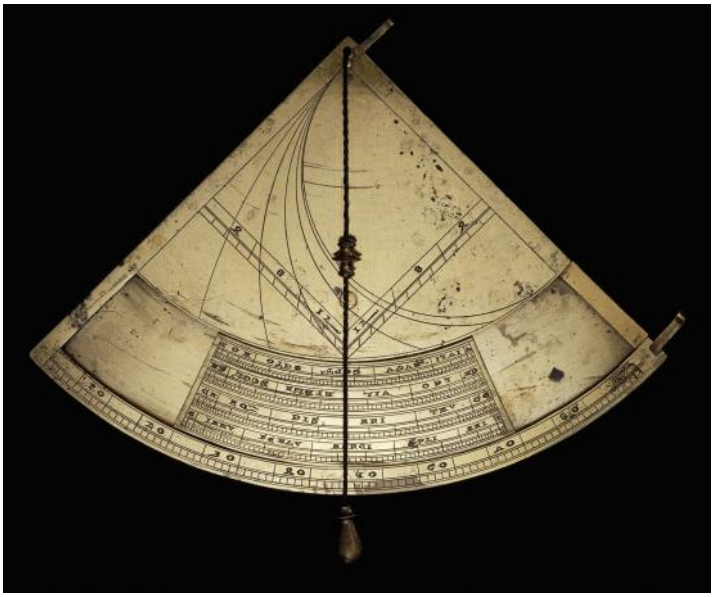

Fig. 3. The British Museum quadrans vetus*, an unequal-hour quadrant with moving cursor. Courtesy of the Trustees of the British Museum, inv. no. 1972,0104.1.*

Although there are quite a number of manuscripts which describe this scheme, only a very small number of actual instruments still exist: examples can be found in the British Museum (Fig. 3), the Oxford Museum of the History of Science, and in the Museo Galileo in Florence.

The Chetwode quadrant also incorporates a 'shadow square', a simple geometrical arrangement which allows the heights of distant buildings to be measured. Its two scales are divided [0], 4, 8, 12 twice, with the corner meeting the 45° point on the altitude scale. This latter scale is divided to individual degrees (not an insignificant task in an age without protractors) and numbered [0], 15, 30, 45, 60, 75, [90]. The numerals are engraved quite deeply and with some skill – the instrument was made by a craftsman with a proper sharpened steel burin (or graver) rather than a pure amateur using a sharpened point. Their form is clearly characteristic of the medieval period but it is difficult to date accurately – any time from the mid 13th century is possible. The numbering in groups of 15 is quite common on small medieval instruments.

Location and History

It is worth considering the circumstances in which the Chetwode quadrant was found. Whereas the Zutphen instrument was discovered in a beautifully layered context in which the layers could be closely dated by many other finds such as coins and pottery, the Chetwode device was simply found in the topsoil of an agricultural field without any closely-associated finds. A cut farthing from the reign of Henry III (r. 1216–72) was found within a metre of the quadrant but in England that can hardly be considered secure dating evidence, although it is at least a sign of medieval occupation. Other coins, of a slightly later date, have also been found in the general vicinity.

Instrument	Notes	Date	Cu	Zn	Sn	Pb	Other significant components
Chetwode *quadrans vetustissimus*	a	14th C?	75	6	6	8	0.3% Ag; 0.4% Sb. Fe omitted.
Norfolk quadrant	b	14th C?	71	11	8.5	6.0	1.8% Fe; 0.9% As
Norfolk *horologium*	c	15th C?	77	12	7.4	2.4	0.2% Ag; 0.9% Fe
Navicula, NMM AST1146	d	mid 15th C?	82	8.6	5.2	1.2	0.9% Fe; 0.9% Ti
Brit Mus *quadrans vetus* inv. no. 1972,0104.1	e	14th C	83	11	3.6	1.3	0.3% Fe; 0.2% Ni
Canterbury *quadrans novus*	f	1388?	87	5.3	3.4	1.5	0.2% Ag; 0.6% Fe
Zutphen quadrant	g	c. 1300	85	12.5	0.5	0.2	0.3% Ag; 0.7% Fe
Richard II quadrant	h	1396	78	22	nd	tr	
Grafendorf compendium	i	c. 1450	79	12	0.8	2	1.4% Fe

Table 1. Composition of metal alloys in wt% as measured by XRF of the Chetwode quadrant and several other medieval time-telling instruments.

a. Fig. 1. Found near Chetwode; analysed by Dr Brian Gilmour. Results after allowance for ground enhancement/depletion.
b. Fig. A1. Found in Norfolk by Graeme Simmonds; analysed by Dr Brian Gilmour.[5]
c. Metal detectorist's find from Shotesham, Norfolk. Analysed by Dr Brian Gilmour (Oxford).
d. Found at Sibton Abbey, N. Suffolk. Measurements by J. Davis, courtesy of the National Maritime Museum, Greenwich; thanks to Dr Louise Devoy.
e. Fig. 2. Measurements by J. Davis, courtesy of the British Museum; thanks to Oliver Cooke.
f. Found in Canterbury by excavation, now in the British Museum. Analysis by Dr Brian Gilmour and Dr Peter Northover (Oxford).
g. Found in Zutphen, The Netherlands. Measured by Dr Bertil van Os of the RCE (Netherlands Cultural Heritage Agency). Thanks to Bert Fermin.
h. One of four known devices (1396–1400), this is the earliest (unsold by Bonhams in 2012). Results supplied by Christopher Becker (Australia). The two devices in the British Museum have very similar compositions (results from Dr Susan La Niece, BM) as does the one in the Dorset County Museum (measured by J. Davis).
i. Excavated in Grafendorf Castle near Vienna, analysis by Prof. Dipl. Ing Dr Manfred Schreiner (Akademie der Bildenden Künste). Thanks to Dr Ronald Salzer.

In the Table, 'nd' and 'tr' indicate not detected and trace, respectively.

The find site was on a footpath that led to Chetwode Priory, a very small Augustinian outpost founded in 1244 by a certain Sir Ralph de Norwich who is believed to have been Bishop of Norwich for a short spell in 1236 (in 1222 he had been Rector of nearby Oakley). It was dissolved in 1460. The possible association with Norwich is an intriguing one as the county of Norfolk has been a particularly rich area for detectorist finds and a significant percentage of early pocket timekeeping instruments now in museums have been found there. One of the items found by a Norfolk detectorist in 2009 was a fragment of a small quadrant very similar to the Chetwode one.[5] (See the Appendix for a re-assessment of the Norfolk quadrant.) In the Norfolk case, the original unequal-hour-lines had been reworked with a later design of quadrant and the outline of the shadow square had been erased, though the numerals (4, 8, 12, 12) are still visible. Other comparisons are still being made but it is possible to speculate that there could have been a link between Norwich, famed for its very early astronomical clock in the cathedral, and Chetwode.

Another interesting coincidence is that the licence for the foundation of Chetwode Priory was signed by Robert Grosseteste (c. 1175–1253), the Bishop of Lincoln and widely recognised as one of the leading proto-scientists of the era. Grosseteste did not write on the quadrant but copies of his works on astronomy and the sphere are sometimes found in codices which also contain instructions on drawing quadrants and other sundials.[6] Thus, whilst it is not suggested that Grosseteste had any direct connection to the Chetwode quadrant, the general interest by scholarly churchmen in timekeeping and cosmology is illustrated.

Metallurgy

The metallurgy of the quadrant is another possible clue to its origins. The alloy of the Chetwode quadrant was analysed by X-ray fluorescence (XRF) by Dr Brian Gilmour (Research Laboratory for Archaeology and the History of Art, Oxford). The use of XRF is sometimes criticised as a method of examining archaeological finds because it is only semi-quantitative and is sensitive to surface corrosion effects. Nevertheless, it is a fast and non-destructive method of obtaining a very useful initial impression of the alloys involved, as shown by recent assessments.[7,8]

A partially-cleaned area on the back of the quadrant and a nearby uncleaned area were analysed, allowing an approximate allowance to be made for the surface enhancement/depletion of some elements (particularly Zn and Sn) by the effects of contact with the soil. The results are shown in the first line of Table 1, which also shows the analyses of a number other medieval scientific instruments. It is clear that the quadrant is made from a quaternary (Cu-Zn-Sn-Pb) alloy, in modern terminology a leaded gunmetal or, in some circles, 'red brass' but at the time called 'latten'. In this, it is quite similar to the other instruments in the top part of the table, most of them associated with East Anglia. This similarity does not allow a definite link of the quadrant with this area as the alloy type was quite widespread but it does not rule it out. By contrast, the last three instruments of Table 1 are clearly of a quite different alloy, best described as brasses with medium levels of zinc and with virtually no tin which are usually associated with Continental sources in the medieval period.

It is interesting to compare the compositions in Table 1 with those of some of the contemporary artefacts found in the Parisian workshop of the Hôtel de Mongelas, dated to 1325–50, which were classed as coming from 'sheet' material, that is, hammered to a thin sheet, as opposed to cast.[9] A total of 102 finds, mainly small artefacts and cutting waste, were examined and had a wide range of low- to medium-zinc quaternary alloys broadly in line with the instruments in Table 1. One noticeable difference, however, was that the vast majority of the Parisian specimens had a tin concentration of below 5 wt%, significantly less than the quadrants of Table 1. Whether this is related to the fact that England had good supplies of tin but no known indigenous source of zinc ores at that time remains to be explored.

Final Thoughts

An alternative possibility for the source of the Chetwode quadrant is St Albans Abbey, not very far away, home of Richard of Wallingford's astronomical clock and known to have been supplying quadrants to ex-Queen Isabella in the 1350s.[10] But our knowledge of the manufacture of mathematical instruments in the medieval period is still very far from complete.

APPENDIX
Revisiting the Norfolk Quadrant

In an earlier article,[5] I described a fragment of a quadrant found by a detectorist in Norfolk (Fig. A1). It featured medieval numerals and two sets of hour-lines. One set of lines was for unequal hours and the second, with the general appearance of a Gunter's quadrant, was for equal hours. The finding of the Chetwode device, having a very similar size (the radii are within 1 mm), has occasioned a reassessment of the Norfolk one.

Fig. A1. The Norfolk quadrant.[5] *Note the alignment of the two '12's.*

One puzzling feature of the Norfolk quadrant was that the noon lines of both sets of hour-lines appeared to be labelled with a numeral '12'. This was strange because noon is the sixth unequal hour. A numeral '8' also labelled one pair of equal-hour-lines. Comparison with the Chetwode device has now led to the realization that these numerals actually belong to a shadow square which has since been erased. The lines and divisions of the square are completely absent but the positions, orientation and alignment of the numerals would fit perfectly and, looking closely, the medieval numeral '4' can also be seen, merging into a patch of corrosion near the left-hand edge. Clearly, what we see is another early *quadrans vetustissimus* which has been later modified to show equal hours with a more modern, perhaps experimental, design. How much later remains an open question. The lines of the shadow square would have been relatively easy to erase as they were quite shallow, as were the unequal-hour arcs in the region now occupied by the equal-hour-lines. The numerals, however, were much more deeply engraved – as is also the case for the Chetwode quadrant – and thus are still visible.

The similarities between the (original, unmodified) Norfolk and Chetwode quadrants are so great that there is a reasonable possibility that they were produced in the same workshop, or at least using the same basic design. One feature which remains puzzling is that neither quadrant features a date or declination scale, needed for setting the position of the bead on the plumb-line. Such a scale would make the device specific to a particular latitude so its absence suggests that the maker was keen to keep the device universal, perhaps supplying the sun's noon altitude in a table for different dates and latitudes separately.

ACKNOWLEDGEMENTS

I am extremely grateful to Simon Neal for informing me of his find, and to John Winter (Assistant Editor of *The Searcher*) for permission to republish this article. Dr Brian

Gilmour (Oxford University) is thanked for his work in conserving the find and for the XRF analysis. Graeme Simmonds (Norwich Detectors Club) kindly allowed me to study the Norfolk quadrant. Frank King kindly provided Fig. 2.

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10. "[to] William Orologer, monk of St Alban's, bringing to the Queen several quadrants of copper, 6th January [1358]". The entry was translated from the original Latin by E. A. Bond, 'Notices of the Last Days of Isabella, Queen of Edward II, drawn from an Account of the Expenses of her Household' published in *Archaeologia*, 35 (1854) pp. 453–69, quoting from the original (and badly fire-damaged) '*Dona*' section of the accounts now British Library Cotton MS Galba E XIV. The identification of the quadrants as being of "copper" depends on Bond's translation but there is much confusion over the Latin terms used for the various alloys of copper – and the scribe would not have been a metallurgist – so this must be taken with some caution. Extensive efforts by the author and by Dr Justin Clegg (British Library researcher) have unfortunately been unable to locate the actual term in the original ms.

For a portrait and CV of the author, see *Bulletin* 23(ii), June 2011. He can be contacted at *john.davis@btinternet.com*

NEW DIALS (1)

A Horizontal Stereographic Projection Dial for South Africa

This dial was commissioned by Pierre Holtzhausen, a noted cartographer of Centurion in Pretoria, as a teaching instrument for his children. It was, for budget reasons, reduced to the minimum area required by the stereographic projection.

The dial is made of 316 stainless steel; I finish all my 316 stainless dials with a satin texture, using 80 grit emery, so that the shadow is not reflected away: the dark appearance in the photograph is an optical illusion. I then passivate the surface as my tools and etching baths have also been used to process brass and thus they can sometimes form a thin layer of Monel on the stainless steel which looks like rust though it is not.

The overall diameter of the dial is 300 mm and the diameter of the horizon circle is 277 mm. The azimuth scale was limited to 120° East and West of North since the maximum azimuth in Centurion is about 116°. The centre of the stereographic projection and the vertical edge of the gnomon are in the geometric centre of the plate, with the bottom of the sloping face of the gnomon offset towards the North, at the bottom of the picture. Note that the ecliptic arc for the summer half of the year (September to March) is nearly a straight line on account of the latitude of 25° 54′ 13″ S.

The Afrikaans and the Latin at the top both mean "moved by the sun's light".

Malcolm Barnfield *sundials@sundials.co.za*

24-HOUR SUNDIAL IN THE SHADOW OF THE MOON

MARTINS GILLS

On 20 March 2015 the British Isles witnessed a partial solar eclipse with up to 98% of the Sun's disc being occulted by the Moon. The path of the total solar eclipse crossed just two dry land locations – the Faroe Islands and the Svalbard Archipelago. Among amateur astronomers, there are eclipse chasers – people who travel to see the total solar eclipse. One such group is led by a member of the Latvian Astronomical Society, Agnese Zalcmane. Since 2008, the Eclipse Tour enthusiasts have travelled to Russia, China, Australia and Kenya to experience total solar eclipses. All trips are documented in their online blog *www.eclipse-tour.org*. The 2015 event led a group of eight eclipse enthusiasts to Longyearbyen in Svalbard. As BSS members most probably know, this is the place where the northernmost sundial is located (78° 13′ N, 15° 37′ E), made by Tony Moss and inspired by Louise Rigozzi of Tasmania. I did not travel to Longyearbyen myself, but asked the eclipse chasers not to miss this unique sundial and to take some pictures of it. Not only is it the most northerly sundial, but on 20 March it gained the additional distinction of being the most northerly to witness a total solar eclipse. As we can see in the photographs, this 24-hour sundial installed in 2004 is in excellent condition and serves as a place worth visiting if you happen to be in Longyearbyen.

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Photos of the dial at Longyearbuyen by Agnese Zalcmane (above) and R. Druva (top right).

Total Eclipse 2015

This photograph of the total eclipse of the sun on 20 March 2015 was taken from a cruise ship, east of the Faroes.

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IN THE FOOTSTEPS OF THOMAS ROSS

Part 11: The *Dyallis* of William Aytoun

DENNIS COWAN

Not much is known of William Aytoun. We do know though that he was assistant to William Wallace, the master mason who was responsible for Heriot's Hospital in Edinburgh; on Wallace's death in 1631, Aytoun took over as master mason. He was also responsible for Innes House in Morayshire in 1641 and we know that he probably died in 1643. Other than that, nothing appears to be known of his life. Much more research is needed.

However, we do know that both Heriot's Hospital and Innes House have a large number of sundials incorporated into their respective buildings.

For more than 350 years George Heriot's School in Edinburgh has served as one of Scotland's most distinguished schools. Today, it flourishes as an independent co-educational day school.

Originally known as Heriot's Hospital, it was founded from a bequest by George Heriot, also known as 'Jinglin' Geordie' on account of his vast wealth, and the rumour that his pockets were always full of gold. Heriot was a native of Edinburgh, coming from a family of goldsmiths. He rose through the ranks and moved to London, eventually becoming Jeweller and Goldsmith to King James VI (James I of England). He died childless in London in 1624 and was buried in St Martin-in-the-Fields.

After payment of considerable private legacies of about £6,826, he bequeathed the remainder of his estate for the purpose of founding a hospital[1] in his native city for the upbringing and education *of* "*puire faitherless bairnes, friemenes sones of that Toune of Edinburgh*". His bequest amounted to some £23,625 and represented a huge fortune in those days.

The plan for the building is of special significance. It was the first completely regular design in Scotland with four equal ranges of buildings around a central quadrangle, with a square tower at each of the four corners rising a storey higher (Fig. 1). No other building in the country had previously been conceived on such a scale and it was the first prominent building to be built outside Edinburgh's city walls.

The foundation stone was laid on the north-west tower on 1 July 1628. There are eleven sundials, each with two declining faces, incorporated into the design of the original building: three on the inner walls facing into the quadrangle and eight on the outer walls. There are another two dials elsewhere in the grounds of the school.

But when I entered the grounds of the school, it was not a sundial that first caught my eyes, it was the view of Edinburgh Castle. The castle is most often viewed and photographed from the northern aspect from Princes Street, but George Heriot's lies to the south of the castle and it was the castle from this direction that dominated the skyline (Fig. 2).

When I was able to draw my eyes away from the castle, I started to contemplate the reason for my visit. It was to see the sundials identified and described by Thomas Ross.

Fig. 1. George Heriot's School from Edinburgh Castle.

Fig. 2. Edinburgh Castle from Heriot's.

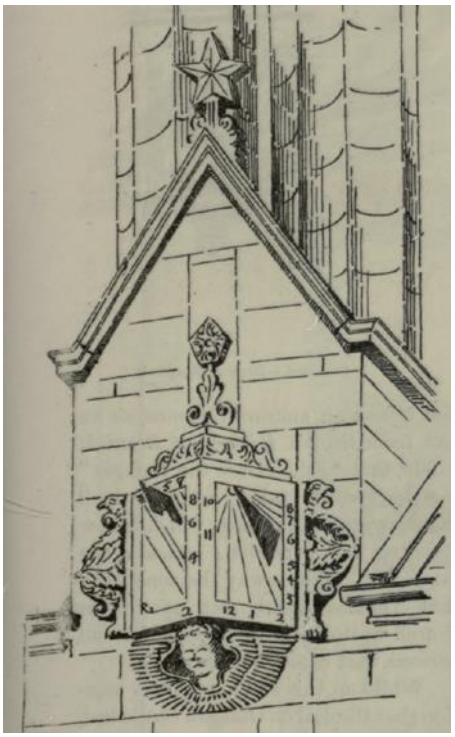

Fig. 3. Sketch of dial on Heriot's west-facing inner wall.

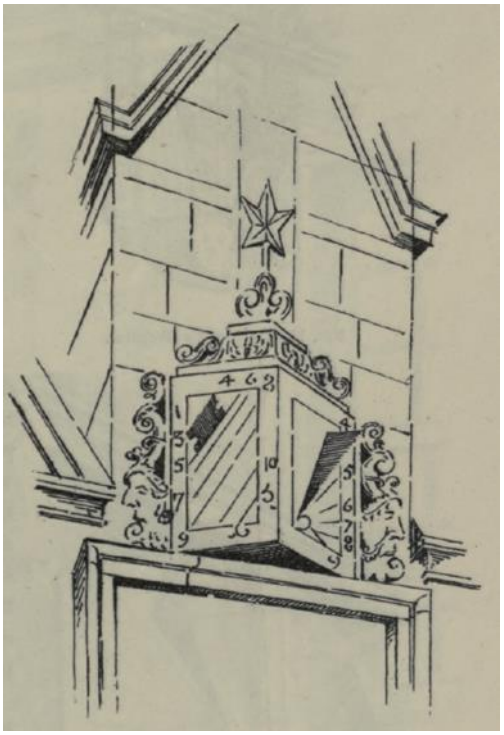

Fig. 4. Sketch of dial on Heriot's east-facing inner wall.

In volume 5 of *The Castellated and Domestic Architecture of Scotland*,[2] Thomas Ross describes the sundials as follows:

"*Perhaps the finest specimens of attached dials in Scotland are to be seen on this building. There are eleven of them, eight being on the outside walls and three facing the courtyard. They are all of the same general form.* [Figs 3–5] *represent those of the courtyard. Those on the outer fronts are similar to the above, and they all differ from each other chiefly in their supporting brackets. One has this feature rounded, as shown by* [Fig. 6]. *Others have brackets, consisting of cupids' heads with wings, similar to* [Figs 3 and 5], *and to the dials at Peffermill. Others have demons' heads, with wings similarly disposed; and one on the east side* [Fig. 7] *rests on what appears to be intended for an elephant's head.*"

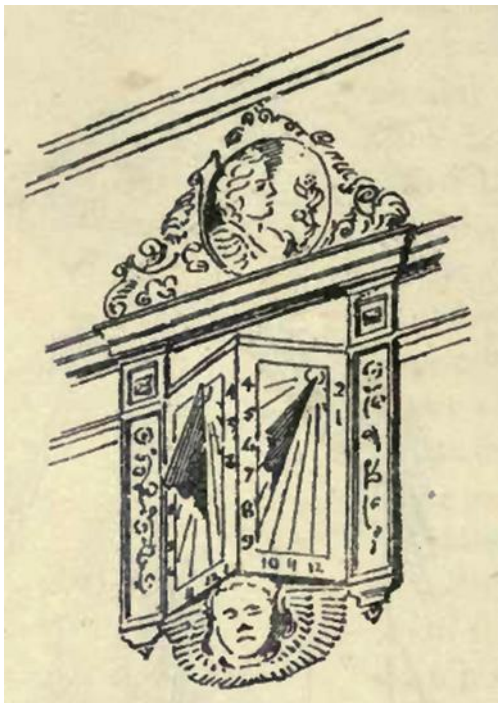

Fig. 5. Sketch of dial on Heriot's south-facing inner wall.

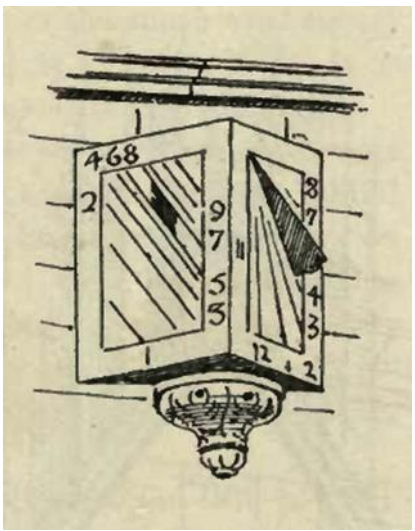

Fig. 6. Sketch of dial on Heriot's west-facing outside wall showing rounded support.

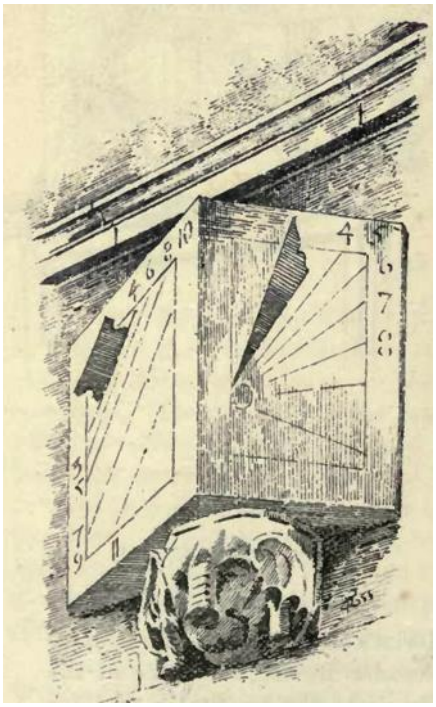

Fig. 7. Sketch of dial on Heriot's east-facing outside wall showing elephant support.

Photographs of the inner courtyard dials are shown at Figs 8–10 and those on the outer walls are shown at Figs 11–18.

Fig. 8. Heriot's west-facing inner wall dial.

Fig. 9. Heriot's east-facing inner wall dial.

Fig. 10. Heriot's south-facing inner wall dial.

Fig. 11. Heriot's north-facing outside wall dial.

Fig. 12. Heriot's north-facing outside wall dial.

Fig. 13. Heriot's east-facing outside wall dial.

Fig. 14. Heriot's east-facing outside wall dial with elephant's head support.

Fig. 15. Heriot's south-facing outside wall dial with demon's head support.

Fig. 16. Heriot's south-facing outside wall dial.

Fig. 17. Heriot's west-facing outside wall dial.

Fig. 18. Heriot's west-facing outside wall dial.

Ross continues:

"*These dials seem to have been made by William Aytoun, who succeeded William Wallace as architect and superintendent of the hospital buildings in 1631–32. In the contract between Heriot's Trustees and Aytoun, the latter was bound 'to maik and carve his Majesties portratt or any other portratt he beis requyrit to mak in that wark; and to mak all sort of dyallis as sal be fund fitting for samyn.'* "

The date of 1631 ties in nicely with the beginning of the rise of sundials in Scotland and it is perhaps no surprise that the Trustees wished that their new building should be so adorned.

Fig. 19. Heriot's lost (and found) multi-facet dial.

Ross continues again:

"*There ought to be another dial at Heriot's Hospital, but it seems to have disappeared. In 1679 'Mr. Alexander Burton, laitly ane of the doctors of the High School, had gifted freely to the hospital a dial for the hospital garden, which he is to put up at his own expense.'*

"*Dials are very liable to get broken, and during repairs and alterations they are apt to disappear; while coveting and taking away a neighbour's dial is not an unknown offence, as we find from Scott's* History of Berwick*, p. 306, that 'Johne Orde the younger' was charged 'for taking away the dyall that was at the Newgate, which is now standing in his garden. As also the same hath taken away the sone dyall that Thomas Smith sett up on the church wall which was a benefit to all persons that came that way.'* "

Unfortunately the theft of sundials is not a modern phenomenon!

Luckily though, according to the *Sundials of the British Isles*[3] edited by Mike Cowham, the sundial referred to above appears not to have been stolen, but simply lost and then found again, having been excavated in the grounds of the school in the 1970s. It is now in a small quiet area of the school grounds well hidden from view. It is a large multi-faceted dial (Fig. 19) with 25 separate dial faces with a cup hollow/scaphe dial on each of the cardinal faces. Unfortunately, the maker of this sundial is unknown.

There is yet another dial at Heriot's, this time a modern direct south-facing dial situated on a wall of the primary school (Fig. 20), which features a bird on a ball looking at a mouse on the end of a tee square, in memory of an architect. Nowhere in Scotland are there so many sundials to be seen in one location, and BSS members took full advantage when access was arranged with the Governors of the school during the Edinburgh conference in 2013.

Fig. 20. Heriot's modern south-facing dial.

Moving up north, Innes House near Elgin in Morayshire provides us with another five sundials, four of which are attributed to William Aytoun. Now owned by the Tennent family, Innes House is a private home built in 1641.

Ross says:

"*There are numerous dials on this house, which is one of great interest, as it is known, from an account of the building kept by the laird, to have been designed by 'William Aytoun, maister massoun at Heriott his work.' As might be expected, the dials here resemble those on Heriot's Hospital.*"

Unfortunately Ross does not provide any sketches of the dials at Innes House but he does provide a sketch of the house (Fig. 21) where, if you look closely, three of the dials can just be seen between first- and second-floor levels.

Fig. 21. Ross's sketch of Innes House showing dials between first and second floors.

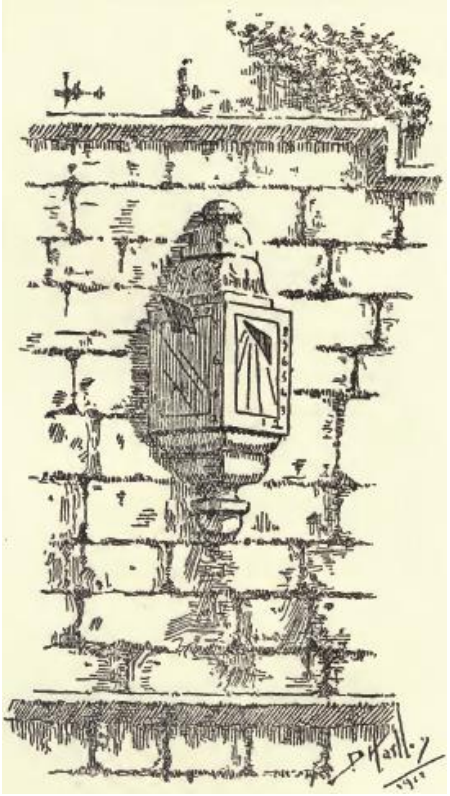

Fig. 22. Henslow's sketch of an Innes House dial.

Figs 23–26. Innes House dials – the last (Fig. 26) with missing face.

Fig. 27. Innes House icosahedron.

However, in *Ye Sundial Booke*[4], Geoffrey Henslow does provide a sketch (Fig. 22) of one of the four dials. Photographs of the four dials are shown at Figs 23–26, the last of which appears to be the one in Henslow's sketch. Although the sketches in Henslow's book are not always accurate in terms of the background and placement of the dials, it appears as though this one has probably been repositioned and lost one of its faces in the process.

We don't know the maker of the fifth dial at Innes House, which is a splendid icosahedron with triangular dial faces and complete gnomons, probably of 18th century on a later pedestal (Fig. 27).

When Ross described the dials at Heriot's he made reference to Peffermill House, which is but a short distance from George Heriot's School and is believed to have been built in 1636. Ross says:

"*There are three dials on this house, all of the same design* [Fig. 28]. *They have a considerable resemblance to those of Heriot's Hospital… and as the house is contemporaneous with Heriot's, being dated 1636, and only two miles distant from it, the dials may be the work of the same designer.*"

As Ross says, the dials at Peffermill and at Heriot's are so similar that they could very well have been designed by William Aytoun.

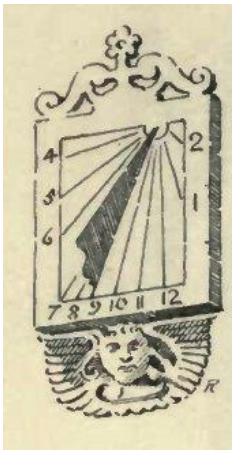

Fig. 28. Ross's sketch of a Peffermill House dial.

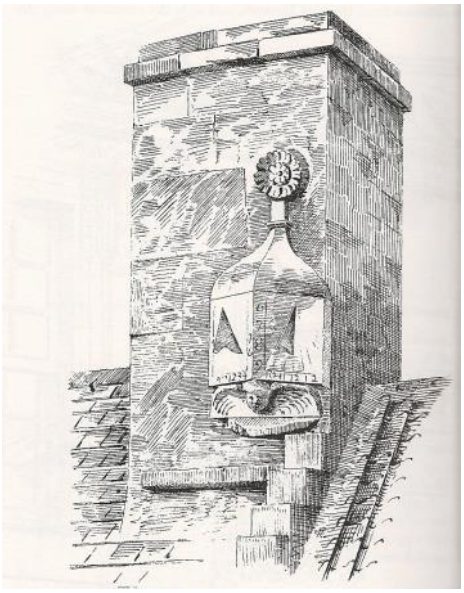

Fig. 29. Ross's sketch of the South Queensferry dial.

Fig. 30. South Queensferry dial showing altered roofline.

Unfortunately, to date I have been unable to obtain access to the house which has changed ownership within the last couple of years. The gates are always locked and my letters have been unanswered.

It is interesting to note that a sundial at South Queensferry[5] is similar in design to these Aytoun dials. Ross describes it thus:

"*The dial from South Queensferry, Linlithgowshire* [Fig. 29]*, is built into a chimney-stack on the south side of a house near the east end of the village. It has had rough usage, and the ledge projecting at the base has been broken as indicated. The dial is about level with the road behind the house, and is not visible from the street; it is doubtless of the same age as the Heriot's Hospital examples.*"

Fig. 31. Detail of the South Queensferry dial.

It took me several months on and off to find this sundial – as can be seen above, Ross did not give many clues as to its exact whereabouts, and for some time I was virtually certain that it no longer existed. But I eventually found it, although the roofline had changed in the intervening 120 years or so (Fig. 30). It seems possible that this too was an Aytoun dial; at the very least it is in the same style with its winged cherub below and flower above. See Fig. 31 for a close up photograph.

So there we have it – William Aytoun, master mason, who probably died in 1643 and was responsible for eleven dials at Heriot's, four dials at Innes House, probably three dials at Peffermill House and possibly another at South Queensferry. He deserves to be better known.

ACKNOWLEDGEMENTS

Many thanks to the Governors of George Heriot's School and to the owners of Innes House and the house at South Queensferry for allowing me access to their grounds to view and photograph their sundials.

REFERENCES and NOTES

1. In Scotland at that time a hospital, as referred to here, was in fact a school.
2. D. MacGibbon and T. Ross: *The Castellated and Domestic Architecture of Scotland,* David Douglas, Edinburgh (1892).
3. M. Cowham: *Sundials of the British Isles*, M.J. Cowham, Cambridge (2005).
4. T.G.W. Henslow: *Ye Sundial Booke*, E. Arnold, London (1914).
5. Previously described in *BSS Bulletin*, 25(i) (March 2013).

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

RE-IMAGINING THE PEWTERERS' GLASS SUNDIAL

GEOFFREY LANE

A shorter version of this article appeared in March in the Pewterers' Annual Review 2014–2015.

A recent refurbishment of the Pewterers' Company Hall in Oat Lane, London EC2, has helped to show off the glass sundial the Company commissioned a decade or so ago from the Sussex firm of Opus Stained Glass. It bears the Company's arms on a pediment, and the dial face is enlivened with a spider attacking a fly (Fig. 1).

Fig. 1. The Pewterers' Company dial …

The dial is a fairly freehand copy of one originally made for the Company in the mid-17th century. The old dial survived a devastating fire at the Old Hall in 1840, and was illustrated in black-and-white (Fig. 2) in Charles Welch's *History* of the Pewterers' Company, published in 1902.[1] (Welch does not refer to the dial in his text, and seems to have had little idea of its date, since he places it in his first volume, among glazing records from the end of the 15th century.) The dial itself is understood to have gone into store at the outbreak of the Second World War, and been destroyed along with other Company property in December 1940 when an air raid struck the Army and Navy depository in Chiswick.

The original dial was almost certainly made when the Company was rebuilding its former hall in Lime Street, London EC3, following the Great Fire of 1666. Several of the City Companies, including the Weavers and Girdlers, commissioned glass sundials around this time to grace their new buildings. The Pewterers seem to have employed Richard Dutton, who lived in Holborn, just outside the area devastated by the Fire, and did much of his work for the nearby Inns of Court and Chancery. The regular glazing of the new hall was entrusted to two established City glaziers, Samuel Rainger and John Odell, and the Company Accounts show several payments to them. But those for the year 1669–70 have this additional entry:

> Paid Mr Dutton painting glass as p[er] receipt £6 12s.

Fig. 2. … and its 17th-century model.

Although there is no specific mention of a dial, it is likely to have been included in this payment. Dutton was an obvious choice, since his late father-in-law, Baptist Sutton, had been a pioneer of glass dials in London, and had painted coats of arms for the Pewterers' old hall back in 1659/60:

> Paid Mr Sutton for ye painting glass in ye new parlour
>
> 3 Coates of Armes & repairing ye glass in ye hall £7 10s

The new dial is designed to fit against a pane in an existing window, and its aspect ratio has evidently been modified to achieve this. It was clearly not intended to be a working dial, and it lacks the gnomon which the original dial would have had attached to its external face, sloping downwards and outwards from a point in the centre of the sun depicted at the top of the central area. This part of the face would have been painted behind with a white or pale-grey matt, in order to catch the shadow of the gnomon, while eliminating any distracting view of the outside world. The hour lines and other dial details have been painted in imitation of the original – the fact that it shows six hours before noon but only four after midday tells us that the original was designed to face several degrees east of due south – an orientation unlikely to be replicated exactly in its new home. Although the dial details have been copied reasonably faithfully, the light-and-dark scale showing the quarter-hours on the sides of the inner field should have been continued across the bottom edge – its equivalent on the original dial may have been hidden thanks to a repair at some stage using slightly thicker lead strips (cames).

Fig. 4. Suggested reconstruction of the old Pewterers' dial and surround.

Fig. 3. Dial made by Baptist Sutton for Sir Thomas Barrington MP (photo: John Davis).

In its general layout, Dutton's dial is similar to a dial made by his father-in-law Baptist Sutton a few years earlier for the London home of a prominent MP, Sir Thomas Barrington – which also features a spider and fly (Fig. 3).[2]

But there are differences too – the Barrington dial was all painted on a single sheet of glass, whereas the Pewterers' dial was made up from nine different pieces, each separately leaded-up. This prompts the question whether the dial as illustrated by Charles Welch in 1902 was complete in itself, or whether it formed part of a larger decorative glazing scheme. The prominent classical pediment at the top, bearing the Company arms, seems oddly incomplete – it cries out to be extended on either side, with columns or other architectural devices to support their 'weight'. Classical architecture was in vogue at the time, with Wren and his colleagues about to embark on the rebuilding of St Paul's Cathedral and dozens of city churches. Glass painters regularly used prints as their source material, and it would have been a simple matter for Richard Dutton to acquire a print showing a Greek or Roman temple and use it as a template.

So, as an experiment, I downloaded the most basic temple design I could find to see how it might be made to fit. It had four pillars arranged symmetrically, and once I had embedded the Welch photo at its heart, I needed only to raise the floor a little, and shift the two inner pillars outwards, to achieve a fairly harmonious design. What seemed to be lacking was something to lift the dial off the floor. At this point I happened upon a previously unnoticed description of the Pewterers' dial, which appeared in 1803 in Volume III of James Peller Malcolm's *Londinium Redivivum* – an august work of local history. Malcolm's brief description of the old Pewterers' Hall in Lime Street contains these words:

*"There is an old carving above the door, representing a crown over a red rose, T.G. a ship on a globe, and the sun rising, inscribed, '*Si Deus pro nobis, quis contra nos?'

*And in a window a dial of painted glass, '*Sic Vita'*, with a spider and fly crawling on it; and the Company's arms, under a little pediment: Azure, on a chevron, between three cross-bars Argent; as many roses Gules: '*In God is all our trust' ".[3]

The last six words are of course a brief paraphrase of the company motto "If God be for us, who can be against us", as given in Latin over the door. But why quote them here unless they appeared on the dial (Fig. 4)?

Malcolm's description strongly suggests that Dutton's original dial of 1669–70 may have contained a second text, and where better to place it than across the bottom of my very tentative reconstruction?

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1. C. Welch: *History of the Worshipful Company of Pewterers of the City of London,* London, Blades East & Blades (2 vols, 1902). The dial is illustrated in Vol. I, opposite p. 73.
2. J. Davis: 'The "Lost" Barrington stained glass dial rediscovered', *BSS Bulletin*, 21(ii), p.12 (June 2009).
3. J.P. Malcolm: *Londinium Redivivum, or, An Antient History and Modern Description of London* Vol. III, p. 440, London (1803).

For a portrait and CV of the author, see *Bulletin* 24(iii), September 2012. He can be contacted at *geoffrey.lane1@btopenworld.com*

ENGLISH POTTERY SUNDIAL PICTURE

Recently my mother-in-law had to go into an old age retirement village. Whilst packing up her household we came across this dish. It is 160 × 110 mm. There is no signature on it. It is numbered on the back as you can see.

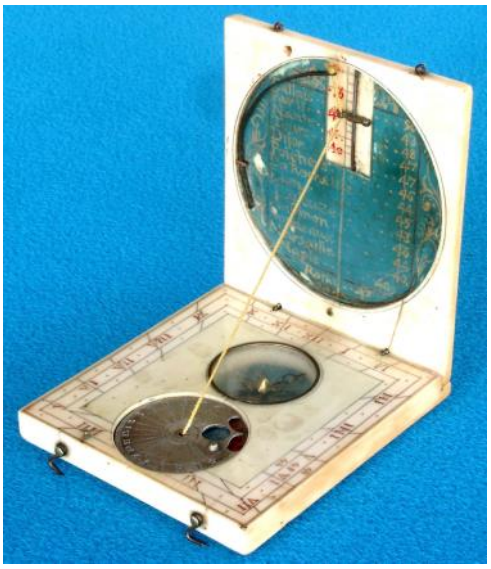
The company, Lancaster & Sandland, were based in the Dresden Works in Hanley, Stoke-on-Trent and operated from 1944 to 1968.

Malcolm Barnfield *sundials@sundials.co.za*

WHO MADE THESE IVORY DIPTYCH DIALS?

MIKE COWHAM

Over the last 30 or more years I have spent much time looking at portable dials. Normally, these dials are signed and sometimes dated. Those that are unsigned are generally either low value mass-produced pieces or attributable to a specific maker, or at least to his workshop, by their style. The dials without dates can frequently be dated fairly accurately by their magnetic declination figures. Occasionally dials without signatures or any firm clues appear and are often treated as one-offs. The dials discussed below, of which those in Figs 1–3 are typical examples, have been found in reasonable numbers but so far I have not pinned down a maker or even a town of origin. If any readers are able to help with a positive identification of these, please contact me.


Figs 1–3. Three French diptych dials with their blue and gold painting.

Fig. 4. Compass bowl of the dial in Fig. 1.

French Diptych Dials, c. 1620

So far I have located about sixteen dials of this type in various museums, collections and sales. Some of these are also illustrated or described in various publications. The dials are made from ivory and the majority have two very distinct features:

- a list of towns and their latitudes in gold, usually on a blue painted background and placed on the inside vertical face;
- a compass decorated with gold and blue paint.

Other details seem to vary considerably, such as the addition of lunar dials, nocturnals and so on.

Fig. 5. Showing a declination of 7°.

The dial shown in Fig. 1 has only a few towns listed and they are placed round the compass bowl rather than on the vertical face (which has a lunar volvelle taking up this whole area). Note the unusual spelling of Calais as 'Cales

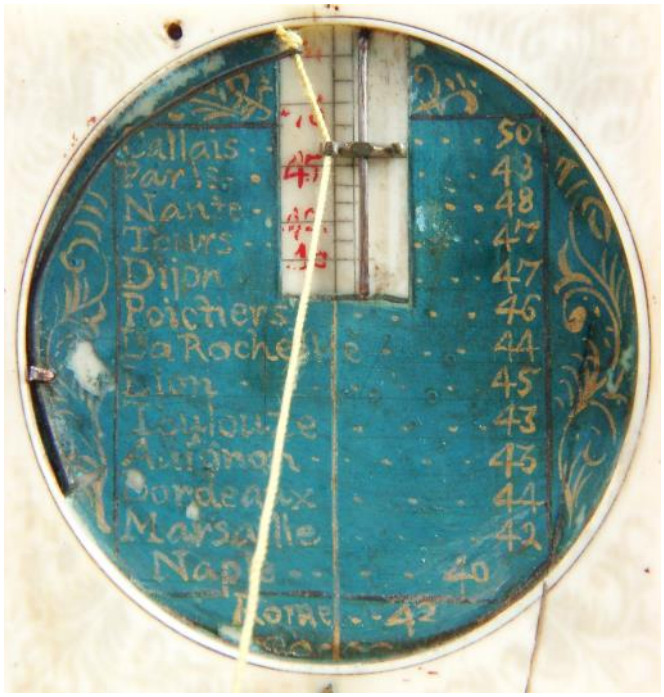


Fig. 6. List of towns and adjustment for the gnomon on the vertical face of the dial in Fig. 2.

50' (top left) (Fig. 4). Scotland is also listed as 'Escosse 55' using the old long form of 's', next to 'Londres 52' (top right). Some of the dials share other common features. From their compass declinations it seems that most of these dials are made for about 7° eastwards, suggesting a construction date of around 1620. On the compass shown it is just possible to see a thin red arrow pointing to 7° E (Fig. 5). (Its tail, on the opposite side of the compass, seems to be more in line with 8°.) Other dials seem to have the compass layout painted at a slight angle to the dial body, but it is still eastwards by about 7°.

Another interesting feature of the compass bowls on these dials is the presence of four primary direction markings at the tips of the main cross. **N** is missing because the main fleur-de-lys pointer is placed here, **M** is for Merides or South, **O** is for Oest or West, but instead of **E** for Est, the maker has placed a cross, +, as this is the direction of the Holy Land.

These dials are French and they bear some resemblance to the fine ivory diptych dials of Dieppe but I believe that they come from somewhere else in Normandy or perhaps even from Paris. There is a slight possibility that they could be early Dieppe dials, but they do not share many features that are commonly used by those makers, whose dials are dated only a few years later.

As may be seen in the three pictures shown in Figs 1–3, the dials differ somewhat in their layouts but they share several common points. The list of towns on the vertical leaf often has the string gnomon attached to a moveable fixing so that it may be set to the required latitude against a scale (Figs 6 and 7). The rather odd choice of markings in increments of 2, 3, 3 and 2 is found on some of the other dials too. (Ignore

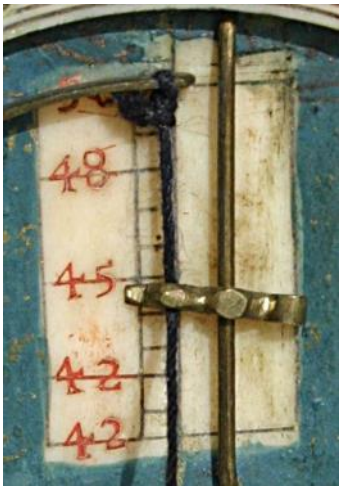


Fig. 7. Latitude scale details of the dial in Fig. 3.

Fig. 8. Typical 'picture frame' type border.

Figs 9 and 10. **R F** *and a strange symbol that may be found stamped on some of these dials.*

the lower 42 in Fig. 7 as this is a simple mistake for 40.) The string is kept tight by a quarter-round spring fitted on the left side of the round chart (Fig. 6).

Another common feature is the 'picture frame' type of patterning around both the lids and the bases (Fig. 8).

The maker has not been identified but a few of the dials are stamped with initials **R F** and with a small symbol which is a bit like dividers surmounted by a crown (Figs 9 and 10).

There is a dial with some similarities to these in the museum at Ecouen, near Paris (Musée National de la Renaissance, Château d'Ecouen). Their dial is signed by Pierre du Jardin of Paris and is dated 1627. However, it is a much larger and considerably more complex dial than any others of this type and it is difficult to prove that this dial is by the same maker.

One of these dials in the Collection of Historical Scientific Instruments, at Harvard University, USA,[1] dated 1623, is stamped with two, or possibly three, initials, superimposed one on top of the other. The mark is very small but it appears to consist of the letters **D** and **N**, but there could also be a **P** included. My interpretation of the mark from their photograph is shown on the left.

In later articles I hope to show some other diptych dials that are unsigned (this time probably of Southern Germanic origin), and then some interesting English portable dials, all with no signatures.

REFERENCE

1. S.A. Lloyd: *Ivory Diptych Sundials 1570–1750.* Harvard University Press (1992).

For a portrait and CV of the author, see *Bulletin* 24(iv), December 2012. He can be contacted at *mike@brownsover.orangehome.co.uk*

MIKE GROOM

Mike was a really nice fellow and an engineer who liked an intriguing problem to sort out.

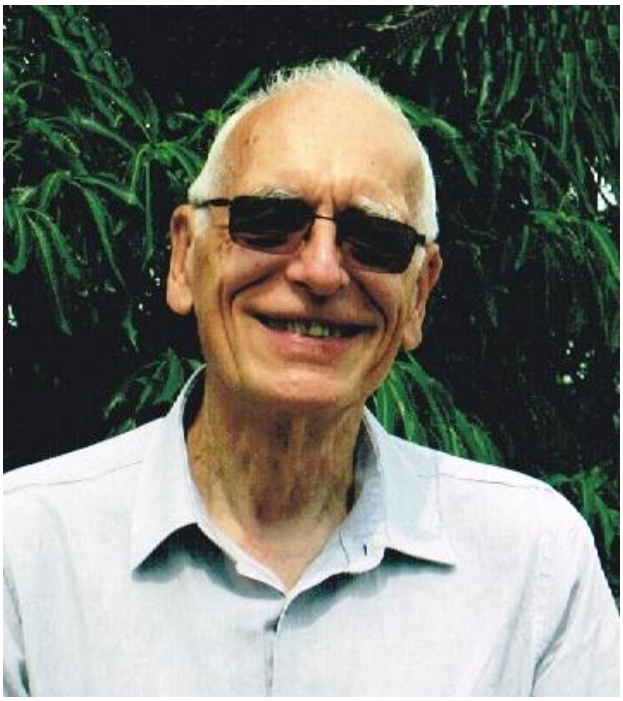
He worked for the Central Electricity Generating Board, starting out as an apprentice mechanical engineer at Battersea Power Station and later working at Bankside, now Tate Modern. After taking early retirement in 1991 he was regularly tempted back into work by interesting jobs.

The first of these was helping to re-establish power supplies in Kuwait after the first Gulf War. Then for about eight years he worked for SELCHP (South East London Combined Heat and Power), helping to commission a new incineration plant in Deptford that generates electricity from waste material. He worked as a freelance consultant on many other similar projects in the UK, Europe and Taiwan.

Why sundials? Mike saw a dial one day and felt compelled to figure out the trigonometry for himself. This led him to join the BSS in the early 1990s. He enjoyed all the diverse aspects of dialling and came along to conferences and Newbury meetings where he gave a couple of talks. One was about setting up the heavy dial his wife Mary had secretly commissioned from me for his 70th birthday in 2011. Mike and Mary went on the Cowhams' Alsace Sundial Safari, a trip Mary describes as "Excellent!"

Along with children from the local primary school, Mike designed a sundial for the nearby recreation ground to celebrate the Queen's Golden Jubilee. He also gave several well received talks to local societies about sundials.

Mike was a member of a local walking group; he set up and ran their website and was actively involved in campaigns to protect local rights of way. He was also a successful racing dinghy helmsman, sailing a Miracle on the River Medway where he and crew, a fellow OAP, usually beat the younger opposition by fair means or foul.



Mike finally permanently retired (unless something really interesting turned up) and he and Mary enjoyed trips to Europe and frequent short breaks in this country. They had a flat in Hammersmith and had lots of fun rediscovering London, often on foot and always on the lookout for sundials. Last Christmas, staying in Bideford, Devon for a week was very happy time. On Boxing Day the Grooms discovered a sundial on the church of St Peter and St Mary in Barnstaple.

In January this year Mike was suddenly taken ill and died two days later. Mike was 73. He leaves Mary, his lovely wife of 49 years, their two daughters and two grandsons.

He will be much missed.

Ben Jones

SETTING THE BEAD ON AN HORARY QUADRANT WITHOUT A DATE SCALE

FRANK H. KING

In his interesting article on the Chetwode Quadrant on pages 2–6 of this issue, John Davis notes that the instrument has no date scale from which one can determine where to place the bead according to the date and no table of solar altitudes either. How did the user know where to place the bead?

The operation of the instrument is based on the assumption that the bead falls on the noon hour line when the string indicates the noon altitude of the sun on the altitude scale.

It is quite easy to place the bead in approximately the correct place without knowing the noon altitude of the sun or the direction of south or the date or the local latitude. The only skill required is to be able to use the sights and thereby arrange for the string to indicate the altitude of the sun. You don't even need to be able to read what that altitude is! This is what you should do…

You take the instrument outside soon after sunrise and wait until the sun is high enough to be able to use the sights. You then hold the string against the altitude scale and slide the bead along the string until it is on the noon hour line. This is the wrong place of course but that is of no account!

You then carry on your daily business for a while and repeat the procedure. You will find that, with the string at the new altitude, the bead is *above* the noon hour line. You have to slide the bead down the string to reposition it on the noon hour line.

You continue in this way until you find that the bead is *below* the noon hour line. This means that the time is after midday. Leave the bead in its last position. This will serve well enough for the rest of the day *and* for the morning of the following day.

If you have been very assiduous and made frequent observations, the bead will be very close to its correct position. If you have made only two or three observations then the bead may be well adrift of its proper place but you can live with the false assumption that it is correct until the error becomes obvious…

The analogy to keep in mind is owning a not-very-good watch! You won't know that it is wrong until you check it against a more trustworthy watch or a time signal. You can then put it right.

With the horary quadrant you will find on the morning of the second day that you turn up for appointments too early. The bead will (almost certainly) be too high rather than too low and when you notice that the bead is above the noon hour line you can refine its position.

Note that if you leave the bead too high you will be late for afternoon appointments!

At most times of year, the bead can be left in position for several days at a time. Provided you keep an eye on the instrument around the time that it *indicates* noon any sunny day, you can keep refining the position of the bead. If you find the bead above the noon line you have to move it down. If you find that the bead never reaches the noon line, then you have to move the bead up.

The bead serves as the instrument's memory. You can use it after dark to see what the solar altitude was at noon or at any other (unequal) hour of the day. In practice it is easy to displace the bead unintentionally so it is, after all, useful to be able to read the altitude. If you can keep the most recent noon altitude in your head, then you can always reset the bead if it is inadvertently moved.

The horary quadrant works very well at low latitudes but at British latitudes it can be a little awry. Not having the bead in exactly the correct position may not be the most significant source of error!

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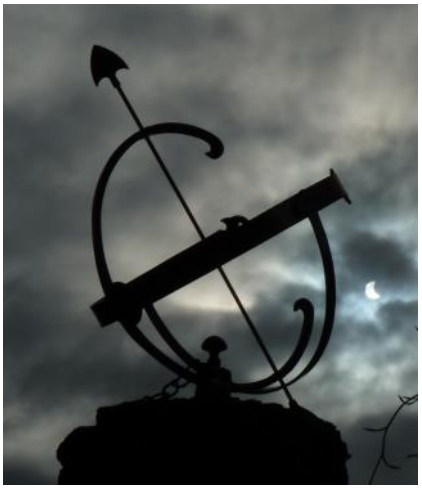
The Eclipse as Seen in Fife



This photo of the March solar eclipse was taken from my garden in Fife about half an hour before maximum. The photo is deliberately underexposed as the sun was still quite bright at that point.

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ANTON SCHMITZ – BILDHAUERMEISTER

Or, how a young German soldier eventually joined the British Sundial Society

DOUGLAS BATEMAN
with assistance from Ursula Schmitz

Anton Schmitz, sculptor, sundial maker, and master stonemason, is well known to members who have attended the Society's conferences. These members know that Anton is a lover of the English countryside, and would combine the conferences with visits to our 'stately homes'.

Before describing his expertise and a selection of his dials, we begin with a very personal account that led up to a story of events that began towards the end of the Second World War. Following the conference near Ripon in 1995, Anton and his wife, Vera, accompanied by the instrument maker Erich Pollähne (more later), travelled south to find bed-and-breakfast. Out of luck they telephoned for advice, and we responded with a quick tidy-up of the spare bedrooms, and invited them to stay. During the evening meal, the conversation took an extraordinary turn towards military events. Our grandparents were in the First World War (one killed, one survived), my father was in the Royal Engineers (Dunkirk, Anzio), my wife's brother was in the Royal Air Force, and my career was in research for the Ministry of Defence. Erich was in the Wehrmacht, whereas Anton was taken prisoner some time after D-Day. Anton's story alone is worth a diversion.

Anton's schooling was interrupted by the war and at the age of 18 he was sent for military training. Despite volunteering for U-boat service (and thus avoiding being forced to enter the Waffen-SS) he joined marine artillery, finally stationed in Cap Gris Nez, where Hitler expected the invasion (see Fig. 1). About two months after D-Day (6 June 1944) and the liberation of Paris on 25 August, the area was surrounded by the Canadian army. The soldiers became prisoners on 29 September and lived in squalid conditions.

Eventually, batches of 1,000 prisoners at a time were transferred to England. Anton recalls being in a greyhound race track near Hampton Court for initial interrogation. The fact that he had learnt to speak English at school was a great advantage. His first POW camp was in Oswestry, North Wales, in November 1944, where he began four years as a prisoner dismantling unwanted barracks and working on farms. The prisoners moved to different camps around southwest England (Fig. 2), and with general post-

Fig. 1. Anton Schmitz, a young soldier aged 19. Photographed in Brussels, 1944, on the way to Cap Gris Nez.

Fig. 2. POW camp, Winterbourne near Bristol. Anton is seated on the left, his role as an interpreter giving him this privileged position.

Fig. 3. Equatorial dial by Erich Pollähne, on show at the 1995 BSS Conference.

war relaxation (only two guards to 50 prisoners and no barbed wire), Anton was given a bicycle and was befriended by several English families. For some time he worked at the Collegiate School, Winterbourne. He returned to the French zone in April 1948, and over the years maintained contact with one of the English families – Mr and Mrs Hopes of Winterbourne. He recounted many tales of Christmases and kind treatment. Those who know Anton will appreciate that this is a very brief summary of Anton's wartime and post-war experiences.

Returning to our other unexpected guest, Erich Pollähne, his war ended in Italy and he walked home over the Alps, subsequently establishing an instrument company. Some conference members will remember his clever 'optical' sundials of various types that he brought to the meeting. Figs 3 and 4 show examples as a reminder. Erich died in 2005 but his company continues as MEKU Erich Pollähne GmbH, Wennigsen, still creating all kind of precision mechanics such as laboratory equipment. The acrylic optical sundials are still available.

After returning to Germany, Anton was unable to continue his academic studies, and took work where he could find it. Initially this was with a wood carver. I saw his master-work in wood carving – a St Margaret of Antioch staying the devil – a truly beautiful piece of carving, some 60 cm high, but there was "no money in wood carving" and his attention turned to stone. In 1949 he was able to embark on a 3-year apprenticeship for stone masonry and sculpture, qualifying with a Diploma as Bildhauermeister (master sculptor) in 1956. During the training he worked for a sculptor in Zurich, returning to Germany in 1959. He returned to his home region, the Eifel, a rural mountain area lying between the river Rhine, the Moselle and the Ardennes. He married Vera in 1960 and they moved to Bonn where he set up his stone workshop. After 1970 he studied in Freiburg under the eminent diallist, Heinz Schumacher.[1] Commissions followed for memorials and a growing number of sundials.

With increasing success Anton and Vera were able to make several trips to England. One of these was to Cornwall in 1993 where they met Richard Thorne, a very early member of the BSS. Of course there were many dials to see in the county, and the purchase of the Shire Booklet on *Sundials* by Christopher Daniel[2] led to joining the Society (membership number 300). Anton attended the conference in Urchfont, 1994, and has attended almost every conference since then.

The social side has continued: he has stayed with members Peter and Jane Walker in Somerset, and even joined in some dial work with David Brown!

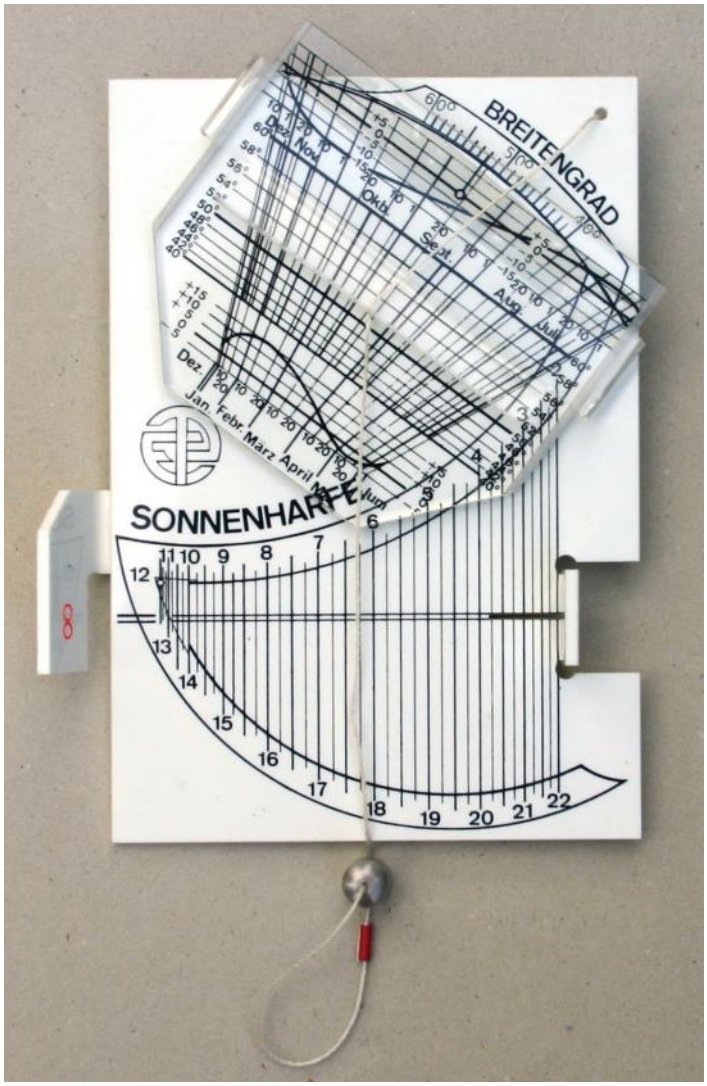

Fig. 4. A fully adjustable 'Capuchin' dial by Erich Pollähne.

Given that Anton has made over 100 dials, where does one begin?

The workshop and yard (Fig. 5) is a start with some work in progress and a casual collection of sculptures, dials and memorials. Some of the latter have been returned after graveyard alterations or for family reasons.

Fig. 5. Various scenes from the workshop.

In Bonn, on an old tow-path promontory on the Rhine, is the massive pedestal and horizontal 'Europa' dial (Figs 6 and 7). The dial commemorates the 12 continental capitals of 1988 around the central raised ring: Athens, Luxemburg, Copenhagen, Rome, Amsterdam, Lisbon, Brussels, Madrid, Dublin, Bonn, Paris and London. The top and base are polished granite whilst the pedestal, with a 'tooled' surface finish, is a dense Belgian limestone.

Fig. 6. Beside the river Rhine, the dial commemorating the United Capitals of Continental Europe (Bonn being a UCCE member in 1988 as the capital of West Germany before the German reunification). When installed in 1989 there were 12 stars surrounding UCCE, but they have since 'disappeared'. Photo: Ursula Schmitz.

Fig. 7. The granite top of the dial in Fig. 6: this and the double dial on the left show the distinctive method of showing the hours and half-hours. Double dial photo: Ursula Schmitz.

Not surprisingly, some dials are in prestigious locations: one such example is a large analemmatic dial in the Rheinaue park in Bonn, laid out in 1979 for the German national garden show, the equivalent of the Chelsea Flower Show. A more recent analemmatic dial was made in 2008 for the Skulpturenpark in Rees, Niederrhein (Fig. 8).

Another dial of note is at the Schloss Miel golf club. In the elegant gardens is a multiple dial with a globe dial (Figs 9 and 10).

Fig. 8. The unveiling of an analemmatic dial made for a sculpture park. Photo: Ursula Schmitz.

Fig. 9. Schloss Miel golf club and dial.

Fig. 10. South, east and west, all slightly reclining, with the Schmitz speciality, a globe dial. The tapering pedestal is a 'greywacke' stone.





Figs 11–15. Shaping a globe dial. Photos: Ursula Schmitz.

Fig. 16. The finished globe dial from the sequence above, showing the hours and geographic features. Photo: Martin Jenkins.

Globe dials are almost a Schmitz speciality and, to me, an interesting challenge. How is it done? Figs 11–15 show some of the stages, starting from a rectangular block.

The end result in Fig. 16, one of five Schmitz dials in the British Isles, is now at the home of Martin and Janet Jenkins in Dorset.

Occasionally restorations have been called for and a good example is of a polyhedral Scottish-style dial. All the original gnomons were missing and the finished dial is shown in Fig. 17.

Fig. 17. A restored polyhedral dial at Schloss Ahrenthal, Sinzig. Photo: Ursula Schmitz.

Fig. 18. A multiple polar dial.

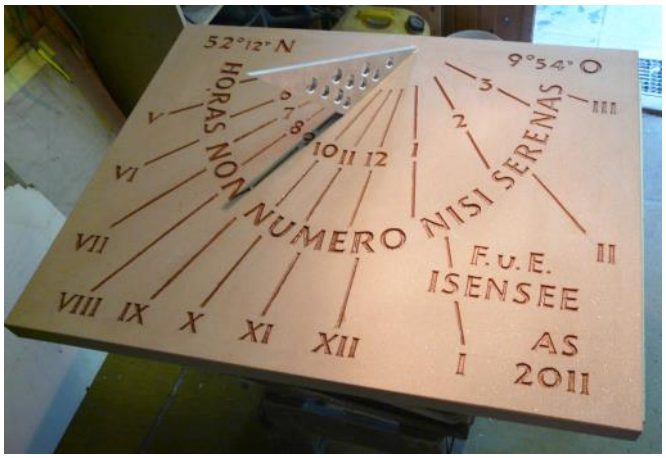

Fig. 19. A vertical dial before delivery. Photo: Anton Schmitz.

Fig. 20. Horizontal memorial dial. Photo: Ursula Schmitz.

As may be expected, a variety of dials have been made and some of them are shown in Figs 18–20.

Although Anton qualified as a sculptor, and I have seen fine examples of his work, the dials are very much 'form fits function'. In other words, only minor flourishes appear on the dials, and this artistic understatement means that the eye concentrates on the dial.

Germany is fortunate to have so many dials by such a talented hand – wood carver, water colourist, sculptor – who at the age of 89 is still carving! I count myself fortunate to have a Schmitz bird-bath horizontal dial in my garden, to have met Anton and his wife Vera so many times, and to have visited their home in 2014.

Finally, a sculptor with a sense of humour…

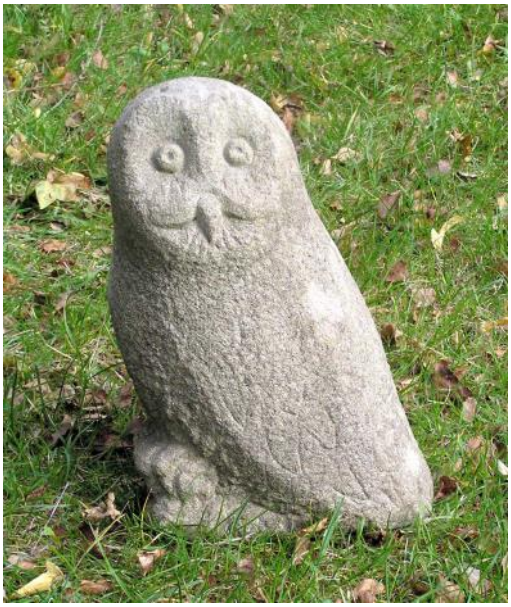

Fig. 21. A contented owl, at home in Somerset. Photo: David Brown.

ACKNOWLEDGEMENT

Credits for the information in Note 1 below to Wolfgang R. Dick, Sasch Stephens and Steve Lelievre, contributors to the Internet Sundial Mailing List.

REFERENCES and NOTES

1. Heinz Schumacher was a teacher at the vocational school for sculptors and stonemasons in Freiburg im Breisgau, in the southwest of Germany, later becoming director. He was author of *Sonnenuhren: Eine Anleitung für Handwerk und Liebhaber 1. Gestaltung, Konstruktion, Ausführung,* Callwey, München (1973). A second volume in the series is by Adolf Peitz: *Sonnenuhren: Eine Anleitung für Handwerk und Liebhaber 2. Tabellen und Diagramme zur Berechnung*, Callwey, München (1978). The third volume by Schumacher and Peitz, *Sonnenuhren: Eine Anleitung für Handwerk und Liebhaber 3. 303 Beispiele aus 12 Ländern*, Callwey, München (1981) features dials by his former pupil, Anton Schmitz!
2. C.St J.H. Daniel: *Sundials*, Shire Album 176 (1986).

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A PROPOSED HELIOCHRONOMETER

ALAN MITCHELL

The excellent photograph of the Campbell–Stokes sunshine recorder on the back cover of the September 2014 issue of the *Bulletin* prompts me to send to the Society a record of my invention, many years ago, of a new and, I believe, unique type of sundial. Sadly I have had neither the wit nor the determination to build one, but I think my story could be of interest to members of the Society.

In 1978/9 I was in my forties with a very stressful and responsible job on a major construction project. I had many active outside interests. I was the father of four young children and had just extended the house, to my own design, to accommodate us all. Part of the south-facing upper wall of the extension presented a windowless aspect overlooking an access track to a neighbouring recreation ground. You can imagine that I already had more than enough to occupy my mind but, in idle moments, I considered decorating this wall with a sundial.

Turning this idea over in my mind, I could see three main problems with conventional sundials:

1. They depend on full sun to be really useful;
2. They are difficult to read at a distance, and
3. They do not tell 'clock' time.

Pondering this in bed one cold winter's night I had a Eureka moment and startled my wife by leaping up to write down my thoughts in case I forgot them in the morning!

I knew about Campbell–Stokes sunshine recorders, which collect sunshine by means of a spherical lens and direct an intense spot of light onto sensitive paper, leaving a visible mark. This mark is in a unique position on the paper at each moment in the year (or rather in six months of each year). In those days, fibre optic cables (FOCs) were just coming into popular use – remember those lamps with sprays of tiny filaments which produced magical spots of light at their ends? Why not pierce the backing plate of a sunshine recorder with a multitude of holes, into each of which an FOC could be fastened, then lead the other ends of the FOCs to a dial face? The dial face could be of any shape and could be placed anywhere, limited only by the length of the FOCs – even inside a building with the light-collecting ends outside. The arrangement could correct for the Equation of Time. A schematic diagram of the basic layout is shown in Figs 1–3.

The sphere, being large in relation to the spot of light it produces, would help to give readings in weak sunlight.

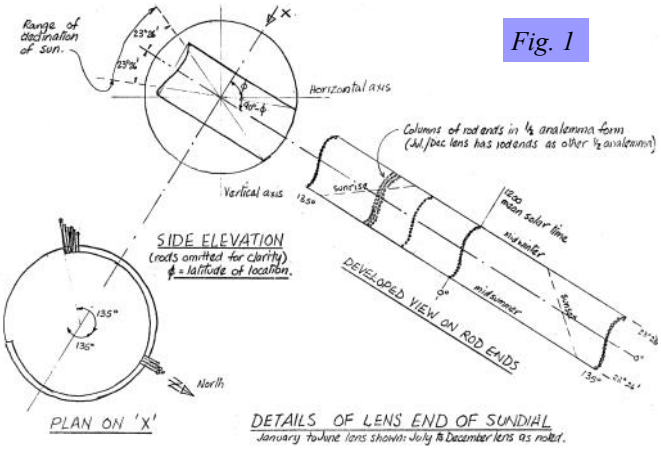


Fig. 1

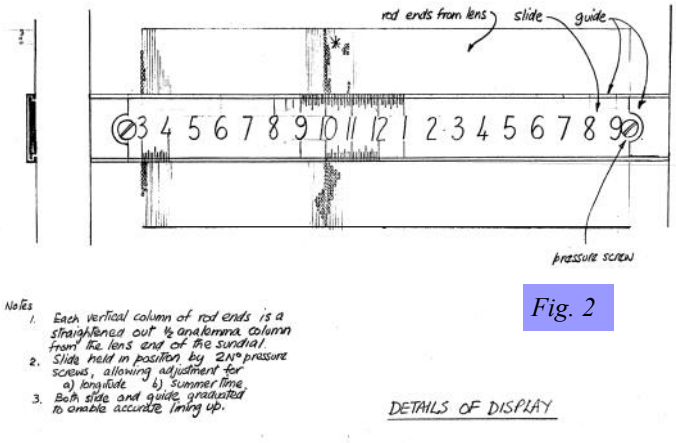


Fig. 2

(A later thought was that the lens would have to be given a light-reactive coating to limit the intensity at the receiving optical fibre). Two devices would be needed to cover each half of the year, thus covering each of the two halves of the analemma, with a shutter arrangement to cover the 'inactive' half. If required, the daylight-saving clock change and any required longitude correction could be dealt with by having the numeral part of the dial movable (Fig. 2). The use of fibre optic cables in sundial design is not, of course, unique (see references below).

This then was the basis for my invention. I could visualise examples all over the world, in public squares as well as in private gardens! I could make a fortune!

I became extremely secretive in case someone else might capitalise on this idea. I went to a Patent Agent who gave me free advice in his, and my, lunch hour – it seemed to be new, it was probably patentable. I should apply for a

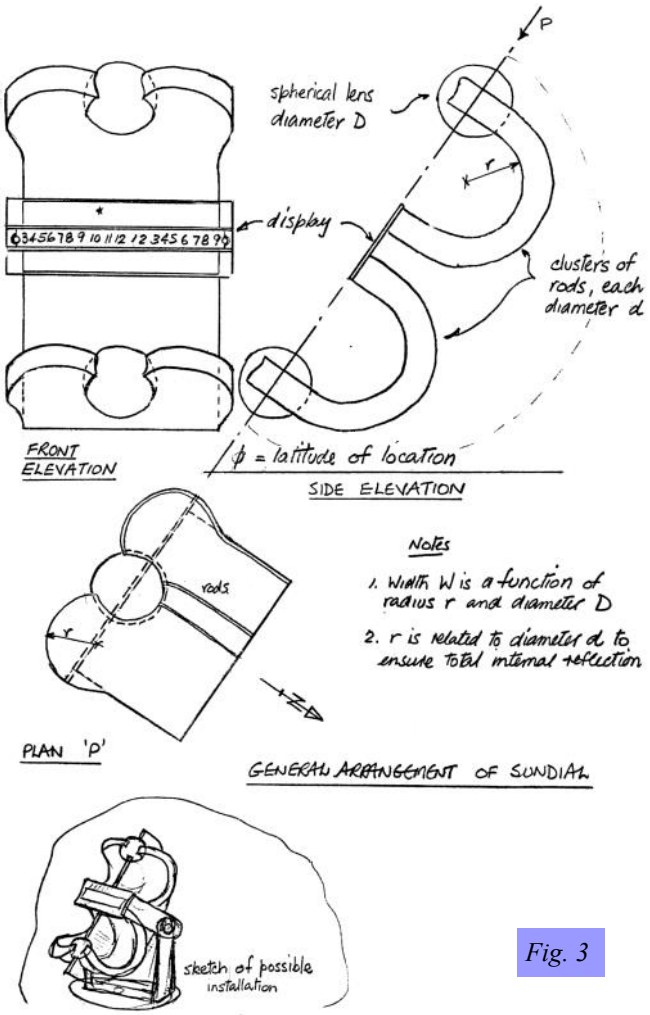


Fig. 3

provisional patent but to get a full patent would be expensive and I should first contact a business organisation to develop and market it.

I took the first step of applying for a provisional patent in February 1979, and followed this up with a repeat, though slightly modified, provisional patent application in February 1980 in the knowledge that this would expire in a year's time unless it was followed up.

I was then very fortunate to be introduced to your President, Chris Daniel, who, at that time, was at the National Maritime Museum, Greenwich and happened to live only a mile or so from me. He was very supportive and described my proposal as a heliochronometer. He encouraged me to join the Society. However, he recognised, as I did, that making such an instrument would be difficult and expensive. He spoke to a few people who might have relevant expertise but got no positive responses and advised me to seek help from specialist firms. This I did, enclosing fairly detailed design examples for an instrument with two lenses concentrating on a lens diameter of about 100 mm (as for the Campbell–Stokes recorder), 1 mm FOCs and a reading interval of 5 minutes. Though some found the concept interesting, they were not prepared to find resources to become involved.

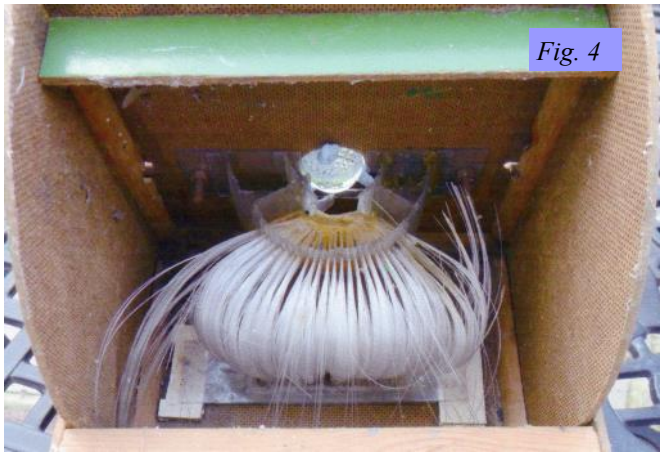


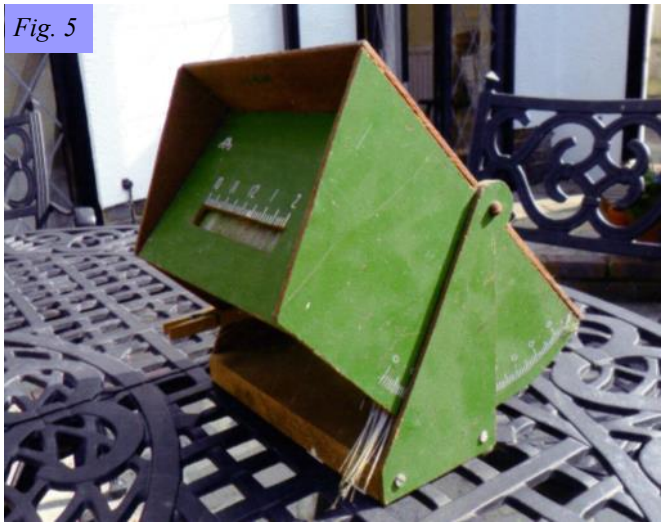
Fig. 4

Chris Daniel suggested that I enter the design into a sundial competition in France – *Concours Cadran Solaire* 1981. I am afraid my submission was rushed and badly put together, with accompanying text in my schoolboy French. I received some encouraging recognition but no prize!

I started to make prototypes, the first with a large clear marble and a bunch of fine FOCs (as in the lamps) stuck together with glue. I have rescued this from the garage. The photograph of the rear of the model (Fig. 4) shows that, though my workmanship was crude, the principle was proved. Fig. 5 shows a different view; the intention was to have the finished instrument wall mounted.

There followed a period of continued demands on my time from work, family and other interests so that I went back to the sundial project only very intermittently. I purchased two 3″ diameter clear acrylic balls and a 400 metre reel of 2 mm diameter polymer fibres. I found that a 6″ diameter hollow plastic ball, when cut in half, could serve as a support for the spherical lenses clear of the inside face. This could be drilled to hold the receiving ends of the optical fibres at the focal length of the lens. And there I became stuck! It proved well beyond my capability to drill 2 mm diameter holes in a close grid on a curved surface. I gave up. I put the bits and pieces in a box in the garage and though I have often boasted to my friends and acquaintances that I have invented the best sundial in the world, I have made no further progress towards realising my dream.

Fig. 5



FOOTNOTE

I also conceived a variation on the basic idea without the magnification produced by the lens. This comprised a curved opaque screen perforated by a grid of holes with a significant length to diameter ratio. Each hole was aligned so that the rays of the sun passed through it only when the sun was at a specific vertical and horizontal bearing to the screen, that is, at specific intervals of time at specific times of the year. FOCs at the bottom of each hole would transfer the incident light to a dial.

As with my original idea, corrections for the equation of time would be made by utilising two screens and the corrections for longitude and summer time would be incorporated. This would simplify construction, albeit with appreciable loss of function.

If someone reading this goes on to achieve what I have failed to do, I would be glad if they could give me some credit!

REFERENCES

1. W.G. Benoy: 'A remote reading sundial', *BSS Bulletin* 89.2, 16–18 (September 1989).
2. J.M. Shaw: 'A remote reading sundial using fibre optics', *BSS Bulletin* 13(ii), 67–68 (June 2001).
3. R. Adzema and M. Jones: *The Great Sundial Cutout Book*, Hawthorn/Dutton, New York (1978).
4. *www.wiz.to/sundials*
5. *cargocollective.com/chelseascharbach/Fiber-Optic-Sundial*
6. US Patent No. 8065808, issued 29 November 2011.

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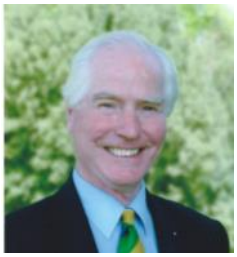


NEW DIALS (2)

Armillary Dial in Eire

In 2013 I was invited to design a dial to cover an unused well head at a country house in Southern Ireland. We decided on an armillary dial having two identical arcs each with an outside diameter of 800 mm (Fig. 1).

David Johnston (*davetheblacksmith@gmail.com*) of Thortergill Forge in Cumbria made it. A slab of phosphor bronze 1000 × 1000 × 40 mm was purchased and three large sections were cut out of it by water jet. I find it so hard to accept that a water jet can apparently with ease cut through such a hard metal of this thickness; I show in Fig. 2 a screenshot of the drawing produced using the Vectorworks CAD software program which, when converted appropriately, was sent down the line to the firm who cut it. David arranged for its engraving, again from a computer drawing, then finished, polished and assembled the dial, and transported it in his van for installation across the Irish Sea.

Fig. 1. The pristine dial on installation.

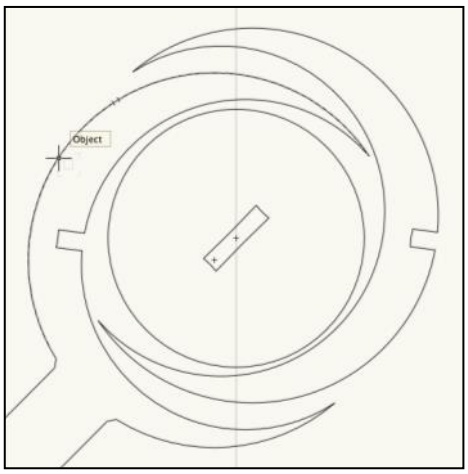


Fig. 2. Screenshot of the 1000 × 1000 mm sheet showing the cut-out sections.

Tony Moss has very kindly given me invaluable advice on how to get rid of some unwelcome bird droppings and ensure that it will tarnish evenly.

Mark Lennox-Boyd marklennoxboyd@mac.com

SUNDIAL DISCOVERIES IN INDIA AND SRI LANKA

MARTIN JENKINS

Over the last three years, my wife Janet and I have motorcycled in various parts of India and Sri Lanka. Wherever we travel we are always on the lookout for sundials. In India there are the famous Jai Singh observatories in Delhi and Jaipur which we have visited, but our travels have uncovered very few 'ordinary' dials. This is surprising given that for the most part there is plenty of sunshine in both countries and remnants of historical periods are everywhere.

In India we have so far discovered only six dials. The first one to mention is the Sanderson dial in the Mughal Garden of the Qutb Minar complex in the southern part of Delhi (Figs 1–3). The dial commemorates Gordon Sanderson who was one of the superintendents of the Archaeological department at the Qutb Minar complex from 1910 to 1914. It stands on its own in the complex grounds, surrounded by a small iron fence to all sides. The dial is a horizontal one, made of marble, and delineated with hour and half hour lines and Roman numerals. We first became acquainted with the dial when BSS American member Jim Holland had made a visit to Delhi some time previously and showed us some photos he had taken of it. The dial is a little bit damaged, one corner having disappeared but showing signs that at one time a repair had been attempted.

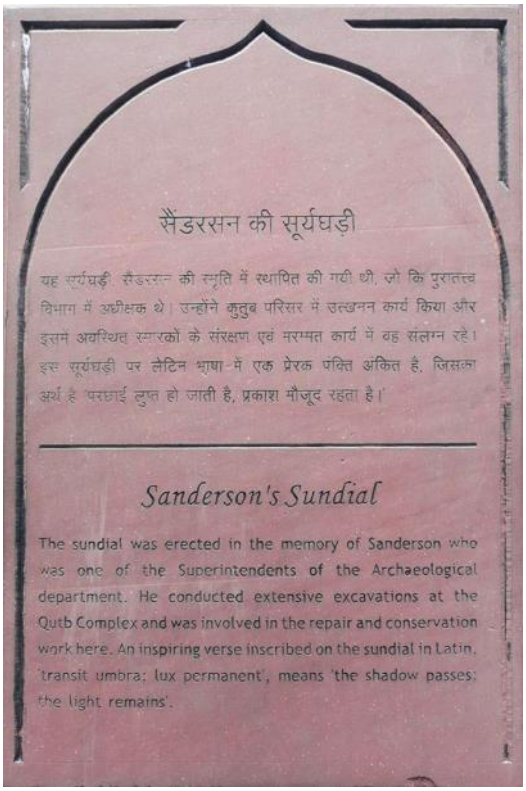


Fig. 2. Sanderson dial information plaque. Photo: Jim Holland.

Fig. 1. Qutb Minar, Mughal garden and dial. Photo: Jim Holland.

Fig. 3. Sanderson dial plate showing missing corner.

The next dial of note is one from our Himalayan tour and is located in Shimla (also known as Simla). In colonial days, Shimla in the northern province of Himachal Pradesh was the summer retreat capital for the British, to enable them to escape the oppressive heat of the Delhi plain. In Shimla, there is a dial in the grounds of the once Viceregal Lodge, known as the Rashtrapati Nivas. The Lodge is now an

Figs 4–6. Shimla dial plate; dial pedestal; dial plate, location details.

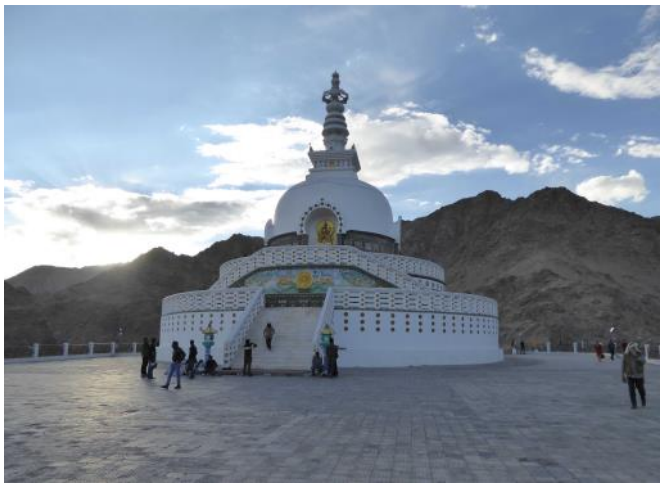
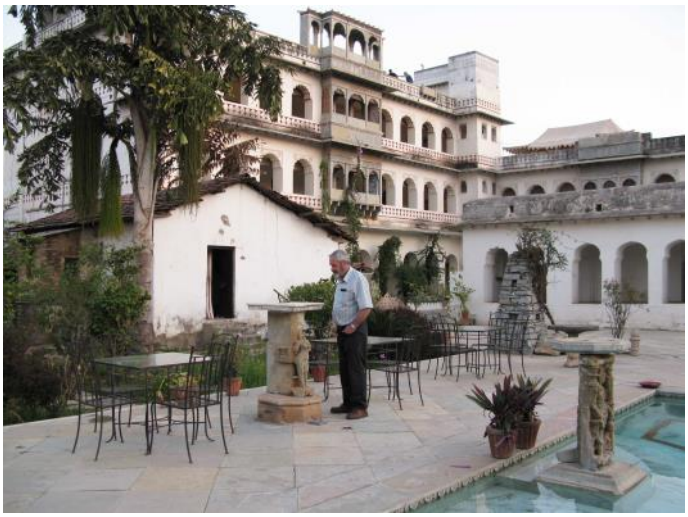
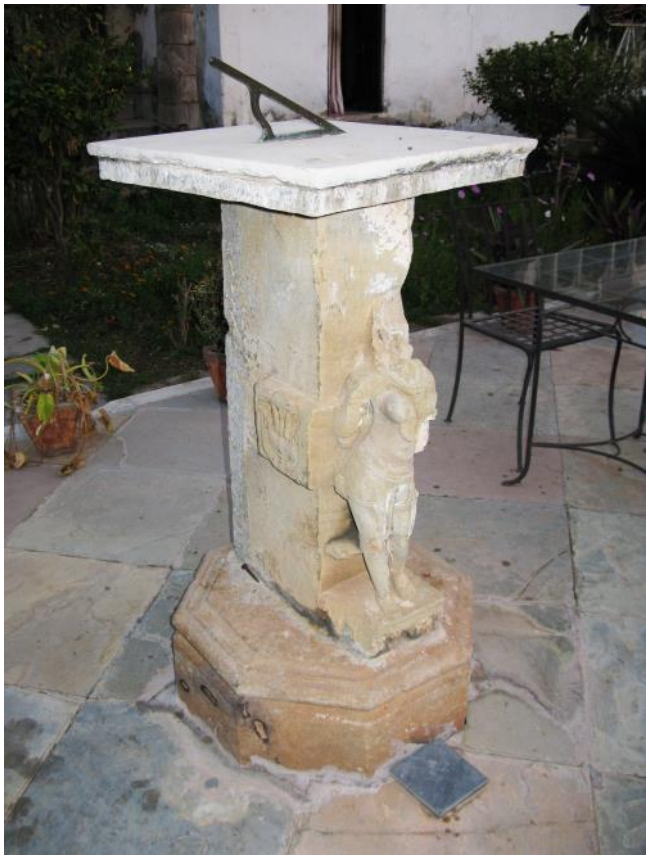


Fig. 7. Shanti Stupa, Leh.

educational establishment. The dial is bronze set on a stone plinth (see Figs 4–6). Unfortunately, the gnomon is missing. The dial is very nicely engraved and carries a table for the Equation of Time and in addition bears the inscription: MATH. INST: OFFICE CALCUTTA 1892 and the legend: MADRAS OR RAILWAY TIME IS 12 MINUTES FAST OF SIMLA MEAN TIME. Interestingly, Madras time was a time zone set up in 1802 by John Goldingham, the first official astronomer of the British East India Company in India. It was set to 5 hours and 30 minutes ahead of Greenwich Mean Time (GMT+05:30). Bombay time and Calcutta time were set up later as the two official time zones of British India in 1884, with railway companies in India using Madras time as an intermediate time zone between the two zones. This led to Madras time also being known as 'Railway time India'. At the time, the Indian railway companies had to deal with a number of different local times as the rapidly expanding routes extended out from Bombay (Mumbai), Calcutta (Kolkata), Lahore and Madras (Chennai). Towards the end of the 1860s the situation became even more confused as the networks linked up. To overcome the problems, Madras time was adopted for all railways in 1870, the two main reasons for this being: the longitude of Madras is roughly midway between those of Calcutta and Bombay, and the Observatory based in Madras already ran the telegraphic service which could be utilised to synchronise station times via the same time-signal system used in Britain in 1852 to regulate railway time.

Our other Himalayan dial is in Leh, the capital of the Ladakh region and the highest capital in India at an altitude of 3,500 metres (11,600 feet). Leh is in one of the most sparsely populated, coldest, and elevated districts in the world and is also very close to Tibet. Overlooking the city is a very large stupa of the Buddhist faith, the Shanti Stupa, surrounded by a terrace (Fig. 7). At the end of the terrace furthest from the part overlooking Leh, and painted on the ground, is a rather crudely produced analemmatic dial with a website address given[1] and bearing the date June 2014 (Figs 8 and 9). However, this is a very interesting dial; it is apparently number 17 of a series of 18 analemmatic dials throughout the Uttar Pradesh region. The dial is part of the



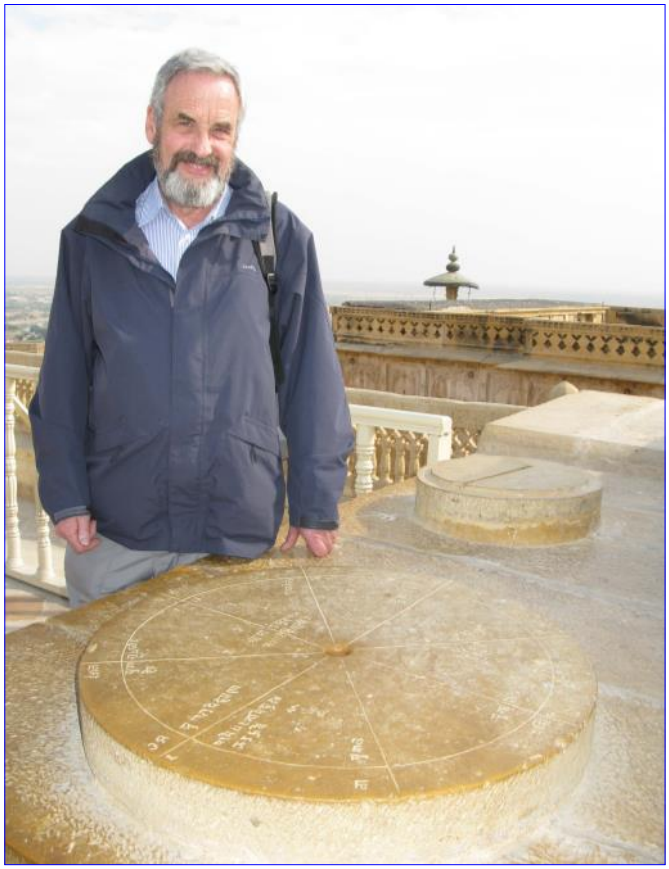


Figs 8 and 9. Shanti Stupa, analemmatic dial with gnomon! Analemma detail.

Eratosthenes Project run by the French Foundation 'La Main à la Pâte' to help improve the quality of science teaching in schools. The project is run in conjunction with the Pragati Vigyan Sansthan Science Club of Meerut, Uttar Pradesh.

South and west of Delhi is the large province of Rajasthan, famous for beautiful cities, palaces, and military forts. On our tour of Rajasthan one of our overnight stops was at the Castle Bijaipur Hotel in Bijaipur, a small village not far from Chittorgarh, one of the most romantic of Rajasthan's fortifications. In the hotel garden by the poolside was a rather nice horizontal dial in marble set on a plinth which I do not think was original, as the style did not seem to be in keeping with the simplicity of the dial. Was this dial in its correct location? We don't know. The dial face was nicely engraved (see Figs 10–12). Unfortunately the text was in Sanskrit and our Hindu-speaking friend could only translate the date of 'May 1830'. Nearby was another plinth which looked as though it too had at some time supported a dial.

Figs 10–12. Castle Bijaipur hotel, poolside terrace; dial and pedestal; dial plate detail.



Figs 13–15. Jaisalmer Palace, rooftop dials; sundial minus gnomon; eight-segment dial?

The next Figures 13–15 are of two dials located on the roof of the Palace in Jaisalmer, the 'golden fort' on the edge of the Thar Desert to the far west of Rajasthan. It is a living fort with over one quarter of Jaisalmer's population living within it. There was no information to be had locally about the dials; I suspect no-one locally even knows what they are. One is clearly a horizontal dial with the gnomon missing but the other is a complete mystery. Perhaps it just indicated the direction of the sun, but why? In addition, I do not think that they are in their original locations as they are shaded by the adjacent building for most of the day.

Fig. 16. Bawa dial viewed from across the bridge in the direction of the causeway.

After India, we now move on to Sri Lanka. Here it would appear that dials are even rarer. Our travels have only discovered a relatively 'modern' one. It is in the gardens of Sir Geoffrey Bawa's estate at Lunuganga, to the south of Colombo. Sir Geoffrey was a famous architect, his most notable commission being the design of the Sri Lankan Parliament building. Given Sri Lanka's close connection with Britain it is strange that he never received any official accolade from Britain until 1998 when Prince Charles paid a personal visit to the then ailing architect at Lunuganga. Later, in 2001, Sir Geoffrey received the Aga Khan's special award for architecture.

Sir Geoffrey was born in 1919 and died in 2003. His father was Justice B.W. Bawa, a wealthy and successful lawyer of Muslim and English parentage, and his mother, Bertha Marianne Schrader, was of mixed German, Scottish and Sinhalese descent. He had one older brother Bevis Bawa who became a renowned landscaper. Sir Geoffrey's design style was classed as tropical modernist. He had two homes, one in Colombo and the one at Lunuganga. When he died in 2003 the estate and house passed to the Sri Lankan state as part of a trust. The Lunuganga home consists of his house, studio gallery, various smaller buildings, and extensive gardens which include a lake. On the day of our visit, only the garden and lake area was open. The dial is located in the lower-level garden: the centrepiece of a pond. It is accessed via a bridge and causeway. It is a

Fig. 17. Bawa dial plate and steel gnomon.

Fig. 18. Bawa gnomon detail.

strange dial in that according to the guide it indicates time only from 9 am to 3 pm and only for three months of the year. There are no visible markings on the ground-based curved dial face. We were informed by the property custodian that the gnomon was recovered from the lake quite recently. I really don't know why they bothered to reinstate the gnomon; it is crudely made from steel adopting welded construction, lacks finesse, and is very difficult to interpret (see Figs 16–18). I do also wonder whether it is the original gnomon.

The only other Sri Lankan dial known to us, also fairly modern, is in front of the Engineering faculty building of Moratuwa University. The ceremonial opening of the dial was performed by the Chancellor Sir Arthur C. Clarke in 1996. Unfortunately we have not yet had the opportunity to see it, maybe on our next visit! This dial was apparently the result of a student final year project, subsequently written up as a paper for the Astronomical Association.[2] The dial has a moveable gnomon so that the Equation of Time difference can be ameliorated to enable the dial to indicate civil time more closely. It is claimed that the accuracy is ±5 minutes.

On our travels throughout Sri Lanka, particularly to historical capitals such as Nuwara Eliya, Kandy and Galle, we have been surprised that we have not found any dials from Dutch, Portuguese, or British colonial days; maybe they all got destroyed in the days of colonial rivalry or the days leading to independence?

That is our collection of Indian and Sri Lankan sundial discoveries so far; maybe future visits will uncover more.

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1. *www.analemmaweebly.com*, website of the Pragati Vigyan Sansthan Science Club of Meerut, Uttar Pradesh.
2. S.R. Munasinghe and N. Hettiarachchi: *Design of a Novel Sundial based on Dial Swing Concept,* Astronomical Association, University of Moratuwa, Sri Lanka (1996).

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

NEW BOOK

La Mesure du Temps dans L'Antiquité by Jérôme Bonnin. Published March 2015 by Les Belles Lettres, price €35.
448 pages, 160 × 240 mm. ISBN 978-2-251-44509-0.

This book, which is based on Jérôme Bonnin's PhD research on Roman archaeology, deals mainly with Graeco-Roman sundials. It shows how advances in time-measuring technology led to numerous changes in the conduct of daily life, both private and public.

The book presents a significant revision to traditional classification and terminology, using examples from archaeology and literature. Many new aspects are covered, including examples of time-measuring instruments in inscriptions, mosaics, sarcophagi and reliefs.

A chapter by Denis Savoie reflects on various mathematical challenges.

Jérôme Bonnin

Further details may be seen at the publisher's website *www.lesbelleslettres.com*

RESTORATION OF THE HOLE PARK SUNDIAL

BRAD DILLON

Hole Park Gardens are in the Weald of Kent, between Rolvenden and Cranbrook. The main dial (SRN 6900), by Cary of London, is in the Sundial Garden, but the present article concerns another one, found in an old outbuilding. It had been shown to David Hawker by Edward Barham, the owner of Hole Park, and in consequence of Mr Barham's interest in restoring the dial, David put him in touch with John Davis.

John identified it as a possible 17th-century dial and carried out tests to determine the alloy content of the material and he made a note of the style of the engraving of the numerals and the minutes around the outer chapter ring (Figs 1 and 2). Unfortunately, because of ill-health, he was unable to continue with the restoration, so passed the work to me.

I received the dial in two pieces, the gnomon having been removed from the dial plate by John. The dial face was badly warped in the centre and two holes had been drilled, either side of the gnomon (see Fig. 1), in addition to the original four fixing holes located in the corners. I assumed that the original gnomon had been wrenched from its moorings at some stage, causing the distortion of the dial face and thus necessitating the additional holes to bring the dial face flat when reattaching it to the plinth.

The gnomon did not appear to be the original one and, when I refitted it, I noticed that there was a 3 mm exposure on the surface of the dial plate at the north end of the foot of the gnomon. It seems that this replacement gnomon had been set too far to the south. I dealt with this by removing 3 mm from the north faces of the lugs thereby allowing the gnomon to be repositioned 3 mm further north. I then refitted the gnomon using three wedged pins in the original holes (Fig. 3). Inspection of Fig. 1 shows that the two VI lines are not aligned, so positioning the gnomon necessarily requires compromise.

Fig. 1. The dial plate from above (note the two additional holes).

I was reluctant to remove the patina from the dial face, for obvious reasons, but after years of neglect and rough handling it had become so badly scratched that the engraving had become almost indistinct. I removed most of it with medium emery paper, then switched to a solution of bicarbonate of soda and lemon juice to help things along, using a scouring pad to attack the patina. I worked the pad in a north–south direction, varying the pressure with my fingertips to accommodate the uneven nature of the surface. When I felt the patina had given way to the bare

Fig. 2. Chapter ring detail.

Fig. 3. The wedged pins on the underside of the dial plate.

Fig. 4. The finished dial with (assumed) later gnomon.

Fig. 5. Hole Park House. Photo: Edward Barham.

metal I stopped working that area and moved to another that required attention. I finished using a fine sanding block and warm water, then darkened both dial face and gnomon to a mid-brown colour with bronze patinating fluid supplied by Liberon. Finally, I applied a coat of mahogany beeswax which enhanced the engraving and gave the dial a 'finished' look.

Whoever supplied the replacement gnomon had made a good job of casting it and had added a rather stylish 'foot' along its base. The scroll work, I felt, was a little unorthodox but did not distract from the fact that this is a charming little dial (Fig. 4).

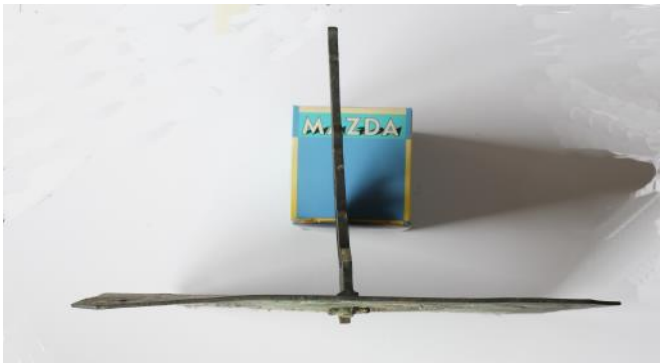
Edward Barham, the owner of Hole Park, tells me that the dial will shortly be mounted on a new pedestal and located in the gardens at Hole Park later this year. It will be placed in front of the house (Fig. 5) and it is hoped to use the dial to commemorate a great uncle killed in 1915.

ACKNOWLEDGEMENT

Thanks are due to Edward Barham for permission to publish this article about the Hole Park dial.

Brad Dillon first became interested in sundials whilst working as a blacksmith for an architectural salvage company in London in the 1980s. He began restoring then moved on to making, first in steel, for his own use and as artisan gifts for local craft societies, then progressed to making wall and horizontal dials in brass and bronze, later progressing to armillary spheres in bronze and stainless steel. He recently made an 800 mm armillary for Dumfries House in Scotland which was unveiled by HM The Queen and Prince Charles. He can be contacted at *brad.dillon48@yahoo.co.uk*

THE HOLE PARK DIAL, UNRESTORED



These pictures show the Hole Park dial prior to any restoration. The heavily patinated and scratched dial plate has been stretched into a convex shape by someone wrenching the gnomon upwards. The gnomon itself has a slight kink.

John Davis

NEWLY REPORTED DIALS, 2014

JOHN FOAD

Most reports nowadays are welcome follow-ups on dials already in the Register, giving news of changes in condition or location, and sometimes additional historical details. But we also have a pleasing flow of new dials and refurbishments, and indeed of older dials only now recorded for the first time. Some of these received in 2014 are briefly described below.

1. The earliest dial in this selection was reported by Margaret Ribchester, and is this on Provand's Lordship, the oldest house in Glasgow. The house was built in 1471, but the dial probably dates from the 1640s when the house was extended by William Bryson, a wealthy clothmaker and tailor. The wall faces south but the dial is a west decliner, appropriately canted. We do not know whether it came from somewhere else, or whether it was mounted like this to make it more visible from further down the street. SRN 7643. 3 Castle Street, Glasgow G4 0RH, Open.

2. And here we have a similar effect, found by Ian Butson in a private garden. The 18th-century west-declining dial is set into a deeply canted recess in a south-facing wall, perhaps again to suit a viewpoint elsewhere in the garden. SRN 7571. Ford Place, Thetford, Norfolk IP24 2EP, Restricted.

3. An important and unusual geographical dial with 32 place names. It is signed by Meredith Hughes of Bala in Wales and is dated 1767. Inside a circular Equation of Time scale is a separate once-moveable brass ring whose inscriptions are now hard to read but which may have served to supply the EoT correction. Investigation into the details continues. Irene Brightmer has made a particular study of Welsh dials, and supplied both this report and the next. SRN 7580. Clwyd area, Refer to Registrar.

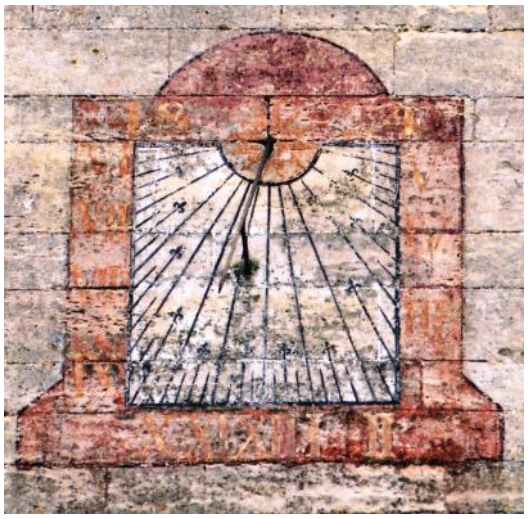
4. Another 18th-century Welsh dial, this by Richard Glynne of the Clockmakers' Company, apprentice to Henry Wynne. Originally in a local landowner's garden, it now stands in the village churchyard. SRN 7660. Dyfed area, Refer to Registrar.

5. Wales is a happy hunting ground. This attractive dial in Clwyd is inscribed with the date, 1736, and the names of the churchwardens. The plate is in good condition for a

Upper row: Nos. 1–3. *Lower row: Nos. 4–6.*



Upper row: Nos. 7–9.
Lower row: Nos. 10–12.




sandstone dial of its age; the gnomon may be a replacement, or it has been recently re-gilded. SRN 7659. St Maughain's Church, Ruthin, Clwyd LL15 2UT, Open.

6. This fine horizontal was installed at its present Gloucestershire home in 1984 but Tony Wood understands from the owner that it came originally from Wales. Most unusually, it is inscribed by the maker Thomas Barnett with a specific day – 'March ye 19th 1724'. SRN 7664. Refer to Registrar.

7. Staying with the 18th century we next come to a private house in West Yorkshire, another area well blessed with good sundials – or enthusiastic reporters! John Sanders made this one in 1791. There is no nodus on the gnomon, supporting the view that the apparent solstice and equinox lines are more decorative than functional, but it is an attractive dial. SRN 7649. Honley Holmfirth, West Yorkshire, Private.

8. Continuing our move up-country, Frank Evans found this strange construction. A sturdy figure of Father Time bears a stone cuboctahedron on his head with 12 dial faces, two marked Ephesus and Madagascar. He holds an hourglass, and has a scythe and ouroboros on his back, but his wings are now missing. He stands on a cube, marked with Acapulco, Rome and Bordeaux – an eclectic mixture, and the whole could bear further investigation! SRNs 7662 and 7663. Shildon, Corbridge, Northumberland NE45 5PY, Private.

9. On up to Scotland for this fine dial from 1849, suffering from lichen but still readable. SRN 7641. The Episcopal Church, Woodhead, Fyvie, Turriff, Grampian Region AB53 8LS, Open.

10. This painted dial has survived for nearly 200 years with no noticeable 'drift' from the re-paintings that it must have endured. It is dated 1824 and was noted by Arthur Mee in his "King's England" series, and tracked down by Ian Butson. SRN 7575. St Peter's Church, Lenton, Lincolnshire, Open.

11. This dial at the home of the Duke of Westminster is one of three on a decorative stone pillar designed by Edwin Lutyens. Francis Barker made the dials in 1899, and Mike Shaw described the various doubtfully recorded locations of the pillar in *Bulletin* 16(iii), September 2014. SRN 7678. Eaton Hall, Eccleston, Cheshire CH4 9JD, Private.

12. On a corbel outside the high belfry window of a locked church on a steep hill, this dial is not easy to reach, far less to read (not least because it is rotated 180°)! It is incised

Upper row: Nos. 13–15. *Lower row: Nos. 16–18.*

'D. Landsborough / 1811'. The much-respected Rev. David Landsborough (1779–1854) was ordained Minister of Stevenston in September 1811, and was a renowned naturalist and author. Thanks to Christine Northeast for cracking this difficult one! SRN 7681. High Kirk, Stevenston, Strathclyde KA20 3DL, Restricted.

13. Moving forward in time and outward in location, Maureen Harmer found this Campbell–Stokes sunshine recorder in Madeira. Please, travellers, continue to note overseas dials by British makers. SRN 7674. Jardim Botânico, Funchal, Madeira, Restricted.

14. An elaborate pillar dial (refurbished since this report) with extensive inscriptions in memory of Lt R. Cecil Hopkinson of the Royal Engineers, who died in 1917 from wounds suffered near Loos two years earlier. SRN 7613. Ascension Parish Burial Ground, All Souls Lane, Huntingdon Road, Cambridge, Open.

15. Somersham is twinned with Challain-la-Potherie in western France, and this slate dial on the church commemorates the fact. SRN 7625. St Mary's Church, Somersham, Suffolk, Open.

16. Hungerford is twinned with Liguel in central France, and this white stone dial commemorates the fact. Are we seeing a charming trend? SRN 7671. The Fire Station, Church Street, Hungerford, Berkshire, Open.

17. This well designed and well made modern declining dial adorns the wall of a pub. The inscription 'Carpe Cerevisi' means roughly 'Enjoy the Beer'! SRN 7676. The Chequers Inn, Claypit Lane, Ledsham, North Yorkshire LS25 5LP, Open.

18. Finally, thanks to Tony Wood for an exceptional dial by Ben Jones, which stands outside the entrance to the Nature in Art Museum. SRN 7637. Wallsworth Hall, Twigworth, Gloucestershire, GL2 9PA, Restricted. The full story will be published in the September issue of the *Bulletin*.

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BSS ANNUAL CONFERENCE

Nottingham, 10–12 April 2015

Geoff Parsons, John Lester, Irene Brightmer and Frank Coe

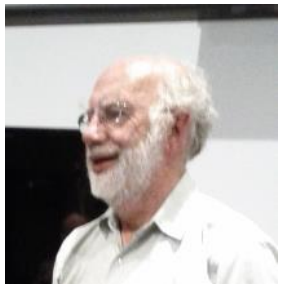
This year's Conference, organised by Chris Lusby Taylor, was held at the East Midlands Conference Centre, Nottingham, on the University Park Campus with its beautiful grounds containing several sundials.

Friday 10 April

A buffet supper and welcome by the Chairman, Frank King, were followed by…

David Brown: *Marg Folkard: Sundials Australia*

David gave a presentation on his family visit to Adelaide when he met Marg Folkard and John Ward of Sundials Australia, mentioning his difficulty becoming accustomed to the orientation of sundials in the southern hemisphere and the south-pointing gnomons. He went on to describe the wide range of sundial types and materials used by Marg and John, and their impressive workshop facilities and sundial collection, and emphasised the immense care they took to make precise sundials of the highest quality. He visited a local laser cutter Eddie Ptak who made him a 3D St George and the Dragon gnomon to David's design, and was surprised and deeply honoured to be presented with a plaque commemorating his visit. David then highlighted a few of the important dials Marg and John had made, including the large armillary sphere in the Australian National Botanic Gardens, Canberra, and finally showed a video of the manufacturing of the large brass armillary sphere in the Royal Botanic Gardens, Sydney.



Saturday 11 April

A brief AGM was followed by the morning's papers…

Frank King: *The Sundial of Adventure: A New Enid Blyton Story*

All will have heard of Enid Blyton, the prolific children's author who, Frank told us, lived at a house in Beaconsfield which was built in 1912. It had a slate sundial embedded in the timbers of a mock-Tudor gable. This carried the inscription 'To measure life learn thou betimes', a quotation from the poet Milton. Below the dial was a veranda whose roof was supported by four brick piers of distinctive design. The dial was commissioned by Charles Albert Milton Mount Maggs around 1913 from Francis Barker & Son. Enid Blyton moved into the house in 1938 and named it 'Green Hedges'. She lived there until her death in 1968. The house was demolished in 1973 and the dial was relocated to Amersham until 2013 when a benefactor bought it for The Bekonscot Model Village where it will be erected in an area surrounded by green hedges on a reinforced concrete column encased in ornamental brickwork. In outward appearance the brickwork will be similar to one of the piers that supported the veranda roof. The restored dial will be mounted on one face of an elongated timber cube (colloquially referred to as 'the dog kennel') topped by a cruciform ridged roof.

David Payne: *The Burlingham Walks and Sundial Trail – an 8-Year Quest*

On land owned by Norfolk County Council situated around North Burlingham a large tree planting exercise took place some years ago, resulting in the Burlingham Walks. With suitable open spaces what better to add interest to these spaces, asked David, than a Sundial Trail? A series of dials are now in place; these include a human analemmatic, cube as well as polar and equatorial dials. The equatorial dial is set in a tea garden at Fairhaven Gardens. These dials are supplemented by six scratch dials which can be found on churches in the neighbouring villages of Acle and South Walsham. Visitors can see 16 dials and are given instruction about sundials. Three declining dials are planned to be installed on the three sides of a triangular prism at another location and completed in 2016, giving a grand total of 19 dials.

Ben Jones: *The Roadford Lake Sundial (Quite a Big Sundial)*

Roadford Lake is a large reservoir north of the A30 a few miles west of Okehampton and it was here, Ben told us, that it was decided to erect a sundial to commemorate the Queen's Diamond Jubilee. The intention was that it

should be constructed entirely of materials which could be found in the county of Devon. Various designs were considered but rejected as impracticable and the decision was finally made to construct a large horizontal dial with a gnomon made of six vertical bars of increasing height, one for each decade of the Queen's reign. A diamond cut-out would be made in the tallest bar. These bars were to be made of highly polished stainless steel, hardly a Devon material, but at least the bars were made by Babcock's in Plymouth Dockyard. There are no working granite quarries in Devon now so the hour posts could only be made from reclaimed material. At the midnight position a pillar supports an Equation of Time scale.

Johan Wikander: *Octaval Hours and Common Hours in the Norwegian Middle Age*

Johan began by reminding us of two ways of dividing a dial, by lines at 45 or 15 degree spacing. In 17th-century Norway the former (indicating octaval hours) were used by sailors and fishermen while the latter (representing common hours) were used by inland town dwellers. Because of the Midnight Sun, dials were often calibrated throughout 360 degrees. He told us of the similarity between Anglo-Saxon and Norwegian terminology relating to tides and specific times of day. Johan then described a horizontal dial at the outer harbour of Traksvag which had been carved in sandstone probably between 1640 and 1660. The many carved lines would serve as a guide for later painting. This dial appeared to have lines belonging to both systems. A line well outside the circumference of the dial but radiating from its centre should be regarded as part of the dial; it probably marked an important mealtime for the dial's users.

Doug Bateman: *The Bromley House Library – its Meridian Line and its Connection with Nottingham's famous Mathematician, George Green*

Bromley House Library incorporates the library of the British Sundial Society, initially based on the books collected by Andrew Somerville, one of the principal founders of the Society. There is also a meridian line, one of only four in Britain, the others being at Ramsgate, Durham and Bramshill House. The meridian line was installed in 1834 and is a plain brass strip with no dates or zodiac signs engraved on it. It was covered over by carpet but was rediscovered and then completely revealed in 2013. The library has associations with George Green (1793–1848), a local miller's son, who became a renowned mathematician and developed a function which anticipated the work of James Clerk Maxwell on electromagnetism. There are two interesting clocks in the library while in its garden is a copy of a Pilkington & Gibbs heliochronometer.

Piers Nicholson: *The Sad Story of a Sundial – With a Happy Ending*

In the early 1990s the cycle charity Sustrans was developing cycle routes across England and, in order to help them, Piers rode across the whole of Wales from Holyhead to Chepstow in 1996. The following year the charity decided to switch to work camps to improve these routes and the speaker offered to make a sundial for them. This was sited on the south bank of the River Witham about one mile from Lincoln. Various designs were considered but considered impracticable or too expensive and the end result was a horizontal dial with a six metre stainless steel gnomon carrying an appropriate inscription and a concrete chapter ring infilled with gravel. Bad weather dogged the exercise and it was found later that local youths had been using the gravel as a skidpan for their bikes. The dial was to have been opened by John Prescott who failed to appear and the next year the river overflowed and washed mud all over the dial. More floods followed and trees grew up around the dial and when the speaker visited the site in 2013 he couldn't find it. Things did improve. Trees were removed in 2014 and it is hoped that further restoration will occur in the future.

Tony Moss: *A New BSS Universal Horizontal Dial for UK and European Latitudes*

Having an interest in the educational side of dialling, Tony began to develop various designs for dials that could be constructed by schoolchildren. Combinations of vertical, equatorial, polar and horizontal dials were submitted to teachers who declared them either too complicated or too difficult to make. A dial was needed which could be used throughout the length of Britain from the Isles of Scilly to the Shetlands. An approach was made to Kellogg's to ask if they could incorporate a cut-out dial on their cereal packets but this was declined for lack of space in their scheduled programme. Eventually a design was produced which could be downloaded from the BSS website to be printed onto A4 paper or self-adhesive labels and fixed to a suitable material such as plywood or thick card. These dials apply equally to schools or to any adult seeking an accurate working sundial.

After lunch we were taken by bus into Nottingham where the first port of call was Bromley House, home to the Nottingham Subscription Library and, of course, to the BSS Library. The staff had laid on a special display for us which included a print of a time ball on Nottingham City hall which is notable because it was not one that Doug Bateman had heard about. Bromley House incorporates a meridian line which has now been revealed over its entire length. In the back garden we enjoyed looking at a working heliochronometer made by Thomas Clarke.

Our second port of call in Nottingham was Sneinton to see Green's Mill, a windmill in full working order which was built by the father of George Green the noted 19th-century mathematician. In the grounds we admired a spherical dial by Harriet James.

We then returned to the University campus where we

At Bromley House, top to bottom: looking at the BSS Library; one-person-at-a-time staircase; the meridian line (SRN 3862) with hole cut out for a possible plumb-bob; heliochronometer (SRN 4181).

Spherical dial by Harriet James (SRN 6678) at Green's Mill.

visited the Millennium Garden to admire a fine armillary sphere by David Harber and to puzzle over the 'fountain clock'. On the wall of the School of English was an elegant new Saxon-style memorial sundial. In an attractive sunken garden some members looked at a puzzlingly plain horizontal dial. Then it was time for tea and sundial cakes, and in the evening the Gala Dinner.

Nottingham campus: David Harber armillary sphere in the Millennium Garden.

Nottingham campus: Horizontal dial in the sunken garden at Hugh Stewart Hall (SRN 1883). There are few hour numerals and fewer hour lines.

School of English, Nottingham: Copy of the Anglo-Saxon Kirkdale dial (SRN 0320) made in the 1990s for the 60th birthday of Christine Fell, a Professor of English, and donated to the University after her death. Thanks to John Foad for this information.

David Brown: *Graeco-Roman Sundials for Young Novices*

Immediately following our gala dinner, and still sitting at our tables, David gave us an impromptu presentation. Using a short video he gave an account of BSS educational work last January with Cheney School in Oxford. It was a practical workshop on classical dials and time keeping, and pupils made a card and plastic hemicyclium dial to take home. The day was so well-received that the BSS team has been invited back! See more details on the BSS website. This initiative is an important part of our mission to educate the public in all aspects of dialling.

John Lester: *Meet Jeanie Crowley – Renowned for her Sketches of West Country Sundials*

Jeanie died in 1965 and left behind an important and unique collection of 181 drawings of sundials, or parts of them, in Devon and Cornwall, based on visits to 543 churches, but she also included manor houses and farms in her search. Some dials were described and not drawn, for reasons which John discussed in his book on the subject and on a sheet of paper in the Conference exhibition. Jeanie began them in 1953

and they are now held in the Guildhall Library in London. Jeanie omitted dials in the towns, perhaps preferring to avoid spectators as she meticulously set about her task with her measuring equipment and so on, but never a camera! John has examined the original drawings and has also her interest in antiquities, and the techniques she used in her sundial project, pondering, for example, on the variability in the quality of the drawings (perhaps rain prevented her from finishing some of them on site?).

Chris Lusby Taylor: *A Mean Time Horizontal Sundial*

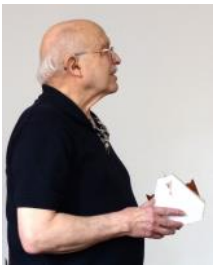
Our conference organiser had the least favoured slot for his talk, namely, following the conference dinner *and* two other presentations. But he rose to the challenge admirably (well he *was* the person responsible for the programming!), and the room was still full for his challenging subject (for some). Chris is well-known in the Society for his innovative sundial designs, and brings us at least one of them every year, to my knowledge. He told us that he had found Cousins's 1967 book the best one available for anyone wanting to make sundials. The dial described in the talk was commissioned by his late father and is located at an arboretum in Worcestershire. It uses a gnomon at the circumference rather than at the centre of the dial plate, and exploits the theorem that the angle at the centre is twice the angle at the circumference. An extra feature of the design is that the gnomon can be swivelled not only to track the Equation of Time but also to show BST or GMT. There were many more details and explanations than mentioned here. Chris finished by asking whether his dial design is the first of its kind. So, here is a challenge to all you dial designers and makers out there!

Sunday 12 April

There was a short discussion about the BSS *Bulletin*. It was noted that John Davies had carried the burden of this for a number of years and had built the *Bulletin* into the first-class publication that we have today. For this work he really deserved a medal but could not be expected to continue alone. Without further volunteers, we may have to accept slimmer issues of the *Bulletin* or less frequent publication.

Allan Mills: *Dialling Instruments in Holbein's Painting "The Ambassadors"*

Allan explained that the Ambassador was on the left of the picture and the figure on the right, the cleric, was possibly his brother from the strong facial resemblance. A number of dialling devices are shown in the picture made, it is thought, by Nicholas Kratzer. The most familiar are the celestial dial, the cylindrical or shepherd dial, a quadrant and a polyhedral dial. There is also shown a torquetum – an instrument for making astronomical observations and calculations. The painting has always prompted speculation about hidden meanings, not least because of the anamorphosis used in depicting the skull in the foreground. These are well covered in the book by John North but Allan's talk suggested that while Holbein was a consummate painter and Kratzer a master diallist, the former did not always grasp what the latter had done. At least one questioner suggested that Kratzer was not perhaps the master diallist that is often assumed and that Holbein simply painted what Kratzer had given him.



Dennis Cowan: *Scottish Obelisks and the Kirktonhall Project*

As well as entertaining us with stories associated with his photographing of some of Scotland's 20+ obelisk dials, Dennis described the proposal to renovate Kirktonhall, a 'B' listed historic mansion in West Kilbride, to include reduced-scale copies of all such dials on the roof of a new extension. He remarked that the form of several obelisks would lend themselves to the design of pieces for a chess set – and indeed this idea is being investigated. Dennis is pictured here holding the first example chessman.

Geoff Parsons: *The Memorial Sundial at Bosworth Field*

Geoff recommended a visit to the site of Richard III's defeat by Henry Tudor. Red and white roses are planted around the dial, a large horizontal which carries a crown at the top of the halbard-shaped gnomon. The dial marks the points of the compass and is surrounded by three thrones bearing the names of Richard III, Henry Tudor, Earl of Richmond, and Thomas, Lord Stanley who seemed to have a foot in both camps, although his action in support of Henry at Bosworth is thought to have been decisive.

John Wilson: *Studies on a Nottinghamshire Mass Dial (at Holy Trinity Church, Lambley)*

John Wilson, the Society's new Librarian, described a mass dial that had been revealed after being covered up for several centuries during repairs to Norman stonework. John speculated on the significance of the principal hour lines on the dial and reported on observations he had made of the dial in the sun.

Fred Sawyer: *Resurrecting Canon Pierre Georges*

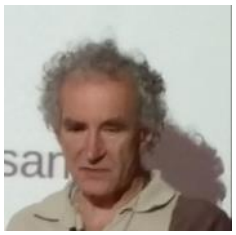
Fred Sawyer described his research on the work of the virtually forgotten 17th-century French Canon Pierre Georges. After ploughing through hundreds of pages of antiquated French, Fred managed to put together the story of an independent (ca. 1650) discovery of the analemmatic sundial and the design of an instrument similar to what we know today as a Bloud dial. Fred was able to reconstruct Georges' instructions for correcting for magnetic variation, and for reading time by the sun, the moon and any star you select in the heavens.

The Andrew Somerville Memorial Lecture

Leofranc Holford-Strevens: *The Dates of Easter Through the Ages*

Chris Lusby Taylor explained that this year's invited Andrew Somerville Memorial Lecturer, the author of *The History of Time* (OUP), was unwell and unfortunately unable to attend the conference, but had sent his manuscript in the hope that someone could present it.

Accordingly, Chris added some explanatory slides, extracted the points he felt confident to present, and did so.



The talk was on the history of the determination of the date of Easter. It ranged from the mathematical and astronomical to the political, taking in secular and religious conflicts of interest over 2000 years. A tenuous link to sundials was provided by Regiomontanus, who was one of many asked to revise the Catholic Church's calendar.

The climax of the talk was the revelation that, while most attendees had celebrated Easter a week before, the date of the lecture was, in fact, the Orthodox Easter Day. One of our members is Greek Orthodox and we were able to wish her Happy Easter.

All too soon it was time to say goodbye, but not before we were asked to cast our votes for the Most Enjoyed *Bulletin* Article 2014 (see Editorial for the result).

Photos from Irene Brightmer, Jackie Jones, Frank King, Mike Shaw and Chris Lusby Taylor

MINUTES OF THE 26th BSS ANNUAL GENERAL MEETING
Nottingham, 11 April 2015

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

This was the Society's first AGM as a Charitable Incorporated Organisation (CIO) held under the new constitution. The 'old' Society (Registered Charity Number 1032530) has been dissolved.

1. Minutes of previous AGM

The minutes of the 25th AGM, held at Greenwich on 25 April 2014, were published with the June 2014 *Bulletin*. No comments were received by the Secretary and the Chairman signed them prior to the 'old' Society's dissolution.

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

As required by the new CIO constitution both documents were circulated to all members before the AGM. No comments were made on either, and both the accounts and report were taken as accepted.

3. Election of trustees

The new CIO constitution requires a third of elected trustees to retire each year by rotation: the exception being the first CIO AGM when all must retire. All trustees offered themselves for re-election.

David Brown, Jackie Jones, Frank King, Chris Lusby Taylor, Graham Stapleton, Bill Visick, and Chris Williams were elected to the office of charity trustee.

4. Appoint examiner for 2015 annual statement of accounts

Independent Examiners Ltd was reappointed.

5. AOB

No other business was raised.

Secretary
16 April 2015

TRUSTEES' ANNUAL REPORT

Last year witnessed the Society's Silver Jubilee. As befits such an historic milestone it was celebrated at a special conference held in historic and iconic Greenwich. The Society has much to be proud of. We have an established cycle of activities for members and charitable support for the public. Our publications (the *Bulletin* and Monographs) and Registers (fixed and mass dial) are an outstanding contribution to knowledge and a massive resource. Turning to the future the Society has successful and firm foundations to build on.

Increasingly the world is being shaped by, and dependent on, the Internet. Our website is the Society's primary interface with the public. Visits thereto continue to grow strongly with page views up by about a third year-on-year, with both new and returning visitors viewing more of the site's content. Most new members find us via the website, often having got in touch with our Help and Advice service. In today's world improving the website is the most effective lever we have to meet the Society's object – the advancement of the education of the public in the science and art of gnomonics.

More of the Society's knowledge and research needs to be made available on the website. An excellent start has been made with some 2,500 dials (from our fixed dial records) now on our website; and work is in hand to upload a further significant tranche of dials. Preparatory work has begun to commence uploading mass dials. It is also planned to put the *Biographical Index of British Sundial Makers from the Seventh Century to 1920* and *Make a Sundial* online. This is the start of a rolling programme that will see increasing content on our website.

In January the Society held a series of workshops for some 120 pupils at Cheney School (Oxford) on classical Greek and Roman time keeping and dials. The day was a tremendous success and we have been invited back. Activity and materials aimed at schools and pupils is a relatively underdeveloped area. Dialling is a subject that can be incorporated into several parts of the curriculum – history, science, mathematics and design/technology. There is an opportunity to discuss the role of the Society in schools at the Nottingham conference.

The Greenwich AGM's overwhelming vote that the Society become a Charitable Incorporated Organisation (CIO) has been implemented. The Society now has a (new) constitution reflecting the Charity Commission's current view on best practice governance. The CIO is also a legal structure that removes exposure to unlimited liability. Together with changes to the website's terms of use (including privacy policy and acceptable use), and an enhanced insurance policy, risk is now materially reduced and better managed. The Society is fit for purpose in the modern world.

A consequence of the change to CIO status is that the Society existed as two separate legal entities during the last year. As a result there are two sets of accounts – the closing accounts of the dissolved 'old' Society (presented to members in the March 2015 *Bulletin*) and the opening accounts of the 'new' CIO Society (made available before the Nottingham AGM). Together, the two sets of accounts show that in our normal accounting period, calendar 2014, the Society's income and expenditure were in balance. The Society's finances remain on a sound footing able to sustain the Society for the foreseeable future.

The fourth Sundial Design and Restoration awards scheme, covering dials made or restored between 2010 and 2015, has been announced.

The Society's Library continues to flourish, and we are grateful for donations from the estates of Dick Chambers and Anthony Eden. We must also thank Chris Daniel for donating further books and items: these supplement his very generous earlier donations. Chris' recent donations include his remarkable collection of 244 'The Sundial Page' articles in *Clocks Magazine* 1988–2008. It is hoped that the Library and its meridian line can be visited during the Nottingham conference.

The Society's 'output' is solely dependent on members' participation and cooperation. Thanks are due to all individuals who make the Society what it is – authors, recorders, specialists, trustees, and those who help on an *ad hoc* basis. We have a dedicated and devoted band of volunteers, but more are always welcome. Much work is behind the scenes, and the burden on certain individuals is not always generally realised. If you have an idea or would like to help we would love to hear from you.

David Brown, Jackie Jones, Frank King, Chris Lusby Taylor, Graham Stapleton, Bill Visick and Chris Williams

ANNEXE

Registrar

Bridol (British Dials On Line) is now operational on the website, thanks to the skill and dedication of Bill Visick, and thanks to the small army of helpers who have re-written the Register entries to make them suitable for public use. Bridol currently shows some 2,500 dials classified in the Register as 'Open'. Helpers are currently engaged on a similar exercise for 'Visible' and 'Restricted' dials, which will potentially bring in a further 2,000 dials.

The Register has been published every five years since the year 2000, and I hope to issue it again this year. The full printed version had grown to two fat volumes for the 2010 edition, and would now probably run to three volumes. The

format for 2015 is still under discussion, but may consist of the DVD and the Abridged A5 volume, as in 2010, plus 'County' versions of the full Register, each about the size of a *Bulletin*, which could be purchased individually.

John Foad

Education

Like last year, the small number of sundial-related queries that have come through emails have been answered within 48 hours either by me or directed to someone appropriate. I have continued to distribute back copies of the *Bulletin* to practising teachers in the hope this will increase awareness of the BSS.

I was contacted by the sons of David Scott in June with regard to his collection of material dealing with Anglo-Saxon dials. This proved what a small world it is as I had taught David's granddaughter without knowing a decade ago! David's research materials were passed onto Tony Wood at the Newbury meeting in September and since his collection of *Bulletins* was not wanted by any single BSS member there they have been distributed to mathematics teachers.

Unfortunately I could not make the Ancient Greek and Roman astronomy day at the East Oxford Community Classics Centre on 20 January, but it was attended by David and Jenny Brown, Bill Visick and Chris Williams and a full report can be read at: *sundialsoc.org.uk/news/dial-making-at-the-iris-project/* – what a fantastic job they did!

Peter Ransom

Mass Dial Group

There has been a steady number of reports from various sources, NADFAS as usual continuing to provide useful data. There have also been a few enquiries from people of the nature 'Is this a mass dial?'

Entries to the Mass Dial Register have continued and it was decided that, to speed things up a bit, a 'Reduced Information Format' would be adopted wherein the basic information of: site (O.S. ref.), dedication, location on church details (including height above ground level), and a photograph would be entered. The remaining data could then be entered and provided if requested. Oxfordshire (537 dials recorded) is the first county to be so treated and is now complete. The letters RIF appear on the data sheets for those dials entered under the new system.

One NADFAS report was for St Cuthbert's, Darlington which has had on display for over 100 years a marked-out stone which has been labelled 'Mass Dial'. There is a difference of opinion within the Group as to whether it is mass dial (or part of a cheese press or similar) – a difference so far unresolved, I am afraid.

I hope to make a start on Berkshire as the next county. Copies of the County Records will continue to be sent to the BSS Library. The Borthwick Institute in York will hold the original reports and provide printed county records for public access.

Tony Wood

Biographical Projects

I have been totting up the additional material that has accumulated since the publication of BSS Monograph No. 2 – *The Biographical Index of British Sundial Makers.* The number of new names is nearing 300, major changes or complete rewrites have been made to some 28 entries and almost 250 others have been significantly added to, let alone two deletions. One of the latter turned out to have been a misreading of a damaged inscription and the other was a chap with the same name as a maker but a different date and location of premises. And innumerable new *Bulletin* and other references have been entered as well.

Once again, my heartfelt thanks to all who have sent me information about known or new makers that they have come across. Please keep the details coming. I hope that it will not be long before I can hand over a revised draft so that you all can read the new version.

Meanwhile – do not hesitate to contact me if you think I may be able to provide some information of help to you.

Before the third version is ready to be sent to the Editor, I am pleased to be able to tell you that there are plans to place the current edition (and future versions) on the website. As part of that scheme I've formally assigned the copyright of all existing and future editions to the Society – with all the working papers and so on. I had thought that the BSS possessed the copyright anyway – after all, they published both first and second editions, but this means there can be no misunderstandings or complications. 1 now have a licence to use all the material I've collected (subject to certain rather obvious conditions of course) so there is no problem about continuing my collection of new material or altering existing notes or indeed any other use I can imagine. This also seems to have the potential advantage that, should I decide that enough is enough and I shall not be proceeding to a fourth version, all my files, folders and papers can be handed over to BSS and I shall not have to worry about whether they will be properly looked after. If you have ever produced anything for the BSS it could be well worth while thinking about making sure they hold the formal copyright – it could save a lot of hassle.

Jill Wilson

Photographic Competition

Members are reminded that the next competition will take place in the 2015–16 year, with the results being announced at the 2016 Conference. Reminders will be included in the September and December 2015 editions of the Newsletters, with entry forms and a copy of the rules also being included with the *Bulletin* at the same time.

Ian Butson

BSS ACCOUNTS FOR THE PERIOD

THE BRITISH SUNDIAL SOCIETY
(CHARITABLE INCORPORATED ORGANISATION)

LEGAL AND ADMINISTRATIVE INFORMATION

CHARITY NUMBER	1155688
LEGAL FORM	Charitable Incorporated Organisation formed under the Charities Act 2011.
START OF FINANCIAL PERIOD	7th February 2014
END OF FINANCIAL PERIOD	31st December 2014

TRUSTEES AT 31ST DECEMBER 2014

Dr F King - Chairman
C Williams - Secretary
J Jones - Membership Secretary
G Stapleton - Treasurer
B Visick - Webmaster
C Lusby Taylor - Conference Organiser
D Brown - Help & Advice Coordinator

GOVERNING INSTRUMENT	Constitution as incorporated 7th February 2014.
OBJECTS	The advancement of the education of the public in the science and art of Gnomonics.
CONVERSION TO CIO	The members of the unincorporated charity British Sundial Society (former registered charity number 1032530) agreed at the April 2014 AGM that the Society become a Charitable Incorporated Organisation (CIO). The British Sundial Society (CIO) was formed and registered as a charity on the 7th February 2014 (registered charity number 1155688) and took over all the activities of the former British Sundial Society from the 8th August 2014.
CORRESPONDENCE ADDRESS	The British Sundial Society c/o Royal Astronomical Society Burlington House Piccadilly London W1J 0BQ
PRIMARY BANKERS	The Co-operative Bank plc PO Box 101 1 Balloon Street Manchester M60 4EP
INDEPENDENT EXAMINER	M J Easton BSc (Hons) MBA Independent Examiners Ltd Sovereign Centre Poplars Yapton Lane Walberton West Sussex BN18 0AS

7 FEBRUARY TO 31 DECEMBER 2014

INDEPENDENT EXAMINER'S REPORT ON THE ACCOUNTS

Report to the trustees/members of The British Sundial Society on the accounts for the first period as a CIO ended 31st December 2014 which have been set out on pages 5 to 11.

Respective responsibilities of trustees and examiner

The organisation's trustees are responsible for the preparation of the accounts. The organisation's trustees consider that an audit is not required for this period (under section 144(2) of the Charities Act 2011 (the Act)), and that an independent examination is needed.

It is my responsibility to:

- examine the accounts (under section 145 of the Act);
- follow the procedures laid down in the General Directions given by the Charity Commissioners (under section 145(5)(b) of the Act); and
- state whether particular matters have come to my attention.

Basis of independent examiner's statement

My examination was carried out in accordance with General Directions given by the Charity Commissioners. An examination includes a review of the accounting records kept by the organisation and a comparison of the accounts presented with those records. It also includes consideration of any unusual items or disclosures in the accounts, and seeking explanations from the trustees concerning any such matters. The procedures undertaken do not provide all the evidence that would be required in an audit, and consequently no opinion is given as to whether the accounts present a 'true and fair view' and the report is limited to those matters set out in the statement below.

Independent examiner's statement

In connection with my examination, no matter has come to my attention:

(1) which gives me reasonable cause to believe that in any material respect the requirements:
- to keep accounting records in accordance with section 130 of the 2011 Act as amended; and
- to prepare accounts which accord with the accounting records and comply with the accounting requirements of the Act

have not been met; or

(2) to which, in my opinion, attention should be drawn in order to enable a proper understanding of the accounts to be reached.

M J Easton BSc (Hons) MBA
Independent Examiners Ltd
Sovereign Centre
Poplars
Yapton Lane
Walberton
West Sussex
BN18 0AS

Dated: 26 March 2014

THE BRITISH SUNDIAL SOCIETY
(CHARITABLE INCORPORATED ORGANISATION)

STATEMENT OF FINANCIAL ACTIVITIES
FOR THE FIRST PERIOD ENDED 31ST DECEMBER 2014

	Notes	Unrestricted Funds £	Restricted Funds £	Total 11 months 2014 £
INCOMING RESOURCES				
Voluntary Income	**3a**	0	0	0
Investment Income	**3b**	146	0	146
Incoming Resources from Charitable Activities	**3c**	2,502	0	2,502
TOTAL INCOMING RESOURCES		**2,648**	**0**	**2,648**
RESOURCES EXPENDED				
Charitable Activities	**4a**	4,419	0	4,419
Administration Costs	**4b**	850	0	850
Governance Costs	**4c**	676	0	676
TOTAL RESOURCES EXPENDED		**5,945**	**0**	**5,945**
NET INCOMING/ (OUTGOING) RESOURCES		**-3,297**	**0**	**-3,297**
Total Funds Brought Forward		78,038	8,963	87,001
Gains on revaluation of fixed assets for charity's own use (Library)	**2**	593	0	593
TOTAL FUNDS CARRIED FORWARD		**75,334**	**8,963**	**84,297**

Movements on all reserves and all recognised gains and losses are shown above. All of the old society's operations (registered charity number 1032530) have been transferred to the Charitable Incorporated Organisation (registered charity number 1155688) and all activities of the old society discontinued.

The notes on pages 52 to 56 form part of these financial statements.

THE BRITISH SUNDIAL SOCIETY
(CHARITABLE INCORPORATED ORGANISATION)

BALANCE SHEET
AS AT 31ST DECEMBER 2014

	Notes	Unrestricted Funds £	Restricted Funds £	31-Dec-14 Total £	08-Aug-14 Total £
Fixed Assets					
Tangible assets	2	17,228	0	17,228	16,635
Current Assets					
Debtors	8	0	0	0	0
Cash at bank and in hand	7	58,697	8,963	67,660	80,542
Total Current Assets		**58,697**	**8,963**	**67,660**	**80,542**
Creditors: amounts falling due within one year	9	591	0	591	10,176
NET CURRENT ASSETS		58,106	8,963	67,069	70,366
NET ASSETS		**75,334**	**8,963**	**84,297**	**87,001**
Funds of the Charity					
General Funds		75,334	0	75,334	78,038
Restricted Funds	6	0	8,963	8,963	8,963
Total Funds		**75,334**	**8,963**	**84,297**	**87,001**

Trustees' Responsibilities

The Charities Act 2011 requires the trustees to prepare financial statements for each financial period which give a true and fair view of the state of affairs of the trust and of the surplus or deficit of the trust for that period. In preparing those financial statements the trustees are required to:

- select suitable accounting policies and apply them consistently;
- make judgements and estimates that are reasonable and prudent;
- prepare financial statements on the going concern basis unless it is inappropriate to presume that the trust will continue in existence;
- state whether applicable accounting standards and statements of recommended practice have been followed, subject to any material departures disclosed and explained in the financial statements.

The trustees are responsible for keeping proper accounting records, which disclose with reasonable accuracy at any time the financial position of the trust. They are also responsible for safeguarding the assets of the trust and hence for taking reasonable steps for the prevention and detection of fraud and other irregularities.

These accounts were approved by the Trustees of the CIO on the 18 March 2015 and signed on their behalf by:

Signed Frank H. King Dr. F. King, Chairman.

Signed G. Stapleton, Treasurer.

THE BRITISH SUNDIAL SOCIETY
(CHARITABLE INCORPORATED ORGANISATION)

NOTES TO THE FINANCIAL STATEMENTS FOR THE FIRST PERIOD ENDED 31ST DECEMBER 2014

1. ACCOUNTING POLICIES

Incoming Resources

Recognition of Incoming Resources

These are included in the Statement of Financial Activities (SOFA) when:

- the charity becomes entitled to the resources;
- the trustees are virtually certain they will receive the resources; and
- the monetary value can be measured with sufficient reliability.

Incoming Resources with Related Expenditure

Where incoming resources have related expenditure (as with fundraising or contract income) the incoming resource and related expenditure are reported gross in the SOFA.

Grants and Donations

Grants and Donations are only included in the SOFA when the charity has unconditional entitlement to the resources.

Tax reclaims on Donations and Gifts

Incoming resources from tax reclaims are included in the SOFA during the same period as the gift to which they relate.

Contractual Income and Performance Related Grants

This is only included in the SOFA once the related goods or services has been delivered.

Gifts in Kind

Gifts in kind are accounted for at a reasonable estimate of their value to the charity or the amount actually realised. Gifts in kind for sale or distribution are included in the accounts as gifts only when sold or distributed by the charity. Gifts in kind for use by the charity are included in the SOFA as incoming resources when receivable.

Donated Services and Facilities

These are only included in incoming resources (with an equivalent amount in resources expended) where the benefit to the charity is reasonably quantifiable, measurable and material. The value placed on these resources is the estimated value to the charity of the service or facility received.

Volunteer Help

The value of any voluntary help received is not included in the accounts but is described in the trustees' report.

Investment Income

This is included in the accounts when receivable.

Investment Gains and Losses

This includes any gain or loss on the sale of investments and any gain or loss resulting from revaluing investments to market value at the end of the period.

Expenditure and Liabilities

Liability Recognition

Liabilities are recognised as soon as there is a legal or constructive obligation committing the charity to pay out resources.

NOTES TO THE FINANCIAL STATEMENTS (continued) FOR THE FIRST PERIOD ENDED 31ST DECEMBER 2014

Expenditure and Liabilities (continued)

Governance Costs

Include costs of the preparation and examination of statutory accounts, the costs of the trustees' meetings and cost of any legal advice to trustees on governance or constitutional matters.

Changes in Accounting Policies

There have been no changes to the accounting policies used by the former charity British Sundial Society (registered charity number 1032536).

Annual Commitments

There are no annual commitments under non-cancelling operating leases and no capital commitments.

Assets

Tangible fixed assets for use by the charity:

The British Sundial Society Library is stated at valuation based on the 2014 value calculated by Rogers Turner Books.

Investments

Investments quoted on a recognised stock exchange are valued at market value at the period end. Other investment assets are included at trustees' best estimate of market value.

Basis of preparation:

The financial statements have been prepared on the historical cost basis of accounting in accordance with the Charities Act 2011 and in accordance with applicable accounting standards. In preparing the financial statements the charity follows best practice as laid down in the Statement of Recommended Practice "Accounting and Reporting by Charities" (SORP 2005) issued in March 2005.

2. TANGIBLE FIXED ASSETS

		Unrestricted Funds £	Restricted Funds £	Total £
Library				
Opening	08-Aug-14	16,635	0	16,635
Revaluation		593	0	593
Cost at	31-Dec-14	17,228	0	17,228
Depreciation	08-Aug-14	0	0	0
Charge		0	0	0
Depreciation at	31-Dec-14	0	0	0
Net Book Value	31-Dec-14	**17,228**	**0**	**17,228**
Net Book Value	08-Aug-14	16,635	0	16,635

The British Sundial Society (CIO) has had the Library revalued by Rogers Turner Books as the previous valuation was outdated. The new replacement cost valuation is £17,228.

NOTES TO THE FINANCIAL STATEMENTS (continued) FOR THE FIRST PERIOD ENDED 31ST DECEMBER 2014

3. INCOMING RESOURCES

	Notes	Unrestricted Funds £	Restricted Funds £	Total 11 months 2014 £
a) Voluntary Income				
Donations and Gift Aid				0
Bequests & Legacies				0
		0	**0**	**0**
b) Investment Income				
Interest		146		146
		146	**0**	**146**
c) Incoming Resources from Charitable Activities				
Subscriptions		1,633		1,633
Events	5	350		350
Sales		519		519
		2,502	**0**	**2,502**

4. RESOURCES EXPENDED

a) Charitable Activities				
Bulletin		3,778		3,778
Education		210		210
Events	5	37		37
Sales		53		53
Travel		341		341
		4,419	**0**	**4,419**
b) Administration Costs				
Administration		648		648
Banking / Insurance		176		176
Library		19		19
Miscellaneous		7		7
		850	**0**	**850**

NOTES TO THE FINANCIAL STATEMENTS (continued) FOR THE FIRST PERIOD ENDED 31ST DECEMBER 2014

4. RESOURCES EXPENDED (continued)

	Unrestricted Funds £	Restricted Funds £	Total 11 months 2014 £
c) Governance Costs			
Independent Examiners Fees	591		591
Professional Fees	85		85
	676	**0**	**676**

5. EVENTS

	Balance 08-Aug-14 £	Income £	Expenditure £	Balance 31-Dec-14 £
Cheltenham Conference (2012)	2,178			2,178
Edinburgh Conference (2013)	-2,450			-2,450
Greenwich Conference (2014)	4,717			4,717
Safari	200			200
Day Meetings	229	350	37	542

6. RESTRICTED FUNDS

	Balance 08-Aug-14 £	Income £	Expenditure £	Balance 31-Dec-14 £
Andrew Somerville Memorial Fund	7,815			7,815
St Katherine Cree Restoration Fund	1,148			1,148
	8,963	**0**	**0**	**8,963**

The restricted funds are wholly represented by cash reserves of the charity.

7. CASH AT BANK AND IN HAND

	Unrestricted Funds £	Restricted Funds £	**Total 31-Dec-14 £**	**Total 08-Aug-14 £**
Current Account	5,828		5,828	18,849
Charities Office Investment Fund	52,869	8,963	61,832	61,693
	58,697	**8,963**	**67,660**	**80,542**

8. DEBTORS AND PREPAYMENTS

There are no Debtors or Payments in Advance at the end of the financial period.

9. CREDITORS, ACCRUALS AND DEFERRED INCOME: AMOUNTS FALLING DUE WITHIN ONE YEAR

	Unrestricted Funds £	Restricted Funds £	**Total 31-Dec-14 £**	**Total 08-Aug-14 £**
Independent Examiners Fees	591		591	591
Greenwich Conference (2014)			0	9,585
	591	**0**	**591**	**10,176**

NOTES TO THE FINANCIAL STATEMENTS (continued) FOR THE FIRST PERIOD ENDED 31ST DECEMBER 2014

10. TRUSTEES AND OTHER RELATED PARTIES

Apart from the transfer of assets and liabilities to the Charitable Incorporated Organisation (approved by members at the 2014 AGM) and the reimbursements of expenses incurred whilst acting on behalf of the charity, no other payments were made to trustees or any persons connected with them during this financial period. No material transaction took place between the organisation and a trustee or any person connected with them.

11. RISK ASSESSMENT

The trustees actively review the major risks which the charity faces on a regular basis and believe that maintaining the free reserves stated, combined with the yearly review of the controls over key financial systems carried out on an annual basis will provide sufficient resources in the event of adverse conditions. The trustees have also examined other operational and business risks which they face and confirm that they have established systems to mitigate the significant risks.

12. RESERVES POLICY

The trustees have considered the level of reserves they wish to retain appropriate to the charity's needs. This is based on the charity's size and the level of financial commitments held. The trustees aim to ensure the charity will be able to continue to fulfil its charitable objectives even if there is a temporary shortfall in income or unexpected expenditure. The trustees will endeavour not to set aside funds unnecessarily.

13. PUBLIC BENEFIT

The charity acknowledges its requirement to demonstrate clearly that it must have charitable purposes or 'aims' that are for the public benefit. Details of how the charity has achieved this are provided in the Trustees' report. The trustees confirm that they have paid due regard to the Charity Commission guidance on public benefit before deciding what activities the charity should undertake.

14. CHARITABLE INCORPORATED ORGANISATION (CIO)

At the 2014 AGM the members of the British Sundial Society decided to become a Charitable Incorporated Organisation (Charity Registration Number 1155688).

All assets and liabilities of the British Sundial Society (1032530) were transferred on the 8th August 2014 to The British Sundial Society CIO (1155688) total £87,001 of which £8,963 were restricted as per Note 6 in these financial statements.
This is shown in the Balance Sheet at the 8th August 2014 as:-

Fixed assets of £16,635.
Cash of £80,542 (Current Account £18,849 and Charities Office Investment Fund £61,693) .

Creditors of £10,176 (Greenwich University £9,585 and Independent Examiners Ltd £591 for the accounts).

The British Sundial Society (CIO) accounts were dormant from the formation date of 7th February 2014 until funds were transferred from the British Sundial Society on the 8th August 2014.

HONORARY OFFICIALS OF THE BRITISH SUNDIAL SOCIETY

Patron: The Hon. Sir Mark Lennox-Boyd
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